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Van Son Lai, Duc Khuong Nguyen, William Sodjahin, Issouf Soumaré

IPAG BUSINESS SCHOOL

184, Boulevard Saint-Germain
75006 Paris
France

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DISCRETIONARY IDIOSYNCRATIC RISK, FIRM CASH HOLDINGS AND INVESTMENT

VAN SON LAI *[a] DUC KHUONG NGUYEN [b]
WILLIAM SODJAHIN [c] ISSOUF SOUMARÉ [a]

[a] *Department of Finance, Insurance, and Real Estate, Laval University, Laval, Canada*
[b] *IPAG Business School, Paris, France and SPEA, Indiana University, Bloomington, United States*
[c] *Stern School of Business, New York University, New York, United States*

ABSTRACT

We identify a novel concept of discretionary idiosyncratic volatility proxied by the idiosyncratic volatility component not related to the non-systematic industry volatility, as a source of agency problems that have implications for both firms' cash holdings and their investment decisions. We find that firms with low discretionary idiosyncratic volatility, which likely captures discretionary effort and risk-taking by managers, have smaller cash reserves. Moreover, while high discretionary idiosyncratic volatility firms spend cash internally (internal capital building), low discretionary idiosyncratic volatility firms use it for external acquisitions, consistent with the 'quiet life' hypothesis. Our findings thus indicate a need for reinforcement of existing regulations and corporate laws to control for agency costs, which could in turn reduce firm risk and the probability of financial meltdown at the aggregate level.

JEL Classifications: G13; G22; G28; G32
Keywords: cash holdings, discretionary idiosyncratic volatility, agency problems, investment decisions, 'quiet life' hypothesis.

[*] ***Corresponding author***: FSA ULaval, Department of Finance, Insurance, and Real Estate, 2325, rue de la Terrasse Quebec (Québec), G1V 0A6, CANADA. *Email addresses*: V.S. Lai (VanSon.Lai@fsa.ulaval.ca), D.K. Nguyen (duc.nguyen@ipag.fr), W. Sodjahin (wsodjahi@stern.nyu.edu), and I. Soumaré (Issouf.Soumare@fsa.ulaval.ca)

1. INTRODUCTION

Since the development of the Capital Asset Pricing Model (CAPM), the concept of idiosyncratic risk or specific risk has been extensively employed in many applications. Recently, Vidal-García and Vidal (2014) examine, for example, the relationship between seasonality, idiosyncratic risk and mutual fund returns. Wang et al. (2015) study the impact of using an innovative financial contract, named equity-for-guarantee swap in entrepreneurial finance on the project idiosyncratic risk. Ai and Kiku (2016) propose to measure growth opportunities by firms' exposure to idiosyncratic volatility news. Managing a firm's cash is thus of vital importance and since Miller and Orr (1966), the management science literature on cash management abounds (e.g., Constantinides and Richard, 1978; Srinivasan and Kim, 1986; McBride et al., 1989, Ashford et al., 1988; Premachandra, 2004; Gormley and Meade, 2007; Bensoussan et al., Chutani, and Sethi, 2009).

We show, in this paper, that discretionary idiosyncratic risk as measured by idiosyncratic volatility component not related to the non-systematic industry volatility is a source of agency costs that have implications for firm cash holdings and allocation of cash between internal capital building and external acquisition. In an environment where investors face moral hazard problems stemming from managerial effort, we identify the discretionary idiosyncratic risk and hypothesize it as a channel through which agency costs affect cash holdings, while controlling for cash flow risk (e.g., Jin, 2002; Garvey and Milbourn, 2003). Similar to Servaes and Tamayo (2013), we also highlight that both cash flow and discretionary idiosyncratic risks coexist.[1]

In the related literature, Bates et al. (2009) show that average cash-to-assets ratios for U.S. industrial firms have more than doubled from 1980 to 2006. They argue that cash ratios increased because firms' cash flows became riskier, and while the precautionary motive for cash holdings plays an important

[1] Servaes and Tamayo (2013) study how industry peers respond when another firm in the industry is the subject of a hostile takeover attempt and find that the industry peers cut their capital spending, free cash flows, and cash holdings, and increase their leverage and payouts to shareholders.

role in explaining the increase in cash ratios, they find no consistent evidence that agency conflicts contribute to the increase.[2] Yet, Irvine and Pontiff (2009) show that from 1964 to 2003, the increase in stock market idiosyncratic risk mirrored an increase in cash flow volatility. Hence, if cash flow volatility and idiosyncratic risk have the same effect on cash holdings, the idiosyncratic risk marginal effect should be insignificant, controlling for cash flow volatility. However, the increasing trend in idiosyncratic risk has reversed in recent years as illustrated in Figure 1 and supported by Brandt et al. (2010) and Bekaert et al. (2008), while at the same time, cash flow risk has maintained its upward trend.[3]

INSERT FIGURE 1 HERE

Because firm cash holdings and cash flow volatility maintain their upward trend, we posit that cash flow volatility and idiosyncratic risk may have different effects on firm cash holdings behavior. Moreover, if cash flow volatility and idiosyncratic risk had the same effect on cash holdings, the idiosyncratic risk marginal effect (or for our story, the discretionary idiosyncratic risk) should be insignificant, controlling for cash flow volatility, or vice versa. We provide evidence that this is not the case and offer an agency interpretation. Focusing on the firm's discretionary idiosyncratic risk as fallout from agency problems, this paper is motivated by several works. First, John and Kadyrzhanova (2012) have recently documented that firm-specific risk is an important but overlooked source of agency costs. Second, spinning further, a low discretionary idiosyncratic risk can also reflect a low managerial risk taking (e.g., John et al., 2008) and a "quiet life" enjoyment as in Bertrand and Mullainathan (2003).

[2] Bates et al. (2009) summarize the four motives for firms to increase cash holdings: transaction (e.g., Baumol, 1952; Miller and Orr, 1966), precautionary (e.g., Almeida et al., 2004), Acharya et al., 2007), tax (e.g., Foley et al., 2007), and agency (e.g., Dittmar and Mahrt-Smith, 2007; Pinkowitz et al., 2006; Harford et al., 2008). For recent analyses of other issues on cash holdings, see for example, Denis and Sibilkov (2010), Klasa et al. (2009), Acharya et al. (2012), and Lins et al., (2010).

[3] The puzzling behavior of idiosyncratic risk of stock returns has attracted much attention in the literature (e.g., Duan et al., 2009; Rubin and Smith, 2011; Campbell et al., 2001).

We therefore expect the agency costs of discretionary idiosyncratic risk, just as corporate governance to have implications for firm's cash holdings and cash allocation (Harford et al., 2008).[4]

Our empirical analysis in this paper is conducted in two steps. In the first step, we examine how firms' cash holding policy is affected by the level of discretionary idiosyncratic risk. In the second step, we study the implications of the relationship between discretionary idiosyncratic risk and cash holdings for the firm investments.[5] For these purposes, we introduce a novel metric that we call discretionary idiosyncratic risk to measure the idiosyncratic volatility component not related to the non-systematic industry volatility. In our setting, idiosyncratic risk (or firm specific risk) is measured by equity residual risk after accounting for market risk, which is derived from the CAPM or from the Fama and French (1993) three-factor model.[6] The discretionary idiosyncratic risk is then derived as follows. First, we run a linear regression of the industry cash flow volatility on stock market volatility to obtain the unsystematic (estimated residuals) component. Second, we run a linear regression of idiosyncratic risk on the unsystematic component of cash flow volatility to get the discretionary idiosyncratic risk (estimated residuals). We view this discretionary idiosyncratic risk congruent to managerial discretionary effort, and as a manifestation of agency costs that have implications for not only firm cash holdings but also its investments.[7] Albeit contextually different, similar decomposition approach may be found in, among others, Almeida and Wolfenzon (2005).

Using firm-year observations from 1985 to 2007 and controlling carefully for endogeneity problems, we document a positive influence of discretionary idiosyncratic risk on cash holdings in the

[4] See, also, Casey (2001) for discussing a general stochastic framework for designing firms' corporate investment, financing and risk management strategies, Baule (2014) for the allocation of risk capital on an internal market, and Gamba and Triantis (2013) for integrating liquidity, hedging, and operating policies.

[5] Even though there are other forms of cash allocation, we focus in this paper on the allocation of cash toward internal investment versus external acquisition, among other possible uses of cash.

[6] Among numerous studies à la Fama and French (1993), Brogaard and Detzel (2015) use the model to build portfolios formed on size and momentum returns and find that economic policy uncertainty (EPU) in the US is an economically important risk factor for equities.

[7] See Panousi and Papanikolaou (2012) for a recent study of idiosyncratic risk and investment.

presence of a positive and significant cash flow risk effect. This result suggests that firms with high discretionary idiosyncratic risk hold more cash, whereas firms with low discretionary idiosyncratic risk have smaller cash reserves. In other words, the result indicates that managers who tend to enjoy "quiet life" spend cash quickly. Our analysis thus supports both precautionary and agency motives for firm cash holdings. Interestingly, we complement Bates et al. (2009), by showing that, not only, the precautionary motive for firm cash holding is mainly driven by its business risk (confirming their finding), but also an agency motive, proxied by discretionary idiosyncratic risk, does play a role in all of these.

We then attempt to answer the question of how low discretionary idiosyncratic risk firms spend their cash in the second step of the analysis. To do so, we study the comparative allocation of investment between internal capital building and external acquisition to the extent that capital budgeting is one major corporate decision for managers. These two types of investment can be very different as far as agency problems are concerned because internal capital building is continuous, incremental and requires more constant effort as opposed to more infrequent and lumpier external acquisition (Yang, 2008). For instance, Stenbacka and Tomlak (2002) develop a theory showing that the optimal combination of debt and equity financing depends on the firm's internal funds. Using capital expenditure as a proxy for firm's internal capital investment as opposed to external acquisitions[8], our results show that while high discretionary idiosyncratic volatility firms spend cash internally (internal capital building), low discretionary idiosyncratic volatility firms use it for external acquisitions. This suggests that managers of low discretionary idiosyncratic volatility firms choose to make external acquisition (purchase of "used capital") rather than to build progressively internal capital which presumably requires more effort. This result lends support for the hypothesis that managers enjoy 'quiet life'. Indeed, we

[8] Our choices of investment measures are guided by the fact that capital expenditure is the main class of internal capital investment, while external acquisitions are highly correlated to external investments (see Harford et al., 2008).

argue that the preference for external acquisitions by managers of low discretionary idiosyncratic risk firms may not only be driven by managerial slack but also be motivated by possible opportunities of private benefits extraction derived from the acquisition transactions. Moreover, we provide evidence that this difference in investment behavior is only present when the cash reserves are low. Therefore, the investment behaviors of cash-rich firms do not differ significantly whatever their discretionary idiosyncratic risk levels. Indeed, when high discretionary idiosyncratic risk firms are cash rich, they seem to acquire externally capital, in addition to their internal investment. Further, we find that the likelihood of using more external acquisitions than internal capital expenditures is higher for low discretionary idiosyncratic risk firms regardless of their levels of cash reserves.

Overall, our research contributes to the literature that seeks to understand the determinants of corporate cash holdings (e.g., Opler et al., 1999; Dittmar and Mahrt-Smith, 2007; Bates et al., 2009) by highlighting agency costs stemming from the discretionary idiosyncratic risk effect. It is also relevant to the literature that investigates the consequences of agency problems for corporate investment (Stein, 2003) since we find that high discretionary idiosyncratic volatility firms tend to spend cash internally while low discretionary idiosyncratic volatility firms use it for external acquisitions. The rest of the paper is organized as follows. Section 2 discusses the econometric model specification for cash holdings. Section 3 presents the empirical results. Section 4 concludes.

2. METHODOLOGY

2.1 Econometric model specifications

Our econometric model specification spins from Bates et al. (2009). To control effectively and robustly for endogeneity problem, we run a two-stage regression. We estimate the first-stage model as follows:

$$DiscrIRisk_t = a_0 + a_1 ROE_{t-1} + a_2 VROE_{t-1} + a_3 Market\text{-}to\text{-}Book_{t-1} + a_4 Leverage_{t-1} + a_5 Market\ Cap_{t-1} + a_1 Dividend\ Dummy_{t-1} + a_1 AGE_{t-1} + a_1 DIVER_{t-1} + \varepsilon_t. \quad (1)$$

The explanatory variables of this first-stage regression model, drawn from Ferreira and Laux (2007), include the return on equity (*ROE*), volatility of the return on equity (*VROE*), market-to-book (*Market-to-Book*), leverage ratio (*Leverage*), equity capitalization (*Market Cap*), a dividend payment dummy (*Dividend Dummy*), firm age (*AGE*), and an internal diversification dummy (*DIVER*). The construction of the dependent variable *DiscrIRisk* is described later in Section II.B.

The second stage model is as follows:

$$CashRatio_t = b_0 + b_1 \widehat{DiscrIRisk}_t + b_2 Industry\ Sigma_t + b_3 Market\text{-}to\text{-}Book_t + b_4 Asset\ Size_t + b_5 Cash\ Flow/Assets_t + b_6 NWC/Assets_t + b_7 Capex/Assets_t + b_8 Leverage_t + b_9 R\&D/Sales_t + b_{10} Dividend\ Dummy_t + b_{11} Acquisitions/Assets_t + b_{12} Net\ Equity\ Issue_t + b_{13} Net\ Debt\ Issue_t + Year\ Dummies + Industries\ Dummies + \varepsilon_t, \quad (2)$$

where $CashRatio_t$ is the cash holding measure and $\widehat{DiscrIRisk}_t$ is the fitted value of $DiscrIRisk_t$ from the first stage.[9] Following Bates et al. (2009), we use *CashRatio* measured by cash and marketable securities to total assets as our main cash holding variable. Other variables are:

- *Industry Sigma*: (or cash flow risk) is measured by the Industry median standard deviation of cash flow over a 10-year period; industries are defined by the two-digit SIC code; Cash flow is defined as Operating income before depreciation minus Interest minus Taxes minus Common dividends;
- *Market-to-Book*: (Book value of assets – Book value of equity + Market value of equity)/Book value of assets;
- *Asset Size*: Natural logarithm of total assets adjusted to inflation;

[9] Note that we depart from the Bates, Kahle, and Stulz (2009) equation, in which cash holdings determinants are: $CashRatio = a + b_1 Industry\ Sigma + b_2 Market\text{-}to\text{-}Book + b_3 Size + b_4 Cash\ Flow/Assets + b_5 NWC/Assets + b_6 Capex/Assets + b_7 Leverage + b_8 R\&D/Sales + b_9 Dividend\ Dummy + b_{10} Acquisitions/Assets + b_{11} NetEquityIssue + b_{12} Net\ Debt\ Issue + \varepsilon$, we add the discretionary idiosyncratic risk as an additional explanatory variable.

- *Cash Flow/Assets*: (Operating income before depreciation – Interest – Taxes – Common dividends)/Book value of assets;
- *NWC/Assets*: Net working capital, measured by (Current assets – Cash – Current liabilities)/Total assets;
- *Capex/Assets*: Capital expenditure/Total assets;
- *Leverage*: Total debt (Short-term debt + Long-term debt)/Total assets;
- *R&D/Sales*: Ratio of R&D to sales, set equal to zero when R&D is missing;
- *Dividend Dummy*: Dummy variable equal to one if the firm paid a common dividend in the year and zero otherwise;
- *Acquisitions/Assets*: Ratio of acquisitions to total assets;
- *Net Equity Issue*: Equity issued minus repurchases; and
- *Net Debt Issue*: Debt issued minus debt retired.

Note that we control for the ratio of a firm's acquisition expenses to assets, net equity, and net debt issues. When a change in cash holdings is used as the dependent variable, we include the lagged change in cash and lagged level of cash as regressors to account for partial adjustment of the cash ratio. Finally, we incorporate year dummies to control for time-specific factors. Following Petersen (2009), we estimate the models with clustered standard errors that are also robust to heteroskedasticity. Table I provides a summary description of the variables and the data source. The construction of the discretionary idiosyncratic risk is described in more details below.

INSERT TABLE I HERE

2.2 Discretionary idiosyncratic risk construction

As in Campbell et al. (2001) and others, we use two definitions of idiosyncratic risk as follows:

- Idiosyncratic risk based on the market model ($\bar{\sigma}_{\varepsilon MM}$): Annualized monthly average idiosyncratic standard deviation of equity returns (averaged over the fiscal year and multiplied by 12 to annualize) computed using daily equity data and estimated from the market model, and
- Idiosyncratic risk based on the three-factor Fama and French (1993) model ($\bar{\sigma}_{\varepsilon FF}$): Annualized monthly average idiosyncratic standard deviation of equity returns (averaged over the fiscal year and multiplied by 12 to annualize) computed using daily equity data and estimated from the three-factor Fama-French model.

In sum, these measures of idiosyncratic risk are annualized monthly average idiosyncratic standard deviations computed using daily stock market data and estimated from the CAPM and three-factor Fama-French model, respectively. Further details on the construction of these idiosyncratic risk measures are provided in the *Appendix*.

To distinguish the novel measure of idiosyncratic risk we introduce in the preceding sections which is not driven by industry cash flow volatility, we call it *discretionary idiosyncratic risk*. To determine the *discretionary idiosyncratic risk*, we split idiosyncratic risk into two components following two steps decomposition process. First, we run a linear regression of Industry Sigma (industry cash flow volatility) on stock market volatility to get the unsystematic (estimated residuals) component. In the second step, we run a linear regression of idiosyncratic risk on the unsystematic component of cash flow volatility to obtain the discretionary idiosyncratic risk (estimated residuals). *DiscrIRisk(MM)* and *DiscrIRisk(FF)* are discretionary idiosyncratic risk measures based on the market and the Fama-French models, respectively.

3. EMPIRICAL RESULTS

3.1 Descriptive statistics

The data set comprises all Compustat U.S. firm-year observations from 1985 to 2007 with positive book value of total assets and sales revenue. As in previous studies, we exclude companies that belong

to financial (SIC 6000–6999) and utility (SIC 4910–4939) industries because their financial policies are subject to regulatory requirements. Stock market returns are from the CRSP database. Summary statistics for cash holdings, idiosyncratic risk, and other main key variables are presented in Table II. Consistent with Bates et al. (2009), Dittmar and Mahrt-Smith (2007), and Opler et al. (1999), among others, there is wide variation in the ratio of cash and marketable securities to assets because the sample covers all industries except financial and utility. The mean cash-to-asset ratio is 17.7%, and the median firm has a cash-to-asset ratio of 8.7%. The ratios of cash holdings are highly skewed. The asset size distribution is highly skewed toward small firms. The mean of the asset size is more than 12 times larger than the median. Consistent with the previous literature (e.g., Campbell et al., 2001; Ferreira and Laux, 2007), both measures of idiosyncratic risk display less skewed patterns.

INSERT TABLE II HERE

Table III presents the Pearson correlation coefficients of the main variables. On the one hand, it shows that cash holdings are correlated positively with both idiosyncratic risk and cash flow risk (*Industry Sigma*). On the other hand, idiosyncratic risk and cash flow risk are negatively correlated even though the correlation is weak especially for the Fama-French based idiosyncratic risk (significant at only 10% level). Also, there is a strong positive correlation between the two idiosyncratic risk measures (98%) based on the market model and the Fama and French (1993) model.

INSERT TABLE III HERE

3.2 Effect of discretionary idiosyncratic risk on firms' cash holdings

Table IV presents regression results of cash holdings (*CashRatio or Cash-to-Assets*) and changes in cash holdings on discretionary idiosyncratic risk variables which are the focal explanatory variables, controlling for precautionary motives. Indeed, as in Bates et al. (2009), precautionary motive is controlled by Industry Sigma or cash flow risk. We control for other potential determinants of a firm's cash holdings as suggested by Opler et al. (1999). Furthermore, as indicated earlier, following Bates

et al. (2009), we also control for the ratio of a firm's acquisition expenses to assets, net equity, and net debt issues. When change in cash holdings is used as the dependent variable (columns 3 and 4), we include the lagged change in cash and lagged level of cash as regressors to account for partial adjustment of the cash ratio.

INSERT TABLE IV HERE

The results from all model specifications show that cash holdings and changes in cash holdings are positively and strongly correlated with discretionary idiosyncratic risk. Firms with high discretionary idiosyncratic risk hold more cash, whereas firms with low discretionary idiosyncratic risks have smaller cash reserves. In other words, the positive relationship between discretionary idiosyncratic risk and cash holdings suggests that firms under "quiet life" à la Bertrand and Mullainathan (2003) managers exhibit less cash. The coefficients on all other potential determinants of cash holdings in the specifications are generally significant with the expected signs. Moreover, the coefficients of the explanatory variable *Industry Sigma* (or firm cash flow risk) are positive and significant at the 5% significance level, supporting the precautionary motive for cash holdings. These enable us to highlight discretionary idiosyncratic risk as a new channel through which agency problems affect corporate cash holdings and show that both cash flow and discretionary idiosyncratic risks coexist.

Then, as asked in the introduction, where does the cash go? In other words, how do firms spend their cash? To answer this question, we study next the firm's use of cash for two chosen types of investments decisions.

3.3 Effect of discretionary idiosyncratic risk on investment decisions

In this section, we investigate the comparative effects the discretionary idiosyncratic risk on firms' investment decisions. We focus on capital expenditures and external acquisitions representing respectively, internal and external investments. As argued before, these two types of investments are different not only in terms of their nature but also in terms of governance (see John and Sodjahin (2010)) and

agency problems since internal capital building is continuous, incremental and requires more constant effort as opposed to external acquisition more infrequent and lumpier (see, Yang (2008)).

We use the amount of capital expenditure as a proxy for firm's internal capital investment as opposed to external acquisitions, and investigate how the level of discretionary idiosyncratic risk affects the decision to spend cash internally by way of capital expenditures as in Muscarella and Zhao (2011) and/or by way of using it for external acquisitions as in John and Kadyrzhanova (2012). Our analysis mainly focuses on changes in investment decisions and relates these to the pre-existing discretionary idiosyncratic risk measures.[10] In other words, we investigate how the discretionary idiosyncratic risk is associated with changes in future internal and external investment decisions for different levels of cash reserves. The sample is split between firms with low (i.e. below the median) and high (i.e. above the median) levels of pre-existing cash holdings respectively. Our control variables include: lagged cash holdings, average sales growth, average net working capital (minus cash), average leverage, average market-to-book, and lagged firm size (natural logarithm of firm total assets). Averages are calculated over the years *t-1* and *t-2*. By and large, these variables are used by Comment and Schwert (1995) and Harford et al. (2008), who studied the investment decisions and the probability of acquisitions. The results of the analysis are found in Table V below:

INSERT TABLE V HERE

For our internal investment measure (capital expenditures), the coefficients on the discretionary idiosyncratic risk measures are positive and significant throughout all subsamples. However, for the external acquisitions measure, these coefficients are negative and only significant in the subsample of low cash reserves. These findings suggest that while high discretionary idiosyncratic volatility firms spend cash internally (internal capital building), low discretionary idiosyncratic volatility firms use it

[10] In this way we mitigate the co-determination problem associated with investment and discretionary idiosyncratic risk levels (see among others, Harford et al., 2008).

for external acquisitions, thus consistent with the 'quiet life' hypothesis. Managers of low discretionary idiosyncratic volatility firms choose to make external acquisition (purchase of "used capital" and conduct of integration activities) rather than building progressively internal capital, which presumably requires more effort. This decision may not only be driven by managerial slack but also be motivated by possible private benefits extraction that can be associated with the acquisition transactions (see e.g., Jin and Myers, 2006; Ferreira and Laux, 2007). Moreover, we provide empirical evidence that this difference in investment behavior is only present when the cash reserves are low. Therefore, the investment behaviors of cash-rich firms are not significantly different regardless of their discretionary idiosyncratic risk levels since high discretionary idiosyncratic risk firms that are cash rich, can acquire externally capital in addition to their internal investment.

Additionally, we examine how the pre-existing discretionary idiosyncratic risk measures influence the decision to allocate more resources in external acquisitions (*Acquisitions*) relative to capital expenditures (*Capex*). The dependent variables are binary variables that are equal to one if the difference between *Acquisitions* and *Capex* is positive (i.e. *Acquisitions* - *Capex* > 0) and zero otherwise. Here, the sample is also split between firms with low (i.e., below the median) and high (i.e. above the median) levels of pre-existing cash holdings respectively.

INSERT TABLE VI HERE

The results are presented in Table VI above. We find the likelihood of using more external acquisitions than internal capital expenditures is higher for low pre-existing discretionary idiosyncratic risk firms regardless of their levels of cash reserves buttressing further the above findings.

4. CONCLUSIONS

We highlight the novel concept of discretionary idiosyncratic risk which is defined as the idiosyncratic volatility component not related to the non-systematic industry volatility as a new channel through which agency costs affect firms' cash holdings and their investment decisions. In sum, we find that

low discretionary idiosyncratic risk firms hold more cash and use them for external acquisitions. We start by presenting the discretionary idiosyncratic risk as another determinant of firm's cash holdings and by showing that in fact both cash flow risk and discretionary idiosyncratic risk effects (respectively the precautionary and the agency motives) coexist. Further, we contribute to the literature on the consequences of agency problems for corporate investment by showing that managers of low discretionary idiosyncratic volatility firms choose to make external acquisitions (purchase of "used capital") rather than building progressively internal capital which requires constant effort. This result indicates that managers with low discretionary idiosyncratic risk may enjoy 'quiet life' and extract private benefits.

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APPENDIX

Measures of Idiosyncratic Risk and Discretionary Idiosyncratic Risk

A. Idiosyncratic Risk Based on the Market Model ($\bar{\sigma}_{\varepsilon MM}$)

Let r_{idt} and r_{mdt} be, respectively, firm i daily excess return and the market's daily excess return. Setting intercepts to zero as in Campbell et al. (2001), the CAPM implies:

$$r_{idt} = \beta_{imt} r_{mdt} + \tilde{\varepsilon}_{idt},$$

where $\tilde{\varepsilon}_{idt}$ is the firm-specific residual. A simple variance decomposition with all covariance terms equal to zero yields:

$$\sigma_{it}^2 = \hat{\beta}_{imt}^2 \sigma_{mt}^2 + \sigma_{it\tilde{\varepsilon}MM}^2.$$

The terms σ_{it}^2 and σ_{mt}^2 refer, respectively, to total variance and market variance over month t. β_{imt} is the estimated beta over month *t*. Therefore, the idiosyncratic risk based on the market model is defined as

$$\sigma_{\tilde{\varepsilon}MM} = \sqrt{\sigma_{it}^2 - \hat{\beta}_{imt}^2 \sigma_{imt}^2}.$$

The averaged and annualized (averaged over the fiscal year and multiplied by 12 to annualize) value is $\bar{\sigma}_{\tilde{\varepsilon}MM}$.

B. Idiosyncratic Risk Based on the Three-Factor Fama-French Model ($\bar{\sigma}_{\varepsilon FF}$)

Likewise, based on the Fama-French (FF) three-factor model, idiosyncratic risk based on the market model is expressed as follows:

$$\sigma_{\tilde{\varepsilon}FF} = \sqrt{\sigma_{it}^2 - \hat{\beta}_{imt}^2 \sigma_{imt}^2 - \hat{\beta}_{iSMBt}^2 \sigma_{iSMB}^2 - \hat{\beta}_{iHMLt}^2 \sigma_{iHML}^2}.$$

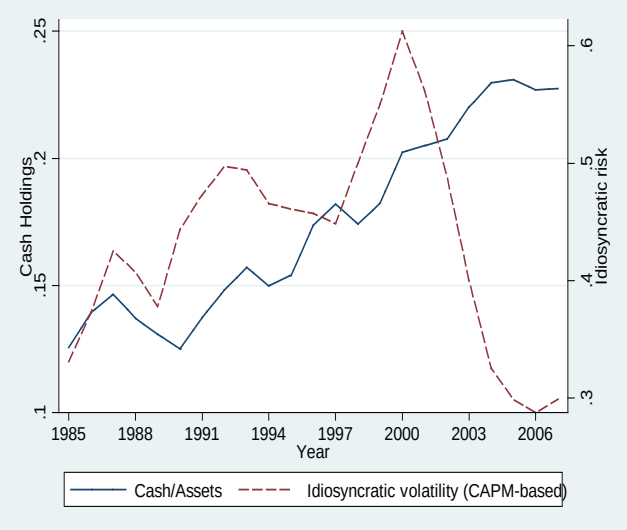
The averaged and annualized (averaged over the fiscal year and multiplied by 12 to annualize) value is $\bar{\sigma}_{\tilde{\varepsilon}FF}$. To determine the discretionary idiosyncratic risk, we split idiosyncratic risk into two components following two steps decomposition process. First, we run a linear regression of Industry Sigma

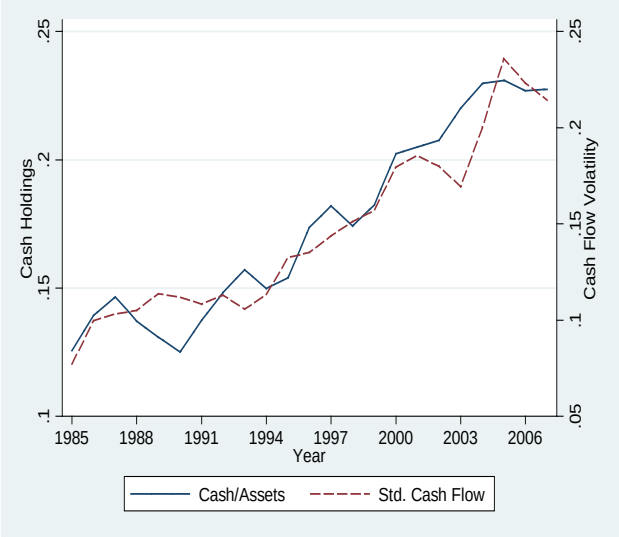
(industry cash flow volatility) on stock market volatility to get the unsystematic (estimated residuals) component. In the second step, we run a linear regression of idiosyncratic risk on the unsystematic component of cash flow volatility to get the discretionary idiosyncratic risk (estimated residuals). *DiscrIRisk(MM)* and *DiscrIRisk(FF)* are discretionary idiosyncratic risk measures based on the market and the Fama-French models respectively. The model is as follows:

$$DiscrIRisk_t = a_0 + a_1 ROE_{t-1} + a_2 VROE_{t-1} + a_3 Market\text{-}to\text{-}Book_{t-1} + a_4 Leverage_{t-1} + a_5 Market\ Cap_{t-1} + a_1 Dividend\ Dummy_{t-1} + a_1 AGE_{t-1} + a_1 DIVER_{t-1} + \varepsilon_t.$$

The explanatory variables are essentially from Ferreira and Laux (2007) and include the return on equity (*ROE*), volatility of the return on equity (*VROE*), market-to-book (*Market-to-Book*), equity capitalization (*Market Cap*), a dividend payment dummy (*Dividend Dummy*), firm age (*AGE*), and an internal diversification dummy (*DIVER*). The discretionary idiosyncratic risk $\widehat{DiscrIRisk}_t$ is the fitted value of $DiscrIRisk_t$ from the model.

FIGURE 1. TREND IN FIRMS' CASH FLOW VOLATILITY, IDIOSYNCRATIC RISK, AND CASH HOLDINGS





Notes: These graphs summarize the trend in average cash-to-assets ratio, cash flow volatility and idiosyncratic risk. The data set comprises all Compustat and CRSP firm-year observations from 1985 to 2007 with positive book value of total assets and sales revenue. We exclude companies that belong to financial (SIC 6000–6999) and utility (SIC 4910–4939) industries. Cash flow volatility is measured by the standard deviations of cash flow over 10 years.

TABLE I: VARIABLES DESCRIPTION AND DATA SOURCES

Variable Name	Variable Definition	Source
Idiosyncratic Risk ($\bar{\sigma}_{\varepsilon MM}$)	Annualized monthly average idiosyncratic standard deviation (averaged over the fiscal year and multiplied by 12 to annualize) computed using daily data and estimated from the market model.	CRSP
Idiosyncratic Risk ($\bar{\sigma}_{\varepsilon FF}$)	Annualized monthly average idiosyncratic standard deviation (averaged over the fiscal year and multiplied by 12 to annualize) computed using daily data and estimated from the three-factor Fama-French (FF) model.	CRSP
Cash Ratio (Cash/Assets)	Cash and marketable securities to total assets.	Compustat
dCash/Assets	Cash ratio (*t*) minus the lagged cash ratio (*t*–1).	Compustat
Market-to-Book	(Book value of assets minus the book value of equity plus the market value of equity)/Book value of assets.	Compustat
Cash Flow/Assets	(Operating income before depreciation minus interest minus taxes minus common dividends)/Book value of assets.	Compustat
Industry Sigma	Mean of standard deviations of the cash flow/assets over 10 years for firms in the same industry. Industries are defined by the 2-digit SIC code.	Compustat
Asset Size	Natural logarithm of total assets adjusted to inflation.	Compustat
Capex/Assets	Ratio of capital expenditures to total assets.	Compustat
Acquisitions/Assets	Ratio of acquisitions to total assets.	Compustat
NWC/Assets	Ratio of current assets net of cash minus current liabilities divided by total assets.	Compustat
Leverage	Ratio of total debt (short- and long-term debt) to total assets.	Compustat
R&D/Sales	Ratio of R&D to sales, set equal to zero when R&D is missing.	Compustat
Advertising Exp/Sales	Ratio of advertising expenses to sales.	Compustat
Dividend Dummy	Dummy variable equal to one if the firm paid a common dividend in that year, and zero otherwise.	Compustat
Net Debt Issuance	(Annual total debt issuance minus debt retirement in the fiscal year)/Book value of assets.	Compustat
Net Equity Issuance	(Equity sales minus equity purchases)/Book value of total assets.	Compustat

Net Assets	Net assets (Total assets minus cash and marketable securities) at year *t*.	Compustat
R&D	R&D expenses over year *t*–1 to *t*.	Compustat
Interest	Interest expenses over year *t*–1 to *t*.	Compustat
Dividends	Common dividends over year *t*–1 to *t*.	Compustat
Debt	Long-term debt plus short term debt at year *t*.	Compustat
Age	Natural logarithm of the number of years the firm was listed on CRSP.	CRSP
ROE	Return on Equity measured as the earnings before extraordinary items divided by the book value of equity.	Compustat
VROE	Variance of annual *ROEs* over the last 10 years.	Compustat
DIVER	Dummy variable that equals one when a firm have more than one business segments and zero otherwise.	Compustat
Market Cap	Natural logarithm of market capitalization.	CRSP
Profitability	Operating income before depreciation)/Book value of assets.	Compustat

TABLE II: SAMPLE DESCRIPTIVE STATISTICS

	Number	Mean	Median	Std. Deviation	25th Percentile	75th Percentile
Cash/Assets	108213	0.177	0.087	0.212	0.024	0.253
Idiosyncratic Risk ($\bar{\sigma}_{\varepsilon MM}$)	104256	0.443	0.368	0.304	0.242	0.552
Idiosyncratic Risk ($\bar{\sigma}_{\varepsilon FF}$)	104039	0.376	0.310	0.264	0.204	0.468
Industry Sigma	108252	0.868	0.215	2.830	0.114	0.643
Market-to-Book	106363	2.118	1.463	2.329	1.090	2.257
Asset Size	110317	1791.242	130.353	6767.237	130.353	665.744
Cash Flow/Assets	100812	-0.009	0.060	0.319	-0.006	0.104
NWC/Assets	104945	0.071	0.072	0.299	-0.038	0.216
Capex/Assets	106448	0.067	0.044	0.073	0.022	0.083
Leverage	107862	0.245	0.200	0.258	0.039	0.367
R&D/Sales	108258	0.069	0.000	0.180	0.000	0.061
Dividend dummy	109738	0.308	0.000	0.462	0.000	1.000
Acquisitions/Assets	103395	0.022	0.000	0.060	0.000	0.006

Notes: This table provides summary descriptive statistics for the sample. The data set comprises all Compustat and CRSP database firm-year observations from 1985 to 2007 with positive book value of total assets and sales revenue. We exclude companies that belong to financial (SIC 6000–6999) and utility (SIC 4910–4939) industries. *Cash/Assets, Cash/Net Assets, Industry Sigma, Market-to-Book, Asset Size, Cash Flow/Assets, NWC/Assets, Capex/Assets, Leverage, R&D/Sales,* and *Acquisitions/Assets* are winsorized at the 1st and 99th percentiles. Variable definitions are provided in Table I. Cash flow risk is measured by *Industry Sigma*, which is the mean of standard deviations of the cash flow/assets over 10 years for firms in the same industry. Industries are defined by the two-digit SIC code.

TABLE III: PEARSON CORRELATION MATRIX

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Cash/Assets	-												
2. Idiosyncratic Risk ($\bar{\sigma}_{\varepsilon MM}$)	0.133 (0.000)	-											
3. Idiosyncratic Risk ($\bar{\sigma}_{\varepsilon FF}$)	0.136 (0.000)	0.980 (0.000)	-										
4. Industry Sigma	0.096 (0.000)	-0.016 (0.000)	-0.006 (0.054)	-									
5. Market-to-Book	0.320 (0.000)	0.078 (0.000)	0.077 (0.000)	0.017 (0.000)	-								
6. Asset Size	-0.101 (0.000)	-0.192 (0.000)	-0.186 (0.000)	0.112 (0.000)	-0.042 (0.000)	-							
7. Cash Flow/Assets	-0.218 (0.000)	-0.322 (0.000)	-0.312 (0.000)	-0.035 (0.000)	-0.374 (0.000)	0.069 (0.000)	-						
8. NWC/Assets	-0.144 (0.000)	-0.203 (0.000)	-0.200 (0.000)	-0.078 (0.000)	-0.078 (0.000)	-0.064 (0.000)	0.495 (0.000)	-					
9. Capex/Assets	-0.152 (0.000)	-0.066 (0.000)	-0.070 (0.000)	-0.053 (0.000)	-0.264 (0.000)	-0.005 (0.085)	0.038 (0.000)	-0.110 (0.000)	-				
10. Leverage	-0.362 (0.000)	0.076 (0.000)	0.067 (0.000)	-0.027 (0.000)	-0.045 (0.000)	0.036 (0.000)	-0.200 (0.000)	-0.379 (0.000)	0.073 (0.000)	-			
11. R&D/Sales	0.492 (0.000)	0.194 (0.000)	0.185 (0.000)	0.045 (0.000)	0.301 (0.000)	-0.057 (0.000)	-0.370 (0.000)	-0.135 (0.000)	-0.089 (0.000)	-0.139 (0.000)	-		
12. Dividend Dummy	-0.219 (0.000)	-0.418 (0.000)	-0.412 (0.000)	-0.022 (0.000)	-0.109 (0.000)	0.255 (0.000)	0.169 (0.000)	0.092 (0.000)	0.017 (0.000)	-0.029 (0.000)	-0.190 (0.000)	-	
13. Acquisitions/Assets	-0.117 (0.000)	-0.087 (0.000)	-0.088 (0.000)	-0.002 (0.499)	-0.034 (0.000)	0.004 (0.153)	0.061 (0.000)	0.002 (0.539)	-0.072 (0.000)	0.085 (0.000)	-0.049 (0.000)	0.023 (0.000)	-

Notes: This table presents the Pearson correlation matrix for the key variables. Data are from the Compustat and CRSP tape from 1985 to 2007. We require the book value of total assets and sales revenue to be positive and exclude companies that belong to financial (SIC 6000–6999) and utility (SIC 4910–4939) industries. Variable definitions are provided in Table I.

TABLE IV: CASH HOLDINGS AND DISCRETIONARY IDIOSYNCRATIC RISK

Dependent Variable	*Cash/Assets*		*Change in Cash/Assets*	
Model	(1)	(2)	(3)	(4)
Intercept	0.205	0.204	-0.110	-0.115
	(0.000)	(0.000)	(0.000)	(0.000)
Lag *dCash/Assets*			-0.091	-0.091
			(0.000)	(0.000)
Lag *Cash/Assets*			-0.230	-0.230
			(0.000)	(0.000)
$\widehat{Discr IRisk_t}$ *(MM)*	**0.141**		**0.240**	
	(0.000)		**(0.000)**	
$\widehat{Discr IRisk_t}$ *(FF)*		**0.173**		**0.290**
		(0.000)		**(0.000)**
Industry Sigma	0.002	0.002	0.0005	0.0005
	(0.000)	(0.000)	(0.016)	(0.016)
Market-to-Book	0.009	0.009	0.005	0.005
	(0.000)	(0.000)	(0.000)	(0.000)
Asset Size	0.002	0.002	0.013	0.013
	(0.384)	(0.337)	(0.000)	(0.000)
Cash Flow/Assets	0.034	0.034	0.047	0.047
	(0.000)	(0.000)	(0.000)	(0.000)
NWC/Assets	-0.144	-0.143	-0.067	-0.067
	(0.000)	(0.000)	(0.000)	(0.000)
Capex/Assets	-0.379	-0.379	-0.328	-0.327
	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	-0.284	-0.283	-0.107	-0.105
	(0.000)	(0.000)	(0.000)	(0.000)
R&D/Sales	0.342	0.342	0.063	0.063
	(0.000)	(0.000)	(0.000)	(0.000)
Dividend Dummy	-0.003	-0.002	0.030	0.032
	(0.605)	(0.779)	(0.000)	(0.000)
Acquisitions/Assets	-0.355	-0.355	-0.428	-0.428
	(0.000)	(0.000)	(0.000)	(0.000)
Net Equity Issue	0.0001	0.0001	0.0001	0.0001
	(0.369)	(0.369)	(0.358)	(0.357)
Net Debt Issue	0.201	0.201	0.117	0.116
	(0.000)	(0.000)	(0.000)	(0.000)
Year dummies	Yes	Yes	Yes	Yes
48 Fama-French industries dummy	Yes	Yes	Yes	Yes
Adj.R^2	45.74%	45.74%	24.36%	24.35%
Number of observations	76,679	76,679	67,298	67,298

Notes: This table presents results of two-stage regressions of cash holdings on the discretionary idiosyncratic risk. To determine the discretionary idiosyncratic risk, we split idiosyncratic risk into two components following two steps decomposition process. First, we run a linear regression of Industry Sigma (industry cash flow volatility) on stock market volatility to get the unsystematic (estimated residuals) component. In the second step, we run a linear regression of idiosyncratic risk on the unsystematic component of cash flow

volatility to get the discretionary idiosyncratic risk (estimated residuals). *DiscrIRisk(MM)* and *DiscrIRisk(FF)* are discretionary idiosyncratic risk measures based on the market and the Fama-French models respectively. The first-stage model is as follows:

$DiscrIRisk_t = a_0 + a_1 ROE_{t-1} + a_2 VROE_{t-1} + a_3 Market\text{-}to\text{-}Book_{t-1} + a_4 Leverage_{t-1} + a_5 Market\ Cap_{t-1} + a_1 Dividend\ Dummy_{t-1} + a_1 AGE_{t-1} + a_1 DIVER_{t-1} + \varepsilon_t$. The explanatory variables are essentially from Ferreira and Laux (2007) and include the return on equity (*ROE*), volatility of the return on equity (*VROE*), market-to-book (*Market-to-Book*), equity capitalization (*Market Cap*), a dividend payment dummy (*Dividend Dummy*), firm age (*AGE*), and an internal diversification dummy (*DIVER*). The second stage model is as follows:

$Cash\ Ratio_t = b_0 + b_1 \widehat{DiscrIRisk}_t + b_1 Industry\ Sigma_t + b_2 Market\text{-}to\text{-}Book_t + b_3\ Asset\ Size_t + b_4 Cash\ Flow/Assets_t + b_5 NWC/Assets_t + b_6 Capex/Assets_t + b_7 Leverage_t + b_8 R\&D/Sales_t + b_9 Dividend\ Dummy_t + b_{10} Acquisitions/Assets_t + b_{11} Net\ Equity\ Issue_t + b_{12} Net\ Debt\ Issue_t + Year\ Dummies + Industries\ Dummies + \varepsilon_t$, where $Cash\ Ratio_t$ is the cash holding measure and $\widehat{DiscrIRisk}_t$ is the fitted value of $DiscrIRisk_t$ from the first stage. The sample consists of Compustat and CRSP database firm-year observations from 1985 to 2007. We require the book value of total assets and sales revenue to be positive and exclude companies that belong to financial (SIC 6000–6999) and utility (SIC 4910–4939) industries. We use pooled OLS regressions in which significance levels are based on standard errors corrected for clustering at the firm level and robust to heteroskedasticity. Accounting data are winsorized at the 1% level. Variable definitions are provided in Table I. *Change in Cash/Assets* is the cash ratio at *t* minus the lagged cash ratio at *t*–1 as in Bates, Kahle, and Stulz (2009). It captures the extent to which the level of cash ratio this year is higher or lower than last year. The *p*-values of the regression coefficients are reported in parentheses.

TABLE V: DISCRETIONARY IDIOSYNCRATIC RISK AND CASH SPENDING: INTERNAL VERSUS EXTERNAL INVESTMENT DECISIONS

	Δ(Industry Adjusted Capital Expenditures)						Δ(Industry Adjusted Acquisitions)					
	Full Sample		Low Cash Holdings		High Cash Holdings		Full Sample		Low Cash Holdings		High Cash Holdings	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Intercept	-6.295	-5.861	10.839	11.679	-28.088	-28.054	17.116	17.725	31.087	32.117	1.237	1.830
	(0.742)	(0.759)	(0.793)	(0.777)	(0.001)	(0.001)	(0.551)	(0.000)	(0.546)	(0.533)	(0.966)	(0.950)
DiscrIRisk(MM)	**14.675**		**21.774**		**7.665**		**-5.686**		**-19.739**		**7.415**	
	(0.000)		**(0.002)**		**(0.005)**		**(0.029)**		**(0.000)**		**(0.104)**	
DiscrIRisk(FF)		**14.873**		**21.738**		**8.501**		**-8.555**		**-25.363**		**5.992**
		(0.000)		**(0.004)**		**(0.004)**		**(0.004)**		**(0.000)**		**(0.197)**
LagCash/Assets	0.062	0.060	-0.152	-0.156	0.223	0.223	-0.030	-0.033	-0.038	-0.042	-0.212	-0.215
	(0.441)	(0.598)	(0.262)	(0.246)	(0.083)	(0.082)	(0.739)	(0.710)	(0.825)	(0.808)	(0.466)	(0.460)
Avg. Sales Growth	0.001	0.001	-0.020	-0.019	0.010	0.010	-0.003	-0.003	-0.007	-0.007	-0.001	-0.001
	(0.650)	(0.649)	(0.517)	(0.523)	(0.384)	(0.385)	(0.189)	(0.195)	(0.398)	(0.382)	(0.771)	(0.771)
Avg. Working Capital (net cash)	-4.886	-5.303	0.356	-0.390	-9.324	-9.427	0.297	-0.128	1.484	0.731	7.246	6.902
	(0.012)	(0.007)	(0.918)	(0.910)	(0.000)	(0.000)	(0.909)	(0.960)	(0.770)	(0.885)	(0.168)	(0.187)
Avg.Leverage	-17.979	-17.700	-17.798	-17.354	-12.768	-12.722	-21.637	-21.440	-22.671	-22.379	-7.489	-7.303
	(0.000)	(0.000)	(0.001)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.271)	(0.282)
Avg.Market-to-Asset	1.620	1.601	4.085	4.028	1.066	1.062	0.462	0.441	1.467	1.433	0.319	0.289
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.014)	(0.020)	(0.197)	(0.210)	(0.171)	(0.212)
Size(t-1)	8.851	8.706	9.859	9.626	7.676	7.644	1.160	1.034	-6.305	-6.472	9.781	9.614
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.211)	(0.259)	(0.000)	(0.000)	(0.000)	(0.000)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
48 Fama-French industries dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	1.12%	1.11%	1.16%	1.15%	1.56%	1.56%	0.10%	0.10%	0.10%	0.10%	0.61%	0.61%
Number of observations	78,769	78,769	39,442	39,442	39,327	39,327	74,799	74,799	37,399	37,399	37,400	37,400

Notes: This table investigates the relation between the internal (capital expenditures) and external (acquisitions) investments and discretionary idiosyncratic risk measures by pre-existing cash holdings. The dependent variables are the changes in industry-adjusted capital expenditures and acquisitions. Both dependent variables are industry-adjusted on a yearly basis using the Fama-French 48 industry classification. The sample is split between firms with low (below the median) and high (above the median) values of pre-existing cash holdings respectively. To determine the key variable of independent variable, discretionary idiosyncratic risk, we split idiosyncratic risk into two components following two steps decomposition process. First, we run a linear regression of Industry Sigma (industry cash flow volatility) on stock market volatility to get the unsystematic (estimated

residuals) component. In the second step, we run a linear regression of idiosyncratic risk on the unsystematic component of cash flow volatility to get the discretionary idiosyncratic risk (estimated residuals). *DiscrIRisk(MM)* and *DiscrIRisk(FF)* are discretionary idiosyncratic risk measures based on the market and the Fama-French models respectively. The control variables include: lagged cash holdings, average sales growth, average net working capital (minus cash), average leverage, average market-to-book, and lagged firm size (natural logarithm of firm total assets). Averages are calculated over the years *t-1* and *t-2*. The sample consists of Compustat and CRSP database firm-year observations from 1985 to 2007. We require the book value of total assets and sales revenue to be positive and exclude companies that belong to financial (SIC 6000–6999) and utility (SIC 4910–4939) industries. We use pooled OLS regressions in which significance levels are based on standard errors corrected for clustering at the firm level and robust to heteroskedasticity. Accounting data are winsorized at the 1% level. Variable definitions are provided in Table I. The *p*-values of the regression coefficients are reported in parentheses.

TABLE VI: LIKELIHOOD OF THE DECISION TO USE MORE EXTERNAL ACQUISITIONS THAN INTERNAL INVESTMENT

Dependent Variable	=1 if *Acquisitions – Capex* > 0					
Sample	Full Sample		Low Cash Holdings		High Cash Holdings	
Model	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-2.189	-2.189	-2.333	-2.332	-2.151	-1.959
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
DiscrIRisk(MM)	**-1.071**		**-1.382**		**-0.785**	
	(0.000)		**(0.000)**		**(0.000)**	
DiscrIRisk(FF)		**-1.167**		**-1.547**		**-0.834**
		(0.000)		**(0.000)**		**(0.000)**
LagCash/Assets	-0.005	-0.004	-0.009	-0.009	-0.003	-0.003
	(0.504)	(0.511)	(0.394)	(0.402)	(0.791)	(0.792)
Avg. Sales Growth	0.0005	0.0005	0.001	0.001	0.0004	0.0004
	(0.064)	(0.068)	(0.013)	(0.015)	(0.271)	(0.271)
Avg. Working Capital (Net Cash)	0.639	0.652	0.744	0.750	0.708	0.724
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Avg.Leverage	0.071	0.062	0.162	0.153	0.197	0.189
	(0.388)	(0.455)	(0.159)	(0.184)	(0.091)	(0.105)
Avg.Market-to-Book	-0.008	-0.008	0.073	0.073	-0.032	-0.032
	(0.213)	(0.245)	(0.000)	(0.000)	(0.000)	(0.000)
Asset Size(t-1)	0.066	0.072	0.046	0.049	0.095	0.100
	(0.000)	(0.000)	(0.002)	(0.001)	(0.000)	(0.000)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
48 Fama-French industries dummy	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	5.33%	5.30%	6.65%	6.63%	4.94%	4.92%
Number of observations	75,939	75,939	37,968	37,968	37,971	37,971

Notes: We examine the impact of discretionary idiosyncratic risk measures on the decision to use higher external acquisition (*Acquisitions*) relative to capital expenditures (*Capex*). The dependent variables are binary variables that are equal to one if the difference between *Acquisitions* and *Capex* is positive (*Acquisitions – Capex* > 0) and zero otherwise. The sample is split between firms with low (i.e., below the median) and high (i.e. above the median) values of pre-existing cash holdings respectively. To determine the key variable of independent variable, discretionary idiosyncratic risk, we split idiosyncratic risk into two components following two steps decomposition process. First, we run a linear regression of Industry Sigma (industry cash flow volatility) on stock market volatility to get the unsystematic (estimated residuals) component. In the second step, we run a linear regression of idiosyncratic risk on the unsystematic component of cash flow volatility to get the discretionary idiosyncratic risk (estimated residuals). *DiscrIRisk(MM)* and *DiscrIRisk(FF)* are discretionary idiosyncratic risk measures based on the market and the Fama-French models respectively. The control variables include: lagged cash holdings, average sales growth, average net working capital (minus cash), average leverage, average market-to-book, and lagged firm size (natural logarithm of firm total assets). Averages are calculated over the years t-1 and t-2. The sample consists of Compustat and CRSP database firm-year observations from 1985 to 2007. We require the book value of total assets and sales revenue to be positive and exclude companies that belong to financial (SIC 6000–6999) and utility (SIC 4910–4939) industries. We use pooled logistic regression models in which significance levels are based on standard errors corrected for clustering at the firm level and robust to heteroskedasticity. Accounting data are winsorized at the 1% level. Variable definitions are provided in Table I. The *p*-values of the regression coefficients are reported in parentheses.