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Does Accrual Management Impair the Performance of Earnings-Based Valuation Models?

Abstract: This study examines empirically how the presence of accrual management may affect firm valuation. We compare the performance of earnings-based and non-earnings-based valuation models, represented by Residual Income Model (RIM) and Discounted Cash Flow (DCF), respectively, based on the absolute percentage pricing and valuation errors for two subsets of US firms: "Suspect" firms that are likely to have engaged in accrual management and "Normal" firms matched on industry, year and size. Results indicate that RIM enjoys an accuracy advantage over DCF when accrual management is not a serious concern. However, the presence of accrual management significantly narrows RIM's accuracy advantage over DCF from the level observed for the matched Normal firms. These results are robust to the choice of model benchmark (i.e., current stock price vs. *ex post* intrinsic value), alternative definitions of Suspect (i.e., loss or earnings-decline avoidance vs. earnings-decline avoidance only vs. loss avoidance only) and of Normal firms (i.e., excluding vs. including real activity manipulators), and different assumptions about post-horizon growth (i.e., 2% vs. 4%). The overall conclusion that accrual management impairs RIM's performance extends to settings where the regression model is expanded to include accrual components and when we focus on large, rather than small, earnings manipulators. Taken together, these results highlight the importance of considering earnings quality when assessing the performance of earnings-based valuation models.

JEL Classification: M41

Key Words: Accrual Management; Firm Valuation; Earnings- and Non Earnings-based Valuation Models; Valuation Errors

1. Introduction

Ohlson (1995) and Feltham and Ohlson (1995, 1996) provide a conceptual framework for relating accounting earnings to firm value. Since then, several empirical studies have shown that earnings-based valuation models can give better estimates of firm value than non-earnings-based valuation models. While accounting earnings have regained popularity among researchers, financial analysts and investors in recent years, evidence suggests that earnings are often subject to managerial manipulations. Such manipulations, driven by the pressure to meet or beat earnings expectations, are believed to have eroded the quality of earnings and led to highly publicized corporate scandals. The perceived erosion of financial reporting quality in turn prompted the US Congress to pass the Sarbanes-Oxley Act (SOX) on July 30, 2002 with the stated objective of restoring investor confidence in financial and public reporting.

The purpose of this study is to examine empirically how the presence of accrual management may affect firm valuation. We integrate two major streams of academic research: First, the valuation literature that compares the relative performance of earnings-based and non-earnings-based valuation models (e.g., RIM and DCF), after taking into consideration the potential effect accrual management may have on model inputs. Our aim is to shed light on whether the previously documented superiority of earnings-based valuation models continues to hold when earnings are managed (Beaver, 2002). Second, we extend the traditional earnings management literature that examines the incentives for, and the existence of, earnings management, as well as the more recent literature studying its market consequences. Our contributions lie in documenting the impact of earnings management on the *usefulness* of earnings vs. cash flows using analysts' forecasts of earnings and cash flows as proxies for current market expectations about future firm performance for valuation purposes.

Using a matched-pair design, we compare the absolute percentage estimation errors for the RIM and DCF valuation models calculated by reference to two benchmarks, current stock price and *ex post* intrinsic value. Our sample is drawn from an eleven-year (1990–2000) period that pre-dates major corporate scandals and the ensuing legislative events, allowing us to better isolate the effect of accrual management on the relative performance of these two models. In our main analysis, the final sample consists of 776 (768) firm-year observations with complete annual financial and stock price information and forecast data based on the pricing-error (valuation-error) analysis. Half of the sample is suspected to have engaged in accrual management and the other half, matched on industry, year and size, is considered to be normal. Univariate results indicate that in the absence of accrual management RIM enjoys an accuracy advantage over DCF, measured by the difference in mean absolute percentage estimation errors. This difference is larger than that documented for the full sample in the prior valuation literature. Results from both univariate and regression analysis also show that accrual management adversely affects the performance of the RIM model to significantly narrow its accuracy advantage over DCF from the level observed for the matched Normal firms. Under RIM, for the average share price of $36.46 in our sample, accrual management yields on average a $1.97 (5.4%) higher forecasted price than if firms do not manage earnings, an effect which is economically and statistically significant. The corresponding per share difference in forecasted price under DCF is considerably lower at $0.40, and it is not statistically significant.

Our results are robust to the choice of model benchmark (e.g., current stock price vs. *ex post* intrinsic value), alternative definitions of Suspect (i.e., loss or earnings-decline avoidance vs. earnings-decline avoidance only vs. loss avoidance only) and of Normal firms (i.e., excluding vs. including real activity manipulators), and different assumptions about post-horizon growth (i.e., 2% vs. 4%). Further analysis indicates that the overall conclusion that accrual management impairs RIM's performance extends to settings where the regression model is expanded to include components of accruals and when we focus on large, rather than small, earnings manipulators. Taken together, these results highlight the importance of considering earnings quality when assessing the performance of earnings-based valuation models. By explicitly allowing for the manipulations of reported earnings, we arguably offer a more accurate assessment of the estimation ability of earnings-based valuation models relative to non-earnings-based models.

Our study is of practical relevance. Earnings are used extensively to evaluate firm performance and estimate firm value in practice. The majority of the 400 CFOs surveyed by Graham, Harvey and Rajgopal (2005) believe that earnings, not cash flows, are the key metric used by outside stakeholders. Skinner and Sloan (2002) find that investors use earnings to evaluate firm performance. However, when earnings are managed, heavy reliance on this number in firm valuation may result in inaccurate assessment, undesirable investment decisions and misallocation of resources. Our research intends to quantify this effect and to raise awareness among investors and practitioners about the pitfalls of taking managed earnings at face value and using them directly in firm valuation.

The remainder of the paper is organized as follows: Section 2 reviews the relevant literature and develops the hypotheses; Section 3 discusses the research methodology, along with variable definitions and measurements; Section 4 summarizes our sample selection procedure; Section 5 presents the main empirical findings and robustness checks, followed by further analysis in Section 6; and Section 7 concludes the study.

2. Literature Review and Hypothesis Development

Usefulness of Earnings in Firm Valuation

Earnings-based valuation models, such as the Residual Income Model (RIM), express firm value as a function of current book value and forecasted future earnings. Several empirical studies have shown that the intrinsic value metrics estimated using these models help identify potential stock mispricing and predict future returns (Dechow et al., 1999; Lee et al., 1999; Frankel and Lee, 1998). In particular, investors can earn positive abnormal returns by adopting a strategy of buying stocks which are undervalued relative to intrinsic value estimates and short selling overvalued stocks.

Parallel to this line of enquiry is research that looks into the relative performance of earnings-based and non-earnings-based valuation models. Penman and Sougiannis (1998) invoke the perfect-foresight assumption and use *ex post* payoffs over various horizons as model inputs to construct intrinsic value estimates. For a sample containing an average of 4,192 firms per year between 1973 and 1987, the authors report that RIM yields smaller pricing errors than the Discounted Cash Flow model (DCF) due to GAAP-based accounting accruals under RIM which bring future cash flows forward, making RIM more value-relevant than DCF. These findings are consistent with those documented by Courteau et al. (2001) and Francis et al. (2000) using *ex ante* Value Line (VL) analyst forecasts as model inputs on a much smaller sample of firms over a shorter time period.[1,2]

The aforementioned so-called "horse race" literature focuses on pricing errors and uses current stock price as the benchmark for model comparisons under the maintained assumption that the market is efficient and stock price is the best measure of firm value. More recently, Subramanyam and Venkatachalam (2007) argue that *ex post* realizations may provide a more appropriate benchmark for *ex ante* market expectations than current stock price, as the former is not subject to potential problems arising from temporary mispricing in the presence of earnings management. Notwithstanding differences in the choice of benchmarks however, the authors again conclude that earnings are more useful for firm valuation than cash flows.

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[1] Courteau et al.'s (2001) sample consists of 500 firms annually between 1992 and 1996, whereas Francis et al. (2000) includes 554 to 607 firms each year between 1989 and 1993.

[2] The consistency of findings across these studies suggests that VL analysts' cash flow forecasts are unlikely to be a mechanical transformation of their earnings forecasts.

Earnings Management

Healy and Wahlen (1999, p. 368) remark that "... earnings management occurs when managers use judgment in financial reporting and structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers." Studies have shown that firms often manage their earnings in advance of IPOs and seasoned equity offerings (Erickson and Wang, 1999; Teoh et al., 1998a; Teoh et al., 1998b; Dechow et al., 1996) and that firms involved in earnings manipulations or singled out by the SEC for accounting enforcement actions generally have weak internal governance (Farber, 2005; Bédard et al., 2004; Klein, 2002; Beasley, 1996; Dechow et al., 1996).

Dechow et al. (2003) point to meeting or beating earnings targets as one of the important incentives for earnings management. Consistent with this notion, Gore et al. (2007) find that the low frequency of small losses and the high frequency of small profits documented in Burgstahler and Dichev (1997) disappear when they remove the current accruals management from the reported earnings of a sample of UK firms. Several factors have been cited as contributing to a firm's motivation to meet or beat earnings targets by managing reported earnings. First, the stock market tends to punish firms for falling short of earnings expectations (Skinner and Sloan, 2002). In particular, firms maintaining a string of steadily increasing earnings are rewarded with market premiums and are severely punished as soon as the string is broken (Myers et al., 2006; Barth et al., 1999). Second, meeting or beating earnings targets allows executives to enhance their reputation with stakeholders, enjoy better terms of trade and achieve higher bonus compensations (DeGeorge et al., 1999; Burgstahler and Dichev, 1997; Bowen et al., 1995; Healy, 1985). Failing to meet earnings expectations could result in reputation loss and pay cuts for CEOs (Matsunaga and Park, 2001).

Countering these incentives are the capital market consequences that firms face when their alleged earnings manipulations become public (Dechow et al., 1996). If the market can see through accrual manipulations, then its participants should be able to spot earnings management practices and undo manipulations to reflect pre-managed earnings for use in firm valuation. However, corporate disclosures often do not contain sufficient information for the investors to infer accounting accruals, limiting their ability to completely impound the effect of earnings management into stock prices (Gleason and Mills, 2008; Baber et al., 2006; Balsam et al., 2002). Likewise, studies have found that financial analysts cannot fully correct for earnings management in their short-term (e.g., one-year ahead) earnings forecasts (Bradshaw et al., 2001; Dechow et al., 1999), as it is far more difficult to determine the effect of earnings management when forecasting future years' earnings due to the uneven reversal patterns of discretionary accruals, compared to estimating the discretionary accruals for the current year.

While both investors and financial analysts have at least some information about the firm to partially undo accrual manipulations, there is one important incentive difference that sets these two groups of market participants apart. Unlike the investors, most analysts are rewarded, financially or reputationally, for their ability to issue accurate short-term earnings forecasts (Hong and Kubik, 2003; Mikhail et al., 1997). If this is the case, then we would expect analysts to be motivated to minimize forecast errors by forecasting post-managed, rather than the pre-managed, earnings.

Hypotheses

A number of high-profile corporate scandals involving financial reporting frauds taking place around the year 2000 have called into question the integrity of published accounting numbers. Unlike the extant literature looking into the market consequences of earnings management, our interest is in contrasting the *usefulness* of earnings in firm valuation, relative to cash flows, when earnings are managed. In this case, earnings are likely to be biased and hence do not accurately reflect the firm's true performance. As a result, valuation models using analysts' forecasts of managed earnings as inputs may be less accurate in estimating a firm's true intrinsic value. By comparison, accrual management is likely to have a more limited effect on the estimation ability of the DCF model. Burgstahler and Eames (2010) find that analysts forecast "earnings after management" to achieve forecast accuracy (i.e., the difference between forecasted and actual earnings). To achieve accurate cash flow forecasts, they would start from the earnings forecast and try to undo accrual management to arrive at the correct cash flow forecasts. This conjecture is supported by our data (discussed in Section 4) which indicate that only 48% of the variability in VL cash flow forecasts are driven by common factors that also drive the earnings forecasts. Thus, the former is unlikely to be a naïve extension of the latter.

Taken together, we expect the accuracy advantage of RIM over DCF documented in previous research to be most pronounced for the subset of firms not suspected to have managed earnings (labelled Normal firms hereafter), but much less so for the subset of firms suspected to have managed accruals (labelled Suspect firms hereafter). Comparing the wedge between RIM and DCF across these two groups of firms, we expect accrual management to bring the wedge down from the level observed when the prospect of accrual management is not considered. The above discussion leads to the following two hypotheses (stated in the alternate form):

H1: The DCF valuation models generate larger estimation errors than the corresponding RIM valuation models for the Normal firms.

H2: The superiority of RIM over DCF valuation models is lower for the Suspect firms than for the Normal firms.

3. Research Methodology

Normal and Suspect Firms

In the main analysis, we focus on small earnings manipulations that allow firms to just avoid incurring loss or earnings decline in the current reporting period.[3] This approach generates a larger number of Suspect firms and hence offers a more powerful test than the case when each of these two earnings thresholds is analyzed separately. For the loss-avoidance threshold, we follow Givoly et al. (2010) and classify firms into the Suspect group when (1) their reported earnings before extraordinary items exceed zero by no more than 4% of the end-of-year market value of equity;[4] (2) they report positive discretionary accruals;[5] and (3) their level of discretionary accruals is greater than the amount of reported earnings, but does not exceed 4% of the market value of equity.[6] The remaining firms are placed in the Normal group.[7] Suspect and Normal firms for the earnings-decline avoidance threshold can be defined analogously.[8]

Later on, we demonstrate that our results remain qualitatively unchanged when these two earnings thresholds are introduced one at a time (Section 5.3) or when the Normal group of firms are redefined to exclude firms which are suspected to have managed their real activities (Section 5.4). We also consider the effect of individual accrual components in firm valuation (Section 6.1)

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[3] We do not consider the threshold of meeting or beating analyst forecasts, because earnings forecasts serve not only as a benchmark to measure earnings management but also as an incentive for managers to manipulate earnings.

[4] Givoly et al. (2010) work with quarterly data and define their Suspect firms as those whose earnings exceed the respective thresholds by no more than k% of the end-of-quarter market values of equity, where k = 0.25, 0.5 or 1. Since we work with annual data in this study, we multiply each of the thresholds by 4, but only report the results based on k = 4% to conserve space. Results for the alternative thresholds of k = 1% and 2% are qualitatively similar.

[5] We compute discretionary accruals using a modified version of the Jones model (Dechow et al., 2003) which controls for the effect of accrual reversals by adding lagged accruals as an explanatory variable.

[6] Givoly et al. (2010) define quarterly discretionary accruals as "too large" to emanate from earnings management when they exceed 1% of the market value of equity.

[7] Admittedly, some of the firms classified as Normal may have managed earnings to beat analyst forecasts. However, this scenario would reduce the difference between RIM's accuracy advantage over DCF for Suspect firms versus that for Normal firms, thus working against finding support for our predictions under H2.

[8] Specifically, we classify firms into the Suspect group when (1) the increase in their reported earnings (before extraordinary items) in year t exceeds zero by no more than 4% of the end-of-year market value of equity, (2) they report positive discretionary accruals; and (3) their level of discretionary accruals is greater than the increase in earnings but is not too large to emanate from earnings management. In this case, discretionary accruals are viewed as "too large" when they exceed 2% of the market value of equity (see Givoly et al., 2010).

and the implications of having Suspect firms alternatively defined as large earnings manipulators (Section 6.2).

Valuation Models

We use RIM (DCF) as the representative earnings- (non-earnings-) based valuation model. To test the predictions of Hypotheses H1 and H2, we estimate intrinsic values (IV) for each firm-year observation on the valuation date t as indicated below:

$$\mathrm{IV}_{\mathrm{t}}^{\mathrm{RIM}} = B_t + \sum_{\tau=1}^{T} R^{-\tau} E_t\left(X_{t+\tau}^{a}\right) + R^{-T}(R-1-g)^{-1} E_t\left(X_{t+T+1}^{a}\right); \tag{1}$$

$$\begin{aligned}\mathrm{IV}_{\mathrm{t}}^{\mathrm{DCF}} = FA_t &+ \sum_{\tau=1}^{T} R^{-\tau} E_t\left(C_{t+\tau} - I_{t+\tau} + i_{t+\tau} - \left(R-1\right) FA_{t+\tau-1}\right) \\ &+ R^{-T}(R-1-g)^{-1} E_t\left(C_{t+T+1} - I_{t+T+1} + i_{t+T+1} - \left(R-1\right) FA_{t+T}\right).\end{aligned} \tag{2}$$

The valuation date t is defined as the date of the first VL forecast made after Year t's earnings announcement, but not more than 30 days after the first quarterly earnings announcement for Year t+1. The variable R is one plus the cost of equity capital.[9] In Equation 1, B_t denotes current book value[10] and $X_{t+\tau}^{a}$ the residual income for forecast year t+τ. In Equation 2, FA_t denotes current net financial assets, $C_{t+\tau}$ the expected cash flows, $I_{t+\tau}$ the expected investments, $i_{t+\tau}$ the expected return on the previous year's financial assets and $C_{t+\tau} - I_{t+\tau} + i_{t+\tau} - \left(R-1\right) FA_{t+\tau-1}$ the residual free cash flows to common for forecast year t+τ.[11]

[9] We use the industry cost of capital in both valuation models and when calculating *ex post* intrinsic values. It is obtained from the CAPM where the risk-free rate is the 5-year treasury constant maturity rates at the beginning of the forecast month from the Chicago Federal Reserve Bank database, Beta is the average of firm-specific Betas provided each year by Value Line across firms in the same Fama and French (1993) industry group and the risk premium is set at 6%.

[10] We use the earnings and dividend forecasts for Year t+1 to update book value at the end of Year t to the forecast date. Net financial assets FA_t is updated similarly from cash flow, dividend and investment forecasts.

[11] This version of the DCF model, proposed by Penman (1997), avoids measurement problems associated with estimating the weighted average cost of capital under an equivalent version of DCF model discussed in many valuation textbooks.

Assuming that residual income ($X^a_{t+\tau}$) and free cash flows ($C_{t+\tau} - I_{t+\tau} + i_{t+\tau} - (R-1)FA_{t+\tau-1}$) will grow in simple perpetuity at a constant rate of g beyond the forecast horizon t+T, we estimate terminal values for Equations 1 and 2 from $X^a_{t+T+1} = (1+g)\left[X_{t+T} - (R-1)B_{t+T}\right]$ and $\left(C_{t+T+1} - I_{t+T+1} + i_{t+T+1} - (R-1)FA_{t+T}\right) = (1+g)\left[\left(C_{t+T} - I_{t+T} + i_{t+T}\right) - (R-1)FA_{t+T}\right]$, respectively. For most of the analysis reported in the paper, the constant growth rate g is set at 2% to approximate the rate of inflation during our sample period (Penman and Sougiannis, 1998). As robustness checks, we also consider the consequence of having a larger constant growth rate of 4% (see Section 5.5).[12]

Valuation Benchmarks

To assess the relative performances of RIM and DCF valuation models, we employ the following two benchmarks throughout the paper: (1) Current stock price, which assumes that any bias or measurement error due to violations of the efficient market hypothesis is a constant factor in comparisons across DCF and RIM models, (2) *Ex post* intrinsic value (IV) measure, calculated as the sum of actual dividends over a three-year horizon and market price at the horizon, discounted to the forecast date (Subramanyam and Venkatachalam, 2007).

Since our interest is in the relative accuracy of RIM and DCF models, we focus on the absolute value of percentage estimation errors. For each firm-year observation, the percentage estimation errors under RIM are defined as the difference between estimated intrinsic value calculated according to Equation 1 and the chosen valuation benchmark (i.e., current stock price or *ex post* IV measure), scaled by the latter. The corresponding percentage estimation errors under DCF are defined analogously by reference to Equation 2.

[12] Lundholm and O'Keefe (2001) point out that it is an error to assume the same perpetual growth beyond the horizon for residual income and residual cash flows. However, having different growth rates for the two value drivers would introduce additional measurement errors, as both growth assumptions would be arbitrary and hence may create differences between RIM and DCF that have nothing to do with earnings management.

Research Approaches

We use a matched-pair design under which each Suspect firm-year observation is matched with a Normal firm drawn from the same Fama and French (1993) industrial sector and from the same year and whose size, measured by total assets, is closest to that of the Suspect firm. Following the convention in the valuation literature (Courteau et al. 2001; Francis et al., 2000; Penman and Sougiannis, 1998), we rely mainly on univariate comparisons of mean absolute percentage estimation errors to test both hypotheses in this study.[13] To facilitate the discussion, we label absolute percentage estimation errors for each Normal firm-year observation as AE_RIM^{Normal} and AE_DCF^{Normal} for the RIM and DCF valuation models, respectively, and the corresponding labels for Suspect firms are $AE\_RIM^{Suspect}$ and $AE\_DCF^{Suspect}$, respectively.

A significantly larger mean AE_DCF^{Normal} than mean AE_RIM^{Normal} implies that the DCF model is on average less accurate than RIM among firms not suspected to have managed their reported earnings, as predicted in H1. To test Hypothesis H2, we use a difference of differences approach, subtracting the difference in absolute percentage estimation errors between RIM and DCF for each Suspect firm from the difference for its matched Normal firm i.e., $(AE\_DCF^{Normal} - AE\_RIM^{Normal}) - (AE\_DCF^{Suspect} - AE\_RIM^{Suspect})$. If the mean of the resulting difference distribution is significantly positive, it implies that the RIM model has a larger accuracy advantage over DCF in matched Normal firms than in Suspect firms, as predicted in H2.

Our matched-pair design helps ensure that any observed narrowing of the difference in estimation errors between RIM and DCF for Suspect firms vis-à-vis that for matched Normal firms (i.e., H2) is not due to variations in industry, year and firm size across these two groups of firms. However, factors, quite apart from attempts by firms to manage reported earnings, may also alter the wedge between RIM and DCF. For example, firms experiencing high growth (i.e., lower *BM*

[13] Results based on comparisons of median absolute percentage estimation errors are qualitatively similar and hence are not discussed in the text or reported in a table to conserve space.

ratios), large earnings shocks or volatile past returns tend to have more unpredictable earnings and/or cash flows than established firms and firms with stable earnings and returns. This in turn can complicate the efforts by analysts to come up with accurate earnings and cash flows forecasts for use in valuation to adversely affect the estimation ability of RIM and DCF, though not necessarily by the same degree. To control for these potential sources of differences in estimation errors between RIM and DCF, we provide a further test of the prediction of H2 in a multivariate setting using the following regression model:

$$DIFF = a_0 + a_1 SUSPECT + a_2 BM + a_3 ES + a_4 Std\_ROE + \varepsilon, \quad (3)$$

where the dependent variable *DIFF* is defined as the difference in absolute percentage estimation errors between RIM and DCF for each firm-year observation, i.e., (AE_DCF – AE_RIM). "*SUSPECT*" is the test variable, set equal to one if the firm is suspected to have managed its earnings and zero otherwise. Equation 3 includes three control variables: book-to-market ratio (*BM*), defined as book value per share over stock price, measured at the end of Year t; earnings shock (*ES*), defined as the absolute value of the change in net income from Year t–1 to Year t, scaled by opening total assets; and standard deviation of return on equity (*Std_ROE*) over a 5-year period immediately preceding the end of Year t.

The slope coefficient a_1 in Equation 3 captures the effect of accrual management on RIM's accuracy advantage over DCF, after controlling for the cross-sectional variations in growth, earnings shocks and return volatility, and it is predicted to be negative under H2. We do not offer directional predictions for any of the control variables, as these factors may also affect analyst forecasts of future cash flows. Thus, it is not clear whether the reduction in valuation accuracy due to these factors is greater under RIM or under DCF.

4. Sample Selection

Our initial sample consists of 39,826 annual earnings announcements made between January 1, 1990 and December 31, 2000 by publicly traded US firms with complete financial and stock price information for the announcement year on COMPUSTAT and CRSP, respectively. We delete observations in the Financial (SIC codes 6022–6200), Insurance (SIC codes 6312–6400), Real Estate (SIC codes 6500–6799) and Utilities (SIC codes 4911–4940) industries because they use special accounting rules, making them unsuitable for comparison with firms in other industries. We then apply the following three filters: (1) Forecasted valuation attributes are available from the Datafile and Historical Reports published by Value Line Investor Services.[14] (2) Financial data and stock price information required to compute the second valuation benchmark, i.e., *ex post* intrinsic value over a three-year period following the fiscal yearend, are available from COMPUSTAT and CRSP, respectively. (3) Data required to construct all regression variables are available. We delete extreme observations in the top and the bottom 1% of the distribution for each independent variable in the *DIFF* regression.

For the sample using current stock price as the valuation benchmark (termed the pricing-error sample hereafter), the above filters reduce the initial sample to 5,123 firm-year observations, of which 420 are classified as "Suspect" and 4,703 are classified as "Normal" (Column 1, Panel A of Table 1). Among the 420 Suspect firm-year observations, 32 cannot be matched with a Normal firm whose total assets are within +/– 80% of the corresponding Suspect firm's total assets. Deleting these observations from further consideration results in a final sample of 388 Suspect and 388 matched Normal firm-year observations. The corresponding sample for the *ex post* IV-based analysis (termed the valuation-error sample hereafter) includes 384 pairs of Suspect and matched Normal firms (Column 2, Panel A of Table 1).

[14] We choose not to use IBES forecast data in this study because, compared to VL, IBES provides cash flow forecasts for a limited number of firms.

Except for the Year 2000, both the pricing-error and the valuation-error samples are evenly distributed from 1990 to 1999 (Columns 1–2, Panel B of Table 1). Moreover, there is no obvious domination by any particular industry in either sample. As is evident in Column 1 (2), Panel C of Table 1, the industry distribution for the pricing-error (valuation-error) sample ranges from a high of 9% (9.1%) in the Automobiles and Trucks (Machinery) industry to a low of 0% (0.3%) in the Printing & Publishing and Consumer Goods (Textiles) industries.

[Insert Table 1 about Here]

5. Empirical Results

5.1 Descriptive Statistics

Panels A and B of Table 2 report the descriptive statistics on firm size, the two valuation benchmarks and the three control variables in the *DIFF* regression (i.e., Equation 3), both overall and separately for Suspect and matched Normal firms. Panel A shows that Value Line follows mostly large firms but includes a wide variety of firm sizes. The average market value is $3.3 billion, with standard deviation of $5.3 billion. The distribution of our two valuation benchmarks, measured by the quartiles, is quite similar, though the *ex post* IV measure shows more variability (standard deviations of $48.387 vs. $27.483 for current stock price).[15] The average cost of capital is 12.4% and shows very little variation within the sample.

On average, Suspect firms have a significantly larger market value ($4 billion vs. $2.7 billion), higher current stock price ($40.679 vs. $32.237) and greater *ex post* IV value ($45.184 vs. $36.784), compared to the corresponding matched Normal firms. They also have a relatively lower book-to-market ratio (*BM*: 0.339 vs. 0.493), smaller earnings shock (*ES*: 0.024 vs. 0.044) and lower standard deviation of return on equity (*Std_ROE*: 0.132 vs. 0.164). The means of the paired

[15] This difference in distribution of valuation benchmarks leads to minor differences in our univariate and multivariate results discussed in Sections 5 and 6.

differences are statistically significant at the 1% level for all variables except *Std_ROE*. While Suspect firms are more likely to have higher growth, they tend to have lower earnings shocks and returns volatility than Normal firms, suggesting potential income smoothing by Suspect firms.

Panel C of Table 2 presents the pair-wise Pearson (Spearman-rank) correlations among our Equation 3 regression variables, appearing above (below) the diagonal. Two of the control variables, *BM* and *ES*, are positively correlated with the dependent variable in the *DIFF* regression, with the Pearson correlations of 0.104 and 0.105, respectively, both significant at the 1% level. The Pearson correlation between *DIFF* and the remaining control variable *Std_ROE* is also positive, but weaker. The Spearman-rank correlations exhibit a similar pattern, though *Std_ROE* is more strongly correlated with the dependent variable (*DIFF*), whereas *BM* is less so. These descriptive statistics point to the need to control for all three variables in the analysis of relative accuracy of RIM and DCF, as we do in a multivariate setting.

[Insert Table 2 about Here]

5.2 Main Results

Panel A of Table 3 presents the univariate one-tailed tests of Hypotheses H1 and H2 using a 2% constant growth rate to estimate terminal values. The corresponding multivariate one-tailed tests of Hypothesis H2 appear in Panel B. In each panel, we report two sets of results, where the first one is based on the pricing-error sample using current stock price as the model benchmark (Column 1) and the second one based on the valuation-error sample using *ex post* intrinsic value as the benchmark (Column 2). This presentation format is used in subsequent tables as well.

As is evident in Panel A, the matched Normal group's DCF model on average generates significantly larger absolute percentage pricing errors than its RIM counterpart (0.389 vs. 0.350, $p < 0.001$; Column 1a), implying that RIM enjoys an accuracy advantage over DCF absent accrual management as predicted in H1. The mean difference of 0.040 is larger than the mean difference of 0.018 observed for the full sample (Column 1d). Thus, the relative accuracy advantage of RIM documented in the prior valuation literature may have been biased downward by the presence of accrual management in some of the sample firms.[16] For the Suspect group, the two valuation models produce statistically similar absolute percentage pricing errors (0.400 vs. 0.404, p = 0.288; Column 1b). The mean difference in the pricing errors between DCF and RIM for the Normal group (0.040) is larger than that for the Suspect group (-0.004). This difference of 0.044 [i.e., 0.040−(−0.004)] is statistically significant (p < 0.001; Column 1c), consistent with the prediction of H2 that accrual manipulation reduces the accuracy advantage of RIM over DCF.[17] These results extend to the valuation-error sample**.** For example, the matched Normal group's mean absolute percentage valuation errors under DCF are significantly larger than those under RIM (0.569 vs. 0.512, p < 0.001; Column 2a). While RIM continues to enjoy a significant accuracy advantage over DCF in the Suspect group, the wedge between these two models nonetheless narrows significantly from that observed for the matched Normal firms by 0.036 (0.057 vs. 0.021, p = 0.015; Column 2c).

For the average share price of $36.46 in our sample, under RIM the forecasted price can deviate by $12.76 in either direction for Normal firms and by $14.73 for Suspect firms based on the mean percentage pricing error of 0.350 and 0.404, respectively. This results in a forecasted stock price which is $1.97 higher if the firm manages its accruals, a difference which is economically significant. By comparison, under DCF the difference in mean forecasted price between Normal and Suspect firms is $0.40, which is not statistically significant and is less significant, economically speaking, than that obtained under RIM.

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[16] Our mean difference of 0.018 for the full sample is comparable to that reported by Courteau et al. (2001) over a five-year sample period (1992-1996). In particular, the mean absolute percentage pricing errors for their DCF and RIM models are 0.397 and 0.372, respectively.
[17] That is, $(AE\_DCF^{Suspect} - AE\_RIM^{Suspect}) < (AE\_DCF^{Normal} - AE\_RIM^{Normal})$.

Moving next to the multivariate analysis based on Equation 3, we find a consistent support for the prediction of H2 regardless of the choice of model benchmarks (see Panel B). In particular, after controlling for the potential effects of factors affecting forecast accuracy, the coefficient estimates on the *SUSPECT* variable are –0.026 (p = 0.028; Column 1) and –0.031 (p = 0.044; Column 2) in the pricing-error and valuation-error samples, respectively. These regression results are consistent with our univariate findings that RIM's relative accuracy advantage is diminished for Suspect firms.

Of the three control variables, the coefficient estimates on *BM, ES* and *Std_ROE* are positive and significant at the 5% level in the pricing error-based *DIFF* regression. In the valuation error-based regression, the results are somewhat weaker and only *Std_ROE* retains its significance, possibly due to the higher variability in the distribution of *ex post* IV identified in Table 2. It would appear that RIM's advantage is more pronounced among firms experiencing high volatility in ROE (i.e., large values of *Std_ROE*), low growth (high *BM* ratios) and an earnings shock in the current period (*ES*).

[Insert Table 3 about Here]

5.3 Robustness Checks Based on Alternative Definitions of Suspect Firms

To maximize the sample size, we have assumed that firms were motivated to avoid either losses or earnings declines. We now check the sensitivity of our main results to alternative definitions of Suspect firms by reference to a single earnings threshold.

Starting with the avoidance of earnings-decline criterion, we identify 318 firm-year observations as Suspect for the valuation-error sample and match them against 318 Normal firms by industry, year and size to yield a total of 636 firm-year observations. The corresponding figures for the pricing-error sample are 322, 322 and 644 firm-year observations, respectively. Results from univariate (multivariate) one-tailed tests of Hypotheses H1–H2 appear in Panel A (B) of Table 4. To conserve space, we only discuss valuation-error results based on this and subsequent tests and refer briefly to the corresponding pricing-error results in a footnote.

Column 2a of Panel A shows that the matched Normal group's mean absolute percentage valuation errors are higher under DCF than under RIM with a difference of 0.042, significant at the 1% level. While on average RIM continues to enjoy a significant accuracy advantage over DCF in the presence of accrual management (0.452 vs. 0.467, $p = 0.050$; Column 2b), the size of its advantage nonetheless decreases significantly from the level observed for the matched Normal firms (0.015 vs. 0.042, $p = 0.074$; Column 2c). The reduction is consistent with a negative and significant coefficient on the *SUSPECT* variable ($a_1 = -0.027$, $p = 0.093$) in the *DIFF* regression (Column 2, Panel B).[18]

[Insert Table 4 about Here]

Much of the above evidence extends to the case where Suspect firms are alternatively defined according to the loss-avoidance criterion, though the number of Suspect firms is considerably lower. For the valuation-error sample, we identify 72 Suspect and 72 Normal firms for a total of 144 firms. Un-tabulated results indicate that the difference in mean absolute percentage valuation errors between RIM and DCF in the Normal group is positive and significant at the 1% level, consistent with the prediction of H1. Moreover, the mean of matched-pair differences across the Suspect and Normal groups, at 0.080, is also significant at the 10% level. The latter result, along with a negative and significant coefficient estimate on the *SUSPECT* variable in the *DIFF* regression ($a_1 = -0.075$ and $p = 0.034$), once again provides evidence in support of H2.

[18] Univariate results for the pricing-error sample are qualitatively similar, but multivariate results are weaker. In particular, the *SUSPECT* variable is insignificantly different from zero at the conventional levels.

5.4 Robustness Checks Based on Alternative Definitions of Normal Firms – Real Activity Earnings management

In the main analysis, we have viewed firms as normal if they do not meet the three criteria involving total discretionary accruals for Suspect firms discussed in Section 3. However, accrual management is not the only tool that firms may use to manage reported earnings. Graham et al. (2005) find that 80 percent of survey respondents favor reducing discretionary expenses as a means to achieving an earnings target. Several empirical studies also show that firms manage discretionary expenses and other real activities in order to avoid losses and to meet or beat the last year's earnings (see Gunny 2010; Roychowdhury 2006). To address the concern that some of the so-called Normal firms in our sample may have managed their real activities, we re-define the Normal group to include firms which are not in the Suspect group and that do not meet the criteria for real activity manipulations (defined shortly) and match each Suspect firm identified in our main analysis with a Normal firm, drawn from this modified Normal group, along the industry, year and size dimensions.[19]

For the purpose of this analysis, we work with abnormal discretionary expenses calculated by estimating the following model adapted from Roychowdhury (2006) cross-sectionally for each two-digit SIC industry-year:

$$\frac{DIS_{it}}{TA_{it-1}} = \alpha_0 + \alpha_1 \frac{1}{TA_{it-1}} + \alpha_2 \frac{S_{it-1}}{TA_{it-1}} + \varepsilon_{i.t} \quad (4)$$

where *DIS* denotes discretionary expenses (the sum of R&D, advertising, and SG&A expenses); *TA* and *S* denote total assets and total revenue. The residuals from Equation 4 represent abnormal discretionary expenses for firm *i* in year *t*. Firms are classified as a real activity manipulator when (1) they have negative abnormal discretionary expenses (i.e., cutting discretionary expenses); (2) their reported earnings before extraordinary items exceed zero by no more than 4% of the end-of-year market value of equity (i.e., exceed the zero earnings benchmark); and (3) the absolute level of

[19] We thank the editor for the suggestion.

abnormal discretionary expenses is greater than the amount of reported earnings. The additional data requirements of Equation 4 reduces our pricing-error (valuation-error) sample to 364 (360) pairs of Suspect and matched Normal firms, for a total of 728 (720) firm-year observations.

Panel A (B) of Table 5 reports results from univariate (multivariate) one-tailed tests of Hypotheses H1–H2 (H2). As predicted in H1, the mean absolute percentage valuation errors for the matched Normal group are higher under DCF than under RIM with a difference of 0.059, significant at the 1% level (Column 2a, Panel A). The size of RIM's accuracy advantage diminishes significantly from 0.059 for Normal firms to 0.020 for Suspect firms ($p = 0.012$; Column 2c, Panel A). This result, along with a negative and significant coefficient estimate on the *SUSPECT* variable in the *DIFF* regression ($a_1 = –0.028$, $p = 0.069$; Column 2, Panel B), lends consistent support for the prediction of H2.[20]

[Insert Table 5 about Here]

In the above analysis, we excluded real activity manipulators from the definition of Normal firms to arrive at the modified Normal group, but did not add real activity manipulators to the definition of Suspect firms. As a further sensitivity test, we re-define Suspect firms to include those that meet not just the three criteria for discretionary accruals described in Section 3, but also the conditions for real activity manipulations. This more stringent definition of Suspect firms yields a much smaller pricing-error (valuation-error) sample, comprised of 76 (75) pairs of Suspect and matched Normal firms, for a total of 152 (150) firm-year observations. Nonetheless, all the results (un-tabulated) continue to hold. For example, the matched Normal group's mean absolute percentage valuation errors under DCF exceed those under RIM by 0.132, significant at the 1%

[20] Univariate results extend to the pricing-error sample, whereas multivariate results are stronger. In particular, the coefficient estimate on the *SUSPECT* variable ($a_1 = –0.025$) is significant at the 5% level.

level. The coefficient estimate on the *SUSPECT* variable in the valuation error-based *DIFF* regression is again negative and significant (a_1 = –0.071, p = 0.046).[21]

Both sets of sensitivity test results are comparable to those reported in Table 3. Findings that real activity manipulations have little effect on our inference about the relative performance of RIM vs. DCF are not surprising, however. Unlike accruals which are closely scrutinized by external auditors, real activity management represents deviations from optimal business operations. Suboptimal operating decisions lower firm value in the long run, but are of little concern to external auditors so long as manipulations are properly accounted for in the financial statements. Without a formal vetting process, real activity management is expected to be far more difficult for the capital market, including financial analysts, to detect than accrual management.[22]

5.5 Robustness Checks Based on an Alternative Constant Growth Assumption

When estimating terminal values, we have assumed a constant annual growth rate of 2%, which approximates the rate of inflation during our sample period. We now relax that assumption and use an alternative constant growth rate of 4%.

Univariate (multivariate) one-tailed tests of Hypotheses H1–H2 (H2) appear in Panel A (B) of Table 6. For 770 firm-year observations in the valuation-error sample, we find that the matched Normal group's mean absolute percentage valuation errors are larger under DCF than under RIM and moreover the difference of 0.120 is statistically significant at the 1% level (Column 2a, Panel A). While DCF continues to yield larger mean absolute percentage valuation errors than RIM in the Suspect group (0.526 vs. 0.483; Column 2b, Panel A), the difference nonetheless narrows

[21] Both univariate and multivariate results for the pricing-error sample are very similar. For example, the coefficient estimate on the *SUSPECT* variable is –0.073 (p = 0.020) and the matched Normal group's mean absolute percentage valuation errors under DCF exceed those under RIM by 0.120, significant at the 1% level.

[22] Consistent with this discussion, we find weaker support for the prediction of H2, when we re-define Suspect firms to include firms that only meet the conditions for real activity manipulations, while drawing matched Normal firms from the modified Normal group defined in this section. In particular, the coefficient estimates (p-value) on the *SUSPECT* variable are –0.040 (0.001) and 0.000 (0.493) for the pricing-error and the valuation-error samples, respectively.

considerably from 0.120 to 0.043. A formal *t*-test of the reduction (0.077) is significant at the 1% level (Column 2c, Panel A). Extending the analysis to the multivariate setting, we find that the estimated coefficient on the test variable *SUSPECT* is negative and significant (–0.053, p = 0.030; Column 2, Panel B). After controlling for the potential effects of covariates, the presence of accrual management adversely affects RIM's performance such that its advantage over DCF is significantly narrowed from the level observed for Normal firms, as predicted in H2.[23]

[Insert Table 6 about Here]

5.6 Summary

In short, the evidence presented in this section indicates that the RIM model can better estimate a firm's intrinsic value than the DCF model when accrual management is not a serious issue (H1). However, the presence of accrual management is found to adversely affect the performance of RIM such that the accuracy advantage enjoyed by RIM over DCF narrows significantly from the level observed for Normal firms (H2). These results are invariant to alternative definitions of either Suspect or Normal firms, or both. They also remain qualitatively unchanged under an alternative constant growth rate of 4%.

6. Further Analyses

6.1 Sources of Accrual Management

In this section, we examine the question of which component(s) of the total accruals (i.e., specific accruals) would impair the RIM model's ability to outperform the DCF model.[24] Following Marquardt and Wiedman (2004), we focus on unexpected accounts receivable (*UAR*), unexpected

[23] Univariate and multivariate results for the pricing-error sample are qualitatively similar (see Column 1, Panels A-B).
[24] We thank an anonymous reviewer for the suggestion.

inventory (*UINV*), unexpected accounts payable (*UAP*), unexpected depreciation (*UDEP*) and unexpected special items (*USI*), estimated as follows:

$$UAR_t = [AR_t - (AR_{t-1} * REV_t/REV_{t-1})]/TA_{t-1} \quad (5a)$$

$$UINV_t = [INV_t - (INV_{t-1} * COGS_t/COGS_{t-1})]/TA_{t-1} \quad (5b)$$

$$UAP_t = [AP_t - (AP_{t-1} * COGS_t/COGS_{t-1})]/TA_{t-1} \quad (5c)$$

$$UDEP_t = [DEP_t - (DEP_{t-1} * PPE_t/PPE_{t-1})]/TA_{t-1} \quad (5d)$$

$$USI_t = SI_t / TA_{t-1} \quad (5e)$$

where REV_t, TA_t, $COGS_t$ and PPE_t denote, respectively, revenues, total assets, cost of goods sold and gross property, plant & equipment at the end of Year *t*.

We require our sample to have sufficient data to calculate the unexpected accrual components included in Equations 5a-5e before creating the Suspect and the matched Normal firms (as defined in the main analysis). These additional data requirements reduce the sample size to 282 (281) pairs of Suspect and Normal firms, or equivalently a total of 564 (562) firm-year observations, for the pricing-error (valuation-error) sample.[25] We now estimate the following expanded Equation 3 to include all five accrual components:

$$DIFF = a_0 + a_1 SUSPECT + a_2 UAR + a_3 UINV + a_4 UAP + a_5 UDEP + a_6 USI + a_7 BM + a_8 ES + a_9 Std\_ROE \quad (6)$$

Results, appearing in Table 7, indicate that the coefficient estimates on the *SUSPECT* variable, at –0.025 for the pricing-error sample (p = 0.051; Column 1) and –0.038 for the valuation-error sample (p = 0.027; Column 2), are very similar to those reported in Table 3. Except for *UAP*, none of the coefficient estimates on the unexpected specific accruals are significantly different from zero, suggesting that none of the components are used systematically by Suspect firms to meet or beat earnings targets.

[25] To ensure that our Table 3 results for H2 continue to hold for these much reduced samples, we re-run the regression based on Equation 3 and find that the coefficient estimates (un-tabulated) on the key test variable "*SUSPECT*" in the pricing-error and valuation-error samples are –0.024 and –0.036, significant at the 10% and 5% levels, respectively.

[Insert Table 7 about Here]

These regression results continue to hold when we use an alternative model specification that adds to Equation 3 five interaction terms between each of the accrual components and the test variable, *SUSPECT*.[26] To conserve space, we do not tabulate these results. Taken together our results suggest that, when assessing the relative performance of RIM vs. DCF valuation models, accrual components add very limited incremental information, beyond the type of firms (i.e., Suspect vs. Normal) constructed based on aggregate discretionary accruals. The weak contribution of accrual components is consistent with the results reported by Ibrahim (2009) who finds that accrual components do not contribute much to the detection of earnings management, beyond total discretionary accruals, even in simulation samples where revenue and expense manipulations have been artificially introduced (see Table 8, Page 1109).

6.2 Large Earnings Manipulations

Throughout the paper, we have focused our attention on small earnings manipulations intended to avoid loss or earnings decline in the current reporting period. This research design is motivated by Burgstahler and Dichev (1997) who report that small positive earnings changes occur more frequently than small negative earnings changes, pointing to the likely presence of earnings management to reach earnings targets. We have tried to overcome the concern that small earnings manipulations may not be apparent to the market by working with two model benchmarks, current stock price and *ex post* intrinsic value measure, in the main as well as sensitivity analysis. Our overall findings of a reduction in the accuracy advantage of RIM over DCF in setting where accrual

[26] The coefficient estimates (p-values) on the *SUSPECT* variable are –0.024 (0.065) and –0.037 (0.038) for the pricing-error and the valuation-error samples, respectively, whereas none of the interaction terms is significant at the conventional levels.

management is considered are invariant to the choice of model benchmarks, giving us confidence in our conjecture that Value Line analysts likely forecast post-managed earnings for incentive reasons.

Before concluding the study, we turn our attention to firms that have undertaken egregious earnings management to see if the RIM model continues to perform relatively poorly when earnings management would be more readily apparent to the market. For this analysis, we define firms suspected to have practiced egregious earnings management as those whose values of discretionary accruals are in the top 10% of the distribution for the entire pricing-error (valuation-error) sample of 5,123 (5,144) firm-year observations before matching. The resulting 505 (506) Suspect firms are then matched on industry, year and size with a Normal firm, drawn from the group of firm-year observations not classified as Suspect and not considered as part of the manipulators in our main Table 3 analysis, to generate a combined total of 1,010 (1,012) firm-year observations for the pricing-error (valuation-error) sample.[27]

Panel A (B) of Table 8 presents results from univariate (multivariate) one-tailed tests of Hypotheses H1–H2 (H2). As predicted in H1, the Normal group's mean absolute percentage valuation errors are higher under DCF than under RIM with a difference of 0.082, significant at the 1% level, (Column 2a, Panel A). By comparison, RIM has a significantly smaller accuracy advantage over DCF in the Suspect group (0.437 vs. 0.491; Column 2b, Panel A). The reduction in accuracy wedge, from 0.082 for the matched Normal firms to 0.054 for the Suspect firms, is significant at the 5% level (Column 2c, Panel A). This univariate result is consistent with a negative and significant coefficient estimate on the *SUSPECT* variable in the *DIFF* regression ($a_1 = -0.028$, $p = 0.035$; Column 2, Panel B), lending further support for the prediction of H2.[28]

[27] Alternatively, we could have used a sample of firms that had restated their earnings or had been subject to enforcement actions by the SEC but both Callen et al. (2005) and Ettredge et al. (2010) find a very low number of such cases in relation to the population of US listed firms. Since Value Line analysts follow only 1,700 (mostly large) firms each year, the set of accounting restatements or AAER firms that fit the VL data requirements is likely to be very small.

[28] These results extend to the pricing-error sample. For example, the coefficient estimate (p-value) on the *SUSPECT* variable is –0.030 (0.015).

[Insert Table 8 about Here]

Since firms whose values of discretionary accruals lie in the bottom 10% of the distribution may have also managed earnings by taking a big-bath in order to increase accounting reserves for future periods, it may be more appropriate to exclude these firms from the definition of the Normal group. Our results however remain qualitatively unchanged and hence are not tabulated to conserve space.[29] Findings that the estimation ability of RIM continues to suffer in a setting where the earnings management practice can be more readily detected by the market support our conjecture that Value Line analysts do not fully incorporate in their earnings forecasts the fact that the numbers are misrepresented.

7. Conclusion

In this study, we have examined the effect of accrual management on the performance of the earnings-based valuation models (e.g., RIM) relative to the non-earnings-based valuation models (e.g., DCF). Our aim is to show that findings from prior valuation literature that the RIM model generates more accurate intrinsic value estimates than DCF need not hold when one allows for variations in the quality of earnings in assessing the performance of these two classes of valuation models.

We use a research design that matches firms suspected of managing reported earnings through accrual manipulations to just avoid small losses or earnings declines in the current period with non-suspect (Normal) firms along the industry-year-size dimensions and employ analyst earnings or cash flows forecasts as proxies for market expectations. Results indicate that the RIM model can better estimate a firm's intrinsic value than the DCF model when accrual management is

[29] At the univariate level, the difference in mean percentage valuation errors between DCF and RIM are 0.082 (0.054) for the Normal (Suspect) group. Moreover, the reduction in wedge across groups, at 0.027, is significant at the 10% level. The coefficient estimates on the *SUSPECT* variable are –0.017 (p = 0.118) and –0.026 (p = 0.04) for the pricing-error and the valuation-error samples, respectively.

not a serious issue. The difference in mean absolute percentage estimation errors between these two models in this case is larger than that documented for the full sample in the prior valuation literature. We also find that the presence of accrual management adversely affects RIM's performance such that the accuracy advantage it enjoys over DCF narrows significantly from the level observed for Normal firms. These results are invariant to alternative definitions of either Suspect or Normal firms. They also remain qualitatively unchanged under an alternative constant growth rate of 4% and if we restrict our attention to large, rather than small, earnings manipulations.

An implication from our study is that users of valuation models (i.e., researchers, investors and practitioners) should not take managed earnings at face value and use them directly in firm valuation. In particular, heavy reliance on this number in firm valuation may result in inaccurate assessment, undesirable investment decisions and misallocation of resources in situations where earnings are managed.

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Table 1
Sample Selection and Distributions by Year and Industry

Panel A: **Sample Selection**

	Valuation Benchmarks	
	(1). Current Stock Price	**(2). *Ex Post* Intrinsic Value**
Number of earnings announcements (1990–2000)	39,826	39,826
Less: Filter 1. Missing VL forecasts and historical data for t	(32,636)	(32,636)
Less: Filter 2. Missing financial/stock data and extreme values	(1,409)	(1,409)
Sub-total	5,781	5,781
Less: Filter 3. Missing data to construct regression variables &	(68)	(68)
deleting top and bottom 1% of each regression variable	(590)	(569)
Final sample before matching	5,123	5,144
"Suspect" sub-sample	420	416
"Normal" sub-sample	4,703	4,728
Matched "Normal" sample based on industry, year and firm size		
Size of "Suspect" sample	388	384
Size of matched "Normal" sample	388	384

Panel B: **Sample Distribution by Year**

	Valuation Benchmarks			
	(1). Current Stock Price		**(2). *Ex Post* Intrinsic Value**	
Year	**No. of Firms**	**Percent**	**No. of Firms**	**Percent**
1990	78	10.1	76	9.9
1991	70	9.0	68	8.9
1992	88	11.3	90	11.7
1993	84	10.8	84	10.9
1994	50	6.4	50	6.5
1995	82	10.6	82	10.7
1996	84	10.8	80	10.4
1997	84	10.8	84	10.9
1998	86	11.1	86	11.2
1999	62	8.0	60	7.8
2000	8	1.0	8	1.0
Total	776	100.0	768	100.0

Panel C: Sample Distribution by Industry

	Valuation Benchmarks			
	(1). Current Stock Price		(2). *Ex Post* Intrinsic Value	
Industry	**No. of Firms**	**Percent**	**No. of Firms**	**Percent**
Food Production	26	3.4	26	3.4
Candy and Soda	8	1.0	8	1.0
Recreational Products	4	0.5	4	0.5
Entertainment	6	0.8	6	0.8
Printing and Publishing	0	0.0	20	2.6
Consumer Goods	0	0.0	34	4.4
Apparel	20	2.6	10	1.3
Health Care	36	4.6	6	0.8
Medical Equipment	10	1.3	30	3.9
Drugs	6	0.8	34	4.4
Chemicals	30	3.9	62	8.1
Rubber and Plastic Products	36	4.6	8	1.0
Textiles	62	8.0	2	0.3
Construction Materials	8	1.0	28	3.7
Steel Works, Etc.	2	0.3	10	1.3
Fabricated Products	26	3.4	2	0.3
Machinery	10	1.3	70	9.1
Electrical Equipment	2	0.3	22	2.9
Automobiles and Trucks	70	9.0	8	1.0
Aircraft	22	2.8	18	2.3
Precious Metals	8	1.0	8	1.0
Non-metallic Mining	20	2.6	4	0.5
Petroleum and Natural Gas	10	1.3	38	5.0
Utilities	6	0.8	12	1.6
Telecommunications	38	4.9	30	3.9
Personal Services	12	1.6	14	1.8
Business Services	30	3.9	48	6.3
Computers	14	1.8	16	2.1
Electronic Equipment	48	6.2	54	7.0
Measuring and Control Equipment	16	2.1	20	2.6
Business Supplies	54	7.0	32	4.2
Shipping Containers	20	2.6	8	1.0
Transportation	32	4.1	4	0.5
Wholesale	8	1.0	26	3.4
Retail	4	0.5	34	4.4
Restaurants, Hotel, Motel	26	3.4	12	1.6
Total	776	100.0	768	100.0

Sample: US firms with earnings announcements on Compustat (1990-2000) and forecast data from Value Line.

Industry groups are defined based on Fama and French (1993).

In **Panels A-C**, current stock price refers to the main matched sample and *ex-post* intrinsic value refers to the matched sample for which all data is available to compute ex-post intrinsic values as in Subramanyam and Venkatachalam (2007).

Table 2
Summary Statistics Based on the Pricing-Error Sample

Panel A: **Continuous Variables: At the Overall Level**

Variables	N	1st Quartile	Mean	Median	3rd Quartile	Std Dev
Market value ($mil)	776	524.600	3,347.140	1,500.740	3,582.090	5,344.740
Current stock price	776	20.563	36.458	31.250	46.000	27.483
Ex-post IV	776	17.354	40.984	29.642	50.571	48.387
BM	776	0.236	0.416	0.348	0.530	0.255
ES	776	0.009	0.034	0.021	0.043	0.040
Std_ROE	776	0.036	0.148	0.069	0.120	0.310
Cost of capital	776	0.114	0.124	0.122	0.135	0.013

Panel B: **Continuous Variables: Suspect vs. Normal**

Variables	Mean Suspect (N = 388)	Mean Normal (N = 388)	Mean Matched Differences	*t-statistic*
Market value ($mil)	4,000.56	2,693.73	-1,306.83	-5.410***
Current stock price	40.679	32.237	-8.442	-4.730***
Ex-post IV	45.184	36.784	-8.400	-2.600***
BM	0.339	0.493	0.154	9.532***
ES	0.024	0.044	0.020	7.322***
Std_ROE	0.132	0.164	0.032	1.444

Panel C: **Pearson (*Spearman*) Correlation Coefficients (p-values): At the Overall Level**

	BM	*ES*	*Std_ROE*	*DIFF*
BM	1.000	–0.019 (0.597)	–0.081 (0.023)	0.104 (0.004)
ES	*–0.104* *(0.004)*	1.000	0.153 (< 0.001)	0.105 (0.004)
Std_ROE	*–0.016* *(0.660)*	*0.274* *(< 0.001)*	1.000	0.081 (0.025)
DIFF	*0.045* *(0.207)*	*0.074* *(0.040)*	*0.118* *(0.001)*	1.000

Sample: US firms with earnings announcements on COMPUSTAT (1990-2000) and forecast data from Value Line.

In **Panels A-B**, current stock price is measured at the forecast date; ex post intrinsic value = the sum of future dividends over a three-year horizon and market price at the end of the horizon, discounted at the industry cost of equity, Market value is the current stock price multiplied by the number of shares outstanding.

In **Panels A-C**, *BM* is defined as book value per share over stock price per share, measured at fiscal year-end; *ES* is defined as the absolute value of changes in net income from Year t–1 to Year t, scaled by opening total assets; *Std_ROE* is measured over a 5-year period immediately preceding the annual report date; Cost of capital is computed from the CAPM with industry average Beta and 6% risk premium.

In **Panel B**, Suspect group refers to firms whose reported earnings before extraordinary items exceed zero by no more than 4% of the end-of-year market value of equity, who report positive discretionary accruals; and whose level of discretionary accruals is greater than the amount of reported earnings, but does not exceed 4% of the market value of equity. Each Suspect firm is matched on industry, year and size with a non-suspect (Normal) firm.

In **Panel C**, *DIFF* is defined as the difference in absolute percentage estimation errors for each combination of firm-year observation and valuation model, i.e., (AE_DCF – AE_RIM). Terminal values are calculated using a 2% constant growth rate.

Summary statistics are based on the pricing-error sample. Results for the valuation-error sample are qualitatively similar and hence are not reported in a table to conserve space.

***, **,* t-tests on the difference in means across valuation models, significant at the 1%, 5% and 10% levels, respectively (one-sided).

Table 3
Main Results: Suspect Firms Defined by Either Loss or Earnings-decline Avoidance Threshold

Panel A: **Mean Absolute Percentage Estimation Errors (P-values)**

	Valuation Benchmarks							
	(1). Current Stock Price				(2). *Ex Post* Intrinsic Value			
	(1a) Normal	(1b) Suspect	(1c) Match Diff.	(1d) Sample	(2a) Normal	(2b) Suspect	(2c) Match Diff.	(2d). Sample
N	388	388	388	776	384	384	384	768
DCF	0.389	0.400	-0.011 (0.471)	0.395	0.569	0.488	0.081 (0.058)	0.529
RIM	0.350	0.404	-0.055 (<.001)	0.377	0.512	0.467	0.045 (0.160)	0.490
DCF–RIM	0.040 (<.001)	-0.004 (0.288)	0.044 (<.001)	0.018 (0.003)	0.057 (<.001)	0.021 (0.012)	0.036 (0.015)	0.039 (<.001)

Panel B: **Multivariate Regression Results**
Model: $DIFF = a_0 + a_1 SUSPECT + a_2 BM + a_3 ES + a_4 Std\_ROE$

		Valuation Benchmarks			
		(1). Current Stock Price		(2). *Ex Post* Intrinsic Value	
Variables	**Predicted Sign**	**Coefficient Est.**	**p-Value**	**Coefficient Est.**	**p-Value**
Intercept	+	-0.012	0.245	0.036	0.063
SUSPECT	–	-0.026	0.028	-0.031	0.044
BM		0.062	0.009	0.028	0.205
ES		0.340	0.019	-0.030	0.445
Std_ROE		0.041	0.023	0.048	0.046
Adjusted R2		0.027		0.005	
N		776		768	

Sample: US firms with earnings announcements on COMPUSTAT (1990-2000) and forecast data from Value Line.

In **Panels A-B,** current stock price is measured at the forecast date; *ex post* intrinsic value is future dividends over a three-year horizon plus market price at the end of the horizon, discounted at the industry cost of equity. Terminal value is calculated using a constant growth rate of 2%. P-values are for one-tailed tests when there are directional predictions.

In **Panel A**, absolute percentage estimation errors for each firm-year observation under RIM (or DCF) = the absolute value of the difference between estimated intrinsic value calculated according to Equation 1 (or Equation 2) and the chosen valuation benchmark (i.e., current stock price or *ex post* IV measure), scaled by the latter. For the loss avoidance threshold, firms are classified into the Suspect group if their reported earnings before extraordinary items exceed zero by no more than 4% of the end-of-year market value of equity, they report positive discretionary accruals and their level of discretionary accruals is greater than the amount of reported earnings, but does not exceed 4% of the market value of equity. The Suspect group for the earnings-decline avoidance threshold can be defined analogously, with discretionary accruals not exceeding 2% of market value. Firms are classified as normal if they are not in the Suspect group. Each Suspect firm is matched on industry, year and size with a Normal firm; Match Diff. denotes the mean of differences in estimation errors between each Normal firm and its matched Suspect firm.

In **Panel B**, *DIFF* is defined as the difference in absolute percentage estimation errors for each firm-year observation and valuation model, i.e., (AE_DCF – AE_RIM), where terminal value is calculated using a 2% constant growth rate; *SUSPECT* is set equal to one if firms are suspected to have managed their reported earnings, and zero otherwise; *BM* is defined as book value per share over stock price per share, measured at fiscal yearend; *ES* is defined as the absolute value of changes in net income from Year t-1 to Year t, scaled by opening total assets; *Std_ROE* is measured over a 5-year period immediately preceding the annual report date.

Table 4
Robustness Checks: Suspect Firms Defined by Earnings-decline Avoidance Threshold

Panel A: **Mean Absolute Percentage Estimation Errors (P-values)**

	Valuation Benchmarks							
	(1). Current Stock Price				(2). *Ex Post* Intrinsic Value			
	(1a). Normal	(1b). Suspect	(1c) Match Diff.	(1d). Sample	(2a). Normal	(2b). Suspect	(2c) Match Diff.	(2d). Sample
N	322	322	322	644	318	318	318	636
DCF	0.378	0.384	-0.006 (0.356)	0.381	0.566	0.467	0.099 (0.048)	0.517
RIM	0.352	0.393	-0.041 (0.002)	0.373	0.524	0.452	0.072 (0.083)	0.488
DCF–RIM	0.026 (0.006)	-0.009 (0.106)	0.035 (0.003)	0.009 (0.090)	0.042 (0.003)	0.015 (0.050)	0.026 (0.074)	0.029 (<.001)

Panel B: Multivariate Regression Results

Model: $DIFF = a_0 + a_1 SUSPECT + a_2 BM + a_3 ES + a_4 Std\_ROE$

		Valuation Benchmarks			
	Predicted	(1). Current Stock Price		(2). *Ex Post* Intrinsic Value	
Variables	**Sign**	**Coefficient Est.**	**p-Value**	**Coefficient Est.**	**p-Value**
Intercept	+	-0.016	0.206	0.038	0.079
SUSPECT	–	-0.016	0.134	-0.027	0.093
BM		0.037	0.097	0.014	0.356
ES		0.478	0.006	-0.159	0.269
Std_ROE		0.026	0.113	0.023	0.230
Adjusted R2		0.019		-0.001	
N		644		636	

Sample: US firms with earnings announcements on COMPUSTAT (1990-2000) and forecast data from Value Line.

In **Panels A-B,** current stock price is measured at the forecast date; *ex post* intrinsic value is future dividends over a three-year horizon plus market price at the end of the horizon, discounted at the industry cost of equity. Terminal value is calculated using a constant growth rate of 2%. P-values are for one-tailed tests when there are directional predictions.

In **Panel A**, absolute percentage estimation errors for each firm-year observation under RIM (or DCF) = the absolute value of the difference between estimated intrinsic value calculated according to Equation 1 (or Equation 2) and the chosen valuation benchmark (i.e., current stock price or *ex post* IV measure), scaled by the latter. Suspect group refers to firms whose increase in reported earnings before extraordinary items exceed zero by no more than 4% of the end-of-year market value of equity, who report positive discretionary accruals and whose level of discretionary accruals is greater than the amount of increase in reported earnings, but does not exceed 2% of the market value of equity. Firms are classified as normal if they are not in the Suspect group. Each Suspect firm is matched on industry, year and size with a Normal firm; Match Diff. denotes the mean of differences in estimation errors between each Normal firm and its matched Suspect firm.

In **Panel B**, *DIFF* is defined as the difference in absolute percentage estimation errors for each firm-year observation and valuation model, i.e., (AE_DCF – AE_RIM), where terminal value is calculated using a 2% constant growth rate; *SUSPECT* is set equal to one if firms are suspected to have managed their reported earnings, and zero otherwise; *BM* is defined as book value per share over stock price per share, measured at fiscal yearend; *ES* is defined as the absolute value of changes in net income from Year t-1 to Year t, scaled by opening total assets; *Std_ROE* is measured over a 5-year period immediately preceding the annual report date.

Table 5
Robustness Checks Based on an Alternative Definition of Normal Firms

Panel A: **Mean Absolute Percentage Estimation Errors (P-values)**

	Valuation Benchmarks							
	(1). Current Stock Price				**(2). *Ex Post* Intrinsic Value**			
	(1a) Normal	**(1b) Suspect**	**(1c) Match Diff.**	**(1d) Sample**	**(2a) Normal**	**(2b) Suspect**	**(2c) Match Diff.**	**(2d). Sample**
N	364	364		728	360	360		720
DCF	0.392	0.400	-0.008 (0.631)	0.396	0.551	0.461	0.090 (0.006)	0.506
RIM	0.347	0.401	-0.054 (<.001)	0.374	0.491	0.441	0.051 (0.031)	0.466
DCF–RIM	0.045 (<.001)	0.000 (0.833)	0.046 (<.001)	0.022 (0.001)	0.059 (<.001)	0.020 (0.029)	0.039 (0.012)	0.040 (<.001)

Panel B: **Multivariate Regression Results**
Model: $DIFF = a_0 + a_1 SUSPECT + a_2 BM + a_3 ES + a_4 Std\_ROE$

	Valuation Benchmarks				
	Predicted	**(1). Current Stock Price**		**(2). *Ex Post* Intrinsic Value**	
Variables	**Sign**	**Coefficient Est.**	**p-Value**	**Coefficient Est.**	**p-Value**
Intercept	+	-0.017	0.192	0.025	0.153
SUSPECT	–	-0.025	0.045	-0.028	0.069
BM		0.076	0.004	0.055	0.105
ES		0.362	0.032	0.013	0.952
Std_ROE		0.036	0.082	0.029	0.294
Adjusted R2		0.031		0.007	
N		728		720	

Sample: US firms with earnings announcements on COMPUSTAT (1990-2000) and forecast data from Value Line.

In **Panels A-B,** current stock price is measured at the forecast date; *ex post* intrinsic value is future dividends over a three-year horizon plus market price at the end of the horizon, discounted at the industry cost of equity. Terminal value is calculated using a constant growth rate of 2%. P-values are for one-tailed tests when there are directional predictions.

In **Panel A**, absolute percentage estimation errors for each firm-year observation under RIM (or DCF) = the absolute value of the difference between estimated intrinsic value calculated according to Equation 1 (or Equation 2) and the chosen valuation benchmark (i.e., current stock price or *ex post* IV measure), scaled by the latter. The Suspect group includes both loss and earnings-decline avoiders, as defined in Table 3. Firms are classified as normal if they are not in the Suspect group and do not meet the criteria for real activity manipulation (defined in a similar manner as Suspect group except that, in lieu of discretionary accruals, discretionary expenses are used in the definition). Each Suspect firm is matched on industry, year and size with a Normal firm; Match Diff. denotes the mean of differences in estimation errors between each Normal firm and its matched Suspect firm.

In **Panel B**, *DIFF* is defined as the difference in absolute percentage estimation errors for each firm-year observation and valuation model, i.e., (AE_DCF – AE_RIM), where terminal value is calculated using a 2% constant growth rate; *SUSPECT* is set equal to one if firms are suspected to have managed their reported earnings, and zero otherwise; *BM* is defined as book value per share over stock price per share, measured at fiscal yearend; *ES* is defined as the absolute value of changes in net income from Year t-1 to Year t, scaled by opening total assets; *Std_ROE* is measured over a 5-year period immediately preceding the annual report date.

Table 6
Robustness Checks Based on an Alternative Constant Growth Assumption

Panel A: **Mean Absolute Percentage Estimation Errors (P-values)**

	Valuation Benchmarks							
	(1). Current Stock Price				**(2). *Ex Post* Intrinsic Value**			
	(1a). Normal	**(1b). Suspect**	**(1c) Match Diff.**	**(1d). Sample**	**(2a). Normal**	**(2b). Suspect**	**(2c) Match Diff.**	**(2d). Sample**
N	386	386	386	772	385	385	385	770
DCF	0.417	0.360	0.058 (0.002)	0.389	0.654	0.526	0.129 (0.025)	0.590
RIM	0.342	0.374	-0.032 (0.010)	0.358	0.534	0.483	0.052 (0.162)	0.508
DCF–RIM	0.076 (<.001)	-0.014 (0.062)	0.090 (<.001)	0.031 (<.001)	0.120 (<.001)	0.043 (0.001)	0.077 (0.002)	0.082 (<.001)

Panel B. Multivariate Regression Results
Model: *DIFF* = $a_0 + a_1$*SUSPECT* + a_2*BM* + a_3*ES* + a_4*Std_ROE*

		Valuation Benchmarks			
	Predicted	**(1). Current Stock Price**		**(2). *Ex Post* Intrinsic Value**	
Variables	**Sign**	**Coefficient Est.**	**p-Value**	**Coefficient Est.**	**p-Value**
Intercept	+	-0.022	0.193	0.034	0.180
SUSPECT	–	-0.060	0.001	-0.053	0.030
BM		0.173	<.001	0.184	0.001
ES		0.184	0.209	-0.303	0.187
Std_ROE		0.033	0.107	0.051	0.109
Adjusted R2		0.056		0.024	
N		772		770	

Sample: US firms with earnings announcements on COMPUSTAT (1990-2000) and forecast data from Value Line.

In **Panels A-B**, current stock price is measured at the forecast date; *ex post* intrinsic value is future dividends over a three-year horizon plus market price at the end of the horizon, discounted at the industry cost of equity. Terminal value is calculated using a constant growth rate of 4%. P-values are for one-tailed tests when there are directional predictions.

In **Panel A**, absolute percentage estimation errors for each firm-year observation under RIM (or DCF) = the absolute value of the difference between estimated intrinsic value calculated according to Equation 1 (or Equation 2) and the chosen valuation benchmark (i.e., current stock price or *ex post* IV measure), scaled by the latter. The Suspect group includes both loss and earnings-decline avoiders, as defined in Table 3. Firms are classified as normal if they are not in the Suspect group. Each Suspect firm is matched on industry, year and size with a Normal firm; Match Diff. denotes the mean of differences in estimation errors between each Normal firm and its matched Suspect firm.

In **Panel B**, *DIFF* is defined as the difference in absolute percentage estimation errors for each firm-year observation and valuation model, i.e., (AE_DCF – AE_RIM), where terminal value is calculated using a 2% constant growth rate; *SUSPECT* is set equal to one if firms are suspected to have managed their reported earnings, and zero otherwise; *BM* is defined as book value per share over stock price per share, measured at fiscal yearend; *ES* is defined as the absolute value of changes in net income from Year t-1 to Year t, scaled by opening total assets; *Std_ROE* is measured over a 5-year period immediately preceding the annual report date.

Table 7
Further Analysis Incorporating Components of Discretionary Accruals

Model: $DIFF = a_0 + a_1 SUSPECT + a_2 UAR + a_3 UINV + a_4 UAP + a_5 UDEP + a_6 USI + a_7 BM + a_8 ES + a_9 Std\_ROE$

	Valuation Benchmarks				
		(1). Current Stock Price		(2). *Ex Post* Intrinsic Value	
Variables	**Predicted Sign**	**Coefficient Est.**	**p-Value**	**Coefficient Est.**	**p-Value**
Intercept	+	-0.003	0.435	0.037	0.087
SUSPECT	–	-0.025	0.051	-0.038	0.027
UAR	–	0.015	0.417	-0.093	0.185
UINV	–	-0.179	0.177	0.283	0.146
UAP	+	0.418	0.088	-0.675	0.047
UDEP	+	-1.066	0.072	1.130	0.116
USI	–	0.045	0.429	0.333	0.161
BM		0.049	0.110	0.025	0.535
ES		0.363	0.060	0.114	0.649
Std_ROE		0.023	0.274	0.034	0.226
Adjusted R2		0.021		0.009	
N		564		564	

Sample: US firms with earnings announcements on COMPUSTAT (1990-2000) and forecast data from Value Line.

Current stock price is measured at the forecast date; *ex post* intrinsic value is future dividends over a three-year horizon plus market price at the end of the horizon, discounted at the industry cost of equity. Terminal value is calculated using a constant growth rate of 2%. *UAR*, *UINV*, *UAP*, *UDEP*, and *USI* denote, respectively, unexpected accounts receivable, unexpected inventory, unexpected accounts payable, unexpected depreciation expense, and unexpected special items, calculated based on Equations (5a)-(5e). P-values are for one-tailed tests when there are directional predictions.

DIFF is defined as the difference in absolute percentage estimation errors for each firm-year observation and valuation model, i.e., (AE_DCF – AE_RIM), where terminal value is calculated using a 2% constant growth rate; *SUSPECT* is set equal to one if firms are suspected to have managed their reported earnings, and zero otherwise; *BM* is defined as book value per share over stock price per share, measured at fiscal yearend; *ES* is defined as the absolute value of changes in net income from Year t-1 to Year t, scaled by opening total assets; *Std_ROE* is measured over a 5-year period immediately preceding the annual report date.

Table 8
Further Analysis Based on Extreme Values of Discretionary Accruals

Panel A: **Mean Absolute Percentage Estimation Errors (P-values)**

	Valuation Benchmarks							
	(1). Current Stock Price				(2). *Ex Post* Intrinsic Value			
	(1a) Normal	(1b) Suspect	(1c) Match Diff.	(1d) Sample	(2a) Normal	(2b) Suspect	(2c) Match Diff.	(2d). Sample
N	505	505		1,010	506	506		1,012
DCF	0.422	0.360	0.062 (<.001)	0.391	0.620	0.491	0.129 (0.008)	0.556
RIM	0.350	0.323	0.027 (0.019)	0.337	0.538	0.437	0.101 (0.021)	0.488
DCF–RIM	0.072 (<.001)	0.037 (<.001)	0.035 (0.003)	0.054 (<.001)	0.082 (<.001)	0.054 (<.001)	0.028 (0.022)	0.068 (<.001)

Panel B: **Multivariate Regression Results**
Model: $DIFF = a_0 + a_1 SUSPECT + a_2 BM + a_3 ES + a_4 Std\_ROE$

		Valuation Benchmarks			
		(1). Current Stock Price		(2). *Ex Post* Intrinsic Value	
Variables	Predicted Sign	Coefficient Est.	p-Value	Coefficient Est.	p-Value
Intercept	+	-0.052	0.002	0.049	0.008
SUSPECT	–	-0.030	0.015	-0.028	0.035
BM		0.210	< 0.001	0.059	0.059
ES		0.253	0.107	0.084	0.622
Std_ROE		0.087	0.001	0.023	0.438
Adjusted R2		0.074		0.004	
N		1,010		1,012	

Sample: US firms with earnings announcements on COMPUSTAT (1990-2000) and forecast data from Value Line.

In **Panels A-B,** current stock price is measured at the forecast date; *ex post* intrinsic value is future dividends over a three-year horizon plus market price at the end of the horizon, discounted at the industry cost of equity. Terminal value is calculated using a constant growth rate of 2%. P-values are for one-tailed tests when there are directional predictions.

In **Panel A**, absolute percentage estimation errors for each firm-year observation under RIM (or DCF) = the absolute value of the difference between estimated intrinsic value calculated according to Equation 1 (or Equation 2) and the chosen valuation benchmark (i.e., current stock price or *ex post* IV measure), scaled by the latter. Suspect group refers to firm-year observations with values of discretionary accruals in the top 10% of the distribution for the entire sample. The Normal group includes firm-year observations not classified as Suspect and not considered as part of the manipulators in our main analysis. Each Suspect firm is matched on industry, year and size with a Normal firm; Match Diff. denotes the mean of differences in estimation errors between each Normal firm and its matched Suspect firm.

In **Panel B**, *DIFF* is defined as the difference in absolute percentage estimation errors for each firm-year observation and valuation model, i.e., (AE_DCF – AE_RIM), where terminal value is calculated using a 2% constant growth rate; *SUSPECT* is set equal to one if firms are suspected to have managed their reported earnings, and zero otherwise; *BM* is defined as book value per share over stock price per share, measured at fiscal yearend; *ES* is defined as the absolute value of changes in net income from Year t-1 to Year t, scaled by opening total assets; *Std_ROE* is measured over a 5-year period immediately preceding the annual report date.