Idiosyncratic Return Volatility and the Information Quality Underlying Managerial Discretion*

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Abstract

Variation in idiosyncratic return volatility from 1978 to 2009 is attributable to discretionary accrual volatility and the correlation between pre-managed earnings and discretionary accruals reflective of information quality across firms. These results are robust to controls for firm operating uncertainty, growth options, business cycle variations, and firm age and industry effects, and highlight the importance of managerial discretion in determining idiosyncratic volatility.

JEL Classifications: G14, M41, G12

Keywords: Idiosyncratic return volatility; operating uncertainty; managerial discretion; information quality.

I. Introduction

Idiosyncratic return volatility has exhibited changing temporal patterns since the 1960s: it increased prior to 2000 (Campbell et al. (2001)), declined from 2001 to 2006 (Brandt et al. (2010) and Fink et al. (2010)), and rose sharply during the recent financial crisis. Given that idiosyncratic return volatility has implications for issues such as portfolio diversification, active portfolio management, the risk-reward relation and option valuation, it is important to understand the sources of these temporal patterns. However, proposing an explanation for the observed ebbs and flows has been challenging. For example, Brandt et al. (2010) show that the rise and fall in idiosyncratic return volatility prior to 2006 is attributable to trading of low-priced stocks by retail investors. Zhang (2010) challenges this view and argues that much of the trend and reversal is explained by the fundamentals, specifically the uncertainty about current earnings and future earnings growth.

In this paper, we ask the question whether the information quality underlying managerial discretion on reported earnings serves as an additional mechanism relative to fundamentals in explaining the trend in idiosyncratic return volatility. We decompose earnings into pre-managed earnings (PME) that reflect firms' operating cash flows, and discretionary accruals (DA) that reflect firms' discretion on earnings reporting. Consequently, earnings volatility (standard deviation) has three distinct components: PME volatility (PMEV), DA volatility (DAV), and the correlation between PME and DA ($\rho_{\text{PME,DA}}$).[1] We demonstrate that the time trend in idiosyncratic volatility during the period 1978 to 2009 is associated not only with PMEV, which is driven by operating uncertainty (Wei and Zhang (2006), Irvine and Pontiff (2009), Zhang (2010)), but also with DAV and $\rho_{\text{PME,DA}}$, which together measure multi-period managerial discretion in accruals. We further examine the information quality underlying the two managerial discretion measures and show that poor information quality induces high return volatility. Overall, we provide an information quality-based explanation, showing that managerial discretion drives the ebbs and flows in idiosyncratic

[1]These components are obtained from the identity that earnings variance equals the sum of PME variance, DA variance, and twice the PME-DA covariance.

return volatility via its influence on information quality.

To motivate our argument that managerial discretion in accruals impacts return volatility via information quality, we turn to the literature that focuses on the effect of information asymmetry on both returns and return volatility.[2] O'Hara (2003), and Easley and O'Hara (2004) present information-risk models and demonstrate that returns are positively related to information asymmetry when a lack of public information forces investors to rely more on private information. Pastor and Veronesi (2003) model the relation between information asymmetry and return volatility in an environment where investors learn about the uncertainty in a firm's profitability, and show that higher uncertainty induces larger return volatility. Given that earnings is an important variable that investors observe, if a firm manages the flow of earnings information to the market through discretionary accruals, the resulting information risk can potentially affect investors' perception of the profitability of the firm and thus affect return volatility.

The literature also suggests explicit links between information quality and the proposed managerial discretion variables of DAV and $\rho_{\text{PME,DA}}$. Accrual accounting entails both estimation of future cash flows and a subjective allocation of past cash collections, and is thus related to estimation errors that reduce the beneficial role of accruals to investors in an information-asymmetric environment (Dechow and Dichev (2002), Gu et al. (2005), Dechow et al. (2010)). Higher accrual volatility indicates a general level of managerial discretion (Gu et al. (2005), Bandyopadhyay et al. (2011)); that is, a greater level of time shifting between earnings and actual cash flows may lead to more estimation errors. As such, DAV reduces the accuracy of reported earnings and thus worsens information quality. In contrast, the unit-free measure of $\rho_{\text{PME,DA}}$ indicates the recognition of accruals relative to operating results: a more negative correlation reveals that earnings resemble operating results more closely (Leuz et al. (2003), Tucker and Zarowin (2006)). Under information asymmetry, managers may credibly signal to the market their private information about the

[2] We use the term "information quality" as an attribute of publicly available information that reflects the degree of information asymmetry between the firm and outside investors. Higher information quality reduces information asymmetry.

permanent component of cash flows by consistently exhibiting a negative $\rho_{\text{PME,DA}}$ (Dye (1988), Demski and Sappington (1990), Tucker and Zarowin (2006), Rountree et al. (2008)). Therefore, a more negative $\rho_{\text{PME,DA}}$ indicates a larger revelation of insider information and higher information quality. In sum, higher accrual volatility and less negative $\rho_{\text{PME,DA}}$ are related to lower information quality.

Our contention that poor information quality induces high idiosyncratic return volatility is related to the debate on market transparency, market efficiency, and stock return synchronicity. One school of the market synchronicity literature, pioneered by Morck et al. (2000), argues that lower stock market synchronicity (measured as the market model R^2) is associated with higher transparency of firms' information environment, since stock prices aggregate more firm-specific information. Dasgupta et al. (2010) argue instead that a more transparent environment is associated with higher stock market synchronicity, since market participants would have priced in the likelihood of the occurrence of firm-specific events in an efficient market. Since, *ceteris paribus*, R^2 values are inversely related to idiosyncratic volatility in the market model, our argument is consistent with Dasgupta et al. (2010) that higher market synchronicity is associated with better information quality.

Highlighting the role of managerial discretion in determining idiosyncratic volatility, we demonstrate that the ebbs and flows in idiosyncratic return volatility are associated with similar trends in our managerial discretion variables of DAV and $\rho_{\text{PME,DA}}$ during the period 1978 to 2009. We next show that the impact of managerial discretion on idiosyncratic volatility is driven by the information quality embodied in DAV and $\rho_{\text{PME,DA}}$. In particular, we confirm the relationship between information quality and the managerial discretion variables through a number of measures of information asymmetry, including analyst forecast dispersion, analyst forecast error, the degree of analyst following, and the bid–ask spread. In the final link in the information quality explanation, we directly establish that lower market synchronicity, i.e., higher idiosyncratic return volatility, is associated with worse information quality, consistent with Dasgupta et al. (2010).

Our results relating managerial discretion to idiosyncratic volatility hold after controlling for alternative explanations, such as underlying business uncertainty (Wei and Zhang (2006), Irvine and Pontiff (2009)), growth options (Cao et al. (2008)), business cycle variations (Bekaert et al. (2009)), and new firm and industry effects (Brown and Kapadia (2007), Fink et al. (2010)), and for various subperiods that include the current financial crisis. These results are also robust to controlling for the absolute value of discretionary accruals (a proxy of one-period managerial discretion, as opposed to the multiple-period managerial discretion measure of DAV), since the literature suggests that a high level of accruals also implies low information quality (e.g., Teoh et al. (1998a), Teoh et al. (1998b)).

This paper contributes to the literature by showing that idiosyncratic return volatility is associated with information quality revealed in managerial discretion. We establish a distinct linkage between managerial discretion and information quality, and demonstrate that the information quality underlying managerial discretion affects idiosyncratic return volatility. Specifically, we find that the upward trend in idiosyncratic return volatility is attributable to the deteriorating information quality caused by DAV, as well as the declining ability of $\rho_{\text{PME,DA}}$ to reveal insider information, and vice versa. While many explanations have been proposed for the upward trend in idiosyncratic return volatility documented by Campbell et al. (2001), few are offered for *both* the upward trend and the subsequent reversals in the 2000s.[3] Our study provides an information quality-based explanation that is consistent with the ebbs and flows in idiosyncratic volatility. Finally, we contribute to the literature on transparency and stock return synchronicity by showing that firms with poorer information quality have higher idiosyncratic volatility and lower market synchronicity.

[3]Explanations for the increasing trend in idiosyncratic return volatility before the 2000s include the following: earnings uncertainty (Wei and Zhang (2006)), cash flow volatility due to elevated economy-wide market competition (Irvine and Pontiff (2009)), earnings quality (Rajgopal and Venkatachalam (2010)), changes in the investment opportunity set (Guo and Savickas (2008)), availability of growth options (Cao et al. (2008)), institutional ownership (Bennett et al. (2003), Xu and Malkiel (2003)), and changing sample composition with newly listed firms becoming riskier (Brown and Kapadia (2007)) and younger (Fink et al. (2010)). Explanations for the subsequent decline in idiosyncratic return volatility in much of the 2000s include the following: low stock prices and limited institutional ownership (Brandt et al. (2010)), and the variation in earnings volatility and proxies for growth options (Zhang (2010)).

The rest of the paper is organized as follows. Section II describes the sample and presents the summary statistics of our key variables. In Section III, we establish the three-way relations among managerial discretion, idiosyncratic return volatility, and information quality. In Section IV we present the trend analyses of the time series. Section V concludes.

II. Sample, Variable Definitions and Graphical Trend Analysis

A. Sample Selection and Deseasonalization

Our sample covers more than three decades of data relating to all NYSE/NASDAQ/AMEX listed firms during the period from January 1978 to December 2009. Our quarterly accounting data are from Compustat, and monthly returns from CRSP. Following prior studies (e.g., Richardson et al. (2005), Tucker and Zarowin (2006)), we remove firms from regulated financial (SIC 6000–6999) and utility (SIC 4900–4949) industries due to their unique nature of accounting in accrual recognition. To create the monthly time-series, we assign the same quarterly accounting numbers for each month within the quarter. We then match accounting numbers to one-quarter-ahead monthly returns to ensure that accounting information is known prior to trading. For instance, a fiscal quarter ending in May is used to match returns of September, October and November of the same year.

It is known that quarterly operating variables display strong seasonality. To mitigate this problem, we adopt the Xll procedure developed by the U.S. Bureau of Census to deseasonalize cash flows, the change in working capital, earnings and sales.[4] Following the literature (e.g., Dechow (1994), Richardson et al. (2005)), we calculate cash flows as the sum of earnings (measured

[4]Developed in 1953, the X11 procedure has been used extensively in economics as a deseasonalization tool. Brochet et al. (2010) also use the X11 procedure to deseasonalize quarterly cash and accruals. We employ the additive X11 procedure, in which the observed time-series data (O_t) is decomposed as follows: $O_t = T_t + S_t + I_t$, where T_t is the trend component, S_t is the seasonal component, and I_t is the irregular component. The deseasonalized series equals the sum of T_t and I_t. We use the built-in X11 procedure of the SAS® software (SAS Institute, Cary, NC), which requires at least 12 consecutive non-missing observations.

throughout the paper as earnings before extraordinary items) and depreciation, minus the change in working capital, where working capital is defined as the change in current operating assets net of cash and short-term investments, less the change in current operating liabilities net of short-term debt. Table 1 provides a detailed description of our sample selection process. Our final sample consists of 278,725 firm-month observations among 3,309 firms, with an average cross-sectional size of 726 firms.

[Table 1 about here.]

B. Measuring Managerial Discretion and Idiosyncratic Return Volatility

1. Managerial Discretion Measures

To derive the managerial discretion measures, we decompose earnings into pre-managed earnings (PME) and discretionary accruals (DA), where DA is treated as the part of earnings that is subject to managerial discretion (e.g., Jones (1991)). Specifically, we estimate the following modified Jones model of Dechow et al. (1995):

$$(1) \qquad \frac{\text{ACC}_{i,j,t}}{\text{Assets}_{i,j,q-1}} = \beta_{0,j} + \beta_{1,j}\frac{1}{\text{Assets}_{i,j,q-1}} + \beta_{2,j}\frac{\Delta(\text{Sales})_{i,j,t}}{\text{Assets}_{i,j,q-1}} + \beta_{3,j}\frac{\text{PPE}_{i,j,t}}{\text{Assets}_{i,j,q-1}} + \varepsilon_{i,j,t}$$

where ACC is total accruals (the difference between earnings and cash flows); PPE is property, plants, and equipment; Δ(Sales) is change in sales relative to the last quarter; i indexes firm; j indexes industries defined by the first two digits of the SIC code; and t (q) indexes month (quarter).[5] We follow the method described in Kothari et al. (2005) and run a rolling regression of Equation (1) for each month by industry using the past one year of accounting data. The resulting residual, $\varepsilon_{i,j,t}$, is taken to be the discretionary accruals, $\text{DA}_{i,j,t}$. Pre-managed earnings, PME, is then defined as $\frac{\text{Earnings}_{i,j,t}}{\text{Assets}_{i,j,q-1}} - \text{DA}_{i,j,t}$.

[5] To reduce the effect of outliers, all of the variables in this paper, except those logarithm-transformed such as firm size and age, are winsorized at 0.5 and 99.5 percentiles every year.

After we calculate DA and PME, we define DA volatility (DAV) and PME volatility (PMEV), respectively, as the sample standard deviation of DA and PME over the past 36 months. Using the same estimation window, we further define $\rho_{\text{PME,DA}}$ as the sample contemporaneous correlation between PME and DA, and earnings volatility (EV) as the sample standard deviation of earnings to lagged assets. These measures are available for a large number of firms in Compustat from 1978 onward, which marks the start of our regression sample.

2. Measuring Idiosyncratic Return Volatility

Consistent with the literature (e.g., Zhang (2010)), our measure of idiosyncratic return volatility is adjusted for the Fama-French three-factor risks of market, SMB (size), and HML (value) in a three-step procedure. First, we estimate stock i's month-t Fama-French three-factor betas using monthly returns from month $t-60$ to month $t-1$. Second, we calculate the daily excess returns of the stock within month t as the realized daily returns minus the returns predicted by the betas estimated in step one. And lastly, we calculate stock i's monthly idiosyncratic return volatility in month t as the sample standard deviation of the excess returns within the month. Since we are interested in explaining the long-run trends rather than the temporary changes in return volatility, we take the three-year trailing moving average of the monthly idiosyncratic return volatility as our primary measure of idiosyncratic return volatility. We label the three-year moving average of idiosyncratic volatility as IRV.

C. Summary Statistics and Correlation

Table 2 reports the summary statistics and the sample correlations of EV, PMEV, DAV, $\rho_{\text{PME,DA}}$, and IRV. Consistent with the Fama and MacBeth (1973) cross-sectional regression method used in subsequent regressions, we report the time-series averages of the corresponding monthly cross-sectional statistics. Panel A shows that the mean value of $\rho_{\text{PME,DA}}$ is negative and large (-0.824), implying that firms exert a high level of discretion in their accrual recognition to offset the changes in operating results when reporting earnings. Panel B reports the average cross-sectional correlations of the above variables. Due to overlapping observations in the estimation of these variables, we adjust the significance of the mean correlations with the Newey and West (1987) autocorrelation of 35 lags, which correspond to an autocorrelation order of three years (our estimation window). Panel B demonstrates that the correlation between the two managerial discretion measures (DAV and $\rho_{\text{PME,DA}}$) is small (-0.04), suggesting that these two measures potentially represent different aspects of managerial discretion. Finally, consistent with our hypothesis, IRV is highly positively correlated with DAV and $\rho_{\text{PME,DA}}$: both correlations are no smaller than 0.30. Since a valid interpretation of the univariate correlations assumes that the underlying variables are stationary, these correlations should be interpreted cautiously. We offer multivariate tests that control for the common trends among these series in subsequent sections.

[Table 2 about here.]

D. Graphical Analysis of the Trends

The trends of IRV, earnings volatility and operating volatility are well established in the literature. To illustrate the consistency between our sample and the literature, we now present a graphical analysis of these trends. Figure 1 plots the simple cross-sectional means of the monthly idiosyncratic return volatility (the gray line) and the three-year trailing moving-average of the monthly series (IRV, the solid line) over time. Consistent with Brandt et al. (2010) and Zhang (2010), the monthly return volatility series is increasing prior to 2000, declines after 2000, and rises sharply from 2007 onwards as a result of the recent financial crisis. The IRV series shows a similar pattern, notably with two reversal points at 2003 and 2007, where the reversal of 2003 reflects the moving average calculation of IRV. IRV falls back to the pre-1990 level by 2007, but rises to the levels of the mid-1990s by 2009.

[Figure 1 about here.]

Figure 2 plots the time series of the cross-sectional means of EV, PMEV, DAV, and $\rho_{\text{PME,DA}}$. Interestingly, we observe a similar upward trend in these series before 2002, but a decline after 2003 and an increase after 2007. The increasing trends in EV and PMEV prior to 2002 are comparable with the rising trend in earnings volatility and cash flow volatility documented in Wei and Zhang (2006) and Irvine and Pontiff (2009). Importantly, the trends of all of these series map well with the trend in IRV—they all show similar reversal points in 2003 and 2007.[6]

[Figure 2 about here.]

III. Managerial Discretion, Information Quality, and Idiosyncratic Return Volatility

In this section, we provide evidence that both of our managerial discretion measures help determine idiosyncratic return volatility at the firm level. We further show that, by revealing firms' underlying information quality, DAV and $\rho_{\text{PME,DA}}$ are related to idiosyncratic return volatility. In particular, higher levels of DAV or less negative values of $\rho_{\text{PME,DA}}$ indicate lower information quality.

A. Managerial Discretion and Idiosyncratic Return Volatility

1. Full-sample Results

We illustrate the relation between idiosyncratic return volatility and managerial discretion through the following Fama and MacBeth (1973) cross-sectional regression:

$$
\begin{aligned}
(2)\quad \text{IRV}_{i,t} &= \alpha + \eta_1 \text{RET}_{i,t} + \eta_2 \text{AGE}_{i,t} + \eta_3 \text{SIZE}_{i,t-1} + \eta_4 \text{LEVERAGE}_{i,t-1} + \eta_5 \text{MB}_{i,t-1} \\
&\quad + \beta_1 \text{PMEV}_{i,t-1} + \beta_2 \text{DAV}_{i,t-1} + \beta_3 \rho_{\text{PME,DA}_{i,t-1}} + \sum_{j=2}^{5} \gamma_j D_{i,j,t} + \varepsilon_{i,t},
\end{aligned}
$$

[6] In untabulated results of the Chow structural break tests, we can report that both 2003 and 2007 are structural break points in the time-series of IRV and the earnings volatility components.

where RET is the three-year moving average of monthly stock return, AGE denotes the logarithm of the number of months that a firm has existed in CRSP, SIZE is the logarithm of market equity at the beginning of the month, MB is market-to-book equity calculated as the ratio of the beginning-of-the-month market equity to the end-of-the-month book equity, LEVERAGE is long-term debt to the book value of assets, and $D_{i,j,t}$ is a dummy variable that equals one if firm i is in industry j at month t and equals zero otherwise. The selection of the above control variables is based on Wei and Zhang (2006), Cao et al. (2008), and Brandt et al. (2010). We add industry dummies because the literature shows that the trend in idiosyncratic volatility is concentrated in certain industries (e.g., Zhang (2010)); and we select the five industries of consumer products and services, manufacturing, high-tech, health care, and other, as defined by Kenneth French.[7] In Equation (2), when a variable is only available on a quarterly basis (e.g., PMEV), the $t-1$ subscript refers to the previous quarter; otherwise the $t-1$ subscript refers to the previous month. As previously discussed, the coefficient significance is adjusted with the Newey and West (1987) autocorrelation of 35 lags.

The predicted signs of the control variables are as follows. Following Wei and Zhang (2006), we expect idiosyncratic return volatility to be positively associated with the return variable (RET) due to a risk–return tradeoff. Pastor and Veronesi (2003) argue that younger firms tend to have higher profit uncertainty and hence higher return uncertainty. The same argument can be extended to size. Therefore, we expect a negative association between return volatility and both AGE and SIZE. After controlling for AGE and SIZE, leverage is found to be negatively related to IRV in Brandt et al. (2010). A higher market-to-book ratio suggests a higher growth opportunity (Gaver and Gaver (1993)) and therefore larger equity volatility (Cao et al. (2008)).

Table 3 presents the regression results for various specifications of Regression (2). We first report that the coefficient estimates of the control variables all have the expected signs. The coefficient estimates on the industry dummies are omitted for brevity; we note that the industry dummies are significant most of the time, consistent with the literature.

[7] The industry definition is available at Kenneth French's website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

[Table 3 about here.]

The key results in Table 3 are that both operating uncertainty (PMEV) and managerial discretion (DAV and $\rho_{\text{PME,DA}}$) are significantly positively related to return volatility (specifications 2, 4, 5 and 6). The positive loading of PMEV confirms the point made by Irvine and Pontiff (2009) that operating volatility drives return volatility. More importantly, the results lend support to our hypothesis that managerial discretion contributes to idiosyncratic return volatility; that is, greater DAV and less negative $\rho_{\text{PME,DA}}$ jointly increase return volatility. Taken together, EV, which combines PMEV, DAV and $\rho_{\text{PME,DA}}$, is positively related to IRV (specifications 1 and 3). The results in Table 3 therefore emphasize the roles of managerial discretion in explaining idiosyncratic return volatility after controlling for fundamentals.

We also rank the contributions of the managerial discretion variables and operating volatility in Table 3. We focus on specification 6, where PMEV, DAV, and $\rho_{\text{PME,DA}}$ are used alongside the control variables. We examine their contributions in two ways: the overall contribution and the contribution per standard deviation change in the variables. In each cross-section, we define the overall contribution of a variable as the absolute value of the product of the sample mean and the coefficient estimate of the variable. The average overall contributions of $\rho_{\text{PME,DA}}$, PMEV, and DAV are, respectively, 0.0094, 0.0019, and 0.0015. The difference-in-mean tests (properly adjusted for Newey-West autocorrelation) indicate that the overall contribution of $\rho_{\text{PME,DA}}$ is greater than that of PMEV (t-statistic = 13.90), which is in turn greater than that of DAV (t-statistic = 2.21). Likewise, we define the contribution per standard deviation change in a variable in each cross-section as the absolute value of the product of the sample standard deviation and the coefficient estimate of the variable. The average per-standard-deviation contributions of $\rho_{\text{PME,DA}}$, PMEV, and DAV are, respectively, 0.0027, 0.0017, and 0.0013. Similarly, the rankings indicate that the contribution per standard deviation change in $\rho_{\text{PME,DA}}$ is larger than that of PMEV (t-statistic = 5.10), which is in turn larger than that of DAV (t-statistic = 2.94). In sum, these rankings reveal that the contribution of managerial discretion to idiosyncratic return volatility is no smaller than that of operating uncertainty.

2. The Interaction between DAV and $\rho_{\text{PME,DA}}$

We next examine whether our results hold for firms that exhibit differing DAV and $\rho_{\text{PME,DA}}$. As previously discussed, the literature has used the correlation between cash flows and accruals to reflect the degree of insider information revealed in earnings (e.g., Dechow (1994), Tucker and Zarowin (2006)), and accrual volatility to reflect a general level of accrual management over multiple periods (e.g., Gu et al. (2005)). We denote DAV as "absolute" managerial discretion to emphasize the general level of accruals in multiple periods, and $\rho_{\text{PME,DA}}$ as "relative" managerial discretion to emphasize the level of accruals relative to operating results over time. By this taxonomy, firms may engage in different degrees of absolute and relative discretion. Thus, it is important to examine the the interaction between the two—that is, whether the relation between idiosyncratic return volatility and managerial discretion holds under different combinations of absolute and relative discretion. To address this point, we partition the sample into four subsamples in each month based on median values of DAV and $\rho_{\text{PME,DA}}$, and re-run Regression (2) for each partition. Table 4 provides the results.

[Table 4 about here.]

Some interesting findings emerge from Table 4. Without controlling for the underlying operating uncertainty (PMEV), both DAV and $\rho_{\text{PME,DA}}$ are significantly and positively associated with IRV in all four partitions, consistent with our previous full-sample results. However, after controlling for PMEV, the results change partially: while $\rho_{\text{PME,DA}}$ still loads significantly across all four partitions, DAV remains significant only for the partitions of less negative $\rho_{\text{PME,DA}}$ firms. To explain these results, we note that the mean value of $\rho_{\text{PME,DA}}$ for the more negative $\rho_{\text{PME,DA}}$ partitions is -0.970 (almost -1), indicating that in this subsample, discretionary accruals co-move almost perfectly with pre-managed earnings. As a result, operating shocks are largely offset by discretionary accruals, rendering DAV a nearly redundant measure of PMEV. Thus, the effect of DAV is subsumed by PMEV in this subsample. In contrast, in the less negative $\rho_{\text{PME,DA}}$ subsamples, the mean of $\rho_{\text{PME,DA}}$ is -0.620, suggesting that DAV is distinct from PMEV. In sum, the partition results in Table 4 suggest that, although there are cases where absolute managerial discretion is dominated by operating uncertainty, overall, absolute and relative discretion should be used jointly to capture the consequences of managerial discretion on idiosyncratic return volatility.

3. Robustness Checks

In untabulated results, we provide extensive robustness checks on the significance of managerial discretion in the previous regression. First, our results are robust to a number of alternative idiosyncratic return measures, namely, monthly idiosyncratic volatility (instead of its three-year moving-average), as well as IRV defined on (1) betas estimated from three-year returns, (2) betas adjusted for the market factor only, and (3) industry-adjusted returns as in Campbell et al. (2001) and Brandt et al. (2010).

Second, our results hold in various subperiods. Our previous analysis suggests that the upward trends in IRV and the earnings volatility components reverse in 2003 and change again in 2007. We re-run Equation (2) for the following subperiods: (1) 1978–2002 and 2003–2009, and (2) 1978–2006 and 2007–2009. We find that the effects of managerial discretion on idiosyncratic volatility not only last into the 2000s, but also extend to the current financial crisis and do so with a magnitude similar to that of the pre-2000 period.

Third, our results hold after controlling for the alternative explanations of the business cycle effect (Bekaert et al. (2009)) and the new firm effect (Wei and Zhang (2006), Brown and Kapadia (2007)). Adding the real GDP growth to control for the business-cycle effect in the regression does not alter our conclusions. Moreover, our results are not driven by sample changes induced by new listing of young and riskier firms due to the relaxation of the listing requirements. Focusing on the five industries used earlier (consumer, manufacturing, hi-tech, health care, and others), we can report that while the significance of managerial discretion is stronger in the growing industries of high-tech and health care, the results hold for the other three industries as well.

Fourth, we extend our tests on alternative definitions of the main variables, including (1) using the reported cash flows (available in Compustat from 1988 onwards) rather than the derived cash flows to calculate accruals, (2) employing the estimation windows of 48 and 60 months to measure DAV and $\rho_{\text{PME,DA}}$, and (3) replacing the market-to-book equity and leverage variables in Equation (2) with the corresponding growth options variables in Cao et al. (2008). And finally, we check whether our results are robust to alternative samples and scalars used to deflate relevant accounting variables. The sample that we used earlier is constrained by the X11 deasonalization procedure. Specifically, it reduces the sample size by requiring consecutive observations, and contains look-ahead bias because X11 backs up variables using the full-sample data. To address these concerns, without implementing the X11 procedure, we use sales as the scalar to deseasonalize the quarterly items over the full sample. We further replace sales with assets or book equity as alternative scalars to get different samples. Our results hold under these alternatives.

B. Information Quality Underlying Managerial Discretion

Having shown the link between managerial discretion and idiosyncratic return volatility, we now examine the relation between managerial discretion and information quality. As previously discussed, the literature suggests that a larger DAV indicates a lack of consistency in earnings disclosure, and a less negative $\rho_{\text{PME,DA}}$ suggests that earnings are less informative about the operating status of the firm. Both measures are expected to be negatively associated with information quality. In this section we provide detailed supporting evidence.

1. Information Contents in DAV and $\rho_{\text{PME,DA}}$

We first construct six measures of information asymmetry and show their associations with DAV and $\rho_{\text{PME,DA}}$. Our first four measures rely on analysts given their roles as professional conduits of information flow between firms and investors. These four measures are: analyst forecast dispersion, two analyst forecast accuracy measures (whether or not the absolute difference between the actual EPS and the analyst consensus forecast is within five cents or within 10%), and the number of analysts following the firm. Smaller analyst forecast dispersion, higher forecast accuracy, and greater analyst following all suggest lower information asymmetry between the management and the external shareholders, i.e., higher information quality. We construct these variables from the I/B/E/S database using analysts' forecasts of quarterly earnings per share for the upcoming quarter for the period of June, 1993 to December, 2009.[8] Following Diether et al. (2002), we measure analyst forecast dispersion as the cross-sectional standard deviation of analyst forecasts, scaled by the end-of-the-quarter stock price.

Our remaining two measures of information asymmetry are firm size and bid–ask spread. The literature has shown that firm size is negatively linked to information asymmetry. For example, Atiase (1985) and Bamber (1987) find that larger firms have more pre-disclosure information available prior to earnings announcements. We use bid–ask spread to measure trading informativeness (Glosten and Milgrom (1985), Jayaraman (2008)).[9] Small bid–ask spread indicates low information asymmetry. Unlike the analyst-based measures, we calculate these measures for the full sample period.

Table 5 provides the equal-weighted values of the above information asymmetry measures for quintile portfolios sorted on DAV (Panel A) and $\rho_{\text{PME,DA}}$ (Panel B). We observe that a larger value of DAV and a less negative value of $\rho_{\text{PME,DA}}$ are both associated with a higher degree of information asymmetry. This pattern is almost monotonic across the five quintile portfolios and the

[8]The I/B/E/S data for analyst forecasts goes back to 1982. However, it appears that there was a change of data construction method in June 1993. As I/B/E/S states, "prior to [June of] 1993, Detail History [of I/B/E/S] was a reconstruction of archived Detail tapes. Extensive audits were performed to preserve the integrity of the original data." Abarbanell and Lehavy (2002) document significant differences in earnings properties between pre- and post-1993 I/B/E/S data. Barton and Simko (2002) use post-1993 data for the same reason.

[9]We measure bid–ask spread as the effective spread, i.e., the absolute value of the difference between the transaction price and the midpoint of the quoted bid and ask, divided by the midpoint of these quotes. We average the daily bid–ask spreads within the month to derive the monthly spread.

six measures within each panel: firms with larger DAV or less negative $\rho_{\text{PME,DA}}$ are associated with larger forecast dispersion, lower forecast accuracy, lower degree of analyst following, smaller size, and higher bid–ask spread. In addition, the differences between quintiles 1 and 5 are all highly significant. These results indicate that firms utilizing more absolute managerial discretion or less relative managerial discretion are more opaque to investors.

[Table 5 about here.]

2. Multivariate Regressions of Information Quality

Since the portfolio sorting results in Table 5 do not control for other factors that might affect information asymmetry, we conduct formal multivariate tests on the association between information quality and managerial discretion. We choose analyst forecast dispersion as the information quality measure among the six information asymmetry proxies examined earlier based on the following two considerations. First, forecast dispersion is the only second-moment measure among the six that matches the second-moment measures of DAV and $\rho_{\text{PME,DA}}$. Second, the literature suggests that forecast dispersion reflects the underlying information risk and hence information quality (e.g., Barron et al. (2009)).

In addition to information quality, two factors may also affect the dispersion of forecasts: (1) firms' operating uncertainty, which impedes analysts' ability to make accurate forecasts, and (2) analyst characteristics, which introduce dispersion arising from experience and resource disparities among analysts. Clement (1999) shows that forecast accuracy is positively associated with analysts' experience (a measure for analyst ability and skill) and employer size (a measure for resources available), and is negatively associated with the number of firms followed by the analyst (a measure for task complexity). Since analyst disagreement is inversely related to accuracy, these characteristics are therefore expected to have opposite signs on forecast dispersion.

We therefore run the following regression for the determinants of analysts forecast dispersion:

$$\text{(3)} \qquad \text{DISP}_{i,t} = \alpha + \beta_1 \text{PMEV}_{i,t} + \beta_2 \text{DAV}_{i,t} + \beta_3 \rho_{\text{PME,DA}_{i,t}} + \gamma_1 \text{GEXP}_{i,t} + \gamma_2 \text{FEXP}_{i,t} + \gamma_3 \text{NCOS}_{i,t} + \gamma_4 \text{DTOP10}_{i,t} + \varepsilon_{i,t}$$

where DISP is forecast dispersion, measured as the three-year moving average of monthly firm-specific forecast dispersion to match the time-horizon of IRV. The control variables are PMEV (for operating uncertainty) and the firm-specific, cross-sectional means of the analyst characteristic variables based on Clement (1999). The analyst-related variables are: GEXP (the general experience of the analyst, measured as the number of years during which an analyst supplied at least one forecast), FEXP (firm-specific experience, measured as the number of years during which an analyst supplied at least one forecast for the firm in question), NCOS (number of firms for which an analyst supplied at least one forecast during the year), and DTOP10 (a dummy variable that equals 1 if an analyst is employed by a financial services firm in the top size decile during the year, where size deciles are based on the number of analysts employed in the year).

Table 6 reports the results for Regression (3). We observe that when dispersion is regressed on various combinations of PMEV, DAV, and $\rho_{\text{PME,DA}}$, the estimates on all three variables are significantly positive. These results indicate that at the firm level, forecast dispersion is driven not only by operating uncertainty, but also by managerial discretion. Collectively, the results of Tables 5 and 6 suggest that DAV and $\rho_{\text{PME,DA}}$ are reflective of information quality.

[Table 6 about here.]

3. Alternative Interpretation of Discretionary Accruals

A number of prior studies have also offered information quality-related interpretations for discretionary accruals. Sloan (1996), Teoh et al. (1998a,b), and Fama and French (2008) show that higher levels of accruals lead to lower future returns (perhaps due to managers' abuse of accruals). Rajgopal and Venkatachalam (2010) provide evidence that the increase in return volatility is related to the deterioration in earnings quality, where the authors use absolute value of discretionary accruals as one of their two measures for earnings quality.[10] In addition, Hutton et al. (2009) use the absolute value of discretionary accruals as a measure for opacity in financial reporting. A common theme in these studies is that larger accruals suggest a worse information environment. Since accruals are mean-reverting in the long run, a high level of accruals will necessarily lead to high accrual volatility. Thus, our argument that accrual volatility is indicative of poor information quality is related to this strand of the literature.

However, our information quality argument for managerial discretion differs from this literature in two aspects. First, the level of accruals reflects a one-period estimate of managerial discretion, whereas accrual volatility emphasizes a multi-period estimate. Arguably, information quality may be better captured by a multi-period estimate, since managerial discretion is not a stand-alone, one-time decision, but a repeated game that managers play. Second, we also consider another multi-period measure of managerial discretion, $\rho_{\text{PME,DA}}$, which captures the offsetting relation between PME and DA and is thus distinctly different from the level of accruals.

For completeness, we provide evidence that our results about managerial discretion hold after controlling for absolute discretionary accruals. The results are shown in Table 7. We note that, while the measure of absolute discretionary accruals is significantly and positively associated with IRV, consistent with the aforementioned studies, it does not subsume the significance of EV, PMEV, DAV, and $\rho_{\text{PME,DA}}$. Thus, the evidence shows that manipulation of accruals over multiple periods has information beyond one-period accruals.

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[10]The other measure of earnings quality in Rajgopal and Venkatachalam (2010) is the accrual quality measure of Dechow and Dichev (2002), which is defined as the standard deviation of accrual residuals conditioning on cash flows. Our results hold after controlling for the two earnings quality measures in Rajgopal and Venkatachalam (2010). To some extent, the measures in Rajgopal and Venkatachalam (2010), i.e., the level of accruals and volatility in accrual residuals, can be considered as capturing some aspects of absolute managerial discretion and are thus related to accrual volatility. However, relative managerial discretion, i.e., $\rho_{\text{PME,DA}}$, is not considered in Rajgopal and Venkatachalam (2010).

[Table 7 about here.]

C. Information Quality and Market Synchronicity

We have associated managerial discretion respectively with idiosyncratic return volatility, and with information quality. To complete our investigation of the three-way relations among managerial discretion, information quality, and idiosyncratic return volatility, we now examine the relation between idiosyncratic volatility and information quality.

As previously discussed, we add to the debate on market transparency and the market model R^2 (a measure for a stock's market synchronicity) with our contention that poor information quality is associated with high idiosyncratic return volatility. One school of the literature argues that lower market R^2s are associated with higher transparency of firms' information environment (Morck et al. (2000), Jin and Myers (2006), Hutton et al. (2009)). For example, in Morck et al. (2000), a country with poorer information quality will have a larger, country-specific systematic commonality in stock returns, because firm-specific elements are less likely to be impounded into prices due to a poorer investor protection mechanism that discourages informed arbitrage. This in turn leads to a higher R^2: in other words, poor information quality results in higher R^2. Since idiosyncratic return volatility is inversely related to R^2, and transparency in general means high information quality, one can deduce from this strand of the literature that idiosyncratic volatility is positively related to information quality.

In contrast, Dasgupta et al. (2010) contend that firm-level R^2 increases when information transparency improves. Since stock prices are more informative about future events in a more transparent environment, these authors argue that, when events actually happen in the future, there should be less new information being impounded into stock prices—because market participants would have efficiently priced in the likelihood of occurrence of the events. Consequently, the contemporaneous comovement between individual stock returns and the market return will weaken. Thus, a more transparent environment is instead associated with a higher stock market synchronicity.

A related strand of the literature examines the relationship between R^2 and information quality, arriving at conclusions similar to those of Dasgupta et al. (2010). Using the U.S. data, Kelly (2007) and Teoh et al. (2009) document that low R^2 firms have poor information environments, as measured by trading impediments, such as transactions costs and short sale constraints, and by earnings properties, such as earnings quality, earnings persistence, and earnings predictability. In addition, Rajgopal and Venkatachalam (2010) and Bartram et al. (2011) directly examine the relation between idiosyncratic return volatility and corporate-disclosure or earnings quality, and find a negative association between the two.

Focusing on idiosyncratic return volatility and managerial discretion, we contribute to the debate in this literature by directly examining the relation between R^2 and information quality. We use analyst forecast dispersion, DAV, and $\rho_{\text{PME,DA}}$ as inverse measures of information quality, and run the following regression of R^2 based on Dasgupta et al. (2010):

$$(4) \qquad \log(1-R^2_{i,t}) = \eta_0 + \eta_1\beta^{\text{MKT}}_{i,t} + \eta_2\beta^{\text{SMB}}_{i,t} + \eta_3\beta^{\text{HML}}_{i,t} + \eta_4\text{AGE}_{i,t} + \eta_5\text{MB}_{i,t} + \eta_6\text{SIZE}_{i,t} + \eta_7\text{ROA}_{i,t} + \eta_8\text{LEVERAGE}_{i,t} + \sum_{j=2}^{5}\gamma_j D_{i,j,t} + \theta(\text{Information Quality})_{i,t} + \varepsilon_{i,t}$$

where firm i's month-t R^2 is the adjusted R^2 of the Fama-French three-factor-model regression using monthly returns from month $t-60$ to month $t-1$; β^{MKT}, β^{SMB}, and β^{HML} correspond, respectively, to the Fama-French three-factor betas estimated therein; and ROA is return on assets, defined as the sum of earnings and interest payments over the past four quarters divided by total assets of the last quarter.

Table 8 presents the results. We note that the signs of the control variables are largely consistent with those in Dasgupta et al. (2010). Importantly, the signs on our information quality variables DISP, DAV, and $\rho_{\text{PME,DA}}$ are all positive, suggesting that lower R^2 indicates worse information quality. These findings support the school of Teoh et al. (2009) and Dasgupta et al. (2010). In sum, we have investigated the three-way relations among managerial discretion, information quality, and idiosyncratic return volatility, and have shown that the information quality underlying managerial discretion is negatively associated with idiosyncratic return volatility.

[Table 8 about here.]

IV. Trend Analyses

A. Relating the Trend in Return Volatility to Managerial Discretion

Having established the firm-level associations between idiosyncratic volatility and the two measures of management discretion, we now focus on the trend analyses. Specifically, to relate the trend in idiosyncratic return volatility to the trend in earnings volatility or its components, we conduct the trend analysis based on the cross-sectional means (e.g., Wei and Zhang (2006)). The time-series regression specification is as follows:

$$\overline{\text{IRV}_t} = \alpha + \beta_0 t + \eta_1 \overline{\text{DAV}_{t-1}} + \eta_2 \overline{\rho_{\text{PME,DA}_{t-1}}} + \varepsilon_t, \tag{5}$$

where $\overline{\text{IRV}_t}$ is the cross-sectional average of IRV at month t, and analogously for $\overline{\text{DAV}_{t-1}}$ and $\overline{\rho_{\text{PME,DA}_{t-1}}}$. In alternative specifications, we also replace $\overline{\text{DAV}_{t-1}}$ and $\overline{\rho_{\text{PME,DA}_{t-1}}}$ with $\overline{\text{PMEV}_{t-1}}$ and $\overline{\text{EV}_{t-1}}$, which are analogously defined.[11] In our construct, if IRV shows a trend, it should be picked up by the time variable t. However, if there are some other trending variables, for instance, DAV, that explain the IRV trend, the loading of the variable t will be attenuated when including these trending variables in the regression.

Panel A, Table 9 presents the results using the Generalized Method of Moments (GMM) for both the value-weighted and equal-weighted means. We test three sets of trending variables,

[11]Because both pre-managed earnings volatility and managerial discretion show trends that mimic idiosyncratic return volatility, placing both pre-managed earnings volatility and managerial discretion in one regression to explain the trend in idiosyncratic return volatility might result in severe multi-collinearity problems and dampen the predictive ability of the explanatory variables.

namely, $\overline{\text{PMEV}_{t-1}}$, the combination of $\overline{\text{DAV}_{t-1}}$ and $\overline{\rho_{\text{PME},\text{DA}_{t-1}}}$, and $\overline{\text{EV}_{t-1}}$. These three sets examine, respectively, the contribution from operating uncertainty, managerial discretion, and the aggregation of operating uncertainty and managerial discretion.

[Table 9 about here.]

The results in Panel A demonstrate that the trend in idiosyncratic return volatility is indeed explained by these trending variables. In the equal-weighted-mean case, idiosyncratic return volatility is increasing at a rate of 0.334×10^{-4} (specification 1), indicating that over the full sample period of 1978–2009, there is an upward trend in idiosyncratic volatility. When the explanatory trending variables are either $\overline{\text{PMEV}_{t-1}}$ (specification 2), or the combination of $\overline{\text{DAV}_{t-1}}$ and $\overline{\rho_{\text{PME},\text{DA}_{t-1}}}$ (specification 3), the coefficient estimate on t becomes insignificant. When the explanatory variable is $\overline{\text{EV}_{t-1}}$, or the aggregate effect of operating uncertainty and managerial discretion, the coefficient estimate on t even reverses to negative. In all of the specifications, the loadings of $\overline{\text{EV}_{t-1}}$, $\overline{\text{PMEV}_{t-1}}$, $\overline{\text{DAV}_{t-1}}$, and $\overline{\rho_{\text{PME},\text{DA}_{t-1}}}$ are significantly positive. The results of the value-weighted-mean case are similar to the equal-weighted counterpart, except that $\overline{\rho_{\text{PME},\text{DA}_{t-1}}}$ becomes insignificant.[12]

We further repeat the trend analysis for the subperiods of 1978–2002, 2003–2006, and 2007–2009. The results are presented in Panel B, Table 9. We first note that IRV shows a positive trend in 1978–2002, a negative trend in 2003–2006, and a large positive trend in 2007–2009. This is consistent with the literature that shows a reversal of the idiosyncratic volatility trend in the early 2000s (e.g., Brandt et al. (2010)), and with the observation that return volatility rose sharply during the recent financial crisis. Importantly, we observe that the managerial discretion variables of $\overline{\text{DAV}_{t-1}}$ and $\overline{\rho_{\text{PME},\text{DA}_{t-1}}}$ continue to significantly and positively explain the trend of IRV for all of the subperiods, for both equal-weighted and value-weighted means. For example, using the

[12]In the case of value-weighted-means, the rate of increase in IRV is smaller than its equal-weighted-mean counterpart: the coefficient estimate of t reduces to 0.167×10^{-4}. This is consistent with the argument that smaller/newer firms have been driving the trend in IRV (Brown and Kapadia (2007)).

equal-weighted means, $\overline{\text{DAV}_{t-1}}$ and $\overline{\rho_{\text{PME,DA}_{t-1}}}$ reduce the trend of IRV from 0.658×10^{-4} to only 0.040×10^{-4} in the subperiod of 1978–2002, and from -3.612×10^{-4} to -2.599×10^{-4} in the subperiod of 2003–2006. In sum, Table 9 shows that managerial discretion helps explain both the overall trend and episodic trends in IRV.

B. Simultaneous-Equation Regressions of the IRV Trend

Irvine and Pontiff (2009) show that the increasing trend in idiosyncratic return volatility in their sample period is related to increased cash flow volatility. Recognizing that managerial discretion can be in part caused by the underlying operating uncertainty of firms, we run a simultaneous-equation regression that endogenizes the trend in managerial discretion on operating uncertainty. The system of equations is as follows:

(6)
$$\begin{aligned}\overline{\text{DAV}_{t-1}} &= a_1 + a_2\overline{\text{PMEV}_{t-1}} + \mu_{t-1}\\ \overline{\rho_{\text{PME,DA}_{t-1}}} &= b_1 + b_2\overline{\text{PMEV}_{t-1}} + \upsilon_{t-1}\\ \overline{IRV_t} &= \alpha + \beta_0 t + \eta_1\overline{\text{DAV}_{t-1}} + \eta_2\overline{\rho_{\text{PME,DA}_{t-1}}} + \varepsilon_t\end{aligned}$$

where $\overline{\text{DAV}_{t-1}}$, $\overline{\rho_{\text{PME,DA}_{t-1}}}$, and $\overline{\text{IRV}_t}$ are endogenous variables.[13]

The simultaneous-equation regression results are presented in Table 10. These results corroborate those in Table 9. The trends in both DAV and $\rho_{\text{PME,DA}}$ are significantly related to operating uncertainty. After controlling for the endogeneity of managerial discretion, we find that managerial discretion can fully explain the trends in both equal- and value-weighted $\overline{\text{IRV}_t}$: the estimates on t reverse to negative in both cases. Collectively, the results in Tables 9 and 10 lead us to conclude that the trend in IRV derives not only from operating uncertainty, but also from managerial discretion.

[13]To help identify the equations, we use $\overline{\text{EV}_{t-1}}$ in addition to the exogenous variables of the constant, t, and $\overline{\text{PMEV}_{t-1}}$ as the instrument variables.

[Table 10 about here.]

V. Conclusion

This study provides an information quality-based explanation for the ebbs and flows in idiosyncratic return volatility. We decompose earnings volatility into three elements: pre-managed earnings volatility that reflects the uncertainty in firms' operating activities, discretionary accruals volatility that reflects the general managerial discretion in financial reporting, and the correlation between pre-managed earnings and discretionary accruals that reflects the relative managerial discretion to offset operating shocks. We show that the variation in idiosyncratic return volatility from 1978 to 2009 is attributable to managerial discretion in accruals after controlling for operating uncertainty. These findings hold during various sub-periods including the recent financial crisis and after controlling for a number of alternative explanations.

We further demonstrate that managerial discretion in accruals is related to a number of proxies for information quality. Specifically, we show that higher discretionary accrual volatility and less negative correlation are associated with lower information quality. This evidence is consistent with the implications in the literature that higher accrual volatility imposes a higher level of information asymmetry, and less negative correlation indicates less revelation of managers' insider information. We also add to the debate on transparency and stock-return synchronicity by showing that a firm with poorer information quality has lower market synchronicity (R^2) and thus higher idiosyncratic volatility. Collectively, this paper examines the three-way relations among managerial discretion, idiosyncratic volatility, and information quality, and provides evidence that managerial discretion drives the trend in idiosyncratic return volatility via its influence on information quality.

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Table 1: **Sample Derivation**

This table describes the sample selection process.

Step	Sample Filtering	# of obs.
1	All "domestic" firm-quarter observations from Compustat (June 2010 update)	
	1.1 Set CHEQ (cash and short-term investment) and	
	DLCQ (debt in current liabilities) to zero if missing	1,341,803
2	Non-missing obs. in earnings and cash flow at the same time	713,857
3	Deseasonalize earnings and cash flow using X11 procedure	
	3.1 Require consecutive observations over the firm lifetime and	
	at least 12 consecutive observations in the above variables	296,039
4	Restrict to firms listed in NYSE/AMEX/Nasdaq	167,634
5	Expand to monthly observations and require appearance on CRSP monthly data	477,374
6	Remove financials (SIC # 6000–6999) and utilities (SIC # 4900–4949)	427,869
7	Non-missing obs. in earnings volatility, pre-managed earnings volatility and	
	discretionary accrual volatility at the same time, from 1978 to 2009	
	7.1 Require at least six observations in estimating these volatilities	305,097
8	Require non-missing idiosyncratic return volatility	
	8.1 Require at least 10 daily observations within the month	
	for the estimation of monthly idiosyncratic volatility	278,725
	# of firms	3,309

Table 2: **Summary Statistics and Correlations of the Major Variables**

This table reports the time-series averages of the monthly cross-sectional descriptive statistics (Panel A) and correlations (Panel B) of the major variables. EV = earnings volatility (standard deviation of earnings before extraordinary items/lagged assets over the past 12 quarters); PMEV = pre-managed earnings volatility (standard deviation of pre-managed earnings over the past 12 quarters); DAV = discretionary accrual volatility (standard deviation of discretionary accruals over the past 12 quarters); $\rho_{\text{PME,DA}}$ = correlation between pre-managed earnings and discretionary accruals over the past 12 quarters; and IRV = the three-year trailing moving average of the monthly idiosyncratic return volatilities, where each stock's monthly idiosyncratic return volatility is measured as the standard deviation of the stock's risk-adjusted daily returns by using the returns within the month. Details on the measurement of PMEV, DAV and $\rho_{\text{PME,DA}}$ are provided in Section II.B of the text. EV, IRV, and the regression variables needed to derive PMEV and DAV are winsorized at 0.5 and 99.5% each year. In Panel B, the significance is adjusted with the Newey-West (1987) autocorrelation of 35 lags. t-statistics are in square brackets. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

Panel A: Time-Series Average of Monthly Cross-Sectional Summary Statistics

	# of firms	Mean	Standard deviation	25^{th} percentile	Median	75^{th} percentile
EV	726	0.018	0.024	0.005	0.010	0.021
PMEV	726	0.037	0.034	0.018	0.027	0.044
DAV	726	0.032	0.027	0.016	0.024	0.039
$\rho_{\text{PME,DA}}$	726	−0.824	0.248	−0.978	−0.927	−0.776
IRV	726	0.030	0.014	0.019	0.027	0.037

Panel B: Time-Series Average of Cross-Sectional Correlations

	EV	PMEV	DAV	$\rho_{\text{PME,DA}}$
PMEV	0.69			
	[16.87]***			
DAV	0.48	0.78		
	[23.65]***	[38.88]***		
$\rho_{\text{PME,DA}}$	0.63	0.13	−0.04	
	[58.11]***	[3.11]***	[−1.90]*	
IRV	0.45	0.35	0.32	0.30
	[30.33]***	[13.70]***	[14.93]***	[15.34]***

Table 3: **Determinants of Idiosyncratic Return Volatility**

This table reports the results for various specifications of the following regression:

$$\begin{aligned} \text{IRV}_{i,t} =& \alpha + \eta_1 \text{RET}_{i,t} + \eta_2 \text{AGE}_{i,t} + \eta_3 \text{SIZE}_{i,t-1} + \eta_4 \text{LEVERAGE}_{i,t-1} + \eta_5 \text{MB}_{i,t-1} \\ &+ \beta_1 \text{PMEV}_{i,t-1} + \beta_2 \text{DAV}_{i,t-1} + \beta_3 \rho_{\text{PME,DA}_{i,t-1}} + \sum_{j=2}^{5} \gamma_j D_{i,j,t} + \varepsilon_{i,t}, \end{aligned}$$

where IRV = three-year trailing moving average of monthly idiosyncratic return volatility, RET = the average monthly stock return during the past three years, AGE = the logarithm of the number of months a firm has existed in CRSP, SIZE = the logarithm of the market value of equity at the beginning of the month, LEVERAGE = the long-term debt to the book value of assets, MB = the beginning of the month market equity to the end of the month book equity, PMEV = pre-managed earnings volatility, DAV = discretionary accrual volatility, $\rho_{\text{PME,DA}}$ = correlation between pre-managed earnings and discretionary accruals, and $D_{i,j,t}$ is a dummy variable that equals one if firm i is in industry j at month t and zero otherwise. When a data item is available at the monthly frequency, its lagged value refers to the value of the previous month; otherwise the lagged value refers to the value of the previous quarter. The Fama-MacBeth (1973) cross-sectional regressions are estimated, with all errors adjusted with the Newey-West (1987) autocorrelation of 35 lags. t-statistics are in square brackets. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

	1	2	3	4	5	6
Intercept	0.025	0.038	0.063	0.065	0.075	0.074
	[17.74]***	[27.69]***	[15.82]***	[18.48]***	[20.78]***	[20.64]***
RET			0.068	0.057	0.068	0.067
			[3.05]***	[2.27]**	[3.00]***	[2.99]***
AGE			−0.004	−0.004	−0.004	−0.004
			[−7.54]***	[−8.11]***	[−7.70]***	[−7.54]***
SIZE			−0.004	−0.004	−0.004	−0.004
			[−11.50]***	[−12.80]***	[−12.30]***	[−12.30]***
LEVERAGE			0.001	0.001	0.001	0.001
			[0.78]	[0.83]	[0.61]	[0.53]
MB			0.0002	0.0004	0.0003	0.0003
			[2.78]***	[3.67]***	[3.19]***	[3.21]***
EV	0.296		0.168			
	[13.78]***		[13.92]***			
PMEV		0.039		0.063		0.037
		[3.95]***		[6.99]***		[3.65]***
DAV		0.150			0.071	0.029
		[9.53]***			[7.62]***	[3.62]***
$\rho_{\text{PME,DA}}$		0.018			0.012	0.011
		[16.33]***			[18.74]***	[15.30]***
5-industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of months	384	384	384	384	384	384
Average adj. R^2	20.4%	20.8%	54.1%	50.6%	53.3%	53.5%

Table 4: **Determinants of Idiosyncratic Return Volatility (IRV) for Firms Differing in Relative and Absolute Discretion**

This table presents the results of the impact of managerial discretion on IRV for firms differing in relative and absolute discretion. Each month the sample is partitioned into four groups based on the median values of $\rho_{\text{PME,DA}}$ and DAV. Below (above) median values are categorized as "low" ("high"). For example, "low $\rho_{\text{PME,DA}}$ & low DAV" refers to the group with below-median values of $\rho_{\text{PME,DA}}$ (more negative $\rho_{\text{PME,DA}}$) and below-median values of DAV. Refer to Table 3 for variable definitions. Fama-MacBeth (1973) cross-sectional regressions are estimated, with all errors adjusted with the Newey-West (1987) autocorrelation of 35 lags. t-statistics are in square brackets. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

	Low $\rho_{\text{PME,DA}}$ & low DAV		Low $\rho_{\text{PME,DA}}$ & high DAV		High $\rho_{\text{PME,DA}}$ & low DAV		High $\rho_{\text{PME,DA}}$ & high DAV	
	1	2	1	2	1	2	1	2
Intercept	0.047	0.043	0.181	0.177	0.070	0.068	0.083	0.082
	[1.55]	[1.47]	[10.47]***	[10.63]***	[10.70]***	[10.17]***	[13.30]***	[14.14]***
RET	0.062	0.062	0.108	0.108	0.054	0.056	0.077	0.075
	[3.45]***	[3.44]***	[6.19]***	[6.31]***	[2.22]**	[2.40]**	[3.06]***	[3.03]***
AGE	0.003	0.003	−0.003	−0.003	−0.005	−0.005	−0.005	−0.005
	[0.72]	[0.72]	[−3.21]***	[−3.46]***	[−2.91]***	[−2.83]***	[−4.81]***	[−4.89]***
SIZE	−0.003	−0.003	−0.004	−0.004	−0.004	−0.004	−0.005	−0.005
	[−10.10]***	[−10.10]***	[−9.72]***	[−9.72]***	[−13.10]***	[−12.80]***	[−9.73]***	[−9.69]***
LEVERAGE	0.003	0.003	0.001	0.001	0.001	0.001	0.003	0.003
	[2.52]**	[2.48]**	[0.70]	[0.60]	[1.12]	[0.90]	[1.39]	[1.44]
MB	0.0004	0.0004	0.0003	0.0003	0.0002	0.0002	0.0003	0.0003
	[2.96]***	[2.96]***	[3.45]***	[3.40]***	[1.86]***	[1.66]***	[2.20]**	[2.17]**
PMEV		0.183		0.062		0.088		0.024
		[3.74]***		[2.32]**		[4.74]***		[1.02]
DAV	0.184	−0.004	0.045	−0.024	0.279	0.177	0.083	0.061
	[5.12]***	[−0.08]	[6.65]***	[−0.86]	[6.86]***	[4.00]***	[10.62]***	[2.16]**
$\rho_{\text{PME,DA}}$	0.026	0.023	0.124	0.120	0.008	0.007	0.009	0.009
	[1.96]**	[1.71]***	[6.70]***	[6.74]***	[11.16]***	[7.25]***	[6.30]***	[4.59]***
5-Ind. dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of months	384	384	384	384	384	384	384	384
Average adj. R^2	46.3%	46.6%	45.5%	45.7%	51.5%	52.1%	46.0%	46.8%

Table 5: **Information Quality in Managerial Discretion Measures**

This table provides the equal-weighted means of the information quality measures for portfolios sorted on absolute or relative discretion. Where applicable, the table uses I/B/E/S one-quarter-ahead quarterly earnings forecasts from June 1993. Analyst forecast dispersion is measured as the cross-sectional standard deviation of analysts' forecasts of quarterly earning per share for the upcoming quarter (required at least two observations), scaled by the end-of-the-quarter stock price. "Actual EPS and consensus forecast within 5 cents" is a dummy variable that equals 1 if $|\text{actual EPS} - \text{consensus forecast}| \leq 5$ cents, and 0 otherwise, where consensus forecast is defined as the average forecast (only the most recent forecast of an analyst is used); "Actual EPS and consensus forecast within 10%" is a dummy variable that equals 1 if $|(\text{actual EPS} - \text{consensus forecast}) / (\text{consensus forecast})| \leq 10\%$, and 0 otherwise. Bid–ask spread is the absolute value of the difference between the transaction price and the midpoint of the quoted bid and ask, divided by the midpoint of these quotes. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

Panel A: Information Asymmetry Properties of Quintile Portfolios Sorted on DAV

	DAV Quintile					
	1 (smallest)	2	3	4	5	1 − 5
Analyst forecast dispersion	0.002	0.003	0.003	0.004	0.005	-0.003^{***}
Actual EPS and consensus forecast within 5 cents	0.75	0.77	0.76	0.74	0.71	0.05^{***}
Actual EPS and consensus forecast within 10%	0.56	0.51	0.47	0.43	0.38	0.18^{***}
Number of following analysts	7.11	6.01	5.39	5.07	4.59	2.52^{***}
Log(Market cap)	6.50	5.76	5.34	5.01	4.63	1.87^{***}
Bid–ask spread	0.006	0.008	0.009	0.010	0.012	-0.007^{***}

Panel B: Information Asymmetry Properties of Quintile Portfolios Sorted on $\rho_{\text{PME,DA}}$

	$\rho_{\text{PME,DA}}$ Quintile					
	1 (most negative)	2	3	4	5	1 − 5
Analyst forecast dispersion	0.002	0.002	0.003	0.004	0.006	-0.004^{***}
Actual EPS and consensus forecast within 5 cents	0.82	0.78	0.74	0.72	0.69	0.13^{***}
Actual EPS and consensus forecast within 10%	0.61	0.52	0.46	0.41	0.35	0.27^{***}
Number of following analysts	5.49	5.66	5.98	6.00	5.40	0.09^{**}
Log(Market cap)	5.68	5.58	5.54	5.39	5.07	0.60^{***}
Bid–ask spread	0.007	0.008	0.009	0.010	0.011	-0.003^{***}

Table 6: **Forecast Dispersion and Managerial Discretion**

This table reports the regression results examining the relation between forecast dispersion, a proxy for information quality, and managerial discretion. Forecast dispersion is measured as the three-year moving average of firm-specific analyst forecast dispersion. The independent variables are PMEV, DAV, $\rho_{\text{PME,DA}}$, and the firm-specific cross-sectional average of: GEXP (the general experience of the analyst, measured as the number of years during which an analyst supplied at least one forecast), FEXP (firm-specific experience, measured as the number of years during which an analyst supplied at least one forecast for the firm in question), NCOS (number of firms for which an analyst supplied at least one forecast during the year), and DTOP10 (a dummy variable that equals 1 if an analyst is employed by a financial services firm in the top size decile during the year and 0 otherwise, where size deciles are based on the number of analysts employed in the year). GEXP, FEXP, NCOS, and DTOP10 are constructed from the I/B/E/S database for the period of 1995 to 2009; therefore, the sample period is 1995–2009 (180 months). Fama-MacBeth (1973) cross-sectional regressions are estimated, with all errors adjusted with the Newey-West (1987) autocorrelation of 35 lags. t-statistics are in square brackets. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

Dependent variable: Forecast Dispersion $\times 10^3$	1	2	3	4	5
Intercept	2.196	0.838	4.026	3.897	3.509
	[8.96]***	[7.33]***	[15.98]***	[12.70]***	[14.47]***
GEXP	−0.143			−0.141	−0.132
	[−2.01]**			[−2.25]**	[−2.18]**
FEXP	0.023			0.132	0.139
	[0.57]			[2.97]***	[3.36]***
NCOS	0.002			0.001	0.001
	[5.85]***			[5.01]***	[4.93]***
DTOP10	−0.723			−0.223	−0.270
	[−2.69]***			[−1.23]	[−1.50]
PMEV		31.918			21.205
		[8.06]***			[2.70]***
DAV			35.971	36.494	13.633
			[7.77]***	[8.19]***	[1.65]*
$\rho_{\text{PME,DA}}$			3.612	3.550	3.133
			[11.92]***	[11.74]***	[12.75]***
5-Industry dummies	Yes	Yes	Yes	Yes	Yes
Number of months	180	180	180	180	180
Average adj. R^2	2.7%	6.9%	11.5%	12.5%	13.2%

Table 7: **Robustness to the Control of Absolute Discretionary Accruals**

This table presents the regression results of IRV on managerial discretion, controlled for absolute discretionary accruals (Abs(DA)). For the definitions of the other variables, refer to Table 3. Fama-MacBeth (1973) regressions are estimated, with all errors adjusted with the Newey-West (1987) autocorrelation of 35 lags. t-statistics are in square brackets. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

Dependent variable: IRV				
	1	2	3	4
Intercept	0.063	0.064	0.075	0.074
	[16.05]***	[18.14]***	[20.47]***	[20.36]***
RET	0.068	0.057	0.068	0.067
	[3.08]***	[2.26]***	[3.00]***	[2.99]***
AGE	−0.004	−0.004	−0.004	−0.004
	[−7.54]***	[−7.98]***	[−7.65]***	[−7.49]***
SIZE	−0.004	−0.004	−0.004	−0.004
	[−11.52]***	[−12.70]***	[−12.20]***	[−12.21]***
LEVERAGE	0.001	0.001	0.001	0.001
	[0.81]	[0.88]	[0.64]	[0.56]
MB	0.0002	0.0004	0.0003	0.0003
	[2.72]***	[3.64]***	[3.17]***	[3.19]***
Abs(DA)	0.006	0.008	0.009	0.009
	[1.81]*	[3.03]***	[3.63]***	[3.61]***
EV	0.168			
	[12.92]***			
PMEV		0.061		0.037
		[7.06]***		[3.75]***
DAV			0.066	0.025
			[7.80]***	[3.09]***
$\rho_{PME,DA}$			0.012	0.011
			[18.64]***	[15.25]***
5-Industry dummies	Yes	Yes	Yes	Yes
Number of months	384	384	384	384
Average adj. R^2	54.2%	50.7%	53.4%	53.6%

Table 8: R^2 **and Information Quality**

This table presents the regression results examining the relation between R^2 and information quality. Firm i's month-t R^2 is the adjusted R^2 of the Fama-French three-factor-model regression using monthly returns from month $t-60$ to month $t-1$; β^{MKT}, β^{SMB}, and β^{HML} correspond, respectively, to the Fama-French three-factor betas estimated therein; and ROA is the sum of earnings and interest payment over the past four quarters divided by total assets of the last quarter. Refer to Table 3 for the definitions of the other variables. Fama-MacBeth (1973) cross-sectional regressions are estimated, with all errors adjusted with the Newey-West (1987) autocorrelation of 35 lags. t-statistics are in square brackets. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

Dependent variable: $\log(1-R^2)$	1	2	3	4	5
Intercept	−0.042	0.036	0.158	0.225	0.221
	[−10.54]***	[3.28]***	[9.54]***	[4.57]***	[4.64]***
β^{MKT}	−0.058		−0.061	−0.074	−0.074
	[−20.91]***		[−14.57]***	[−8.20]***	[−8.20]***
β^{SMB}	−0.011		−0.022	−0.030	−0.030
	[−3.52]***		[−6.79]***	[−8.35]***	[−8.35]***
β^{HML}	0.019		0.018	0.021	0.021
	[3.26]***		[3.11]***	[4.11]***	[4.07]***
AGE		−0.013	−0.019	−0.030	−0.030
		[−5.97]***	[−6.01]***	[−2.85]***	[−2.87]***
MB		0.001	0.001	0.004	0.004
		[2.91]***	[4.67]***	[2.54]**	[2.57]**
SIZE		−0.009	−0.013	−0.018	−0.018
		[−8.80]***	[−13.62]***	[−11.20]***	[−11.35]***
ROA		0.0575	−0.0001	−0.0019	−0.0008
		[1.70]*	[−0.01]	[−0.30]	[−0.13]
LEVERAGE		0.024	0.009	0.021	0.021
		[2.99]***	[4.03]***	[3.28]***	[3.19]***
DISP	0.004	0.002	0.002		
	[8.64]***	[3.17]***	[3.61]***		
DAV				0.371	0.181
				[8.71]***	[1.85]*
$\rho_{PME,DA}$				0.050	0.047
				[5.13]***	[5.07]***
PMEV					0.178
					[1.73]*
5-Industry dummies	Yes	Yes	Yes	Yes	Yes
Sample period	——	1995–2009	——	— 1978–2009	—
Number of months	180	180	180	384	384
Average adj. R^2	35.3%	17.0%	44.1%	51.2%	51.3%

Table 9: **Trend Analysis of Idiosyncratic Return Volatility**

This table presents the results of the trend analysis of IRV for the full sample and sub-periods. $\overline{\text{IRV}_t}$ is the cross-sectional average of IRV at month t, and analogously for $\overline{\text{PMEV}_{t-1}}$, $\overline{\text{DAV}_{t-1}}$, $\overline{\rho_{\text{PME,DA}_{t-1}}}$, and $\overline{\text{EV}_{t-1}}$. t is the time variable ranging from 1978:01 ($t = 1$) to 2009:12 ($t = 384$). The regression method is GMM. For subperiods 2003:01–2006:12 and 2007:01–2009:12, errors are adjusted with the Newey-West (1987) autocorrelation of 11 lags; for all the other cases, errors are adjusted with the Newey-West (1987) autocorrelation of 35 lags. t-statistics are in square brackets. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

Dependent variable: $\overline{\text{IRV}_t}$

Panel A: Full Sample Results

	Equal-weighted means				Value-weighted means			
	1	2	3	4	1	2	3	4
Intercept	0.023	0.000	0.083	0.015	0.014	0.001	0.005	0.009
	[12.80]***	[−0.06]	[2.80]***	[7.41]***	[14.79]***	[0.53]	[0.72]	[7.46]***
t/10,000	0.334	0.113	−0.223	−0.365	0.167	0.061	0.122	−0.169
	[2.57]**	[0.80]	[−0.87]	[−2.00]**	[2.14]**	[1.24]	[1.83]*	[−2.23]**
$\overline{\text{PMEV}_{t-1}}$		0.765				0.674		
		[2.73]***				[5.41]***		
$\overline{\text{DAV}_{t-1}}$			0.616				0.779	
			[2.38]**				[3.24]***	
$\overline{\rho_{\text{PME,DA}_{t-1}}}$			0.083				0.007	
			[2.68]***				[0.65]	
$\overline{\text{EV}_{t-1}}$				1.216				1.194
				[4.63]***				[5.18]***
N	384	384	384	384	384	384	384	384
Adj. R^2	37.7%	60.7%	61.9%	72.1%	24.4%	68.7%	59.4%	70.8%

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Panel B: Subperiod Results

	Equal-weighted means					
	1978:01–2002:12		2003:01–2006:12		2007:01–2009:12	
	1	2	1	2	1	2
Intercept	0.020	0.124	0.149	0.111	−0.145	0.081
	[19.06]***	[3.74]***	[34.45]***	[11.88]***	[−8.07]***	[4.75]***
$t/10,000$	0.658	0.040	−3.612	−2.599	4.753	2.847
	[8.00]***	[0.16]	[−26.60]***	[−9.19]***	[9.71]***	[7.04]***
$\overline{\text{DAV}_{t-1}}$		0.209		0.695		−0.472
		[1.72]*		[4.05]***		[−0.77]
$\overline{\rho_{\text{PME,DA}_{t-1}}}$		0.104		0.023		0.080
		[3.02]***		[2.67]***		[6.84]***
N	300	300	48	48	36	36
Adj. R^2	84.9%	90.1%	99.0%	99.5%	89.4%	96.2%

	Value-weighted means					
	1978:01–2002:12		2003:01–2006:12		2007:01–2009:12	
	1	2	1	2	1	2
Intercept	0.013	−0.011	0.092	0.062	−0.065	−0.082
	[9.69]***	[−0.96]	[13.73]***	[6.85]***	[−9.67]***	[−12.60]***
$t/10,000$	0.317	0.243	−2.264	−1.436	2.261	1.677
	[2.89]***	[2.26]**	[−10.9]***	[−7.88]***	[12.32]***	[11.34]***
$\overline{\text{DAV}_{t-1}}$		0.466		0.518		0.472
		[2.04]**		[7.23]***		[3.49]***
$\overline{\rho_{\text{PME,DA}_{t-1}}}$		−0.016		0.009		−0.002
		[−1.07]		[1.70]*		[−0.70]
N	300	300	48	48	36	36
Adj. R^2	49.3%	66.4%	94.9%	98.6%	93.2%	95.1%

Table 10: **Simultaneous-Equation Regressions of the Trend in Idiosyncratic Return Volatility**

This table presents the results of the trend analysis of IRV after controlling for the endogeneity of the managerial discretion variables. $\overline{\text{IRV}_t}$ is the cross-sectional average of IRV at month t, and analogously for $\overline{\text{PMEV}_{t-1}}$, $\overline{\text{DAV}_{t-1}}$, $\overline{\rho_{\text{PME,DA}_{t-1}}}$, and $\overline{\text{EV}_{t-1}}$. t is the time variable ranging from 1978:01 ($t = 1$) to 2009:12 ($t = 384$). The simultaneous equations are as follows:

$$\begin{aligned}
\overline{\text{DAV}_{t-1}} &= a_1 + a_2\overline{\text{PMEV}_{t-1}} + \mu_{t-1} \\
\overline{\rho_{\text{PME,DA}_{t-1}}} &= b_1 + b_2\overline{\text{PMEV}_{t-1}} + \upsilon_{t-1} \\
\overline{\text{IRV}_t} &= \alpha + \beta_0 t + \eta_1\overline{\text{DAV}_{t-1}} + \eta_2\overline{\rho_{\text{PME,DA}_{t-1}}} + \varepsilon_t
\end{aligned}$$

where $\overline{\text{DAV}_{t-1}}$, $\overline{\rho_{\text{PME,DA}_{t-1}}}$, and $\overline{\text{IRV}_t}$ are endogenous variables, and $\overline{\text{EV}_{t-1}}$ is used as an additional instrument. The regression method is GMM. All errors are adjusted with the Newey-West (1987) autocorrelation of 35 lags. t-statistics are in square brackets. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

	Equal-weighted mean			Value-weighted mean		
	Dependent Variables			Dependent Variables		
	$\overline{\text{DAV}_{t-1}}$	$\overline{\rho_{\text{PME,DA}_{t-1}}}$	$\overline{\text{IRV}_t}$	$\overline{\text{DAV}_{t-1}}$	$\overline{\rho_{\text{PME,DA}_{t-1}}}$	$\overline{\text{IRV}_t}$
Intercept	0.011	−1.222	0.154	0.006	−0.926	0.045
	[4.28]***	[−31.70]***	[3.35]***	[11.65]***	[−23.20]***	[4.24]***
$t/10,000$			−0.599			−0.063
			[−2.11]**			[−0.86]
$\overline{\text{PMEV}_{t-1}}$	0.570	10.629		0.637	2.921	
	[7.47]***	[8.33]***		[23.16]***	[2.03]**	
$\overline{\text{DAV}_{t-1}}$			0.329			1.075
			[1.74]*			[4.90]***
$\overline{\rho_{\text{PME,DA}_{t-1}}}$			0.149			0.056
			[3.14]***			[3.85]***
N	384	384	384	384	384	384
Adj. R^2	52.5%	49.2%	53.8%	80.9%	5.1%	42.3%

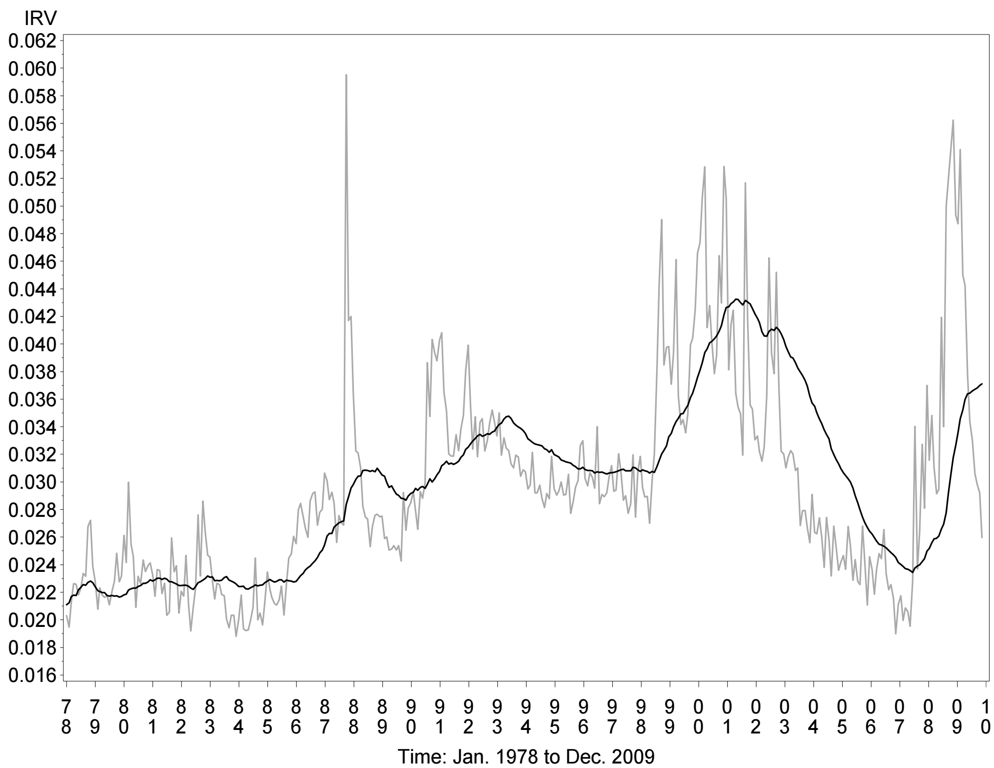
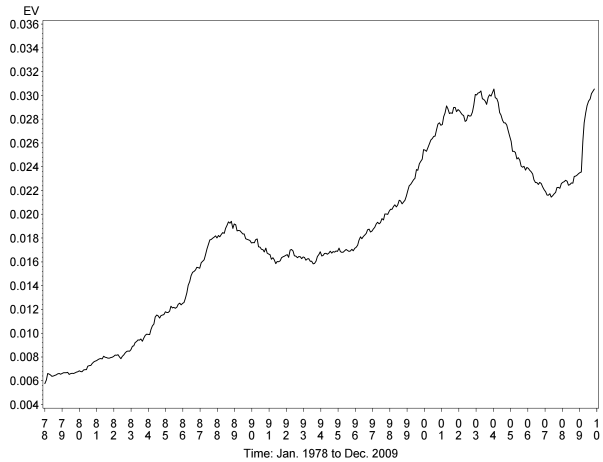
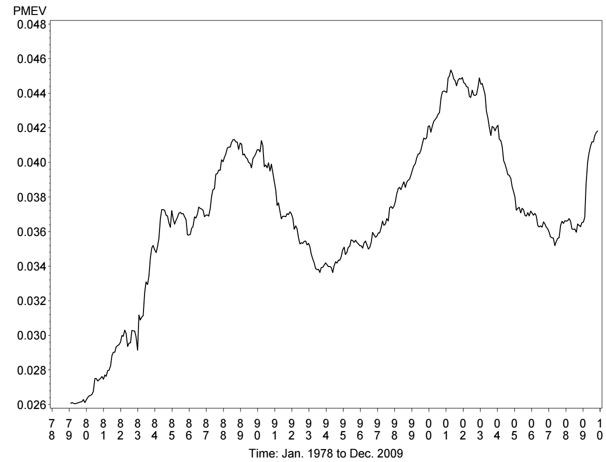


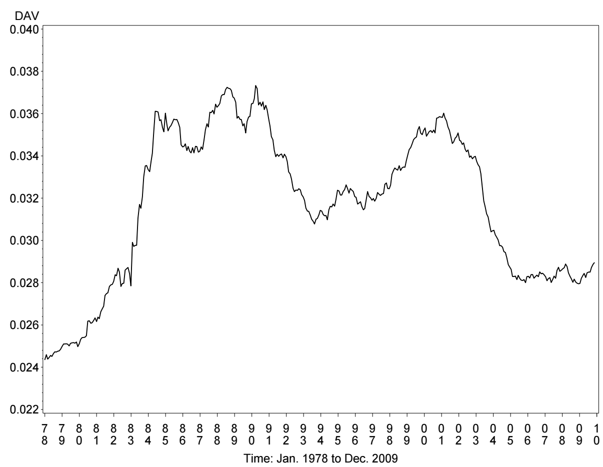
Figure 1: **Time-Series of Idiosyncratic Return Volatility.** The gray line is the cross-sectional mean of monthly idiosyncratic return volatility. The solid line is cross-sectional mean of the three-year trailing moving average of idiosyncratic return volatility (IRV).



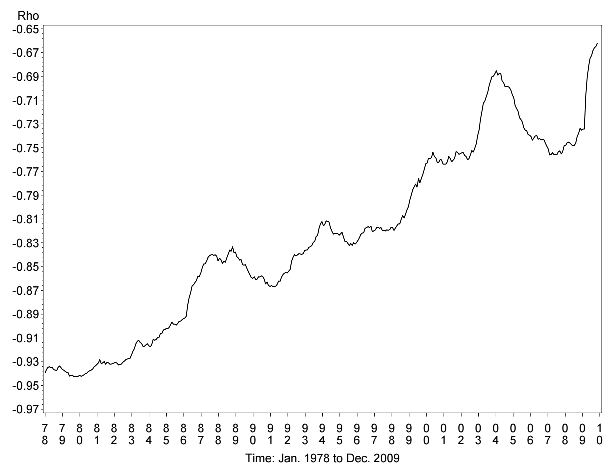
Graph A. EV



Graph B. PMEV



Graph C. DAV



Graph D. $\rho_{\text{PME,DA}}$

Figure 2: **Time-Series of Earnings Volatility and its Components.** This figure plots the time-series of the cross-sectional means of EV, PMEV, DAV, and $\rho_{\text{PME,DA}}$ at the monthly frequency.