

# “On the Asymmetric Timeliness of Operating Cash Flows”

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## **Abstract:**

I examine why operating cash flows exhibit asymmetric timeliness with respect to stock returns and given this understanding, address the consequences for research into conditional accounting conservatism. Numerous studies document that operating cash flows are more sensitive to negative stock returns relative to positive returns. Because the properties of cash flows are defined largely by the operating (rather than reporting) decisions taken by management, the asymmetric relation with returns cannot be explained by conditional conservatism. I find that the asymmetric timeliness of cash flows is primarily driven by product pricing, whereby managers are quick to cut prices in response to bad economic news, but do not appear to increase prices in response to good economic news. Consistent with this reasoning, I find that firms with greater pricing power exhibit lower asymmetric timeliness in operating cash flows as well as in earnings.

Variation in the asymmetric timeliness of earnings induced by operating cash flows should not be interpreted as evidence of conditional conservatism. With this in mind, I revisit several existing inferences regarding conditional conservatism. I conclude that researchers should employ a specification of the Basu 1997 model that (1) avoids the confounding effect of cash flow asymmetry and (2) addresses the matching role of accruals.

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## **1. Introduction**

Conservatism has been a pervasive aspect of financial reporting dating back beyond modern securities regulation (Watts and Zimmerman 1986 and Watts 2003a). Basu 1997 interprets conservatism as accountants' tendency to require a higher degree of verification for recognizing good news than bad news in accounting earnings. Supporting this interpretation, Basu finds that earnings reflect bad economic news more quickly than good economic news (asymmetric timely loss recognition) using stock returns to proxy for economic news. Capitalizing on this new empirical technology, the accounting literature has moved forward to examine many determinants, and to a lesser extent, consequences of accounting conservatism. However, a veritable thorn in the side of this body of literature is wide-spread evidence that operating cash flows also exhibit asymmetric timely loss recognition (Basu 1997, Dietrich et al. 2007 Collins et al. 2009). Because operating cash flows are based on actual cash transactions, this asymmetric timeliness (AT) cannot be explained by accounting conservatism.

In order to document the source of AT in operating cash flows (hereafter cash flows), I empirically test several existing and novel explanations for the asymmetry. This should shed light on the earnings-return relation, which is of fundamental interest to economic based research on capital markets. Also, given this understanding, accounting researchers should be able to foresee when cash flow AT is likely to confound inferences about conditional conservatism tested using earnings' AT. With this in mind, I examine whether several important inferences regarding the determinants of accounting conservatism are robust to the consideration of operating cash flow AT.

Several explanations for operating cash flow AT exist: the project abandonment option (Watts 2003a,b and Ryan 2006), the desire to minimize tax expenses (Ryan 2006), costly intervention to mitigate the impact of bad economic news on the firm (Ball et al. 2009), asymmetries in the relation between returns and working capital changes (Collins et al. 2009), production constraints (Papadakis 2007) and econometric bias inherent in the Basu style regression (Dietrich et al. 2007 and Patatoukas and Thomas 2010). I also develop a new explanation for cash flow AT: product pricing mark-up rigidity.

Despite the multitude of theories, no study to my knowledge has attempted to *directly* identify which explanation(s) generates this asymmetry. I find evidence that supports the product pricing explanation as the primary driver of operating cash flow AT. My findings are consistent with managers not increasing prices when economic news is good, but decreasing prices when economic news is bad. This is consistent with the economics literature which generally finds that price rigidity is higher for price markups (Okun 1981 and Blinder et al. 1998). My results show that a 10% increase in the firm's stock price is associated with a .02% decrease in gross margin, whereas a 10% decrease in stock price is associated with a 1.6% decrease in gross margin. I provide evidence that the pricing effect generates the majority of the AT in cash flows.

I find some support for the costly intervention explanation (Ball et al. 2009). Under this explanation, managers decide to increase (or not reduce) expenses such as R&D, advertising, and SG&A expenses in response to bad economic news. For instance, in response to news that an existing product line is becoming obsolete it may be value maximizing to increase R&D efforts aimed at developing a new or improved product. I demonstrate that research and development expense exhibits a strong asymmetric

relationship with returns. In fact, the coefficient on negative returns is of a sufficient magnitude that R&D actually *increases* as returns become more negative. This also contributes to operating cash flow AT, although to a lesser extent than pricing strategy.

In a contemporaneous working paper Collins et al. 2009 conjecture that cash flow AT is caused by the relation between changes in working capital and economic news. They posit that increases in demand (good economic news) induce immediate cash outflows for inventory while cash collections lag behind. I am unable to document evidence supporting this explanation in my sample. I find limited support for the project abandonment option explanation (Watts 2003a, b and Ryan 2006). My evidence suggests that the project abandonment option is not an economically significant driver of cash flow asymmetry, explaining less than 1%. I find no support for the tax minimization explanation (Ryan 2006), the production constraint explanation (Papadakis 2007), or the econometric bias explanation (Dietrich et al. 2007 and Patatoukas and Thomas 2010).

After establishing the causes of cash flow AT, I move on to explore the consequences for existing inferences. There are two potential issues: (1) variation in the AT of earnings may be induced by variation in cash flow AT because cash flows are included in earnings. This could result in problems when earnings' AT is used to proxy for conditional conservatism as AT induced by cash flows should not be interpreted as evidence of conditional conservatism. However excluding cash flows from earnings to avoid the first issue results in another problem, that is (2) when accruals are employed as the dependent variable in the Basu model (rather than earnings) cash flows become an omitted correlated variable. This is because the level of cash flows exhibits a strong

negative correlation with accruals (the dependent variable) and also exhibits AT (correlation with the independent variables).

To examine the first issue (the influence of cash flows on earnings AT), I exclude cash flows from earnings and re-test some of the primary determinants of conditional accounting conservatism including leverage (Lee 2010, Khan and Watts 2009, amongst others), size (Khan and Watts 2009) and information asymmetry (LaFond and Watts 2008). In each case the extant inferences are unchanged. The AT of cash flows is invariant to leverage and information asymmetry, which indicates that these determinants affect the level of AT in earnings through accruals alone. This is consistent with conditional conservatism driving the variation in the AT of earnings associated with leverage and information asymmetry. I find that size reduces the AT of operating cash flow, earnings, and accruals. This indicates that size affects both conditional conservatism (proxied using the AT coefficient where accruals is the dependent variable), and “real” responses on the part of management to bad economic news (AT where cash is the dependent variable). This is not surprising and is consistent with larger firms having more market power such that product pricing increases more in response to good economic news and decreases less in response to bad economic news in the short term.

Regarding the second issue, researchers may falsely reject hypotheses related to conditional conservatism when accruals are used as the dependent variable in the Basu model rather than earnings. To provide an illustration of this problem I re-examine evidence that product market competition induces greater conditional conservatism (Dhaliwal et al. 2009). In a Basu style regression where accruals is the dependent variable, product market competition does not appear to impact the level of AT.

However, when cash flow is the dependent variable product market competition does impact the level of AT. Together these results appear to reject increased conditional conservatism as the cause of increased AT in earnings, and hence Dhaliwal et al.'s inference. This would be incorrect. When I add cash flows as a control variable to the Basu style regression where accruals is the dependent variable, the positive association between product market competition and AT in accruals obtains. This is consistent with Dhaliwal et al.'s inference, and provides evidence on the importance of controlling for cash flows when accruals is the dependent variable in the Basu model. Otherwise, spurious inferences may result due to cash flows being a correlated omitted variable.

My contribution to the extant literature is fourfold. First, I document why cash flows exhibit asymmetric timeliness. This provides additional insight into how economic income (returns) maps into accounting income (operating cash flows). A maintained assumption in the accounting literature is that the non-linearity in this relation is driven by the accounting technology (Basu 1997), or differences in earnings persistence (Hayn 1995 and Lipe, Bryant and Widener 1998).<sup>1</sup> I provide evidence that non-linearity can also result from real economic choices that are conditional on the sign of economic news.

Second, I examine several extant inferences in the conditional conservatism literature which are based on variation in the AT of earnings. I find evidence that

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<sup>1</sup> Because the return response coefficient is the reciprocal of the earnings response coefficient (Collins and Kothari [1989]) the asymmetry in operating cash flows could potentially be explained by variation in the earnings response coefficient. Hayn 1995 and Lipe et al. 1998 find evidence that the relation between returns and earnings is non-linear depending on the sign of earnings. Hayn explains that this is a manifestation of positive earnings being more persistent than negative earnings. Basu argues that under this theory there should be a higher explanatory power in the return-earnings relation in the positive frame (i.e., when earnings are positive). However, Basu finds that there is stronger explanatory power in the negative frame (i.e., returns are negative). He argues that this is inconsistent with the persistence explanation driving the asymmetry between returns and earnings in his model. When operating cash flows replace earnings as the dependent variable, I also find that there is stronger explanatory power in the negative frame. Likewise, this evidence is inconsistent with the persistence explanation.

conditional conservatism drives this variation, and not cash flow asymmetry. That is, the variation in the AT of earnings associated with these determinants is driven by the effect of accruals, and not the effect of cash flows. This provides strong evidence that existing inferences are not driven by econometric problems with the Basu model, as such problems should generate “spurious” results for cash flows too (they do not). Knowing the causes of cash flow’s asymmetry (pricing strategy and costly intervention) should help researchers identify when there is a danger that variation in earnings’ AT induced by cash flows could generate misleading inferences when the construct under study is conditional conservatism. Researchers should be especially cautious when examining economic determinants of conditional conservatism such as product market competition, labor relations, growth, and industry membership as these economic determinants also impact pricing strategy and R&D expenditures.

Third, I provide evidence that inferences related to conditional conservatism may be spurious when accruals (rather than earnings) is used as the dependent variable in the Basu regression unless cash flows is included as a control variable. This is because cash flows exhibit a strong negative correlation with accruals (the dependent variable) and are themselves asymmetrically timely with respect to returns (the independent variable).

Finally, my evidence that cash flows exhibit asymmetric timeliness for real economic reasons is inconsistent with the argument that the asymmetric timeliness of cash flows is ipso facto evidence that the Basu model suffers from econometric deficiencies (see Dietrich et al. 2007).

## 2. Literature Review and Hypothesis Development

### 2.1 Cash Flow Asymmetric Timeliness

Basu 1997 develops the most widely used econometric technique to measure conditional conservatism. In a “reverse” regression of earnings on returns the coefficient on returns is allowed to vary with the sign of returns. Basu finds that the incremental coefficient on negative returns is positive. He interprets this as evidence that on average, publicly traded firms in the U.S. are conditionally conservative. That is, accountants typically employ a greater verifiability threshold for recognizing good news relative to bad news, resulting in a relatively higher association between bad news and earnings (Table 1, Page 13). Further, Basu finds that earnings exhibit more asymmetric timeliness than cash flows alone, indicating that accruals contribute to asymmetric timeliness in a manner consistent with conditional conservatism (Table 2, Page 17). Nonetheless, Basu does find that cash flows also exhibit asymmetric timeliness, a finding left unexplained. Cash flow AT is somewhat troubling as it cannot be explained by conditional conservatism. Cash inflows and outflows are simply recorded when they occur leaving little room for managerial intervention outside of “real” activities.<sup>2</sup>

A variety of explanations for cash flow AT have been provided in existing studies. These include economic explanations such as costly intervention to mitigate the impact of bad news, asymmetric changes in working capital, the project abandonment option, capacity constraints, and tax avoidance. I add one additional explanation: asymmetric changes in product pricing (Okun 1981 and Blinder et al. 1998). In addition to these economic explanations, several studies cite the asymmetric timeliness of cash

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<sup>2</sup> Managers do also have some leeway with regard to cash flow classification (operating, investing, or financing). It is unclear how (and why) strategic cash flow classification would generate AT in operating cash flows.



flows as evidence that the Basu style asymmetric timeliness test suffers from severe econometric bias. I discuss several of these explanations in more detail in the following sub-sections. The remaining explanations are discussed in the additional analyses section.

## *2.2 Pricing Strategy*

The firm's product pricing response to good and bad economic news may be asymmetric. When there is a negative demand shock the firm faces a tradeoff between reducing the product's price and reducing the quantity sold. Likewise, when there is a positive demand shock the firm faces a tradeoff between increasing the product's price and increasing the quantity sold. Okun 1981, (page 178) refers to the observation that prices are more rigid with respect to markups across the private sector. Further evidence is provided by Blinder et al. 1998 which discusses the results of a survey of 78 firms. According to the survey (Table 13.9, Page 240) in periods of increased demand 61.5% of firms indicate that they prefer to raise production, 4.5% indicate that they prefer to raise price, and 34% prefer to raise both price and production. In periods of decreased demand 36.8% of firms prefer to decrease production, 27% prefer to decrease prices, and 36.2% prefer to decrease both price and production. Of the forty-eight managers responding that they did not want to increase prices when demand increased, nine stated that they did so because of a desire to maintain/increase market share, nine mentioned that competitive pressures made it impossible to raise prices, and seven didn't want to antagonize customers.

Together these authors provide evidence that managers are somewhat reluctant to respond to positive demand shocks by increasing prices, whereas there is less reluctance to decrease prices when a negative demand shock occurs. Similar logic should apply for

supply shocks. I conjecture that when input prices increase (bad economic news) the firm will be reluctant to increase prices and will instead experience decreased margins.

However, when input prices decrease (good economic news) the firm does not face such a significant barrier to lowering prices. Therefore, the firm's gross margin should decrease to a greater extent when there is an adverse economic shock as compared to when there is a favorable economic shock. Using returns to proxy for the combined effect of supply and demand shocks experienced by the firm, the following hypothesis follows:

**H1a: Gross margins are more sensitive to bad economic news relative to good economic news.**

Evidence supporting H1a is not a sufficient condition for pricing to generate asymmetric timeliness in cash flows. This is because the change in margin may be offset by changes in quantity sold. However, there are three reasons to believe that this will not be the case. To begin with, a reluctance to increase price when economic news is good will limit the manager's ability to maximize short-term income when setting price and quantity. This implies a reduced contemporaneous sensitivity of cash flows to good economic news after incorporating the impact of volume. Also, firms face short-term production constraints that may prevent them from producing sufficient quantities to satisfy increased demand. Finally, in a competitive market quantity sold is likely to exhibit lessened sensitivity to negative product pricing changes relative to positive product pricing changes. This is because other firms in the industry are likely to cut prices as well when an adverse demand shock occurs, potentially negating any quantity increase based on lowered prices. This implies that when news is bad, decreased prices are not offset by increases in quantity sold. These factors should not affect cash outflows

for inventory (i.e., purchases of raw materials, manufacturing overhead, wages) which should therefore be less asymmetrically sensitive to negative returns.

**H1b: Cash inflows from sales are more asymmetrically sensitive to bad economic news than are cash outflows for inventory.**

Given that gross margins exhibit asymmetric timeliness with respect to bad economic news (evidence supporting H1a) and that quantity sold does not appear to offset the margin asymmetry (evidence supporting H1b) then it follows that gross cash flows from selling activities induce some of the AT in cash flows.<sup>3</sup> However, the impact on the overall level of cash flow AT also depends on the magnitude of the cash flow item in question.<sup>4</sup> I expect that the pricing strategy explanation explains the majority of the AT in cash flows given that (1) gross cash flows from selling activities are the principle element of cash flows, and (2) I predict a strong asymmetry in the response of margins to bad economic news. Therefore, I formulate the following hypothesis:

**H1c: Gross cash flows from selling activities explain much of the asymmetric timeliness of cash flows.**

### *2.3 Costly Intervention*

Ball et al. 2009, page 36 suggest "...that the asymmetry in cash flows stems from the fact that it is unlikely that the efficient value-maximizing response of cash flows to economic income is symmetric." The authors offer several examples such as increasing advertising in response to a fall in demand, hiring consultants in order to thwart a new threat, and increased maintenance/repair/warranty costs. I expect that costs incurred to engage in product development or redesign may also be of interest. All of these responses

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<sup>3</sup> Gross cash flows from selling activities is defined as the net cash inflows from sales less the net cash outflows for inventory.

<sup>4</sup> For instance, a minor cash flow item may exhibit strong AT; however the effect on overall cash flow asymmetry will be small simply because the item is a minor component of overall cash flows.

are likely to increase cash outflows when economic news is bad, whereas when economic news is good these costs would not necessarily change. Therefore, these cash outflows should induce greater timeliness in cash flows when news is bad, but should have little impact on timeliness when news is good. This line of reasoning leads to the following hypothesis:

**H2a: Bad news mitigating expenses exhibit negative incremental bad news timeliness (relative to good news timeliness).**

Evidence supporting hypothesis 2a indicates that a given expense generates at least some of the asymmetry in cash flows. Keep in mind that the impact of a particular item on the overall level of cash flow asymmetry also depends on the magnitude of the item in question. Therefore, the degree to which a given expense increases operating cash flow AT is an empirical question.

**H2b: After adding back bad news mitigating expenses to cash flows the asymmetric timeliness of cash flows decreases.**

#### *2.4 Changes in Working Capital*

Collins, Hribar and Tian 2009 argue that asymmetric changes in working capital explain operating cash flow AT. For instance, when the firm experiences a positive demand shock (good economic news) immediate cash outlays occur to stock up inventory. Consistent with this reasoning, Thomas and Zhang 2002 find that increases in stock price are associated with an increase in inventory. Further, the increase in sales associated with the demand shock should result in an increase in accounts receivable. This increase in working capital consumes cash flows thereby inducing a negative correlation between changes in working capital accruals and cash flows. Together, these relationships should weaken the association between positive returns and cash flows, but

increase the association between positive returns and the change in working capital accruals. Switching now to the negative return setting, suppliers may require earlier payment and customers may delay payment when economic news is bad. This should intensify the association between negative returns and cash flows, but weaken the association between negative returns and the change in working capital accruals. These arguments imply that the change in working capital accruals should be more sensitive to good economic news relative to bad economic news, i.e., the change in working capital should exhibit negative asymmetric bad news timeliness.

**H3a: The change in working capital accruals exhibits negative incremental bad news timeliness (relative to good news timeliness).**

Evidence supporting hypothesis 3a indicates that changes in working capital may induce some of the asymmetry in cash flows. Further, given the magnitude of working capital and its impact on cash flows, there is little question that the effect on overall cash flows would be significant. However, the degree to which the asymmetric relationship between changes in working capital and returns induce an asymmetry in cash flows is an empirical question.

**H3b: After adding back the change in working capital accruals to cash flows the asymmetric timeliness of cash flows decreases.**

*2.5.a Variance Ratio Bias*

The final explanation for operating cash flow AT is econometric bias. Dietrich et al. 2007 identify sample variance ratio (SVR) bias induced in the Basu model by the reversal of a structural equation (i.e., where stock return is the dependent variable and earnings is the independent variable, as in the basic ERC regression). The authors examine the asymmetric timeliness of cash flows with the maintained assumption that

cash flows should be unaffected by conservative accounting choices. The authors find evidence that cash flows do exhibit asymmetric timeliness, which they use to bolster their argument that econometric problems induce a spurious result in the Basu model.<sup>5</sup> See appendix A for a brief outline of Dietrich et al.’s analysis and derivation of SVR bias. Helpfully, Dietrich et al. identify conditions whereby the estimation of the asymmetric timeliness coefficient is not confounded by SVR bias:

1. X (earnings, or in this case cash flows) has a symmetric distribution;
2.  $\eta$  (non-earnings news) has a symmetric and homoskedastic distribution with a mean of zero; and
3. “good” and “bad” news samples are formed at the mean of R (stock returns).

Based on these guidelines, I perform additional analyses designed to mitigate issues with SVR bias. To meet condition 1, I employ ranked cash flows (and other accounting performance measures) which is distributed symmetrically by construction. I also employ the log transformation of cash flows which is distributed more symmetrically than cash flows (exhibiting far less skewness and kurtosis).<sup>6</sup> Condition 2 requires non-earnings news to be distributed symmetrically with a mean of zero. I proxy for non-earnings news using the error term where stock return is the dependent variable and cash flows (or earnings) is the independent variable. This term is equivalent to  $\eta$  from equation 1 in the appendix by construction and is mean zero by OLS assumption. I evaluate the skewness and kurtosis of non-earnings news across the different specifications (standard, logged and ranked) and evaluate whether operating cash flow AT is robust to their

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<sup>5</sup> It is worthwhile noting that Ball et al. 2009 provide a rigorous analytical analysis of the Basu 1997 model, addressing many of the concerns raised in the Dietrich study. In contrast to the Ball study, I address concerns in the Dietrich study empirically.

<sup>6</sup> I retain negative observations by reversing their sign before log transformation, reversing the sign again after log transformation. I use log base e with a pivot point of 1.

consideration. I divide the sample at the mean of returns (or the alternative economic income proxy) to meet condition 3.

### *2.5.b Deflator Bias*

Patatoukas and Thomas 2010 identify bias induced by deflating earnings per share by beginning stock price. They find that when the inverse of beginning stock price alone is included as the dependent variable in the Basu regression, the asymmetric coefficient remains positive and significant. Also, when lagged EPS is employed as the dependent variable, a positive and significant loading remains on the asymmetric coefficient. To test whether deflator bias induces asymmetric timeliness in cash flows, I perform an analysis where no deflator of any kind is employed in the construction of the dependent or independent variables.

### *2.5 Review of Existing Findings*

It is well established that debt-holders, due to their asymmetric pay-off structure, demand greater conditional conservatism. Firms respond to this demand by increasing asymmetric timely loss recognition in earnings (Khan and Watts 2009, Lee 2010, amongst others).<sup>7</sup> LaFond and Watts 2009 identify information asymmetry as another determinant for the benefit to be gained by providing conservative accounting numbers. Consistent with this reasoning, LaFond and Watts find that firms facing higher information asymmetry (as proxied by PIN score) provide more asymmetric timely loss recognition in earnings. Khan and Watts 2009 argue that larger firms have richer

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<sup>7</sup> Watts 2003a argues that conditional conservatism plays an important contracting role by reducing expected agency costs faced by the firm. He argues further that conditional conservatism arises endogenously in response to the firm's contracting environment, as various contracting parties will benefit to a greater/lesser extent from conditional conservatism. At firms where there is more to gain from conditional conservatism the contracting parties will demand, and the firm will provide, greater conditional conservatism.

information environments and lower contracting demand for conditional conservatism overall, and document a negative relation between size and the asymmetric timeliness of earnings. Finally, Dhaliwal et al. 2009 argues that contracting parties to firms facing a more competitive product market (as proxied by the Herfindahl index) will demand more conditional conservatism. Consistent with this argument, the asymmetric timeliness of earnings is higher for firms facing tougher competition.

Because these inferences regarding conditional conservatism are based on the asymmetric timeliness of earnings, it is possible that variation in operating cash flow AT plays a confounding role. Therefore, I re-examine each of these determinants using the Basu framework with earnings, cash flows, and accruals alternatively as the dependent variable.

### **3. Sample, Research Design and Results**

#### *3.1 The Sample and Variable Construction*

My sample consists of all CompuStat Xpressfeed firms with sufficient data successfully matched to a continuous 12 months of return data on the Center for Research in Securities Pricing (CRSP) database.<sup>8</sup> The sample period begins in 1988 and ends in 2008, because I require several lagged variables the first valid observation occurs in 1989. I also require beginning stock price to be greater than \$2. The asymmetric timeliness of cash flows is calculated using the Basu 1997 model (replacing earnings with cash flows). I use the coefficient on returns interacted with a negative return dummy as the measure for operating cash flow AT ( $\beta_3$  in equation [1] below):

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<sup>8</sup> For the current period I require non-missing annual returns, operating cash flows, net income before extraordinary items (to calculate accruals), earnings per share, book to market, leverage, size, assets, sales and cost of goods sold. I also require current and lagged market value of equity, accounts payable, accounts receivable, other current assets, other current liabilities, taxes payable, and inventory. See the tables for data definitions.



$$DOCF_{it} = \beta_0 + \beta_1 \times RET_{it} + \beta_2 \times N_{it} + \beta_3 \times N_{it} \times RET_{it} + \varepsilon_{it} \quad [1]$$

In equation [1] deflated operating cash flows ( $DOCF_{it}$ ) is calculated as [OANCF] deflated by the lagged market value of equity. The market value of equity ( $MVE_{it}$ ) is calculated as the fiscal year-end stock price [PRCC\_F] multiplied by the number of common shares outstanding [CSHO].  $RET_{it}$  is stock return for the twelve-month period commencing with the fourth month after the end of fiscal year t-1,  $N_{it}$  is an indicator variable that equals one (zero) if  $RET_{it}$  is negative (non-negative), and  $\varepsilon_{it}$  is an error term. Operating cash flow asymmetric timeliness is increasing in  $\beta_3$ .

### 3.2 Descriptive Statistics

Table 1 presents descriptive statistics for variables used to test the hypotheses. Detailed variable definitions are given below the table. The minimum and maximum values for the variables appear reasonable, reducing the likelihood that extreme values will produce spurious results in the following regression analyses. It is worthwhile to note that annual stock returns ( $RET_{it}$ ) is right skewed with a mean of .081 and a median of .021. However, deflated cash flows ( $DOCF_{it}$ ) exhibits little skewness with a mean of .089 and a median of .080. In later tests I perform analyses with various transformations of the variables to mitigate issues with skewness and heteroskedasticity should they exist. The number of observations varies based on data availability with the base sample consisting of 68,908 observations. The sample drops considerably when data items such as research and development expense or PIN score are required.

Table 2 presents the correlation matrix for variables used to test the hypotheses. Of note is the high negative correlation between  $DOCF_{it}$  and  $DACC_{it}$ , with a Pearson (Spearman) correlation of -.587 (-.622) as well as the positive Pearson (Spearman)

correlation between  $DOCF_{it}$  and  $RET_{it}$  of .201 (.292). Further, in later testing I find that cash flows exhibit variation in asymmetric timeliness (related to size and product market competition). Thus, when the Basu 1997 model is employed with accruals as the dependent variable, cash flows should be included as a control variable. Otherwise the exclusion of cash flows will pose significant correlated omitted variable problems to the researcher.

Table 3 presents results from replicating some of the Basu 1997 tests in my sample, in which I employ information from the statement of cash flows to calculate accruals.<sup>9</sup> In the first column, I present results where cash flows is the dependent variable ( $DOCF_{it}$ ). Consistent with Basu 1997 amongst others, I find that cash flows exhibit AT with an incremental coefficient on negative returns that is positive ( $\beta_3 = .1374$ ) and significant (P-Value < .01). In the second column, I present results where accruals ( $DACC_{it}$ ) is the dependent variable. I find that accruals also exhibit AT, although to a lesser degree than cash flows, with an incremental coefficient on negative returns that is positive ( $\delta_3 = .0551$ ) and significant (P-Value < .01). Note the low explanatory power ( $R^2 = .0042$ ) in this model. It is well understood that accruals perform two roles: aligning the timing of revenue and expense recognition under the matching rule and facilitating the timely recognition of bad news. The former induces a great deal of variation into the level of accruals that is not associated with the independent variables, this in turn attenuates the relationship between returns and accruals. In the third column, I present results where earnings ( $DEPS_{it}$ ) is the dependent variable. I find that earnings exhibit the greatest degree of asymmetric timeliness with an incremental coefficient on negative

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<sup>9</sup> Collins and Hribar 2002 provide evidence that there are significant problems with estimating accruals using the balance sheet method.

returns that is positive ( $\delta_3 = .1857$ ) and significant (P-Value  $< .01$ ). Further, the explanatory power when earnings is the dependent variable ( $R^2 = .1420$ ) is the greatest across the three models. This is consistent with cash flows and accruals combining to provide a more meaningful measure of firm performance (Dechow 1994 and Dechow et al. 1998).

### 3.3 Testing the Pricing Explanation

My analysis of hypothesis 1a regarding the pricing strategy explanation for operating cash flow AT is based on the following regression:

$$MARGIN_{it} = \beta_0 + \beta_1 \times RET_{it} + \beta_2 \times N_{it} + \beta_3 \times RET_{it} \times N_{it} + \varepsilon_{it} \quad [2]$$

In equation [2] the variables  $RET_{it}$  and  $N_{it}$  are as previously defined. The dependent variable  $MARGIN_{it}$  is calculated as total sales [SALE] less the cost of goods sold [COGS] which is then divided by total sales. In hypothesis 1a I predict that margins will decrease to a greater extent in response to bad economic news than they increase in response to good economic news. Therefore, a positive loading on ( $\beta_3$ ) would provide evidence supporting this hypothesis.

Table 4, column 1 presents the regression results from equation [2] testing hypothesis 1a. I find that the incremental coefficient on negative returns is positive ( $\beta_3 = .164$ ) and significant (P-Value  $< .01$ ). This indicates that margins decrease to a greater extent in response to bad economic news relative to good economic news, and is consistent with the pricing strategy explanation. Further, the coefficient on positive returns is negative ( $\beta_1 = -.002$ ) and insignificant, indicating that firms have limited appetite (or scope) to increase prices contemporaneously in response to good economic news. However, this analysis is incomplete as it does not incorporate the impact of

pricing or economic news on sales volume.<sup>10</sup> This shortcoming is addressed in the following tests, which take into account sales and production volume.

My analysis of hypothesis 1b regarding the pricing strategy explanation for operating cash flow AT is based on the following regression:

$$CASH\_SALE \text{ or } CASH\_INV_{it} = \delta_0 + \delta_1 \times RET_{it} + \delta_2 \times N_{it} + \delta_3 \times RET_{it} \times N_{it} + \varepsilon_{it} \quad [3]$$

In equation [3] the variables  $RET_{it}$  and  $N_{it}$  are as previously defined. The dependent variable is either cash proceeds from sales ( $CASH\_SALE_{it}$ ) or cash payments for inventory ( $CASH\_INV_{it}$ ). Cash proceeds from sales ( $CASH\_SALE_{it}$ ) is calculated as total sales [SALE] less the change in accounts receivable [RECT], which is then deflated by  $MVE_{it-1}$ . Cash payments for inventory ( $CASH\_INV_{it}$ ) is calculated as the cost of goods sold [COGS] plus the change in inventory [INVT] less the change in accounts payable [AP], which is then deflated by  $MVE_{it-1}$ . In hypothesis 1b I predict that proceeds from cash sales will exhibit greater asymmetric bad news timeliness relative to cash payments for inventory. Therefore, a more positive loading on negative returns ( $\delta_3$ ) when the dependent variable is cash proceeds from sales relative to when cash payments for inventory is the dependent variable would provide evidence supporting hypothesis 1b.

Table 4, columns 2 and 3 present the regression results from equation [3] testing hypothesis 1b. Column 2 displays the results of a regression based on equation [3] where cash inflows from sales is the dependent variable. I find that the incremental coefficient on negative stock returns is positive ( $\delta_3 = .488$ ) and significant (P-value < .01). Column 3 displays the results of a regression based on equation [3] where cash outflows for

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<sup>10</sup> For instance, consistent with the survey results reported by Blinder et al. 1998, when a positive demand shock occurs managers often choose increased sales volume over increased price. In this case, operating cash flows would increase even without an increase in margins.

inventory is the dependent variable. I find that the incremental coefficient on negative stock returns is positive ( $\delta_3 = .372$ ) and significant (P-value < .01). Comparing the coefficient on negative returns when cash inflows is the dependent variable ( $\delta_3 = .488$ ) to that when cash outflows is the dependent variable ( $\delta_3 = .372$ ) it is clear that the cash inflows are more asymmetrically sensitive to bad economic news. This result provides evidence supporting hypothesis 1b. This finding coupled with the findings regarding gross margin (hypothesis 1a) provides significant evidence that prices decrease in response to bad economic news more than they increase in response to good economic news, and changes in volume do not offset this asymmetry.

My analysis of hypothesis 1c regarding the pricing strategy explanation for operating cash flow AT is based on the following regression:

$$DOCF\_SELL \text{ or } DOCF\_OTHER_{it} = \lambda_0 + \lambda_1 \times RET_{it} + \lambda_2 \times N_{it} + \lambda_3 \times RET_{it} \times N_{it} + \varepsilon_{it} \quad [4]$$

In equation [4] the variables  $RET_{it}$  and  $N_{it}$  are as previously defined. The dependent variable is either net cash proceeds from selling activities ( $DOCF\_SELL_{it}$ ) or from other activities ( $DOCF\_OTHER_{it}$ ). I calculate net cash proceeds from selling activities ( $DOCF\_SELL_{it}$ ) as  $CASH\_SALE_{it}$  less  $CASH\_INV_{it}$ , both as previously defined. Cash flows from other activities ( $DOCF\_OTHER_{it}$ ) is calculated as cash flows from operations ( $DOCF_{it}$ ) less  $DOCF\_SELL_{it}$ . Both dependent variables are deflated by  $MVE_{it-1}$ . In hypothesis 1c I predict that net cash flows from selling activities explains much of operating cash flow AT. Therefore, I expect that the incremental coefficient on negative returns will be larger when net cash proceeds from selling activities is the dependent variable as compared to when the remaining operating cash flow is the dependent variable.

Table 4, columns 4 and 5 present the regression results from equation [4] testing hypothesis 1c. Column 4 displays the results of a regression based on equation [4] where  $DOCF\_SELL_{it}$  is the dependent variable. I find that the incremental coefficient on negative stock returns is positive ( $\lambda_3 = .116$ ) and significant (P-value < .01). Column 5 displays the results of a regression based on equation [4] where  $DOCF\_OTHER_{it}$  is the dependent variable. I find that the incremental coefficient on negative stock returns is positive ( $\lambda_3 = .021$ ) and significant (P-Value < .05). Comparing the coefficient on negative returns when net cash flows from selling activities is the dependent variable ( $\lambda_3 = .116$ ) to that when other cash flows is the dependent variable ( $\lambda_3 = .021$ ) it is evident that net cash flows from selling activities are the primary driver of operating cash flow asymmetric timeliness.

#### 3.4 Testing the Costly Intervention Explanation

My analysis of hypothesis 2a regarding the costly intervention explanation for operating cash flow AT is based on the following regression:

$$EXP_{it} = \beta_0 + \beta_1 \times RET_{it} + \beta_2 \times N_{it} + \beta_3 \times RET_{it} \times N_{it} + \varepsilon_{it} \quad [5]$$

In equation [5] the variables  $RET_{it}$  and  $N_{it}$  are all as previously defined. I add various expenses the firm may incur to mitigate the impact of bad economic news on future firm performance as the dependent variable. These expense categories include research and development  $R\&D_{it}$  [XRD], marketing expense  $AD_{it}$  [XAD] and selling, general and administrative expense  $SG\&A_{it}$  [XSGA]. All expense items are deflated by  $MVE_{it-1}$ . In hypothesis 2a, I predict that costly managerial intervention to mitigate the impact of bad economic news should induce an asymmetric relationship between certain expense items and returns. The coefficient on negative returns ( $\beta_3$ ) measures the degree to

which the expense line item co-varies with negative stock returns relative to positive stock returns. In general, if a given expense line item co-varies more positively with positive returns relative to negative returns then the expense line item should contribute to the asymmetric timeliness of cash flows. Therefore, a negative incremental coefficient ( $\beta_3$ ) on negative stock returns indicates that the expense line item may contribute to the asymmetric timeliness of cash flows.

Table 5 presents the regression results from equation [5] testing hypothesis 2a. Column 1 presents results where  $R\&D_{it}$  is the dependent variable. I find that the incremental coefficient on negative returns is negative ( $\beta_3 = -.034$ ) and significant (P-Value  $< .01$ ). In fact, by comparing the incremental coefficient on negative returns ( $\beta_3 = -.034$ ) to the base coefficient on returns ( $\beta_1 = .021$ ) it is evident that research and development expenses actually increase in response to bad economic news. This provides evidence that managers incur additional research and development expenses when returns become more negative, consistent with hypothesis 2a. This suggests that research and development expenses are likely to contribute significantly to operating cash flow AT, a possibility I test formally in later analyses. Column 2 presents results where  $AD_{it}$  is the dependent variable. I find that the incremental coefficient on negative returns is positive ( $\beta_3 = .008$ ) and significant (P-Value  $< .01$ ). This suggests that advertising expenses are unlikely to induce asymmetric timeliness in cash flows, and may actually reduce it. Column 3 presents results where  $SG\&A_{it}$  is the dependent variable. I find that the incremental coefficient on negative returns is positive ( $\beta_3 = .009$ ) but insignificant. This suggests that selling, general, and administrative expenses are unlikely to induce asymmetric timeliness in cash flows.

My analysis of hypothesis 2b regarding the costly intervention explanation for operating cash flow AT is based on the following regression:

$$DOCF\_BEXP_{it} = \delta_0 + \delta_1 \times RET_{it} + \delta_2 \times N_{it} + \delta_3 \times RET_{it} \times N_{it} + \varepsilon_{it} \quad [6]$$

In equation [6] the variables  $RET_{it}$  and  $N_{it}$  are all as previously defined. I add back various expenses to cash flows yielding  $DOCF\_BEXP_{it}$ . If a given expense increases operating cash flow AT, then when the expense is added back, asymmetric timeliness ( $\delta_3$  from equation [6]) should be decreased relative to the benchmark level ( $\beta_3$  from equation [1]). In my testing of hypothesis 2a, I find that research and development expense alone was a promising candidate as a source of cash flow asymmetric timeliness. Therefore, I constrain my analysis in this stage to R&D.

Table 6 presents the regression results from equation [6] testing hypothesis 2b. Columns 1 and 2 present the base-line level of asymmetric timeliness in cash flows. Columns 3 and 4 present results where  $R\&D_{it}$  is added back to cash flows. In columns 1 and 3 the full sample is examined (i.e., R&D is set to zero when missing), whereas columns 2 and 4 present results for the sample where R&D is non-missing. Examining the full sample results, I find that the base-line incremental coefficient on negative returns ( $\beta_3 = .137$ ) decreases when R&D expenses are added back to cash flows ( $\delta_3 = .103$ ). I find similar results in the samples where R&D expense is non-missing. This is a significant change, consistent with R&D expenses explaining approximately 25% of cash flow AT.

### 3.5 Testing the Change in Working Capital Explanation

My analysis of hypothesis 3a regarding the change in working capital explanation for operating cash flow AT is based on the following regression:

$$\Delta WCA_{it} = \beta_0 + \beta_1 \times RET_{it} + \beta_2 \times N_{it} + \beta_3 \times RET_{it} \times N_{it} + \varepsilon_{it} \quad [7]$$



In equation [7] the variables  $RET_{it}$  and  $N_{it}$  are all as previously defined. I add the change in working capital accruals,  $\Delta WCA_{it}$ , as the dependent variable. I calculate the change in working capital accruals as the change in accounts receivable [RECT]<sup>11</sup> plus the change in inventory (INVT) plus the change in other current assets [ACO] minus the change in accounts payable [AP] minus the change in taxes payable [TXP] minus the change in other current liabilities [LCO].<sup>12</sup> In hypothesis 3a, I predict that the change in working capital accruals will exhibit negative incremental bad news timeliness.

Therefore, the coefficient on negative returns ( $\beta_3$ ) should be negative and significant.

Table 7, column 1 presents the regression results from equation [7] testing hypothesis 3a. I find that the incremental coefficient on negative returns is positive ( $\beta_3 = .016$ ) and significant (P-Value < .01). This is inconsistent with the change in working capital explanation, and rejects hypothesis 3a. This result is consistent with the change in working capital actually resulting in reduced asymmetric timeliness in cash flows.

My analysis of hypothesis 3b regarding the change in working capital explanation for operating cash flow AT is based on the following regression:

$$DOCF\_B\Delta WCA_{it} = \delta_0 + \delta_1 \times RET_{it} + \delta_2 \times N_{it} + \delta_3 \times RET_{it} \times N_{it} + \varepsilon_{it} \quad [8]$$

In equation [8] the variables  $RET_{it}$  and  $N_{it}$  are all as previously defined. I add back the change in working capital accruals to cash flows yielding  $DOCF\_B\Delta WCA_{it}$ . Based on my results testing hypothesis 3a, it is likely that cash flows will exhibit greater asymmetric timeliness to bad news after adding back the change in working capital accruals. This is the opposite of my prediction in hypothesis 3b.

<sup>11</sup> I remove the effect of the allowance for doubtful accounts from accounts receivable.

<sup>12</sup> My inferences are unchanged when I limit the change in working capital to inventory, AR, and AP.

Table 7, columns 2 and 3 present the regression results from equation [8] testing hypothesis 3b. Column 2 presents the base-line level of asymmetric timeliness in cash flows. Column 3 presents results where  $\Delta WCA_{it}$  is added back to cash flows. I find that the base-line incremental coefficient on negative returns is positive ( $\delta_3 = .143$ ) for the sub-sample with non-missing change in working capital accruals. When the change in working capital accruals is added back to cash flows the incremental coefficient on bad economic news is higher ( $\delta_3 = .160$ ). This is inconsistent with the asymmetric changes in working capital explanation.

### 3.6 Testing the Bias Explanation

Dietrich et al. 2007 as well as Patatoukas and Thomas 2010 provide evidence that the Basu 1997 methodology for measuring asymmetric timeliness is highly flawed. Dietrich et al. identify sample variance ratio (SVR) bias as the driving force behind a spurious result showing that earnings are asymmetrically timely with respect to negative returns. Recall that in section 2.5a I describe how the non-normality of the variables in the Basu regression can cause SVR bias. Therefore, I proceed by first analyzing the distributional characteristics of the regression variables, which is presented in table 8. It is worthwhile noting that the distribution of deflated cash flows ( $DOCF_{it}$ ) and stock returns ( $RET_{it}$ ) both violate normality to a large extent.  $DOCF_{it}$  is somewhat right skewed (Skewness = .700) and has very wide tails (Kurtosis = 3.737).<sup>13</sup> The distribution of  $RET_{it}$  is rather less normal with strong right skewness (Skewness = 2.494) and very wide tails (Kurtosis = 18.218). The skewness and kurtosis in returns in turn induces the same in the measure for non-earnings related news ( $\eta_{it}$ ) with skewness equal to 2.713 and

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<sup>13</sup> The critical value for skewness is .152 ( $\alpha=.05$ ,  $n > 1,000$ ) and for kurtosis are -.13 or .14 ( $\alpha=.05$ ,  $n > 5,000$ ).

kurtosis equal to 20.204. Recall that non-earnings news ( $\eta_{it}$ ) is calculated as the error term in a regression of returns on cash flows. Together these distributional characteristics are cause for concern that econometric biases are generating spurious results.

In order to address these concerns I assess the normality of (and employ in regression analyses) natural log and rank transformations of the data. I also perform regression analysis where no deflator whatsoever is employed in order to address concerns brought up by Patatoukas and Thomas 2010. Log transformed variables are labeled  $LG\_X_{it}$  whereas rank transformed variables are labeled  $R\_X_{it}$ . For log transformations I employ the log base e, with a pivot point at 1. For rank transformation, I rank variables by year from 0 to 99. The results presented on Table 8 indicate that the log transformation variables are far more symmetrically distributed as compared to the original variables. For instance, the skewness of  $LG\_RET_{it}$  (Skewness = .669) is far lower than for  $RET_{it}$  (Skewness = 2.494) and the skewness of  $LG\_OCF_{it}$  (Skewness = -.404) is lower than for  $DOCF_{it}$  (Skewness = .700). Further, the sign on skewness actually switches for the undeflated change in the logged market value of equity  $LG\_CMVE_{it}$ , an alternative proxy for economic news, to being left rather than right skewed (Skewness = -.644). A similar sign change occurs after the log transformation of cash flows, where  $LG\_OCF_{it}$  is actually left skewed (Skewness = -.404). The results presented in table 8 indicate that  $R\_X_{it}$  variables exhibit no skewness whatsoever (by construction). Also the skewness of non-earnings news ( $\eta_{it}$ ) where ranked variables are employed is statistically insignificant (Skewness=.135). Given the transformed variables' distributional characteristics it is unlikely that econometric biases of the type described by Dietrich et

al. will generate spurious results across various regressions employing the transformed variables.<sup>14</sup>

Table 9 presents the results from regressions using the transformed variables. Across all the specifications employed evidence of asymmetric timeliness in cash flows persists, with a positive and significant (P-value < .01) loading for the incremental coefficient on the bad economic news proxies. This provides evidence that econometric biases of the sort described by Dietrich et al. 2007 do not induce a spurious result. Finally, Column 3 presents results of a regression where no deflator whatsoever is present. A positive and significant (P-value < .01) loading for the incremental coefficient on the bad economic news proxy remains, providing evidence against deflator bias inducing a spurious result (Patatoukas and Thomas 2010).

### 3.7 Tests of Existing Findings

My analysis on the existing determinants of conditional conservatism documented in the accounting literature is based on the following regression:

$$Y_{it} = \beta_0 + \beta_1 \times RET_{it} + \beta_2 \times N_{it} + \beta_3 \times RET_{it} \times N_{it} + \beta_4 \times X_{it} + \beta_5 \times RET_{it} \times X_{it} + \beta_6 \times N_{it} \times X_{it} + \beta_7 \times RET_{it} \times N_{it} \times X_{it} + \varepsilon_{it} \quad [9]$$

In equation [9] the variables  $RET_{it}$  and  $N_{it}$  are as previously defined. The dependent variable (taking the place of  $Y_{it}$ ) is alternatively deflated earnings per share  $DEPS_{it}$ , deflated cash flows  $DOCF_{it}$ , or deflated accruals  $DACC_{it}$ . Deflated earnings per share  $DEPS_{it}$  is calculated as earnings per share before extraordinary items (EPSFX) deflated by beginning of period stock price (PRCC\_F). Deflated cash flows  $DOCF_{it}$  is defined as before. Deflated accruals  $DACC_{it}$  is defined as net income before

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<sup>14</sup> This is because skewness of the regression variables employed varies from being positive, negative, and/or zero across the different regression specifications employed.

extraordinary items (IB) less cash flows (OANCF), which is then divided by  $MVE_{it-1}$ .

The independent variables (taking the place of  $X_{it}$ ) are leverage  $LEV_{it}$ , the probability of informed trading  $PIN_{it}$ <sup>15</sup>, firm size  $SIZE_{it}$ , and the Herfindahl index  $HERF_{it}$ . See table 10 for details on variable construction. The Herfindahl index  $HERF_{it}$  is higher for firms belonging to high concentration industries, and is therefore decreasing in product market competition.<sup>16</sup>

Table 10, Panel A and B present the regression results from equation [9] for each of the dependent and independent variable permutations. Table 10, Panel A columns 1 through 3 present results where leverage is the independent variable of interest. Note that the incremental coefficient on negative returns ( $\beta_7$ ) is increasing in leverage when earnings (column 1) and accruals (column 3) are alternatively the dependent variable. However, when cash flows is the dependent variable (column 2) the incremental coefficient ( $\beta_7$ ) is decreasing in leverage (at a marginal statistical level). This provides strong evidence that the relation between leverage and asymmetric timely loss recognition is an accruals based phenomenon, and not a cash flow based phenomenon. This is consistent with conditional conservatism being the mechanism by which leverage induces greater asymmetric timeliness in earnings.

Table 10, Panel A columns 4 through 6 present results where the PIN score is the independent variable of interest. Note that the incremental coefficient on negative returns ( $\beta_7$ ) is increasing in PIN score when earnings (column 4) and accruals (column 6) are alternatively the dependent variable. However, when cash flows is the dependent variable (column 5) the incremental coefficient ( $\beta_7$ ) becomes insignificant. This provides evidence

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<sup>15</sup> I thank Stephen Brown for graciously providing me with the PIN measure.

<sup>16</sup> For consistency with Dhaliwal et al. 2009 I calculate the Herfindahl index using CompuStat data despite concerns that this method is flawed (see Ali et al. 2009).

that the relation between information asymmetry and asymmetric timely loss recognition is an accruals based phenomenon, and not a cash flow based phenomenon. This is consistent with conditional conservatism being the mechanism by which demand for timely loss recognition resulting from information asymmetry induces greater asymmetric timeliness in earnings.

Table 10, Panel B columns 1 through 3 present results where the firm size is the independent variable of interest. Note that the incremental coefficient on negative returns ( $\beta_7$ ) is decreasing in size when earnings (column 1), cash flows (column 2) and accruals (column 3) are alternatively the dependent variable. This provides evidence that the relation between size and asymmetric timely loss recognition is both a cash flow based and accruals based phenomenon. Firms that are larger provide less conditional conservatism (through accruals as documented in column 3) and have less asymmetrically timely cash flows (documented in column 2). The latter result is consistent with larger firms being able to resist contemporaneous price reductions in response to bad economic news relative to smaller firms.<sup>17</sup>

Table 10, Panel B columns 4 through 6 present results where the Herfindahl index is the independent variable of interest. Note that the incremental coefficient on negative returns ( $\beta_7$ ) is decreasing in the Herfindahl index when earnings (column 4) and cash flows (column 5) are alternatively the dependent variable. When accruals is the dependent variable the incremental coefficient on the Herfindahl index is insignificant (column 6). This provides evidence that the relation between product market competition and asymmetric timely loss recognition is primarily a cash flow based phenomenon. This

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<sup>17</sup> In untabulated tests I replace earnings (the dependent variable in equation [9]) with margins. I find that the incremental coefficient on negative returns is lower for larger firms (P-value < .05), supporting the size and pricing power conjecture.

is inconsistent with a conditional conservatism mechanism. However, as discussed earlier the insignificant loading on ( $\beta_7$ ) could be the result of a correlated omitted variable problem.

Table 11, Column 2 presents results where deflated cash flows is added as an additional control variable to equation [9]. I find that the incremental coefficient on negative returns interacted with the Herfindahl index ( $\beta_7$ ) becomes negative and significant. This provides support for Dhaliwal et al.'s inference that conditional conservatism is increasing in product market competition (i.e., decreasing in the Herfindahl index). The loading on deflated cash flows is highly negative ( $\beta_8 = -.683$ ) and significant (P-value < .01). Also, adding deflated cash flows increases the explanatory power of the model from .005 (Column 1) to .445 (Column 2), and nearly triples the baseline incremental coefficient on negative returns ( $\beta_3$ ) from .054 (see the last column on table 11) to .158. These results demonstrate the importance of controlling for cash flows in a Basu regression where accruals is the dependent variable.

#### **4. Additional Analyses**

##### *4.1 The Abandonment Option*

When expected project performance is revised upwards, a positive impact on current returns should generally result, however increased cash flows are generally recognized over time. This results in a relatively low association between current cash flows and returns when economic news is good. When expected project performance is revised downwards, a negative impact on current returns should generally result. Further, managers may choose to terminate the project due to actual or expected underperformance, which generates immediate cash outflows as the firm winds down the

project. This results in a relatively high association between cash flows and returns when economic news is bad. In untabulated regression results I find that excluding the impact of discontinued operations from cash flows results in cash flows being less asymmetrically timely. However, my evidence suggests that the impact of discontinued operations is not economically relevant. That is, the incremental coefficient on negative returns decreases by less than 2% when the cash impact of discontinued operations is added back to cash flows.<sup>18</sup>

#### *4.2 Tax Explanation*

In order to minimize the firm's tax exposure managers have an incentive to minimize the present value of taxes paid by delaying the recognition of gains and accelerating the recognition of losses in taxable income. In response to this incentive managers may engage in transaction management whereby cash receipts are delayed and cash payments are accelerated. However, it is unclear why a manager would want to delay the settlement of a receivable unless the receivable asset was generating a return exceeding the marginal cost of borrowing. Also, unless the cost of borrowing is zero, managers would have a disincentive to settle payables early.<sup>19</sup> Notwithstanding the arguments above, I test the tax explanation empirically. Firms facing a higher marginal tax rate (MTR) should have a greater incentive to minimize their taxable income. If the AT of cash flows is caused by tax considerations, then high MTR firms should exhibit higher AT in cash flows.

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<sup>18</sup> My results are quantitatively and qualitatively similar when using the extraordinary items and discontinued operations value from the income statement.

<sup>19</sup> Since TRA 86 all public companies are required to employ a basic level of accrual accounting in calculating their taxable income. Employing accounts payable, standard inventory accounting, and accounts receivable falls within this basic accrual framework. This reduces the likelihood that there is sufficient scope to manage operating cash flows in a manner designed to minimize the tax liability.



In untabulated results I find that the incremental coefficient on negative returns is actually a decreasing function of the firm's MTR.<sup>20</sup> This finding provides evidence against taxes explaining the asymmetric timeliness of cash flows. This result may be driven by the positive relation between MTR and past/future profitability. It is possible that ex-ante more profitable firms exhibit less output price sensitivity to bad economic news, or are less likely to incur greater R&D costs to develop new products in response to bad economic news. Further, the correlation between the MTR measure and certain tax shields such as debt may confound the results. Also, I find no evidence that cash taxes paid contribute to operating cash flow AT.

#### *4.3 Production Constraints*

Using a real investment framework Papadakis 2007 predicts that asymmetries between accounting outcomes (Sales, Cash flows, and Earnings) and stock returns are driven by production constraints. The basic reasoning being that firms can react more quickly to negative demand shocks by cutting investment and employment than they can to positive demand shocks where there is a lag in implementing new investments or hiring workers. Therefore, firms are unable to fully realize the fruits of a positive demand shock contemporaneously due to capacity constraints, which reduces the association between positive returns and sales. Based on this reasoning Papadakis predicts and finds that sales are more sensitive to negative stock returns relative to positive stock returns. However, this finding can also be explained by the asymmetric relation between margins and stock returns that I document in table 4. To differentiate between these competing

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<sup>20</sup> I proxy for the firm's MTR using the estimate developed in Graham 1996a and 1996b which can be downloaded from John Graham's website.

explanations I examine how industry level capacity utilization<sup>21</sup> affects the asymmetric relationship between sales and returns. Under the Papadakis explanation, firms with higher capacity utilization should find it more difficult to increase production to capitalize on a positive demand shock contemporaneously. Therefore, those firms nearer to full-capacity should exhibit stronger asymmetric timeliness in sales. To test this prediction I employ the following model, where the lagged value of capacity utilization for the industry is interacted with the elements of the Basu model:

$$SALE_{it} = \beta_0 + \beta_1 \times RET_{it} + \beta_2 \times N_{it} + \beta_3 \times RET_{it} \times N_{it} + \beta_4 \times CAP_{it-1} + \beta_5 \times RET_{it} \times CAP_{it-1} + \beta_6 \times N_{it} \times CAP_{it-1} + \beta_7 \times RET_{it} \times N_{it} \times CAP_{it-1} + \varepsilon_{it} \quad [10]$$

In untabulated tests I find that the coefficient on negative returns interacted with the lagged capacity utilization level is negative ( $\beta_7 = -1.789$ ) and significant (P-value < .01). This is inconsistent with the capacity constraint explanation. I conjecture that the negative coefficient is consistent with firms in industries with less spare capacity having an easier time increasing prices when returns are positive, or maintaining prices when returns are negative.

#### 4.4 Inventory Impairments

Under the lower of cost or market rule, and consistent with conditional conservatism, inventory must be written down when its realizable value falls below that of its carrying cost on the balance sheet. This can accelerate the recognition of production costs into cost of goods sold when bad economic news occurs. This will decrease gross margin for the firm to the extent that inventory remains unsold. Therefore, there is a concern that the asymmetric timeliness of margins documented on Table 4 results from

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<sup>21</sup> Industry level capacity utilization data is gathered from the Federal Reserve website: [http://www.federalreserve.gov/releases/g17/ipdisk/utl\\_sa.txt](http://www.federalreserve.gov/releases/g17/ipdisk/utl_sa.txt).

inventory write-downs (conditional conservatism), rather than asymmetric product pricing responses to economic news. In untabulated tests, I replace margin with a cash-based measure of margin. The cash-based margin is calculated as cash inflow from sales (*CASH\_SALE*) less cash outflows for inventory (*CASH\_INV*) which is then divided by cash inflows from sales.<sup>22</sup> Because the change in ending inventory is added back to inventory costs (*CASH\_INV*), the impairment of inventory has no bearing on the cash based margin. I find that the asymmetric sensitivity of cash margin to negative stock returns is economically and statistically similar to that of margin.

## **5. Conclusion**

In this study I document why cash flows exhibit asymmetric timeliness with respect to negative stock returns. I provide evidence that operating cash flow AT is caused by asymmetric product pricing responses to economic news and by increases in R&D spending in response to bad economic news. Consistent with managers not increasing prices when economic news is good, gross margins exhibit an insignificant response to positive returns. However, when negative returns occur margins decrease by 1.6% for every 10% decrease in stock price. This pricing effect induces the majority of the asymmetric timeliness in cash flows. In addition to the pricing effect, I find that managers actually increase R&D expenses in response to bad economic news. This supports Ball et al. 2009, who conjecture that management may engage in costly intervention to mitigate the impact of bad economic news on future firm performance. These findings contribute to our understanding of how economic earnings map into accounting earnings, and demonstrate that non-linearities in this mapping can result from basic economics as well as from the accounting technology and difference in earnings'

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<sup>22</sup> *CASH\_SALE* and *CASH\_INV* are defined in section 3.3.

persistence. Further, these results demonstrate that operating cash flow AT is not ipso facto evidence of econometric issues with the Basu 1997 model as some authors claim.

After documenting why cash flows exhibit AT, I examine the impact this asymmetric timeliness has on existing inferences regarding conditional conservatism. I investigate several important determinants of conditional conservatism, including leverage, information asymmetry, size, and product market competition. In general, I find that inferences based on a methodology that proxies for conditional conservatism using the asymmetric timeliness of earnings are robust to the consideration of cash flow asymmetry. More specifically, when accruals is the dependent variable in the Basu asymmetric timeliness test, results consistent with existing inferences obtain. This is consistent with conditional conservatism being the mechanism by which these determinants cause asymmetric timeliness in earnings. However, I also find evidence that operating cash flow AT at least contributes to inferences related to firm size and product market competition. The result linking product market competition to conditional conservatism appears to be the especially sensitive, though still present, to addressing the impact of cash flow asymmetry. These findings generally support the possibility that operating cash flow AT may prove a confounding effect in studies using the asymmetric timeliness of earnings to proxy for conditional conservatism. To address this possibility researchers should employ a specification of the Basu 1997 model where accruals is the dependent variable, and cash flows is included as an additional control variable.

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## Appendix A:

Dietrich et al. model returns as a function of earnings (X) and news other than earnings ( $\eta$ ), as follows:

$$R_{it} = \beta X_{it} + \lambda \eta_{it} \quad [10]$$

From the structural equation above the authors derive an unbiased estimate for the earnings response coefficient ( $\beta$ ) based on the equation below:

$$R_{it} = \beta \times X_{it} + \varepsilon_{it} \quad [11]$$

$$p \lim \hat{\beta} = \frac{\sigma_{R,X}}{\sigma_X^2} \quad [12]$$

To demonstrate how SVR bias arises the authors move on to examine the “reverse” ERC regression, which is the basis for the Basu model:

$$X_{it} = \delta \times R_{it} + \xi_{it} \quad [13]$$

Solving for  $\delta$  Dietrich et al. find:

$$\frac{1}{p \lim(\hat{\delta})} = \beta + \frac{\lambda^2 \sigma_\eta^2}{\beta \sigma_x^2} \quad [14]$$

This result implies that the coefficient on returns in the reverse ERC model is a function of the ERC coefficient and a bias induced by reversing the structural ERC equation. Equation [14] demonstrates the following: (1) assuming that the variance of news not captured by earnings ( $\sigma_\eta^2$ ) is non-zero, the coefficient on  $\delta$  is biased downwards, (2)  $\delta$  is biased downwards to a greater extent when  $\lambda^2 \sigma_\eta^2$  is higher, and (3)  $\delta$  is biased upwards when the variance of earnings  $\sigma_x^2$  is higher.

When estimating AT the sample is truncated based on the sign of returns. The AT coefficient is calculated as the difference between the coefficient on negative returns less the coefficient on positive returns:

$$\delta_{R<0} - \delta_{R \geq 0} \quad [15]$$

This induces Sample Truncation (ST) bias as  $\sigma_\eta^2$  and  $\sigma_x^2$  are systematically different in the positive and negative return subsamples. For instance, because positive returns are unbounded, positive returns have a greater variance ( $\sigma_\eta^2$ ) as compared to negative returns.

**Table 1***Descriptive statistics for variables used to test the hypotheses*

	Mean	StdDev	Min	P10	Q1	Median	Q3	P90	Max	Obs
<i>RET<sub>it</sub></i>	0.081	0.557	-0.969	-0.507	-0.253	0.021	0.303	0.675	8.027	68,908
<i>DEPS<sub>it</sub></i>	0.019	0.103	-1.185	-0.095	0.001	0.042	0.071	0.102	0.320	68,908
<i>DOCF<sub>it</sub></i>	0.089	0.126	-0.523	-0.045	0.024	0.080	0.145	0.230	0.999	68,908
<i>DACC<sub>it</sub></i>	-0.065	0.125	-1.552	-0.200	-0.103	-0.041	-0.005	0.035	0.598	68,908
<i>BTM<sub>it</sub></i>	0.641	0.517	0.000	0.182	0.313	0.523	0.810	1.211	9.889	68,908
<i>LEV<sub>it</sub></i>	0.210	0.185	0.000	0.000	0.031	0.184	0.342	0.471	0.809	68,908
<i>SIZE<sub>it</sub></i>	5.669	1.979	-1.038	3.137	4.193	5.582	7.024	8.343	11.764	68,908
<i>AT<sub>it</sub></i>	2791.51	18712.70	0.69	24.74	70.72	277.17	1212.57	4730.34	1817943	68,908
<i>R&amp;D<sub>it</sub></i>	0.046	0.057	-0.006	0.000	0.004	0.026	0.064	0.121	0.449	38,212
<i>AD<sub>it</sub></i>	0.037	0.059	0.000	0.001	0.005	0.015	0.043	0.093	0.888	21,221
<i>SG&amp;A<sub>it</sub></i>	0.308	0.312	-0.139	0.054	0.108	0.209	0.397	0.676	3.393	57,195
<i>ΔWCA<sub>it</sub></i>	0.012	0.099	-1.193	-0.067	-0.018	0.006	0.039	0.101	1.432	65,498
<i>MARGIN<sub>it</sub></i>	0.341	0.430	-10.573	0.135	0.229	0.353	0.511	0.668	0.934	68,908
<i>CASH_SALE<sub>it</sub></i>	1.326	1.497	-1.260	0.165	0.380	0.842	1.712	3.086	15.143	68,908
<i>CASH_INV<sub>it</sub></i>	0.953	1.247	-1.447	0.067	0.191	0.528	1.223	2.359	13.548	68,908
<i>PIN<sub>it</sub></i>	0.214	0.099	0.000	0.109	0.147	0.201	0.262	0.329	1.000	34,415
<i>HERF<sub>it</sub></i>	0.060	0.062	0.011	0.022	0.032	0.047	0.064	0.108	1.000	68,908

**Description:**

The table above presents descriptive statistics for variables used to test the hypotheses. I truncate all continuous variables at the top and bottom 1%, with the exception of variables censored at zero for which I truncated only the top 1%.

**Variable Definitions:**

<i>RET<sub>it</sub></i>	is stock return for the twelve-month period commencing with the fourth month after the end of fiscal year t-1,
<i>DOCF<sub>it</sub></i>	is operating cash flows (OANCF) deflated by the beginning of period market value of equity (PRCC_F*CSHO),
<i>DEPS<sub>it</sub></i>	is deflated EPS, calculated as earnings per share before extraordinary items (EPSFX) deflated by the beginning of period stock price (PRCC_F),
<i>DACC<sub>it</sub></i>	is deflated accruals, calculated as net income before extraordinary items (IB) less operating cash flows (OANCF), which is then deflated by the beginning of period market value of equity (PRCC_F*CSHO),
<i>BTM<sub>it</sub></i>	is the book value of equity (SEQ) deflated by the market value of equity (PRCC_F*CSHO),
<i>LEV<sub>it</sub></i>	is the book value of long-term debt (DLTT) plus the current portion of long-term debt (DLC), which is the deflated by total assets (AT),
<i>SIZE<sub>it</sub></i>	is the log of the firm's market value of equity (PRCC_F*CSHO),
<i>AT<sub>it</sub></i>	is the value of total assets (AT) in millions,
<i>R&amp;D<sub>it</sub></i>	is research and development expense (XRD) deflated by the beginning of period market value of equity (PRCC_F*CSHO),
<i>AD<sub>it</sub></i>	is advertising expense (XAD) deflated by the beginning of period market value of equity (PRCC_F*CSHO),
<i>SG&amp;A<sub>it</sub></i>	is selling, general and administrative expense (XSGA) deflated by the beginning of period market value of equity (PRCC_F*CSHO).
<i>ΔWCA<sub>it</sub></i>	is the change in working capital accruals deflated by the beginning of period market value of equity (PRCC_F*CSHO). Working capital accruals are calculated as change in accounts receivable (RECT) before the allowance for doubtful accounts (RECD) plus the change in inventory (INVT) plus the change in other current assets (OCA) minus the change in accounts payable (AP) minus the change in other current liabilities (OCL) minus the change in taxes payable (TXP),



***MARGIN<sub>it</sub>*** is gross margin, calculated as sales (SALE) less cost of good sold (COGS) which is then deflated by sales,

***CASH\_SALE<sub>it</sub>*** is cash inflows from sales, calculated as sales (SALE) less the change in accounts receivable (RECT) before the allowance for doubtful accounts (RECD), which is then deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),

***CASH\_INV<sub>it</sub>*** is cash outflows for inventory, calculated as cost of good sold (COGS) plus the change in inventory (INVT) less the change in accounts payable (RECT), which is then deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),

***PIN<sub>it</sub>*** is the probability of informed trading from Stephen Brown's web-site

***HERF<sub>it</sub>*** is the Herfindahl index, calculated using the Fama and French 48 industry scheme. The index is calculated as the sum of squared sales shares by industry. A higher value indicates more industry concentration and therefore less product market competition.

**Table 2**  
Correlation table for selected variables used to test the hypotheses

	Spearman Correlations (bottom left) / Pearson Correlations (top right)												
	1	2	3	4	5	6	7	8	9	10	11	12	13
1 $RET_{it}$		0.201	0.017	-0.270	-0.051	0.162	0.099	0.088	0.027	0.051	0.093	0.073	-0.021
		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
2 $DOCF_{it}$	0.292		-0.587	0.137	0.181	0.159	-0.126	0.167	-0.280	0.109	0.332	0.273	-0.023
	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
3 $DACC_{it}$	-0.012	-0.622		-0.256	-0.203	0.048	-0.138	-0.199	0.478	0.040	-0.242	-0.199	0.023
	0.002	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
4 $BTM_{it}$	-0.279	0.204	-0.258		0.077	-0.356	0.041	0.272	-0.056	-0.051	0.292	0.274	0.024
	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
5 $LEV_{it}$	-0.018	0.235	-0.248	0.111		0.087	-0.166	0.114	0.059	-0.024	0.199	0.193	0.001
	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.735
6 $SIZE_{it}$	0.224	0.203	-0.008	-0.361	0.118		-0.181	-0.299	-0.009	0.079	-0.193	-0.174	-0.051
	<.0001	<.0001	0.041	<.0001	<.0001		<.0001	<.0001	0.022	<.0001	<.0001	<.0001	<.0001
7 $R\&D_{it}$	0.002	-0.194	-0.038	-0.027	-0.241	-0.151		0.284	-0.038	-0.058	0.009	-0.042	0.007
	0.716	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001	0.086	<.0001	0.142
8 $SG\&A_{it}$	0.088	0.123	-0.151	0.290	0.087	-0.341	0.260		0.007	-0.034	0.702	0.575	0.033
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001		0.127	<.0001	<.0001	<.0001	<.0001
9 $\Delta WCA_{it}$	0.030	-0.258	0.506	-0.018	0.045	-0.029	-0.017	0.049		0.011	0.022	0.070	0.004
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.001	<.0001		0.004	<.0001	<.0001	0.300
10 $MARGIN_{it}$	0.044	-0.048	0.119	-0.206	-0.160	0.087	0.197	-0.065	-0.012		-0.113	-0.172	-0.006
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.003		<.0001	<.0001	0.106
11 $CASH\_SALE_{it}$	0.147	0.405	-0.248	0.359	0.259	-0.157	-0.050	0.689	0.073	-0.460		0.979	0.046
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001
12 $CASH\_INV_{it}$	0.118	0.343	-0.208	0.356	0.269	-0.148	-0.101	0.581	0.122	-0.634	0.962		0.039
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001
13 $HERF_{it}$	-0.017	-0.061	0.058	-0.019	-0.005	-0.083	0.005	0.046	0.007	0.005	0.037	0.030	
	<.0001	<.0001	<.0001	<.0001	0.194	<.0001	0.377	<.0001	0.064	0.203	<.0001	<.0001	

**Description:**

The table above presents the Pearson correlation coefficients on the top right quadrant, and the Spearman correlation coefficients on the bottom left quadrant. The P-Value is displayed below the correlation coefficient. I truncate all continuous variables at the top and bottom 1%, with the exception of variables censored at zero for which I truncated only the top 1%.

**Variable Definitions:**

- $RET_{it}$  is stock return for the twelve-month period commencing with the fourth month after the end of fiscal year t-1,
- $DOCF_{it}$  is operating cash flows (OANCF) deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- $DACC_{it}$  is deflated accruals, calculated as net income before extraordinary items (IB) less operating cash flows (OANCF), which is then deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- $BTM_{it}$  is the book value of equity (SEQ) deflated by the market value of equity (PRCC\_F\*CSHO),
- $LEV_{it}$  is the book value of long-term debt (DLTT) plus the current portion of long-term debt (DLC), which is the deflated by total assets (AT),
- $SIZE_{it}$  is the log of the firm's market value of equity (PRCC\_F\*CSHO),
- $R\&D_{it}$  is research and development expense (XRD) deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- $SG\&A_{it}$  is selling, general and administrative expense (XSGA) deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- $\Delta WCA_{it}$  is the change in working capital accruals deflated by the beginning of period market value of equity (PRCC\_F\*CSHO). Working capital accruals are calculated as change in

accounts receivable (RECT) before the allowance for doubtful accounts (RECD) plus the change in inventory (INVT) plus the change in other current assets (OCA) minus the change in accounts payable (AP) minus the change in other current liabilities (OCL) minus the change in taxes payable (TXP),

***MARGIN<sub>it</sub>*** is gross margin, calculated as sales (SALE) less cost of good sold (COGS) which is then deflated by sales,

***CASH\_SALE<sub>it</sub>*** is cash inflows from sales, calculated as sales (SALE) less the change in accounts receivable (RECT) before the allowance for doubtful accounts (RECD), which is then deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),

***CASH\_INV<sub>it</sub>*** is cash outflows for inventory, calculated as cost of good sold (COGS) plus the change in inventory (INVT) less the change in accounts payable (RECT), which is then deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),

***HERF<sub>it</sub>*** is the Herfindahl index, calculated using the Fama and French 48 industry scheme. The index is calculated as the sum of squared sales shares by industry. A higher value indicates more industry concentration and therefore less product market competition.

**Table 3***Piecewise regression replicating the Basu [1997] result in-sample*

		<i>Dependent Variable:</i>				
		<i>DOCF</i>		<i>DACC</i>		<i>DEPS</i>
<i>Intercept</i>	$\beta_0$ (?)	0.1165 *** (0.0012)	$\delta_0$ (?)	-0.0625 *** (0.0011)	$\lambda_0$ (?)	0.0485 *** (0.0007)
<i>RET<sub>it</sub></i>	$\beta_1$ (?)	-0.0013 (0.0018)	$\delta_1$ (?)	-0.0048 *** (0.0014)	$\lambda_1$ (?)	-0.0083 *** (0.0013)
<i>N<sub>it</sub></i>	$\beta_2$ (?)	-0.0154 *** (0.0014)	$\delta_2$ (?)	0.0119 *** (0.0014)	$\lambda_2$ (?)	-0.0025 ** (0.0011)
<i>N<sub>it</sub> * RET<sub>it</sub></i>	$\beta_3$ (+)	<b>0.1374 ***</b> <b>(0.0036)</b>	$\delta_3$ (+)	<b>0.0551 ***</b> <b>(0.0038)</b>	$\lambda_3$ (+)	<b>0.1857 **</b> <b>(0.0034)</b>
Number of Observations		68,908		68,908		68,908
Explanatory Power		0.0795		0.0042		0.1420
F-Test		<.001		<.001		<.001

\*\*\* Significant at the 1% level

\*\* Significant at the 5% level

\* Significant at the 10% level

**Description:**

Robust standard errors clustered by firm are reported in parentheses below the coefficient. I truncate all continuous variables at the top and bottom 1%, with the exception of variables censored at zero for which I truncated only the top 1%.

**Variable Definitions:**

<i>RET<sub>it</sub></i>	is stock return for the twelve-month period commencing with the fourth month after the end of fiscal year t-1,
<i>N<sub>it</sub></i>	is an indicator variable that equals one (zero) if <i>RET<sub>it</sub></i> is negative (non-negative),
<i>DOCF<sub>it</sub></i>	is operating cash flows (OANCF) deflated by the beginning of period market value of equity (PRCC_F*CSHO),
<i>DACC<sub>it</sub></i>	is deflated accruals, calculated as net income before extraordinary items (IB) less operating cash flows (OANCF), which is then deflated by the beginning of period market value of equity (PRCC_F*CSHO),
<i>DEPS<sub>it</sub></i>	is deflated EPS, calculated as earnings per share before extraordinary items (EPSFX) deflated by the beginning of period stock price (PRCC_F),
$\varepsilon_{it}$	is an error term,

**Table 4**

*Piecewise regression on stock returns examining the pricing strategy explanation*

Column 1:  $MARGIN_{it} = \beta_0 + \beta_1 RET_{it} + \beta_2 N_{it} + \beta_3 N_{it} * RET_{it} + \varepsilon_{it}$

Column 2 & 3:  $CASH\_X_{it} = \delta_0 + \delta_1 RET_{it} + \delta_2 N_{it} + \delta_3 N_{it} * RET_{it} + \varepsilon_{it}$

Column 4 & 5:  $DOCF\_X_{it} = \lambda_0 + \lambda_1 RET_{it} + \lambda_2 N_{it} + \lambda_3 N_{it} * RET_{it} + \varepsilon_{it}$

	TESTING H1a:			TESTING H1b:		TESTING H1c:		
		<i>MARGIN</i>		<i>CASH_SALE</i>	<i>CASH_INV</i>		<i>DOCF_SELL</i>	<i>DOCF_OTHER</i>
<i>Intercept</i>	$\beta_0$ (?)	0.3649 *** (0.0037)	$\delta_0$ (?)	1.3837 *** (0.0186)	0.9968 *** (0.0156)	$\lambda_0$ (?)	0.3869 *** (0.0045)	-0.2704 *** (0.0043)
<i>RET<sub>it</sub></i>	$\beta_1$ (?)	-0.0023 (0.0061)	$\delta_1$ (?)	0.1166 *** (0.0179)	0.0648 *** (0.0145)	$\lambda_1$ (?)	0.0518 *** (0.0048)	-0.0531 *** (0.0041)
<i>N<sub>it</sub></i>	$\beta_2$ (?)	0.0026 (0.0051)	$\delta_2$ (?)	0.0113 (0.0165)	0.0138 (0.0137)	$\lambda_2$ (?)	-0.0024 (0.0042)	-0.0130 *** (0.0039)
<i>N<sub>it</sub> * RET<sub>it</sub></i>	$\beta_3$ (+)	<b>0.1640</b> *** <b>(0.0176)</b>	$\delta_3$ (+)	<b>0.4882</b> *** <b>(0.0431)</b>	<b>0.3718</b> *** <b>(0.0356)</b>	$\lambda_3$ (+)	<b>0.1164</b> *** <b>(0.0111)</b>	<b>0.0210</b> ** <b>(0.0103)</b>
Number of Observations		68,908		68,908	68,908		68,908	68,908
Explanatory Power		0.0064		0.0106	0.0070		0.0183	0.0046
F-Test		<.001		<.001	<.001		<.001	<.001

\*\*\* Significant at the 1% level

\*\* Significant at the 5% level

\* Significant at the 10% level

**Description:**

Robust standard errors clustered by firm are reported in parentheses below the coefficient. I truncate all continuous variables at the top and bottom 1%, with the exception of variables censored at zero for which I truncated only the top 1%.

**Variable Definitions:**

- RET<sub>it</sub>*** is stock return for the twelve-month period commencing with the fourth month after the end of fiscal year t-1,
- N<sub>it</sub>*** is an indicator variable that equals one (zero) if ***RET<sub>it</sub>*** is negative (non-negative),
- MARGIN<sub>it</sub>*** is gross margin, calculated as sales (SALE) less cost of good sold (COGS) which is then deflated by sales,
- CASH\_SALE<sub>it</sub>*** is cash inflows from sales, calculated as sales (SALE) less the change in accounts receivable (RECT) before the allowance for doubtful accounts (RECD), which is then deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- CASH\_INV<sub>it</sub>*** is cash outflows for inventory, calculated as cost of good sold (COGS) plus the change in inventory (INVT) less the change in accounts payable (RECT), which is then deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- DOCF\_SELL<sub>it</sub>*** is gross cash flows from selling activities, calculated as ***CASH\_SALE<sub>it</sub>*** less ***CASH\_INV<sub>it</sub>***, which is then deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- DOCF\_OTHER<sub>it</sub>*** is other operating cash flows, calculated as operating cash flows (OANCF) less ***DOCF\_SELL<sub>it</sub>***, which is then deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- $\varepsilon_{it}$**  is an error term.

**Table 5***Piecewise regression of expense line items on stock returns*

$$EXP_{it} = \beta_0 + \beta_1 RET_{it} + \beta_2 N_{it} + \beta_3 N_{it} * RET_{it} + \varepsilon_{it}$$

	Prediction		TESTING HYPOTHESIS 2a:		
			<i>R&amp;D</i>	<i>AD</i>	<i>SG&amp;A</i>
<i>Intercept</i>	$\beta_0$	(?)	0.0355 *** (0.0009)	0.0393 *** (0.0014)	0.3047 *** (0.0044)
<i>RET<sub>it</sub></i>	$\beta_1$	(?)	0.0209 *** (0.0010)	0.0023 ** (0.0012)	0.0470 *** (0.0040)
<i>N<sub>it</sub></i>	$\beta_2$	(?)	0.0054 *** (0.0009)	-0.0031 *** (0.0011)	0.0032 (0.0038)
<i>N<sub>it</sub> * RET<sub>it</sub></i>	$\beta_3$	(-)	<b>-0.0344 **</b> <b>(0.0024)</b>	<b>0.0082 **</b> <b>(0.0029)</b>	<b>0.0095</b> <b>(0.0100)</b>
Number of Observations			38,212	21,221	57,195
Explanatory Power			0.0254	0.0049	0.0077
F-Test			<.001	<.001	<.001

\*\*\* Significant at the 1% level

\*\* Significant at the 5% level

\* Significant at the 10% level

**Description:**

Robust standard errors clustered by firm are reported in parentheses below the coefficient. I truncate all continuous variables at the top and bottom 1%, with the exception of variables censored at zero for which I truncated only the top 1%.

**Variable Definitions:**

<i>RET<sub>it</sub></i>	is stock return for the twelve-month period commencing with the fourth month after the end of fiscal year t-1,
<i>N<sub>it</sub></i>	is an indicator variable that equals one (zero) if <i>RET<sub>it</sub></i> is negative (non-negative),
<i>R&amp;D<sub>it</sub></i>	is research and development expense (XRD) deflated by the beginning of period market value of equity (PRCC_F*CSHO),
<i>AD<sub>it</sub></i>	is advertising expense (XAD) deflated by the beginning of period market value of equity (PRCC_F*CSHO),
<i>SG&amp;A<sub>it</sub></i>	is selling, general and administrative expense (XSGA) deflated by the beginning of period market value of equity (PRCC_F*CSHO),
$\varepsilon_{it}$	is an error term,

**Table 6***Piecewise regression of cash flows before R&D expense on stock returns*Column 1 & 2:  $DOCF_{it} = \beta_0 + \beta_1 RET_{it} + \beta_2 N_{it} + \beta_3 N_{it} * RET_{it} + \varepsilon_{it}$ Column 3 & 4:  $DOCF\_BEXP_{it} = \delta_0 + \delta_1 RET_{it} + \delta_2 N_{it} + \delta_3 N_{it} * RET_{it} + \varepsilon_{it}$ 

## TESTING HYPOTHESIS 2b:

		Baseline		Before R&D		
		Full Sample	R&D Sample	Full Sample	R&D Sample	
<i>Intercept</i>	$\beta_0$ (?)	0.1165 *** (0.0012)	0.0972 *** (0.0015)	$\delta_0$ (?)	0.1331 *** (0.0013)	0.1328 *** (0.0016)
<i>RET<sub>it</sub></i>	$\beta_1$ (?)	-0.0013 (0.0018)	-0.0052 *** (0.0019)	$\delta_1$ (?)	0.0171 *** (0.0019)	0.0157 *** (0.0021)
<i>N<sub>it</sub></i>	$\beta_2$ (?)	-0.0154 *** (0.0014)	-0.0123 *** (0.0017)	$\delta_2$ (?)	-0.0113 *** (0.0014)	-0.0070 *** (0.0019)
<i>N<sub>it</sub> * RET<sub>it</sub></i>	$\beta_3$ (+)	<b>0.1374 **</b> <b>(0.0036)</b>	<b>0.1444 ***</b> <b>(0.0041)</b>	$\delta_3$ (+)	<b>0.1025 **</b> <b>(0.0036)</b>	<b>0.1099 **</b> <b>(0.0043)</b>
Number of Observations		68,908	38,212	68,908	38,212	
Explanatory Power		0.0795	0.0918	0.0722	0.0797	
F-Test		<.001	<.001	<.001	<.001	

\*\*\* Significant at the 1% level

\*\* Significant at the 5% level

\* Significant at the 10% level

**Description:**

Robust standard errors clustered by firm are reported in parentheses below the coefficient. I truncate all continuous variables at the top and bottom 1%, with the exception of variables censored at zero for which I truncated only the top 1%.

**Variable Definitions:**

*RET<sub>it</sub>* is stock return for the twelve-month period commencing with the fourth month after the end of fiscal year t-1,

*N<sub>it</sub>* is an indicator variable that equals one (zero) if *RET<sub>it</sub>* is negative (non-negative),

*DOCF<sub>it</sub>* is operating cash flows (OANCF) deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),

*DOCF\_BEXP<sub>it</sub>* is operating cash flows (OANCF) with research and development expense added back (XRD), which is then deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),

$\varepsilon_{it}$  is an error term.

**Table 7**

*Piecewise regression examining the working capital explanation*

Column 1:  $\Delta WCA_{it} = \beta_0 + \beta_1 RET_{it} + \beta_2 N_{it} + \beta_3 N_{it} * RET_{it} + \varepsilon_{it}$

Column 2:  $DOCF_{it} = \delta_0 + \delta_1 RET_{it} + \delta_2 N_{it} + \delta_3 N_{it} * RET_{it} + \varepsilon_{it}$

Column 3:  $DOCF\_B\Delta WCA_{it} = \delta_0 + \delta_1 RET_{it} + \delta_2 N_{it} + \delta_3 N_{it} * RET_{it} + \varepsilon_{it}$

	TESTING H3a:			TESTING H3b:		
		$\Delta WCA$		$DOCF$	$DOCF\_B\Delta WCA$	
Intercept	$\beta_0$ (?)	0.0128 *** (0.0007)	$\delta_0$ (?)	0.1166 *** (0.0012)	0.1295 *** (0.0013)	
$RET_{it}$	$\beta_1$ (?)	0.0017 (0.0011)	$\delta_1$ (?)	-0.0028 * (0.0017)	-0.0012 (0.0018)	
$N_{it}$	$\beta_2$ (?)	0.0019 * (0.0011)	$\delta_2$ (?)	-0.0152 *** (0.0014)	-0.0133 *** (0.0015)	
$N_{it} * RET_{it}$	$\beta_3$ (-)	<b>0.0158 ***</b> <b>(0.0025)</b>	$\delta_3$ (+)	<b>0.1432 ***</b> <b>(0.0035)</b>	<b>0.1589 ***</b> <b>(0.0039)</b>	
Number of Observations		65,498		65,498	65,498	
Explanatory Power		0.0013		0.0852	0.0880	
F-Test		<.001		<.001	<.001	

\*\*\* Significant at the 1% level

\*\* Significant at the 5% level

\* Significant at the 10% level

**Description:**

Robust standard errors clustered by firm are reported in parentheses below the coefficient. I truncate all continuous variables at the top and bottom 1%, with the exception of variables censored at zero for which I truncated only the top 1%.

**Variable Definitions:**

- $RET_{it}$  is stock return for the twelve-month period commencing with the fourth month after the end of fiscal year t-1,
- $N_{it}$  is an indicator variable that equals one (zero) if  $RET_{it}$  is negative (non-negative),
- $\Delta WCA_{it}$  is the change in working capital accruals deflated by the beginning of period market value of equity (PRCC\_F\*CSHO). Working capital accruals are calculated as change in accounts receivable (RECT) before the allowance for doubtful accounts (RECD) plus the change in inventory (INVT) plus the change in other current assets (OCA) minus the change in accounts payable (AP) minus the change in other current liabilities (OCL) minus the change in taxes payable (TXP),
- $DOCF_{it}$  is operating cash flows (OANCF) deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- $DOCF\_B\Delta WCA$  is operating cash flows (OANCF) with the change in working capital accruals ( $\Delta WCA_{it}$ ) added back, which is then deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- $\varepsilon_{it}$  is an error term.



**Table 8***Distribution characteristics of standard and adjusted regression variables*

	Mean	StdDev	Median	Skewness	Kurtosis
$DOCF_{it}$	0.090	0.125	0.081	0.700	3.737
$LG\_OCF_{it}$	2.651	2.719	2.923	-0.404	-0.298
$R\_DOCF_{it}$	49.501	28.857	50.000	0.000	-1.200
$RET_{it}$	0.081	0.546	0.023	2.494	18.218
$LG\_RET_{it}$	0.046	0.364	0.023	0.669	0.925
$R\_RET_{it}$	49.501	28.857	50.000	0.000	-1.200
$LG\_CMVE_{it}$	-0.016	0.519	0.025	-0.644	2.184
$\eta_{it}$	0.000	0.535	-0.066	2.713	20.204
$LG\_ \eta_{it}$	0.000	0.511	0.020	-0.439	2.015
$R\_ \eta_{it}$	0.000	27.629	-1.182	0.135	-0.967

**Description:**

Robust standard errors clustered by firm are reported in parentheses below the coefficient. I truncate all continuous variables at the top and bottom 1%, with the exception of variables censored at zero for which I truncated only the top 1%.

**Variable Definitions:**

- $DOCF_{it}$  is operating cash flows (OANCF) deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- $LG\_OCF_{it}$  is the natural log of operating cash flows (OANCF). I first add one to operating cash flows, then multiply negative operating cash flows values by negative one, take the nature log, then again multiply operating cash flows that were initially negative by negative one,
- $R\_DOCF_{it}$  is  $DOCF_{it}$  ranked from 0 to 99,
- $RET_{it}$  is stock return for the twelve-month period commencing with the fourth month after the end of fiscal year t-1,
- $LG\_RET_{it}$  is the natural log of  $RET_{it}$ , calculated in a manner similar to  $LG\_DOCF_{it}$ ,
- $R\_RET_{it}$  is  $RET_{it}$  ranked from 0 to 99,
- $C\_MVE_{it}$  is the change in the logged market value of equity (PRCC\_F\*CSHO) during the year,
- $\eta_{it}$  is non-earnings news, which is calculated as the residual from a pooled regression of  $RET_{it}$  on  $DOCF_{it}$ ,
- $LG\_
\eta_{it}$  is non-earnings news, which is calculated as the residual from a pooled regression of  $LG\_RET_{it}$  on  $LG\_DOCF_{it}$ ,
- $R\_
\eta_{it}$  is non-earnings news, which is calculated as the residual from a pooled regression of  $R\_RET_{it}$  on  $R\_DOCF_{it}$ ,

**Table 9**

*Piecewise regression on stock returns examining the econometric bias explanation*

Column 1:  $DOCF_{it} = \beta_0 + \beta_1 RET_{it} + \beta_2 N_{it} + \beta_3 N_{it} * RET_{it} + \varepsilon_{it}$

Column 2:  $LG\_DOCF_{it} = \beta_0 + \beta_1 LG\_RET_{it} + \beta_2 N_{it} + \beta_3 N_{it} * LG\_RET_{it} + \varepsilon_{it}$

Column 3:  $LG\_OCF_{it} = \beta_0 + \beta_1 LG\_CMVE_{it} + \beta_2 N_{it} + \beta_3 N_{it} * LG\_CMVE_{it} + \varepsilon_{it}$

Column 4:  $R\_DOCF_{it} = \beta_0 + \beta_1 R\_RET_{it} + \beta_2 N_{it} + \beta_3 N_{it} * R\_RET_{it} + \varepsilon_{it}$

			TESTING FOR BIAS:			
			<i>DOCF</i>	<i>LG_DOCF</i>	<i>LG_OCF</i>	<i>R_DOCF</i>
<i>Intercept</i>	$\beta_0$	(?)	0.1178 *** (0.0013)	3.7358 *** (0.0374)	55.9798 *** (0.8997)	3.5375 *** (0.0380)
<i>RET<sub>it</sub></i>	$\beta_1$	(?)	-0.0002 (0.0017)	-1.6186 *** (0.0557)	0.0073 (0.0117)	-1.3540 (0.0558)
<i>N<sub>it</sub></i>	$\beta_2$	(?)	-0.0249 *** (0.0012)	-0.8519 *** (0.0281)	-28.5940 *** (0.9755)	-0.5400 *** (0.0309)
<i>N<sub>it</sub> * RET<sub>it</sub></i>	$\beta_3$	(+)	<b>0.1152 ***</b> <b>(0.0029)</b>	<b>5.3278 ***</b> <b>(0.1030)</b>	<b>0.6085 ***</b> <b>(0.0170)</b>	<b>3.2949 ***</b> <b>(0.0791)</b>
Number of Observations			67,206	67,206	67,206	67,206
Explanatory Power			0.0783	0.0993	0.1066	0.0777
F-Test			<.001	<.001	<.001	<.001

\*\*\* Significant at the 1% level

**Description:**

Robust standard errors clustered by firm are reported in parentheses below the coefficient. I truncate all continuous variables at the top and bottom 1%, with the exception of variables censored at zero for which I truncated only the top 1%.

**Variable Definitions:**

*DOCF<sub>it</sub>* is operating cash flows (OANCF) deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),

*LG\_DOCF<sub>it</sub>* is the natural log of *DOCF<sub>it</sub>*. I first add one to operating cash flows, then multiply negative operating cash flows values by negative one, take the nature log, then again multiply operating cash flows that were initially negative by negative one,

*LG\_DOCF<sub>it</sub>* is the natural log of operating cash flows (OANCF). , calculated in a manner similar to *LG\_DOCF<sub>it</sub>*,

*R\_DOCF<sub>it</sub>* is *DOCF<sub>it</sub>* ranked from 0 to 99,

*RET<sub>it</sub>* is stock return for the twelve-month period commencing with the fourth month after the end of fiscal year t-1,

*N<sub>it</sub>* is a dummy variable that takes on a value of one if negative market performance is observed, with the exception of column 1 where N takes on a value of one if market performance is below the mean,

*LG\_RET<sub>it</sub>* is the natural log of *RET<sub>it</sub>*, calculated in a manner similar to *LG\_DOCF<sub>it</sub>*,

*R\_RET<sub>it</sub>* is *RET<sub>it</sub>* ranked from 0 to 99,

*C\_MVE<sub>it</sub>* is the change in the logged market value of equity (PRCC\_F\*CSHO) during the year.

**Table 10, Panel A**

*Piecewise regression on stock returns examining existing inferences*

$$Y_{it} = \beta_0 + \beta_1 RET_{it} + \beta_2 N_{it} + \beta_3 N_{it} * RET_{it} + \beta_4 X_{it} + \beta_5 RET_{it} * X_{it} + \beta_6 N_{it} * X_{it} + \beta_7 N_{it} * RET_{it} * X_{it} + \varepsilon_{it}$$

		<i>X = LEV</i>			<i>X = PIN</i>		
		<i>Y = DEPS</i>	<i>Y = DOCF</i>	<i>Y = DACC</i>	<i>Y = DEPS</i>	<i>Y = DOCF</i>	<i>Y = DACC</i>
Intercept	$\beta_0$	0.0478 *** (0.0011)	0.0876 *** (0.0016)	-0.0353 *** (0.0014)	0.0479 *** (0.0019)	0.1196 *** (0.0033)	-0.0638 *** (0.0030)
$RET_{it}$	$\beta_1$	-0.0066 *** (0.0017)	-0.0041 * (0.0022)	0.0000 (0.0016)	-0.0161 *** (0.0039)	-0.0213 *** (0.0052)	0.0056 (0.0044)
$N_{it}$	$\beta_2$	-0.0026 (0.0017)	-0.0106 *** (0.0019)	0.0073 *** (0.0019)	-0.0036 (0.0033)	-0.0171 *** (0.0043)	0.0118 *** (0.0044)
$N_{it} * RET_{it}$	$\beta_3$	0.1617 *** (0.0046)	0.1372 *** (0.0044)	0.0298 *** (0.0046)	0.1218 *** (0.0117)	0.1487 *** (0.0116)	-0.0157 (0.0132)
$X_{it}$	$\beta_4$	0.0040 (0.0044)	0.1251 *** (0.0070)	-0.1165 *** (0.0062)	-0.0105 (0.0093)	-0.0126 (0.0153)	-0.0077 (0.0145)
$RET_{it} * X_{it}$	$\beta_5$	-0.0106 (0.0087)	0.0488 *** (0.0122)	-0.0605 *** (0.0089)	0.0309 (0.0207)	0.1007 *** (0.0275)	-0.0652 (0.0237)
$N_{it} * X_{it}$	$\beta_6$	-0.0006 (0.0070)	-0.0126 (0.0084)	0.0104 (0.0085)	-0.0097 (0.0160)	0.0189 (0.0204)	-0.0253 *** (0.0212)
$N_{it} * RET_{it} * X_{it}$	$\beta_7$	<b>0.1162 ***</b> <b>(0.0196)</b>	<b>-0.0361 *</b> <b>(0.0205)</b>	<b>0.1585 ***</b> <b>(0.0215)</b>	<b>0.2219 ***</b> <b>(0.0538)</b>	<b>0.0281</b> <b>(0.0533)</b>	<b>0.1787 ***</b> <b>(0.0598)</b>
Number of Observati		68,908	68,908	68,908	34,415	34,415	34,415
Explanatory Power		0.1447	0.1156	0.0495	0.1269	0.0912	0.0031
F-Test		<.001	<.001	<.001	<.001	<.001	<.001

\*\*\* Significant at the 1% level

\*\* Significant at the 5% level

\* Significant at the 10% level

**Description:**

Robust standard errors clustered by firm are reported in parentheses below the coefficient. I truncate all continuous variables at the top and bottom 1%, with the exception of variables censored at zero for which I truncated only the top 1%.

**Variable Definitions:**

- $DOCF_{it}$  is operating cash flows (OANCF) deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- $RET_{it}$  is stock return for the twelve-month period commencing with the fourth month after the end of fiscal year t-1,
- $N_{it}$  is an indicator variable that equals one (zero) if  $RET_{it}$  is negative (non-negative),
- $DEPS_{it}$  is deflated EPS, calculated as earnings per share before extraordinary items (EPSFX) deflated by the beginning of period stock price (PRCC\_F),
- $DACC_{it}$  is deflated accruals, calculated as net income before extraordinary items (IB) less operating cash flows (OANCF), which is then deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- $LEV_{it}$  is the book value of long-term debt (DLTT) plus the current portion of long-term debt (DLC), which is the deflated by total assets (AT),
- $PIN_{it}$  is the probability of informed trading from Stephen Brown's web-site,
- $\varepsilon_{it}$  is an error term.

**Table 10, Panel B**

*Piecewise regression on stock returns examining existing inferences*

$$Y_{it} = \beta_0 + \beta_1 RET_{it} + \beta_2 N_{it} + \beta_3 N_{it} * RET_{it} + \beta_4 * X_{it} + \beta_5 RET_{it} * X_{it} + \beta_6 N_{it} * X_{it} + \beta_7 N_{it} * RET_{it} * X_{it} + \varepsilon_{it}$$

		<i>X = SIZE</i>			<i>X = HERF</i>		
		<i>Y = DEPS</i>	<i>Y = DOCF</i>	<i>Y = DACC</i>	<i>Y = DEPS</i>	<i>Y = DOCF</i>	<i>Y = DACC</i>
<i>Intercept</i>	$\beta_0$	0.0207 *** (0.0028)	0.0951 *** (0.0044)	-0.0706 *** (0.0040)	0.0506 *** (0.0010)	0.1231 *** (0.0017)	-0.0665 *** (0.0015)
<i>RET<sub>it</sub></i>	$\beta_1$	0.0045 (0.0048)	0.0022 (0.0064)	0.0033 (0.0054)	-0.0157 *** (0.0018)	-0.0093 *** (0.0026)	-0.0053 ** (0.0023)
<i>N<sub>it</sub></i>	$\beta_2$	-0.0033 (0.0039)	-0.0173 *** (0.0049)	0.0126 *** (0.0049)	-0.0036 ** (0.0016)	-0.0181 *** (0.0019)	0.0134 *** (0.0020)
<i>N<sub>it</sub> * RET<sub>it</sub></i>	$\beta_3$	0.2776 *** (0.0104)	0.2072 *** (0.0108)	0.0785 *** (0.0118)	0.1974 *** (0.0046)	0.1531 *** (0.0050)	0.0537 *** (0.0055)
<i>X<sub>it</sub></i>	$\beta_4$	0.0046 *** (0.0004)	0.0035 *** (0.0007)	0.0013 ** (0.0006)	-0.0394 *** (0.0119)	-0.1156 *** (0.0193)	0.0673 *** (0.0187)
<i>RET<sub>it</sub> * X<sub>it</sub></i>	$\beta_5$	-0.0021 *** (0.0007)	-0.0005 (0.0010)	-0.0013 (0.0009)	0.1379 *** (0.0232)	0.1470 *** (0.0338)	0.0107 (0.0344)
<i>N<sub>it</sub> * X<sub>it</sub></i>	$\beta_6$	-0.0004 (0.0006)	-0.0001 (0.0007)	-0.0003 (0.0007)	0.0216 (0.0196)	0.0509 ** (0.0231)	-0.0269 (0.0260)
<i>N<sub>it</sub> * RET<sub>it</sub> * X<sub>it</sub></i>	$\beta_7$	<b>-0.0238 *** (0.0017)</b>	<b>-0.0179 *** (0.0018)</b>	<b>-0.0064 *** (0.0020)</b>	<b>-0.2081 *** (0.0500)</b>	<b>-0.2749 *** (0.0595)</b>	<b>0.0214 (0.0670)</b>
Number of Observation		68,908	68,908	68,908	68,908	68,908	68,908
Explanatory Power		0.1732	0.0914	0.0059	0.1427	0.0805	0.0049
F-Test		<.001	<.001	<.001	<.001	<.001	<.001

\*\*\* Significant at the 1% level

\*\* Significant at the 5% level

\* Significant at the 10% level

**Description:**

Robust standard errors clustered by firm are reported in parentheses below the coefficient. I truncate all continuous variables at the top and bottom 1%, with the exception of variables censored at zero for which I truncated only the top 1%.

**Variable Definitions:**

- DOCF<sub>it</sub>* is operating cash flows (OANCF) deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- RET<sub>it</sub>* is stock return for the twelve-month period commencing with the fourth month after the end of fiscal year t-1,
- N<sub>it</sub>* is an indicator variable that equals one (zero) if *RET<sub>it</sub>* is negative (non-negative),
- DEPS<sub>it</sub>* is deflated EPS, calculated as earnings per share before extraordinary items (EPSFX) deflated by the beginning of period stock price (PRCC\_F),
- DACC<sub>it</sub>* is deflated accruals, calculated as net income before extraordinary items (IB) less operating cash flows (OANCF), which is then deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- SIZE<sub>it</sub>* is the log of the firm's market value of equity (PRCC\_F\*CSHO),
- HERF<sub>it</sub>* is the Herfindahl index, calculated using the Fama and French 48 industry scheme. The index is calculated as the sum of squared sales shares by industry. A higher value indicates more industry concentration and therefore less product market competition,
- $\varepsilon_{it}$  is an error term.

**Table 11***Piecewise regression of accruals on stock returns interacted with the Herfindahl Index*

$$DACC_{it} = \beta_0 + \beta_1 RET_{it} + \beta_2 N_{it} + \beta_3 N_{it} * RET_{it} + \beta_4 * HERF_{it} + \beta_5 RET_{it} * HERF_{it} + \beta_6 N_{it} * HERF_{it} + \beta_7 N_{it} * RET_{it} * HERF_{it} + \beta_8 DOCF_{it} + \varepsilon_{it}$$

		Prediction	Without DOCF	With DOCF
<i>Intercept</i>	$\beta_0$	(?)	-0.0665 *** (0.0015)	0.0178 *** (0.0012)
<i>RET<sub>it</sub></i>	$\beta_1$	(?)	-0.0053 ** (0.0023)	-0.0114 *** (0.0017)
<i>N<sub>it</sub></i>	$\beta_2$	(?)	0.0134 *** (0.0020)	0.0012 (0.0015)
<i>N<sub>it</sub> * RET<sub>it</sub></i>	$\beta_3$	(+)	0.0537 *** (0.0055)	0.1578 *** (0.0045)
<i>HERF<sub>it</sub></i>	$\beta_4$	(?)	0.0673 *** (0.0187)	-0.0129 (0.0114)
<i>RET<sub>it</sub> * HERF<sub>it</sub></i>	$\beta_5$	(?)	0.0107 (0.0344)	0.1114 *** (0.0229)
<i>N<sub>it</sub> * HERF<sub>it</sub></i>	$\beta_6$	(?)	-0.0269 (0.0260)	0.0054 (0.0193)
<i>N<sub>it</sub> * RET<sub>it</sub> * HERF<sub>it</sub></i>	$\beta_7$	(+)	<b>0.0214</b> <b>(0.0670)</b>	<b>-0.1783</b> *** <b>(0.0493)</b>
<i>DOCF<sub>it</sub></i>	$\beta_8$	(-)		-0.6827 *** (0.0062)
Number of Observations			68,908	68,908
Explanatory Power			0.0805	0.4446
F-Test			<.001	<.001

\*\*\* Significant at the 1% level

\*\* Significant at the 5% level

**Description:**

Robust standard errors clustered by firm are reported in parentheses below the coefficient. I truncate all continuous variables at the top and bottom 1%, with the exception of variables censored at zero for which I truncated only the top 1%.

**Variable Definitions:**

- DOCF<sub>it</sub>* is operating cash flows (OANCF) deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- RET<sub>it</sub>* is stock return for the twelve-month period commencing with the fourth month after the end of fiscal year t-1,
- N<sub>it</sub>* is an indicator variable that equals one (zero) if *RET<sub>it</sub>* is negative (non-negative),
- DACC<sub>it</sub>* is deflated accruals, calculated as net income before extraordinary items (IB) less operating cash flows (OANCF), which is then deflated by the beginning of period market value of equity (PRCC\_F\*CSHO),
- HERF<sub>it</sub>* is the Herfindahl index, calculated using the Fama and French 48 industry scheme. The index is calculated as the sum of squared sales shares by industry. A higher value indicates more industry concentration and therefore less product market competition,
- $\varepsilon_{it}$  is an error term.