The Unique Effect of Depreciation on Earnings Properties: Persistence and Value Relevance of Earnings

C.S. Agnes Cheng
The Hong Kong PolyTechnic University

Cathy Zishang Liu
University of Houston Downtown

Prior studies document high persistence of earnings is a desirable earnings' attribute and associated with high value relevance of earnings. Nevertheless, other studies indicate negative earnings components depress persistence of earnings. Depreciation expense constitutes a major negative earnings component for most firms. Larger depreciation could represent higher cost of utilizing resources; however, it could also represent a higher level of capital improvements and conservative accounting choice. We find firms reporting higher depreciation and amortization expense (High DP) outperform other firms (Low DP) in terms of future operating cash flows. Though the persistence of earnings is lower for High DP firms, the stock markets actually place higher valuation weight of their earnings. Our study contributes to research on earnings attributes and the role of accounting information in the stock markets. We identify potential biases of overly reliance on the persistence of earnings to evaluate a firm's performance and to predict the stock market reactions.

INTRODUCTION

The high persistence of earnings has long been viewed as a desirable property of earnings (Lev, 1983; Kormendi and Lipe, 1987; Penman and Zhang, 2002; Francis et al. 2004). Sustainable earnings are generally achieved by effectively lowering the volatility of firms' operations – that is, steady sales growth and effective cost control (Anctil and Chamberlian, 2005). The high persistence also suggests managers' high level of efforts in running firms (Demski, 1998; Tucker and Zarowin, 2006). Sustainable earnings win much favor from financial analysts and investors as they invoke benchmarks to forecast future lifetime earnings or assess permanent earnings. Studies provide evidence that the persistence of earnings positively influences the perceived "quality of earnings" and therefore, the value relevance of earnings (Lev, 1983; Kormendi and Lipe, 1987; Lipe, 1986; Penman and Zhang, 2002; Francis et al. 2004).

Under the premise that the high persistence is a favorable attribute of earnings, researchers contrast the persistence of earnings attributable to cash flows versus to accruals. Sloan (1996) is among the first to document earnings persistence attributable to accruals is lower than that attributable to cash flows. If the market takes the aggregate earnings number as a whole without "seeing" through the lower earnings persistence attributable to accruals, then the market would have over-priced the accruals. Sloan and numerous followers report findings that are consistent with over-pricing of the accruals (termed the accruals anomaly). Many recent papers still debate on the existence and the reasons for the accruals

anomaly (Xie, 2001; Thomas and Zhang, 2002; Fairfield et al., 2003a; Desai et al., 2004; Richardson et al., 2006; Cheng and Thomas, 2006; Dechow and Ge, 2006; Kraft et al., 2006).

Relying on the framework supporting the relation between the persistence and value-relevance of earnings, the accruals 'anomaly' suggests that the market deviates from the framework (a strong claim of this deviation is market inefficiency). The deviation can be viewed from two prospects. First, lower correlation between current period's accruals and future earnings will depress the persistence of earnings. Second, the market places a weight on earnings regardless whether the earnings possess a lower persistence attributable to accruals. Alternatively speaking, the market may have placed a higher weight on earnings with lower earnings persistence. The Mishkin test (1983) employed by Slaon (1996) is consistent with these two prospects. That is, if these two prospects co-exist, the Mishkin test will reject the null of market efficiency. The portfolio test (i.e. relating future return with current accruals portfolio, also employed by Sloan)[1] does not rely on these two prospects. That is, the market can place a valuation weight that is consistent or inconsistent with the earnings persistence attributable to accruals, still, the portfolio test can either reject or fail to reject the null of market efficiency.[2]

Enough has been said about the accruals anomaly, our goal is not to investigate if the market misprices the *depreciation*[3] accruals. Instead, our goal is to evaluate the fundamental issue that serves as the backbone of the 'anomaly' argument of accruals mispricing. That is, the expected effect of earnings persistence on value-relevance of earnings. We ask the following questions: should we expect a lower earnings persistence to depreciation accruals is a good feature from the perspective of firm's underlying performance? Does the market weigh the earnings according to the underlying good feature or the lower earnings persistence? These questions will help us understand if earnings persistence is an 'unconditional' measure of earnings quality, and the potential cause for the market to deviate from the traditional framework of the persistence and value-relevance of earnings. As discussed above, such a deviation may or may not imply market mispricing of accruals (based on the portfolio test), we leave the exploration of mispricing of depreciation to future research.

We focus our investigation on depreciation and amortization (DP) for several reasons. First, it is the single largest item included in accruals (Sloan, 1996; Guay, 2006; Keating and Zimmerman, 2000); second, it behaves distinctly different from the working-capital accruals (we will discuss this in the next section), hence separate consideration of working-capital accruals from depreciation is necessary when studying accruals (earnings) attributes; third, it is related to long-term capital investment that is crucial for firm's lasting survival; fourth, it is affected by managers' accounting choices which may reflect managers' expectation of the payoffs from their investment (Feltham and Ohlson, 1996; Chamber et al., 1999; Keating and Zimmerman, 2000; Bagnoli and Watts, 2005;)

We start our investigation by first identifying firms that have reported relatively high depreciation and amortization (DP) over five-year periods. High DP is related to a high level of investment, a continuing high DP may reflect that firms have been successful in identifying positive NPV (net present value) projects. Depreciation schedule is initially determined when long-term operating assets (LTOA) are put in place. Managers have to estimate the depreciation expense prior to the realization of cash flows generated by the LTOA. Ideally, depreciation should be matched with the economic benefits provided by the LTOA. Hence, high DP may also reflect managers' expectation of high future cash flows generated by the LTOA. Moreover, high DP may come from manager's conservative accounting choice which will depress current earnings but generate expense reserve for the future, or alternatively speaking, will bias current earnings downward but future earnings upward. All of these aspects should have a positive impact on firm value.[4] However, high DP may also represent higher costs of doing business, which will then decrease firm value. If the positive aspects dominate the negative aspect, then we should observe, on average, firms that have been reporting high DP perform better in the market.

We start our investigation by first assessing characteristics for the firms that have been continuously reporting high DP. In evaluating if the High DP firms outperform the Low DP firms, we first compare multiple characteristics between these two types of firms. We find the High DP firms are larger, report higher operating cash flows and higher growth in those operating cash flows as well. The High DP firms have invested more in PPE and continue to invest and they enjoy higher market returns. Accordingly, we

conclude a continuous reporting of high DP is a positive, instead a negative, feature from the perspective of the underlying firm performance.

For each type of firms, we also conduct a univariate analysis of the effect of DP on other accounting measures. We find the depreciation accruals (i.e. negative DP expressed as –DP in our tables) are reliably negatively correlated with current and future three periods' operating cash flows for the High DP firms but not for the Low DP firms. In our multiple regression analysis, we find this negative relationship continues to exist, especially for the High DP firms. This finding suggests that higher depreciation leads to higher future cash flows. Since depreciation is inherently negative, this positive aspect will depress the persistence of earnings more for the High DP firms than for the Low DP firms. Furthermore, we find depreciation accruals have a coefficient close to 1.1 in predicting next period total accruals for the High DP firms; however, this coefficient is much higher for the Low DP firms. Again, the lower persistence of depreciation in predicting future accruals for the High DP firms leads to a lower persistence of earnings for the High DP firms than for the Low DP firms.

To sum, we find relatively high DP has a potential to identify outperformers in the market. High DP firms possess lower earnings persistence; however, the market places a higher valuation weight on their earnings. We conclude that lower earnings persistence attributed to depreciation accruals is not a bad feature from the valuation perspective.

Our paper contributes to the literature from several perspectives. First, we find that lower earnings persistence implies higher earnings quality if the lower persistence is induced by excessively large depreciation. A few studies have already suggested that higher earnings persistence does not necessarily lead to higher earnings quality (Bao and Bao, 2004; Anctil and Chamberlain, 2005; Ghosh, Gu and Jain, 2005), our paper extends this avenue of research by focusing on depreciation.

Second, we find the market sees through (at least partially) the downward bias induced by high depreciation expense. One argument against historical cost accounting in favor of fair value accounting may be that the historical cost accounting provides biased earnings numbers. If the market can see through some of the bias, the claimed adverse economic effect from the historical cost accounting may not be that severe. In contrasting historical cost and fair value methods, the accounting standard setters should consider this 'seeing through' effect under the historical cost accounting of long-term operating accruals.

Third, we find the empirical relation between cash flows and depreciation accrual is distinctly different between the High DP firms and the Low DP firms. In estimating expected accruals, researchers often use cash flows as the benchmark (e.g. Dechow and Dichive, 2002). Assuming the same relation between cash flows and accruals in estimating expected accruals may lead to a biased measure of expected, hence, unexpected (or discretionary) accruals. Ball and Shivakumar (2006) have added controls for timely gain and loss in their discretionary model, our finding may be extended to this school of research.

Lastly and more directly, our finding shows the usefulness of depreciation. While Chamber et al. (1999) show depreciation is more useful than capital expenditure in explaining market return, we go one step further to show several aspects that depreciation can contribute to financial statement analysis.

This paper is structured as follows. Section 2 discusses the background and related literature. Section 3 discusses the sample and variable definitions. Section 4 presents empirical tests and results, and Section 5 concludes the paper.

BACKGROUND & RELATED LITERATURE

Long-Term versus Working-Capital Accruals

In identifying accrual components, working-capital accruals and non-working-capital (or long-term) accruals constitute two major categories. Accrual accounting improves earnings as a performance measure through these accruals. Working capital accruals (WAC) are considered useful by ameliorating transitory changes in operating cash flow (Dechow, 1994). Long-term accruals, such as depreciation and amortization (DP)[5], ameliorate transitory variation in free cash flow, "which occurs because firms'

investment opportunities vary in time or managers manipulate investment timing" (Ball and Shivakumar, 2006, p. 208). While both are useful for reporting earnings, they are distinct from several perspectives.

WAC relates to short-term assets and liabilities; it will revert to operating cash flows within one period. Hence, higher WAC will lead to higher next-period cash flows; accordingly, increasing earnings persistence. DP relates to long-term operating assets that have been or will be in place for a long time, its relation to operating cash flows is not as straightforward as WCA[6]. Higher DP will lead to higher future cash flows only if DP is associated with higher future productivity. Under this scenario, the relation between depreciation accruals (i.e. - DP) and future cash flows will be negative[7] which will depress earnings persistence.

As suggested in Dechow et al.(1998) and Barth et al. (2001), WAC is sales-driven, higher sales will lead to higher accruals. On the other hand, DP is investment-driven; higher investment will lead to lower accruals. If firms grow their investment in long-term operating assets (LTOA), one should expect higher depreciation expense, i.e. lower accruals (-DP)[8]. If the investment has a positive net present value (NPV), one should expect an increase in operating cash flows and sales, accordingly, an increase in working-capital accruals (WAC). Combining –DP and WAC together will lead to the level of accruals that cannot reflect the favorable economic benefits from the investment. Guy (2006) [9] and Guay and Sidhu (2001) advocate that long-term accruals should be evaluated separately from the working-capital accruals. Dechow and Ge (2006) suggest that both signs and magnitudes are important to evaluate accruals, our study echoes their suggestions and aims to provide a better understanding of the effect of inherently negative long-term accruals – depreciation and amortization – on earnings properties (i.e, persistence and value relevance of earnings).

Information Embedded in Depreciation

A number of studies have documented the value-relevance of depreciation. Ball and Brown (1968) and Beaver and Dukes (1972) found that investment portfolios based on earnings after depreciation perform better than portfolios based on earnings before depreciation. Their findings imply that depreciation is relevant in measuring profitability. Many studies on value-relevance of earnings components also show that depreciation is value-relevant (Lipe, 1986; Rayburn, 1986; Ohlson and Penman, 1992; Jennings et al., 1996). These studies do not explain why depreciation should be value-relevant; moreover, they do not investigate the association between depreciation and the future cash flows. Different from these studies, we examine the association between depreciation and multiple performance measures.

Feltham and Ohlson (1996) and Ohlson and Aier (2007) indicate that discretion embedded in depreciation makes it a better indicator than other factors relating to firms investment status. Chamber et al. (1999) provide empirical evidence that if capital expenditure is expensed rather than depreciated, earnings are less value relevant. Their findings imply that the allocation procedure employed in recognizing depreciation, even though not perfect,[10] improves earnings measurement. Chamber et al. (1999) discuss their view of the role of discretion in informativeness of depreciation: "…while many believe that managers use their discretion to choose useful lives and salvage values in a way that reduce the usefulness of earnings, it is also possible that this discretion is used to convey superior information, thus enhancing the usefulness of earnings." (p.172)

Most of these studies focus on the average role of depreciation and do not distinguish firms that report higher depreciation from firms that report lower depreciation. Keating and Zimmerman (2000) find that higher recognized depreciation in current period is associated with an increase in investment opportunity; their finding hints that firms which report high depreciation may outperform firms that report low depreciation. The focus of their paper is to investigate the context that changes in deprecation incur; different from them, we focus on examining directly the valuation role of depreciation. Our analysis starts by contrasting characteristics between firms that report high depreciation (High DP) and firms that report low depreciation (Low DP). Several studies prior to Keating and Zimmerman (2000) also report that level of depreciation, change in depreciation and choice of depreciation method are associated with firm size, leverage, risk, investment opportunity set and bonus plans (Hagerman and Zmijewski, 1979; Skinner,

1993, Bowen et al. 1995). Part of our analysis supplements their findings. We find that High DP and Low DP firms are different from each other in many firm characteristics and that the High DP firms in general possess higher performance measures.

Earnings Persistence and Earnings Quality

Many studies tie earnings persistence with earnings quality and with the value-relevance of earnings (Lev, 1983; Kormendi and Lipe, 1987; Lipe, 1986 ; Cheng, Liu and Schaefer, 1996; Penman and Zhang, 2002; Francis et al. 2004; Tucker and Zarowin, 2006). Only a few studies suggest that earnings persistence is not always a desired feature. Anctil and Chamberlain (2005) suggest that higher persistence does not necessarily imply good earnings quality because the accounting method can induce an excess persistence of earnings. They suggest that depreciation will contribute to this excessive persistence, hence, reducing the quality of earnings. Using market price to surrogate for permanent earnings (as in Shroff, 1999), they find that earnings persistence increases if firms invest in fixed assets after controlling permanent earnings. Ryan (1991) also thinks that depreciation on average will smooth earnings, but Ryan (1991) does not incorporate the dynamics of growth in investment on earnings sustainability. Different from them, we suggest that when depreciation is exceptionally high (might resulting from a high level of investment), earnings persistence will be reduced; however, this reduction will not affect the market to evaluate the company's future performance.

Bao and Bao (2004) also suggest that earnings quality should not be unconditionally related to earnings persistence. They point out that earnings persistence may come from managers' manipulation; in this case, earnings quality is not good. They use the ratio of operation cash flows to accruals to measure earnings quality. They find the market places different weights on earnings that have the same earnings persistence but different quality. Their results suggest that the market evaluates the persistence of earnings conditionally on other information such as earnings quality. Ghosh, Gu and Jain (2005) suggest that when using earnings persistence to measure earnings quality, one should consider the source of earnings persistence. If the source is a positive aspect, such as a continuous increase in sales instead of recognition of lower expenses, then the link between earnings persistence to earnings quality is stronger. They use earnings response coefficient (ERC) to reflect earnings quality.

Our paper uses different research methods and is structured with a focus on depreciation. One major difference is that we do not rely on any single earnings quality measurement but rely on multiple characteristics to reflect the quality of depreciation reported by High DP firms. While we do not intend to investigate if depreciation is mispriced by the market; we would like to mention two mispricing studies that may have some relation to our study. First, Fairfield et al. (2003) suggests that growth in operating assets coupled with adopting conservative accounting reporting – especially at the early stage of assets committed – reduces earnings persistence attributable to accruals. They use change in net operating assets adjusted for cash flows and working-capital accruals to derive their long-term accruals. Their long-term accruals include a net of capital expenditure and depreciation accrual. They find that earnings persistence attributable to long-term accruals is low and suggest that growth is a driving factor for accruals anomaly. Using similar total accrual measures, Richardson et al. (2006) show that growth in long-term operating assets can only explain a portion of accruals mispricing. Our results cannot be compared with these studies because of different accruals measures used in ours and others. We focus on depreciation; which represents a periodic allocation of investment in LTOA. According to Chamber et al. (1999), depreciation better communicates profitability information than capital expenditure does. One way to extend their studies is to explore the effect of depreciation on earnings properties and its implications for a firm's valuation.

DATA & SAMPLE

Financial data is collected from the 2005 Compustat annual database; while stock return data is obtained from the CRSP daily stock returns files. The resulting sample covers all firms-years with available data on Compustat and CRSP for the period 1988-2005. The empirical analyses are restricted to

observations after the release of SFAS 95 in order to derive accruals from the statement of cash flows.11 Earnings are defined as net income before extraordinary items (IB, Compustat #18) and are composed of the following: [12]

CFO (cash flows from operating activities less the accrual portion of extraordinary items and discontinued operations): #308 – #124
WAC (working capital accruals reported from the cash flow statement, i.e. the sum of change in accounts receivable, accounts payable, inventory and tax payable)): – (#302 + #303 +#304 +#305)
– DP (depreciation & amortization): – #14
NSI (negative special items): #17 if #17 is less than 0, otherwise, 0
OAC (other accruals): (IB– CFO) – WAC + DP – NSI

We replace the missing values of NSI with zero. Total accruals are equal to the difference between IB and CFO. Since total asset is affected by conservative reporting and may potentially induce a spurious relationship among the variables under the investigation, all of the accounting variables used in our regression analyses are scaled by current sales.[13] The sample excludes financial services firms (SIC codes between 6000-6999) and also requires sales to be greater than 10 million.[14] Observations in the extreme upper and lower 1 percent of their respective distributions are also removed from the sample. The total number of observations for our basic sample is 32,021.

For our value-relevance test, we use both cumulative annual return and cumulative annual abnormal return as the dependent variables in our regression analysis. Abnormal return is current monthly return subtracts expected monthly return where expected monthly return is derived based on coefficients estimated from a market model regressing 30- to 60-month firm return on market return prior to the fourth month of a fiscal year. Cumulative annual (abnormal) return is monthly (abnormal) return accumulated over the fourth month of a fiscal year to the third month after the end of the fiscal year. For return analysis, our sample reduces to 25,820 for our full model and for abnormal-return analysis, our sample reduces to 19,286 for our full model. We first use flexible samples for our analysis, however, we also conduct robustness check for the most restricted sample.

To identify firms that report excessively high depreciation, we focus on firms that have been reporting high depreciation and amortization (DP) for a continuing five years. Since depreciation is related to long-term investment and the economic benefits from long-term investment may not be reflected in firm performance immediately (or shortly) after the investment, a continuing high DP may reflect firms that have been successful in achieving profits with respect to long-term investment. To identify our high DP sample, we first rank the DP-to-Total-Assets ratio into ten groups for each year and each SIC two-digit industry. We then standardized each rank by dividing it by 9 to get a value of 0 to 1. We then sum up the standardized deciles rankings of DP over a 5-year period (year -4 to 0). We term this measure as the Cumulative Relative DP-to-Total-Assets (CRDPTA) ratio. We assign a value of 1 (0) to a dummy variable termed HDP when this CRDPTA ratio is higher (lower) then its SIC two digits industry median.

EMPIRICAL RESULTS

High DP versus Low DP Firms

To evaluate what type of firms[15] that the HDP identifies, Table A contrasts various variables between the High DP (i.e. HDP=1) and the Low DP (i.e. HDP=0) samples. In our regression analysis, we use sales instead of total assets as our scalar since large DP will decrease total assets significantly and our results may then be driven by the denominator effect. That being said, we still provide some popular ratios that are total assets based. Panel A reports key variables that are used in our regression analysis. The High DP sample has an average of -2% IB (i.e. income before extraordinary items) relative to sales while the Low DP sample has an average of -3% IB relative to sales. The 1% difference can be decomposed to a 3.2%

higher CFO and a 2.2% lower total accruals (TAC) for the High DP sample than the Low DP sample. The lower 2.2% TAC can be further decomposed into a lower 1% WAC, a lower 2.4% –DP (i.e. higher DP) and a higher 1.1% OAC. These statistics show that even though the High DP sample reports higher DP expenses (2.4% higher), the higher operating cash flow (3.2%) prevails over this effect.[16] Both return and abnormal return are significantly higher for the High DP firms than for the Low DP firms. This is not surprising since High DP firms report higher profitability (especially higher operating cash flows). In other words, it seems that the High DP sample represents observations with better firm performance.

Panel B Table 1 further investigates the differences in firm characteristics between High and Low DP samples. The High DP sample has an average of 1.6 billion market value while the Low DP sample has a smaller average of about 1.3 billion. The differences are significant. Similarly, the High DP sample has a larger mean of total assets. Untabulated results also show that the High DP sample has larger sales and a larger turnover ratio (i.e. sales divided by total assets). We contrast market beta and debt-equity ratio. The High DP sample reports higher risk based on these two measures. These results are consistent with the concept that higher risk leads to higher return. Untabulated results also show that the return volatility is higher (but not significantly different) for the High DP firms.

We also report two popular performance measures, one is book-to-market ratio and another one is return on assets (ROA). The High DP sample reports a lower book-to-market ratio. Many aspects affect book to market ratio; lower ratio reflects conservatism (Feltham and Ohlson, 1995), high growth (Fama and French, 1992, 1996), high investment opportunities (Lakonishok et al., 1994; Beaver and Ryan, 2000, 2005; Ahmed et al. 2000; Easton and Pae, 2004) and higher profitability (Lakonishok et al., 1994; LaPorta et al. 1997). The main reason driving the lower book-to-market ratio for the High DP sample is out of the scope of this paper. However, we believe the lower book value affected by higher DP is certainly an important (if not the main) reason. Different from Panel A where we use sales as the scalar, Panel B reports the High DP sample has a lower ROA for which we use beginning total assets as the scalar. Note that the High DP sample contains large firms, it is conceivable that the rate of return will decrease when firms grow larger. A closer examination of the ratio of IB to sales from untabulated results, the High DP sample actually has a lower median. However, the High DP sample still has a higher median for the ratio of CFO to sales. This implies that even though investment will increase cash flows, excessively high DP will depress earnings downward to a point that a higher operating cash flow cannot overcome.

PPEG over total assets (PPEG/TA) is a popular ratio that can be used to indicate the investment level (Keating and Zimmerman, 2000; Luo, 2005; Anctil and Chamberlian, 2005). The High DP sample reports a higher PPEG/TA ratio (0.654 versus 0.359). The High DP sample also reports a younger asset age (PPEAge measured as the gross PPE over accumulated depreciation). The lower PPEAge ratio implies that even though High DP firms are larger; they continue to invest. This observation can also be reflected by a higher ratio of capital expenditure over total assets: The High DP sample reports a 7.2% ratio while the Low DP sample reports only a 5.4% ratio.

In the last few rows of Panel B, we provide growth statistics. It is interesting to see that the growth rates for sales, total assets, gross PPE and capital expenditure are all positive but the High DP sample reports smaller growth rates than the Low DP sample. Recalling that the High DP sample is larger, when the base is larger, the growth rate tends to not sustain. But this does not necessarily mean that the performance of the High DP sample will be lower than the Low DP sample. This can be seen that when we evaluate the growth of IB and CFO, the High DP sample has higher growth rates. On the other hand, DP has a lower growth rate. The lower growth rate in DP may reflect the fact that the High DP sample has recognized an excessive DP in current period that will not persist into the future.

To sum, descriptive statistics in Table 1 depict a picture for the High DP versus the Low DP samples. High DP firms are larger, invest more in long-term assets in the past and continue to invest, generating higher cash flows and higher earnings, and they also perform better in the market than the Low DP firms.

Relation Between DP and Financial Measures – Univariate Analysis

Table 2 reports the correlation for the accounting variables we use including IB and CFO for current period (t) through future three periods (t+1 to t+3), working capital accruals (WAC_t), depreciation accruals ($-DP_t$), negative special items (NSI_t) and other accruals (OAC_t). All correlation coefficients are averaged across years and all accounting variables are scaled by current sales. Panel A reports results for the High DP sample and Panel B reports results for the Low DP sample. Since our goal is evaluating the effect of DP, we will focus our discussion on the relation between -DP and other variables. The upper right corner reports the Pearson correlation, we use **bold** to highlight the correlation coefficients of –DP and other variables. The lower left corner reports the Spearman correlation; we use *italic* to highlight the correlation coefficients of –DP and other variables. We use underline to highlight the inconsistence between the signs of the Pearson and the Spearman coefficients. We take the position that if the signs of the Pearson and Spearman differ, the quality of the raw measure is low.

We will first analyze the correlation coefficients for the High DP sample and then compare the results between samples. Refer to Panel A. Since –DP is a component of IB, it is not surprising to see that the correlation between –DP and IB_t is positive. However, it is interesting to see that the Spearman coefficient is not significant (even though positive). As for the correlation between -DP and future IB (t+1 to t+3), the Spearman coefficients are all negative and tend to increase in magnitude while the Pearson coefficients are all positive and tend to decrease in magnitude from period t+1 to t+3. As to the correlation between -DP and CFO, the Spearman and Pearson coefficients are all significantly negative for all periods. The negative relationship implies higher DP leads to more CFO. As to the relation between -DP and other accruals, both Pearson and Spearman coefficients report a positive relation.

Refer to Panel B, which reports correlation coefficients for the Low DP firms. A few differences between Panel B and Panel A are noticeable. First, we find –DP and CFO is positively correlated based on the Pearson coefficients, this implies more DP will lead to less CFO, a finding that is not consistent with the suggestion that higher investment will generate higher cash flows. However, the Spearman coefficient for the correlation between –DP and CFO_t is still significantly negative. This implies that the DP measure does not have a stable relationship to CFO and is of low quality. Another interesting finding is that the Pearson correlation coefficients between –DP and future CFO's are negative but only the correlation between –DP and CFO_{t+3} are significant. On the other hand, the Spearman coefficients are all significantly negative. One more interesting point is that the coefficients between –DP and IB's are smaller in magnitude while the coefficients between –DP and CFO's are larger in magnitude for the High DP group than for the Low DP group. This contrast implies the importance of DP in predicting future cash flows when firms report relatively high DP. The correlation analysis does not control for impact from other variables, our next section focuses on multiple regression analysis.

Regression Analysis

Total Accruals versus Accruals Components

Table 3 contrasts the effects of total accruals versus accruals components on future cash flows, future total accruals and future earnings. All regression controls the fixed effects from year and SIC two-digits industries. Total number of observations used in the regression is 32,011. In predicting next period cash flows, CFO_t has a coefficient of 0.807 and TAC_t has a coefficient of 0.201. When TAC_t is separated into its components including working capital accruals (WAC_t), depreciation accruals ($-DP_t$), negative special items (NSI_t) and other accruals (OAC_t), both the coefficient on CFO_t and the adjusted R^2 increased. More importantly, we observe a larger coefficient on WAC_t and negative coefficients on $–DP_t$ and NSI_t. This finding is consistent with Barth et al. (2001), Luo (2005) and Dechow and Ge (2006).

In predicting future accruals, CFO_t has a coefficient of 0.086 and TAC_t has a coefficient of 0.310. When TAC_t is separated into its components, the adjusted R^2 increased from 21.8% to 27.8%. However, the coefficient on CFO_t decreases from 0.086 to 0.052. Moreover, the coefficient that has the highest persistence is the one on -DP. Combining the relation between our independent variables to future CFO and future TAC will lead to the relation to future IB. The last column shows that the persistence of IB_t attributed to CFO_t is 0.893 and attributed to TAC_t is only 0.511. This result is consistent with the findings

from Sloan (1996) that accruals persist less than cash flows. When TAC_t is separated into components, the persistence of earnings attributable to CFO_t increased to 0.932 and the persistence of earnings attributable to the components are very different among them. The persistence of earnings attributable to WAC_t is 0.760, to $–DP_t$ is 1.016, to NSI_t is -0.176 and to OAC_t is 0.405.[17] The coefficient for $–DP_t$ is close to 1. This is comforting since most of firms use the straight-line method and if there is no growth, a '1' is the expected coefficient. A coefficient higher than 1 may reflect growth. This average may not apply to all samples, especially, firms reporting High DP are distinctly different from firms reporting Low DP as we have seen in our univariate analysis. To understand how the behavior of depreciation accruals differ between High DP and Low DP firms, we analyze the relation between current DP and four periods (t to t+3) of CFO, TAC and IB in the next section.

Effect of High Depreciation on Cash Flows, Accruals and Earnings

Depreciation represents managers' estimation of cost of consumption of long-term operating assets (LTOA). Ideally, depreciation should be matched perfectly with the economic benefits (e.g. cash flows) that the LTOA provides. Since the long-term depreciation schedule is normally determined when the LTOA is put in place initially, the matching can never be perfect due to uncertainty. The first column of Panel A in Table 4 reports the relation between current accruals components and current cash flows. If DP were successful in matching with CFO,[18] we should observe a negative relationship between –DP and CFO (i.e. higher depreciation leads to higher CFO).[19] However, the opposite is true. Specifically, coefficients on WAC, -DP, NSI and OAC are -0.620, 0.570, 0.710 and -0.067 respectively. Since our focus is on the behavior of depreciation accruals, we add an interaction variable of HDP and -DP in Panel B to assess the effect of high DP-to-Total-Assets on the informativeness of –DP.[20] We find the coefficient of –DP increases to 1.183 and the coefficient on HDP*-DP is significantly negative (-0.860). However, the sum of the coefficients on –DP and HDP*-DP (0.323) is still positive. This result implies that higher depreciation and amortization is associated with lower CFO, not a good matching; however, the mis-matching is smaller in magnitude for the High DP sample, hence, more effective in matching DP with CFO for the High DP sample.[21]

The second, third and fourth columns in Table 4 report results for predicting future CFO's. Since DP is related to current and past investment in LTOA, its impact on CFO can be long term, hence, we provide the relation between accruals to the future three year's CFO. The adjusted R^2 is around 60% in predicting period t+1's CFO, it reduces to around 40% in predicting period t+2's CFO and further reduce to around 27% in predicting period t+3's CFO. The prediction coefficient on CFO_t starts with a value of around 0.88 in predicting $CFO_{t+1,}$ reduces to around 0.78 in predicting CFO_{t+2} and further reduces to around 0.73 in predicting CFO_{t+3}. The signs of the prediction coefficients on all accruals components change from the first column and their magnitudes in general decrease from predicting t+1's COF to t+3's CFO except –DP.[22]

Panel A reports the coefficients on –DP are all significantly negative in predicting future CFO's and the magnitude increases from 0.175 in predicting CFO_{t+2} to 0.343 in predicting CFO_{t+2} and further increases to 0.487 in predicting CFO_{t+3}. Panel B reports negative coefficients on HDP*DP for period 1 and 2 but a positive (not significant) coefficient for period 3. Specifically, the effects of one dollar of DP on future three periods' cash flows for the Low DP sample are 0.130, 0.290 and 0.511 respectively; they are 0.192, 0.362 and 0.478 for the High DP sample respectively. These results suggest that HDP distinguish effects of DP on future cash flows only for two periods (t+1 and t+2). It is likely that the Low DP firms increase their investment and by the third year (t+3), the High DP and Low DP firms converge.

Table 5 extends Table 4 to predicting the total accruals (TAC). The first column focuses on the relation between $–DP_t$ and TAC_t. Panel A reports the coefficient on –DP is 1.484. Since $–DP_t$ is a component of TAC_t, the expected coefficient is 1; a larger than 1 coefficient implies that $–DP_t$ is positively associated with other accrual components.[23] Panel B adds the interaction variable of HDP*-DP_t, we observe that the coefficient on $–DP_t$ in relating to TAC_t becomes 1.782, much larger than 1, and the sum of coefficients on $–DP_t$ and HDP*-DP_t, i.e. for the High DP sample, is 1.363. In predicting future TAC's, the coefficients on $–DP_t$ continue to be high, they are 1.492, 1.821 and 1.481 for predicting period

t+1, t+2 and t+3's TAC respectively. However, the summed coefficients (i.e. effect of –DP for the High DP sample) are stable with a value of 1.079, 1.123 and 1.096 respectively.

To maintain a steady cash flow, DP is expected to persist at 1. Growth in investment will grow DP; on the other hand, higher recognition of DP in current year years will decrease recognition of DP in latter years, hence, decreases the persistence. Table 1 reports that the High DP sample has higher growth in PPEG/TA than the Low DP sample, this implies that DP shall grow more for the High DP sample. However, Table 1 also reports that the growth in DP is smaller for the High DP sample, which may be due to the reason that higher DP base tends to lead to a smaller growth ratio or the reason that higher recognized DP saves recognition of DP in the future.[24] Since we use sales to scale current and future DP in the regression analysis, the finding that the coefficient on -DP is milder for the High DP sample than for the Low DP sample may be mainly due to the reason that higher (lower) recognized DP saves (boost) recognition of DP in the future at least for period t+1 since High DP sample experience no lower growth in capital expenditure in current period.[25]

Table 6 reports results for predicting IB (i.e. earnings = CFO+TAC). Again, the first column reports the association between $–DP_t$ with current IB and the remaining columns report results for predicting the future three periods' IB. Panel A reports the coefficient on $–DP_t$ in predicting IB_t is 2.091. You will recall that Table 5 reports a relation between $–DP_t$ and TAC_t of 1.484, the difference of 0.607 comes from the relation between $–DP_t$ and CFO_t. The first column in Panel B reports that the coefficient on $–DP_t$ is 2.987 (for the Low DP sample) and the summed coefficient is 1.7 (for the High DP sample). Compare this with Table 5 which reveals that for the Low (High) DP sample, out of 2.987(1.7), 1.762(1.363) comes from the relation between $–DP_t$ and TAC_t and 1.225(0.337) comes from the relation between $–DP_t$ and CFO_t. Regardless relating $–DP_t$ to CFO_t or IB_t , these results imply that higher DP leads to lower profitability for the Low DP firm but less lower profitability for the High DP firms.

Similar to Table 4 and Table 5, the adjusted R^2 for predicting period t+1, t+2 and t+3 in Table 6 has a decreasing trend. For predicting CFO (Table 4), the adjusted R^2 reduces about 50% from period t+1 to t+2 and about 40% from period t+2 to t+3. For predicting TAC (Table 5), the adjusted R^2 reduces about 50% from period t+1 to t+2 and about 25% from period t+2 to t+3. Table 6 reports a decrease of about 50% from period t+1 to t+2 and about one third from period t+2 to t+3. This decreasing trend is expected since usefulness of current accounting information decreases through time. The decreasing trend should also be expected for the coefficients. We find in Panel A, all the accruals components have the decreasing trend except NSI. In Panel B, we find $–DP_t$ does not have a straightforward decreasing trend, the coefficient on $–DP_t$ actually increases from predicting period t+1's IB to predicting period t+2's IB (from 1.362 to 1.531) but reduces a great deal for predicting period t+3's IB (from 1.531 to 0.970). However, the summed coefficient (i.e. coefficients on $–DP_t$ and HDP*-DP_t) has a smooth decreasing trend (from 0.888 to 0.761 to 0.617). We do not know why the coefficient on $–DP_t$ increases for predicting period t+2's IB; however, the smooth behavior of $–DP_t$ for the High DP sample gives us comfort of the quality of –DP in predicting future profitability for the High DP sample.

The detailed analysis of the High DP versus the Low DP sample and the association of -DP and other accounting measures lead us to conclude that High DP firms (i.e. firms that have reported relatively high depreciation and amortization to total assets ratio in their industries) have the benefit of higher operating cash flow and higher growth in profitability; yet, their bottom-line earnings may not be high due to excessively high DP. However, they enjoy higher market return. Our next section continues to explore the effect of HDP and $–DP_t$ on market return using various models.

Effect of High Depreciation on Return

Various models and measures have been used to relate earnings and return. Table 7 continues to include year and industry dummies and reports the association between IB_t, IB_t's components: CFO_t and TAC_t, and TAC_t's components. Studies have shown that both the level and change in earnings should be included in evaluating return-earnings relation (e.g. Cheng, Liu and Schaefer, 1996); studies also show that conclusions are similar using either raw or abnormal return (Easton et al., 1992) in evaluating return-earnings relation. Since we focus on DP, which is related to long-term investment that in turn has effects

on risk, we report results for both return and abnormal return.[26] Since the models with level and change variables are more complete, our main results are based on models with both level and change variables included.[27] Table 7 reports the summed coefficients on the level and the change variables.

The dependent variable for the first major column is current raw return and for the second major column is current abnormal return. We report results for three models. The first model has IB_t only, the second model has CFO_t and TAC_t and the third model has CFO_t and the accruals components. As expected, the adjusted R^2 increases when earnings are more disaggregated. Refer to Panel A, all the dependent variables have significant positive coefficients. It is interesting to note that TAC has a higher coefficient than CFO (0.383 versus 0.212 or 0.449 versus 0.420). Recall that Table 3 reports that the persistence of earnings attributed to CFO_t is 0.893 (refer to the fifth column) and to TAC_t is only 0.511. Following Sloan (1996), the higher relation between TAC_t and return is consistent with the market over-pricing the accruals. However, when we evaluate the accruals components, we find the NSI has the highest coefficient in Table 7 (0.933 and 1.140 in Panel A for return and abnormal return respectively) but the earnings persistence attributed to NSI is negative (-0.176, as reported in the last column of Table 3). This is consistent with Dechow and Ge's (2006) finding that the market may have mis-priced special items. On the other hand, -DP has the highest prediction coefficient for IB_{t+1} (1.016), the coefficient on the relation between $-DP_t$ and abnormal return is 0.922, a much closer value. It is interesting to note that the coefficient on $-DP_t$ differs a great deal between regressions using return and abnormal return as the dependent variable (0.278 versus 0.922). The coefficients on CFO also differ (0.278 and 0.479), coefficients on other accruals components do not possess such a difference. These results imply that DP and CFO have a close relation to risk.

Panel B adds an interaction variable of HDP*-DP to every model. For raw return, this variable is only significant for the third model (the model with TAC components). However, it is significant for all models when abnormal return is used as the dependent variable. For the abnormal return, we can see that the market places a weight of 0.607 on $-DP_t$ while $-DP_t$ reports a higher coefficient in predicting IB_{t+1} (1.362 in Panel B Table 6); however, for the High DP firms, the market places a weight of 1.302 while $-DP_t$ reports a lower prediction coefficient (0.888, second column in Panel B Table 6). This can be explained that the market under-value depreciation accruals for the Low DP sample and over-valued depreciation accruals for the High DP sample. However, these results can also be viewed that lower persistence caused by $-DP_t$ is not a bad feature if it is due to excessive high recognition of DP.[28] The main goal of our paper is to show that High DP is useful to identify firms that are of superior performance and that due to higher DP, such firms will experience lower earnings persistence. Accordingly, the lower earnings persistence attributed to DP is not a bad characteristic. To confirm this argument, we predict that the High DP sample should enjoy a higher value-relevance of earnings. Higher value-relevance of earnings does not preclude mis-pricing, however, mis-pricing is out of the scope of our paper.[29]

Our detailed analysis of the High DP and Low DP sample characteristics and the relation between $-DP_t$ and other variables lead us to conclude that the HDP is a good firm aspect regardless of its potential effect on lower earnings and lower persistence of depreciation accruals. Our next section evaluates how the HDP affects the persistence and value-relevance of earnings.

Effect of High Depreciation on the Persistence and Value-Relevance of Earnings

Our results so far show that earnings persistence attributed to $-DP_t$ is less for the High DP sample; this will depress earnings persistence for the High DP sample. On the other hand, we have also shown that the High DP firms perform better in many aspects than the Low DP firms. We predict that the market shall place a higher valuation weight on earnings for the High DP firms. This prediction can be viewed from at least one perspective. Since the High DP firms reports higher DP that may bias earnings downward; accordingly, the market shall place a higher valuation weight on the biased-downward earnings even if the future profitability is similar between the High DP and the Low DP samples. Table 8 documents the effect of HDP on the persistence of earnings and the value-relevance of earnings.

Panel A reports the effect of HDP on IB in predicting next period IB (i.e. earnings persistence), current period return and abnormal return (i.e. value-relevance of earnings). The second column reports

that earnings persistence is -0.164 (the coefficient on HDP*IB) lower for the High DP firms. However, the value relevance of IB, as reflected by the sum of the coefficients on HDP*IB and HDP*ΔIB, is higher (0.163 and 0.189 when return and abnormal return are used as dependent variables respectively). Since High DP has different firm characteristics from Low DP firms, we also add various controls to check if the effect of High DP can be driven away by these characteristics. Panel B reports the results. For simplicity, we only report results for raw return; our results using abnormal return as the dependent variable are similar. The last column in Panel B shows that HDP has a positive effect on the relation between earnings and return even after the control of high sales growth, capital expenditure, beta, size and age of PPE.[30]

Robustness Tests and Additional Analysis

Fama-MacBeth Statistics

Cross-sectional correlation can inflate the t-statistics in pooled regression. Hence, we also conduct annual regression analysis and assess the significance of the Fama-MacBeth t-statistics (Fama and Macbeth, 1973). Panel A Table 9 reports results for the effect of HDP on the persistence and value-relevance of earnings. Comparing with Table 8, Table 9 reports lower adjusted R^2 when the dependent variable is IB_{t+1} and $Return_t$; however, the adjusted R^2 increases from 6.61% to 7.9% when the dependent variable is abnormal return. The magnitude of the coefficients tends to be larger. Most importantly, we continue find that High DP firms report a lower persistence of IB; however, the market places a higher valuation weight upon them.

Ignore Industry Dummies

Studies often ignore control for industry dummies. For comparison reasons, we provide results without industry dummies. Panel B reports results. Comparing Panel B and Panel A, the magnitudes of the coefficients are very similar. However, Panel B reports lower adjusted R^2, especially for the valuation models. The adjusted R^2 when IB_{t+1} is the dependent variable reduced from 50.2% to 48.7% (about 3% reduction). However, when return or abnormal return are used as the dependent variable, the adjusted R^2 is reduced about 50% (from about 8% to about 4%). These results reflect that average return is very different across industries. However, our fundamental conclusion is not affected by including or excluding the industry control.

Using Different Scalars

For our main regression analysis, we use sales as the scalar since its value (in principle) will not be affected by accounting methods. We also use per share basis in our cash flows and earnings prediction regression, we find the signs are similar to our main analysis but the t-statistics are often low due to large standard deviations of the independent variables. We also use beginning price as the scalar. Price may not be a good scalar since it may be affected by the degree of market efficiency. Panel C provides partial results. We still find that the High DP firms experience a lower persistence of IB (-0.093); however, the market places a higher valuation weight on them (0.063, significant only at 10% level one-tailed test). Earnings persistence attributable to –DP is less for the High DP firms (-0.155); however, the market places a higher valuation weight on –DP (0.861). When we use Fama-MacBeth statistics, results are similar for the earnings prediction equation but the value-relevance equations do not report significant coefficients. Since many factors may affect market behavior, the insignificance may be due to the instability across time.

Other Tests

We control for the scalar effect by adding a one over the scalar; our results do not change. We also run regression analysis for the High DP sample and Low DP sample separately. Our main conclusions remain.

CONCLUDING REMARKS

In assessing the behavior of accruals, literature focuses on either working capital accruals or total accruals and often assumes the behavior of working capital accruals applies to long-term accruals. Depreciation (and amortization) constitutes a major item of accruals for many firms. Its economic source is distinctly different from working capital accruals and should be evaluated separately from the working capital accruals. When firms grow investment, the sales will also grow. Accordingly, the long-term accrual will be smaller (due to large depreciation) but the working capital accruals shall be higher (due to increase in sales). In predicting future cash flows and earnings, these two types of accruals shall have different impacts if firms grow their investment. Especially, we expect that larger depreciation will depress earnings and earnings persistence; however, if the larger depreciation reflects superior underlying performance, value-relevance on earnings should be higher.

We design our study by first identifying two groups of firms, one group reports relatively high depreciation for five years (the High DP sample) and the other group reports the opposite (the Low DP sample). We contrast multiple performance measures and firm characteristics and find that the High DP firms are outperformers. We then assess if depreciation is related with higher future cash flows for the High DP firms. This positive aspect actually depresses earnings persistence. We further assess if depreciation persists lower in predicting future accruals for the High DP sample, we find this is the case. Again, the lower persistence depresses earnings persistence. Even though the High DP firms experience significantly lower earnings persistence, the market actually assigns a higher valuation weight on the earnings.

This paper identifies a case that lower earnings persistence or lower earnings persistence attributable to accruals is not necessarily a bad feature. Our methodology and findings may have implications for other accruals components. Assessing accruals quality has been a very important topic in recent research; an understanding of accruals properties will advance our research on this area.

ENDNOTES

1. The portfolio test has gained its popularity in recent mis-pricing literature (Desai et al.2004; Cheng and Thomas, 2006; Dechow and Ge, 2006)
2. In evaluating different models for measuring discretionary accruals, Xie (2001) report the Mishkin test and the portfolio tests are not always consistent.
3. We focus on depreciation and amortization (DP); we use depreciation as a general term.
4. Conservatism has been a desired feature for efficient contracting (Watts 2003a,b; Gigler and Hemmer, 2001; Chen, Hemmer and Zhang, 2007; Antle and Lambert, 1988; Kwon, Newman and Suh, 2001;Demski and Sappinton, 1990). Contracting theory implies that value of firms adopting conservative accounting reporting should be higher because conservatism enhances liquidation value and mitigates agency problems. Even if firm value is not affected by conservative accounting choice, one dollar of earnings should be valued more at the stage when earnings are biased downward.
5. There are other long-term accruals such as write-downs and deferred tax accruals; we focus our discussion on depreciation and amortization. In our empirical analysis, we will add other long-term accruals as control variables.
6. Dechow, Kothari and Watt (1998) provide a sales-driven working capital accrual process and illustrate how working capital accruals should relate to future cash flows. Barth, Cram and Nelson (2001) and Luo (2005) empirically document working capital accruals and long-term accruals (i.e., DP) possess differential weights in predicting future cash flows, but they are most silent on why such as relationship exist. From a theoretical point of view, DP as accounting cost allocation procedure should not relate to future cash flows, there should be no causal relationship between DP and future cash flows. On the other hand, if DP reflects future investment level or asset base, then it is reasonable to assume such a relationship can be observed. Several studies provide evidence that DP contain information regarding firms' investment prospects (Feltham and Ohlson, 1996; Ohlson and Aier, 2007; Chamber, Jennings and Thompson, 1999; Keating and Zimmerman, 2000).

7. Barth, Cram and Nelson (2001) find that depreciation (as expense) is positively correlated with future cash flows. In other words, depreciation accrual is negatively correlated with future cash flows.
8. Depreciation and amortization expenses reduce earnings, or alternatively speaking, it decreases accruals. In our paper, we use DP to represent the expenses and –DP to represent the accruals.
9. Guay (2006) mention "…the modeling of working capital accruals has received the most attention in the literature and, as a result, working capital accruals are better understood than long-term accruals. More accurate models of long-term accruals will likely improve the overall modeling of the accrual process…" (p.254).
10. Dutta and Reichelstein, 2002 term this perfect matching as "relative benefit depreciation" and report "A necessary condition for the relative benefit depreciation rule to coincide with straight line depreciation is that the project cash flows are declining over time…" (p.279). Even this condition is satisfied; it is very difficult to achieve the perfect matching in reality if not impossible.
11. Hribar and Collins (2002) suggest that cash flows and accruals generated from the statement of cash flows are more accurate. In contrast, cash flows and accruals derived from balance sheet are subject to errors during the process of divesture, merger & acquisition or foreign currency exchange.
12. We express depreciation and amortization (-DP) as negative accruals in this study, contrasting to Barth et al. (2001) who display DepAmort as positive expense. Hence, we need to put an opposite sign on the coefficients from regression when comparing our results with Barth et al.
13. We also use per share measure for some of our regressions, the results are more unstable; however, in general they agree with our key conclusions.
14. This is similar to Barth et al. (2001).
15. We group our firm year observations into High DP and Low DP samples. When we say High DP firms, we mean firms that have reported high DP for the previous five years at a specific year. The same firm can be categorized into Low DP firms in a different year.
16. Especially interesting is the significantly higher WAC and highly negative OAC for the Low DP sample. Higher WAC may be due to higher sales growth for the Low DP sample (as reported in Panel B). However, we cannot explain why the Low DP sample has highly negative OAC. This may deserve future research.
17. If we use the persistence coefficient to assess the quality of accruals, we will conclude that, on average, –DP has the highest quality and NSI has the lowest quality. The focus of our paper is not to contrast the quality of accruals components; however, our results may shed light on this issue.
18. CFO is supposed to be cash flows from operating, however, the current US GAAP is rather broad in defining 'operating activities'. For example, interest revenues/expenses are included in CFO. This may also obscure the matching relationship between DP and CFO.
19. Recall that the univariate analysis reported in Table 2, the relation between –DP and CFO is significantly negative for High DP sample but not for the Low DP sample.
20. We can add an interaction variable of HDP to all accounting variables, however, for simplicity, we only add the interaction variable for –DP. In the robustness check, we have conducted regression analysis for High DP and Low DP samples separately and our conclusions on -DP remain.
21. Note that the regression analysis controls for industry and year effects, the coefficient on –DP cannot be strictly used to assess effectiveness of matching, however, we can use the interaction variable (i.e. HDP*-DP) to assess matching effectiveness for the High DP sample relative to the Low DP sample.
22. It is interesting to see that the coefficient on WAC increases a bit in period t+2 but decreases a great deal in period t+3.
23. Table 2 reports that all accruals components are positively correlated.
24. Untabulated results report that High DP sample contains more firm observations that use accelerated accounting methods.
25. Recall that the High DP sample reports a higher mean of Capital Expenditure/TA, however, when we use Capital Expenditure/SA, the High DP sample experience a lower mean but a higher median.
26. Our abnormal return is market-model adjusted return. We also use market and size-adjusted return, results are similar but the coefficients on $-DP_t$ using these measures as the dependent variable are less different from the coefficient on $-DP_t$ using raw return as the dependent variable. These results may imply that using market return or size portfolio return as the expected return is not as precise as using the market-model coefficients to measure the expected return, especially if DP is highly related to risk.
27. We also use level only or change only variables, our main conclusion remains.

28. As discussed before that DP represents costs of using the LTOA, higher DP means higher costs (expenses) and less profit. In this regard, higher DP is not a good feature. However, if higher DP is higher than the real cost (which is hard to measure) of using LTOA, this excessiveness decreases current earnings but will increase future earnings. In this regard, higher DP is not a bad feature.
29. A crude analysis show that the market may have mis-priced the depreciation accruals, however, the degree of mispricing seems to be less for the High DP sample. We leave this to future research.
30. To be consistent with the HDP measure, we also use 0 and 1 to measure relatively low and high characteristics for each observation.

REFERENCES

Ahmed, A.S., Morton, R.M. & Schafer, T.F. (2000). Accounting conservatism and the valuation of accounting numbers: evidence of the Feltham-Ohlson (1996) model. *Journal of Accounting, Auditing & Finance* 15, 271-292.

Anctil, R.M. & Chamberlain, S. (2005). Determinants of the time series of earnings and implications for earnings quality. *Contemporary Accounting Research* 22, 483-517.

Antle, R. & Lambert, R. (1988). Accounting loss functions and induced preferences for conservatism. *In Economic Analysis of Information and Contracts*: *Essays in Honor of John. E. Butterworth.* Edited by G.A. Feltham, Amershi, A.H. & Ziemba, W.T. Boston: Kluwer.

Bagnoli, M. & Watts, S. (2005). Conservative Accounting Choice. *Management Scien*ce 51, 786-801.

Ball, R. & Brown, P. (1968). An empirical evaluation of accounting income numbers. *Journal of Accounting Research* 6, 159-178.

Ball, R. & Shivakumar, L. (2006). The role of accruals in asymmetrically timely gain and loss recognition. *Journal of Accounting Research* 44, 207-242.

Bao, B.H. & Bao, D.H. (2004). Income smoothing, earnings quality and firm valuation. *Journal of Business Finance & Accounting* 31, 1525-1557.

Beaver, W.H. & Dukes, R.E. (1972). Interperiod tax allocation, earnings expectations, and the behavior of security prices. *The Accounting Review* 47, 320-332.

Beaver, W.H. & Ryan, S. (2000). Biases and lags in book value and their effects on the ability of the book-to-market ratio to predict book return on equity. *Journal of Accounting Research* 38, 127-148.

Beaver, W.H. & Ryan, S. (2005). Conditional and unconditional conservatism: concepts and modeling. *Review of Accounting Studies* 10, 269-309.

Bowen, R., DuCharme, L. & Shores, D. (1995). Stockholders' implicit claims and accounting method choice. *Journal of Accounting and Economics* 20, 255-296.

Chamber, D., Jennings, R & Thompson II, R. (1999). Evidence on the usefulness of capital expenditures as an alternative measure of depreciation. *Review of Accounting Studies* 4, 169-195.

Chen, Q., Hemmer, T. & Zhang, Y. (2007). On the relation between conservatism in accounting standards and incentives for earnings management. *Journal of Accounting Research* 3, 541-567.

Cheng, C.S.A. & Thomas, W.B. (2006). Evidence of the abnormal accrual anomaly incremental to operating cash flows. *The Accounting Review* 81, 1151-1167.

Cheng, C. S. A., Liu, C.S. & Schaefer, T. (1996). Earnings permanence and the incremental information content of cash flows from operations. *Journal of Accounting Research* 34, 173-181.

Dechow, P. & Ge, W. (2006). The persistence of earnings and cash flows and the role of special items: implications for the accrual anomaly. *Review of Accounting Studies*11, 253-296.

Dechow, P. (1994). Accounting earnings and cash flows as measures of firm performance: the role of accounting accruals. *Journal of Accounting and Economics* 18, 3-42.

Dechow, P. M., Kothari, S.P. & Watts, R.L. (1998). The relation between earnings and cash flows. *Journal of Accounting and Economics* 25,133-168.

Dechow, P. M & Dichev, I. (2002). The quality of accruals and earnings: the role of accrual estimation errors. *The Accounting Review* 77, 35-59.

Demski, J. (1998). Performance measure manipulation. *Contemporary Accounting Research* 15, 261-285.
Demski, J. & Sappington, D. (1990). Fully revealing income statement measurement. *The Accounting Review* 65, 363-383.
Desai, H., Rajgopal, S. & Venkatachalam, M.(2004). Value-glamour and accruals mispricing: one anomaly or two? *The Accounting Review* 79, 355-385.
Dutta, S. & Reichelstein, S. (2002). Controlling investment decisions: depreciation and capital charges. *Review of Accounting Studies* 7, 253-281.
Easton, P. & Pae, J. (2004). Accounting conservatism and the relation between returns and accounting data. *Review of Accounting Studies* 9, 495-521.
Easton, P., Harris, T. & Ohlson, J. (1992). Aggregate accounting earnings can explain most of security returns: the case of long return intervals. *Journal of Accounting and Economics* 15, 119-142.
Fairfield, P., Whisenant, S. & Yohn, T. (2003). Accrued earnings and growth: implications for future profitability and market mispricing. *The Accounting Review* 78, 221-243.
Fama, E. & MacBeth, J. (1973). Risk, return, and equilibrium: empirical tests. *Journal of Political Economy* 81, 607-636.
Fama, E. & French, K. (1992). The cross-section of expected stock returns. *Journal of Finance* 47, 427-466.
Fama, E. & French, K. (1996). Multifactor explanations of asset pricing anomalies. *Journal of Finance* 51, 55-84.
Feltham, G. & Ohlson, J. (1995). Valuation and clean surplus accounting for operating and financial activities. *Contemporary Accounting Research* 11, 689-731.
Feltham, G. & Ohlson, J. (1996). Uncertainty resolution and the theory of depreciation measurement. *Journal of Accounting Research* 34, 209-234.
Francis, J., LaFond, R.Z., Olsson, P. & Schipper, K. (2004). Cost of capital and earnings attributes. *The Accounting Review* 79, 967-1010.
Ghosh, A., Gu, Z.Y. & Jain, P.C. (2005). Sustained earnings and revenue growth, earnings quality, and earnings response coefficients. *Review of Accounting Studies* 10, 33-57.
Gigler, F.B. & Hemmer, T. (2001). Conservatism, optimal disclosure policy and the timeliness of financial reports. *The Accounting Review* 76, 471-493.
Guay, W. & Sidhu, B. (2001). The usefulness of long-term accruals. *Abacus* 37, 110-131.
Guay, W. (2006). Discussion of the role of accruals in asymmetrically timely gain and loss recognition. *Journal of Accounting Research* 44, 243-255.
Hagerman, R. & Zmijewski, Z. (1979). Some economic determinants of accounting policy choice. *Journal of Accounting and Economics* 1, 141-38.
Jennings, R., Robinson, J., Thomposon II, R.B & Duvall, L. (1996). The relation between accounting goodwill numbers and equity values. *Journal of Business Finance & Accounting* 23, 513-533.
Keating, A.S. & Zimmerman, J.L. (2000). Depreciation-policy changes: tax, earnings management, and investment opportunity incentives. *Journal of Accounting & Economics* 28, 359-389.
Kormendi, R. & Lipe, R. (1987). Earnings innovations, earnings persistence, and stock returns. *Journal of Business* 60, 323-345.
Kraft, A., Leone, A. & Wasley, C. (2006). An analysis of the theories and explanations offered for the mispricing of accruals and accruals components. *Journal of Accounting Research* 44, 297-339.
Kwon, Y., Newman, P. & Suh, Y. (2001). The demand for accounting conservatism in management control. *Review of Accounting Studies* 6, 29-51.
Lakonishok, J., Shleifer, A. & Vishny. R. (1994). Contrarian investment, extrapolation, and risk. *Journal of Finance* 49, 1541-1578.
La Porta, R., Lakonishok, J., Shleifer, A & Vishny, A. (1997). Good news for value stocks: further evidence on market efficiency. *Journal of Finance* 52, 859-874.
Lev, B. (1983). Some economic determinants of the time series properties of earnings. *Journal of Accounting and Economics* 5, 31-38.

Lipe, R. (1986). The information contained in the components of earnings. *Journal of Accounting Research* 24, 37-68.
Luo, M. (2005). Do stock prices fully reflect information in operating cash flows? Working Paper, University of Illinois at Urbana-Champaign.
Mishkin, F. A. (1983). A rational expectations approach to macroeconomic: testing policy effectiveness and efficient markets models. Chicago, IL; University of Chicago Press.
Ohlson, J. & Aier, J. (2007). On the analysis of firms' cash flows. Working paper, Arizona State University.
Ohlson, J. & Penman, S. (1992). Disaggregated accounting data as explanatory variables for returns. *Journal of Accounting, Auditing & Finance* 7, 553-573.
Penman, S. & Zhang, X. (2002). Accounting conservatism, the quality of earnings and stock returns. *The Accounting Review* 77, 237-264.
Rayburn, J. (1986). The association of operating cash flow and accruals with security returns. *Journal of Accounting Research* 24, 112-133.
Ryan, S. (1991). Historical cost accrual methods and the role of book value and earnings in linear valuation models. *Journal of Accounting, Auditing & Finance* 6, 257-287.
Richardson, S., Sloan, R., Soliman, M. & Tuna, I. (2006). The implications of accounting distortions and growth for accruals and profitability. *The Accounting Review* 81, 713-743.
Shroff, P.K. (1999). The variability of earnings and non-earnings information and earnings prediction. *Journal of Business Finance & Accounting* 26, 863-882.
Skinner, D. (1993). The investment opportunity set and accounting procedure choice: preliminary evidence. *Journal of Accounting and Economics* 16, 407-445.
Sloan, R. (1996). Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review* 71, 289-315.
Thomas, J. & Zhang, H. (2002). Inventory changes and future returns. *Review of Accounting Studies* 7, 163-187.
Tucker, J.W. & Zarowin, P.A. (2006). Does income smoothing improve earnings informativeness? *The Accounting Review* 81, 251-270.
Watts, R.L. (2003a). Conservatism in accounting part I: explanations and implications. *Accounting Horizons* 17(3), 207-221.
Watts, R.L. (2003b). Conservatism in Accounting Part II: evidence and research opportunities. *Accounting Horizons* 17(4), 287-301.
Xie, H. (2001). The mispricing of abnormal accruals. *The Accounting Review* 76, 357-373.

ACKNOWLEDGEMENT

We appreciate comments of participants in workshops at the University of Houston, Louisiana State University, Peking University and the First Research Camp on The Role of Financial Reporting in Firm Valuation at the Concordia University, especially Andrew Christie, Thomas Hemmer, Ole-Kristian Hope, Jeong-Bon Kim, Michel Magnan, Claudine Mangen, James Ohlson, Ken Reichelt, Lynn Rees, Joshua Ronen, Liyan Wang, George Wilson, and Liansheng Wu.

TABLE 1
DESCRIPTIVE STATISTICS

	High DP Sample		Low DP Sample		Differences	
	Mean	Std	Mean	Std	Mean	
Panel A: Distribution of Key Variables Used in Regression						
IB_t/SA	-0.020	0.259	-0.030	0.378	0.010	***
CFO_t/SA	0.062	0.218	0.030	0.300	0.032	***
TAC_t/SA	-0.082	0.180	-0.060	0.243	-0.022	***
WAC_t/SA	0.011	0.084	0.021	0.134	-0.010	***
$-DP_t/SA$	-0.070	0.078	-0.046	0.065	-0.024	***
$-WDown_t/SA$	-0.018	0.057	-0.019	0.068	0.001	***
OAC_t/SA	-0.005	0.121	-0.016	0.172	0.011	***
Return	0.169	0.587	0.152	0.633	0.017	**
Abnormal Return	0.030	0.637	-0.013	0.615	0.043	***
Panel B: Distribution of Firm Characteristics and Growth Variables						
Market Value (in billions)	1.618	16.706	1.296	8.995	0.322	***
Total Assets (in billions)	1.386	6.693	1.083	4.159	0.303	*
Market Beta	1.070	0.781	1.038	0.770	0.032	***
Debt/Equity	0.532	0.276	0.484	0.264	0.048	***
Book-to-Market	0.623	0.824	0.653	0.774	-0.030	**
ROA ($=IB_t/TA_{t-1}$)	0.007	0.205	0.020	0.250	-0.013	***
PPEG/TA	0.654	0.376	0.395	0.324	0.259	***
PPEAge (=PPEG/Accumulated Dep)	2.426	1.514	3.396	2.878	-0.970	***
Capital Expenditure/TA	0.072	0.062	0.054	0.059	0.018	***
Growth in Sales	0.093	0.247	0.140	0.359	-0.047	***
Growth in Total Assets	0.068	0.322	0.133	0.435	-0.064	***
Growth in PPEG	0.077	0.296	0.167	0.466	-0.090	***
Growth in Capital Exp	0.258	1.168	0.432	1.531	-0.174	***
Growth in IB_{t+1}	0.045	3.543	-0.001	3.535	0.046	***
Growth in CFO_{t+1}	0.489	3.555	0.419	4.152	0.071	*
Growth in DP_{t+1}	0.076	0.393	0.223	0.625	-0.147	***

High DP (Low DP samples) contain firm year observations that have reported a relative large (small) depreciation and amortization in its SIC2 industry continuously for five years (include current year). For our basic sample (accounting information only), the High (Low) DP sample has a sample size of 16277 (15744). For return-restricted sample, the sample size is reduced to 15239 (14587). For abnormal return-restricted sample, the sample size is further reduced to 13125 (9362). PPEG is gross PPE.

TABLE 2
CORRELATION ANALYSIS

Panel A: High DP Sample

	IBt	IB_{t+1}	IB_{t+2}	IB_{t+3}	CFO_t	CFO_{t+1}	CFO_{t+2}	CFO_{t+3}	WAC_t	$-DP_t$	NSI_t	OAC_t
IB_t/SA_t		0.626	0.362	0.358	0.672	0.554	0.335	0.312	0.131	**0.244**	0.423	0.310
IB_{t+1}/SA_t	0.668		0.535	0.371	0.550	0.652	0.441	0.372	0.020#	**0.170**	0.134	0.080#
IB_{t+2}/SA_t	0.521	0.677		0.376	0.337	0.430	0.604	0.431	0.039	**0.094**	0.075	-0.005#
IB_{t+3}/SA_t	0.465	0.533	0.675		0.286	0.333	0.325	0.486	0.043	**0.105**	0.073	0.058#
CFO_t/SA_t	0.619	0.528	0.436	0.388		0.718	0.511	0.464	-0.252	**-0.191**	0.166	-0.131
CFO_{t+1}/SA_t	0.532	0.653	0.543	0.457	0.660		0.639	0.538	-0.009#	**-0.239**	0.094	-0.026#
CFO_{t+2}/SA_t	0.490	0.564	0.662	0.551	0.603	0.687		0.654	0.020#	**-0.269**	0.066	-0.106
CFO_{t+3}/SA_t	0.473	0.527	0.583	0.666	0.573	0.640	0.711		0.004#	**-0.264**	0.037	-0.045#
WAC_t/SA_t	0.178	0.067	0.034	0.026	-0.292	0.018#	0.009#	0.012#		**0.038**	0.103	-0.095
$-DP_t/SA_t$	*0.032#*	*-0.017#*	*-0.053*	*-0.063*	*-0.338*	*-0.331*	*-0.334*	*-0.321*	*0.046*		**0.129**	**0.076**
NSI_t/SA_t	0.367	0.153	0.111	0.108	0.137	0.091	0.089	0.082	0.108	*0.107*		-0.095
OAC_t/SA_t	-0.039	-0.030	-0.031	-0.025	-0.167	-0.115	-0.114	-0.100	-0.139	*0.091*	-0.213	

High DP sample contains firm year observations that have reported a relative large depreciation and amortization in its two-digit SIC industry continuously for five years (include current year).
All coefficients are significant at 5% level, except # indicates not significant.
Left lower corner of Panel B reports average Spearman correlation coefficients, upper right corner reports average Pearson correlation coefficients. Underline indicates inconsistent sign between Spearman and Pearson coefficients.
CFO_T (where T=t,t+1 ...t+3) is cash flows from operation ((#308 - #124) for period T. IB_T (where T=t,t+1 ...t+3) is income before extraordinary item (#18) for period T. WAC_t is working capital accruals: – (#302 + #303 + #304 + #305). $-DP_t$ is negative depreciation and amortization (#14).
NSI_t is negative special items (#17), it equals zero when special item is positive. OAC_t is other accruals = (IB-CFO)-WAC+DP-NSI .
Note that all accounting variables are scaled by current sales (SA_t)

TABLE 2
CORRELATION ANALYSIS (CONT.)

Panel B: Low DP Sample

	IBt	IB_{t+1}	IB_{t+2}	IB_{t+3}	CFO_t	CFO_{t+1}	CFO_{t+2}	CFO_{t+3}	WAC_t	$-DP_t$	NSI_t	OAC_t
IB_t/SA_t		0.703	0.484	0.385	0.691	0.612	0.485	0.396	0.155	**0.335**	0.387	0.370
IB_{t+1}/SA_t	0.700		0.666	0.494	0.597	0.735	0.624	0.531	0.068	**0.292**	0.156	0.172
IB_{t+2}/SA_t	0.539	0.697		0.625	0.422	0.532	0.606	0.511	0.024#	**0.228**	0.103	0.112
IB_{t+3}/SA_t	0.461	0.545	0.692		0.343	0.416	0.497	0.596	0.006#	**0.157**	0.094	0.072
CFO_t/SA_t	0.601	0.531	0.441	0.392		0.718	0.573	0.504	-0.294	**0.027**#	0.161	-0.057#
CFO_{t+1}/SA_t	0.529	0.630	0.543	0.461	0.632		0.749	0.627	0.006#	**-0.007**#	0.106	-0.002#
CFO_{t+2}/SA_t	0.486	0.552	0.629	0.548	0.558	0.641		0.753	0.029#	**-0.059**#	0.070	0.005#
CFO_{t+3}/SA_t	0.451	0.512	0.553	0.631	0.514	0.567	0.638		-0.010#	**-0.109**	0.054	-0.014#
WAC_t/SA_t	0.164	0.049	0.001#	0.004#	-0.380	-0.049	-0.027!	-0.027!		**0.081**	0.085	-0.120
$-DP_t/SA_t$	*0.040*#	*0.013*#	*-0.019*#	*-0.053*	*-0.228*	*-0.233*	*-0.251*	*-0.260*	*0.068*		**0.167**	**0.105**
NSI_t/SA_t	0.312	0.145	0.103	0.083	0.089	0.052	0.044	0.052	0.090	*0.135*		-0.076
OAC_t/SA_t	0.010#	0.008#	0.026#	0.012#	-0.140	-0.094	-0.075	-0.074	-0.129	*0.114*	-0.193	

Low DP sample contains firm year observations that have reported a relatively small depreciation and amortization in its 2-digit SIC industry continuously for five years (include current year).

All coefficients are significant at 5% level, except # indicates not significant, ! Indicates significant at 10% level.

Left lower corner of Panel B reports average Spearman correlation coefficients, upper right corner reports average Pearson correlation coefficients. Underline indicates inconsistent sign between Spearman and Pearson coefficients.

CFO_T (where T=t,t+1 ...t+3) is cash flows from operation ((#308 - #124) for period T. IB_T (where T=t,t+1 ...t+3) is income before extraordinary item (#18) for period T. WAC_t is working capital accruals: – (#302 + #303 + #304 + #305). $-DP_t$ is negative depreciation and amortization (#14).

NSI_t is negative special items (#17), it equals zero when special item is positive. OAC_t is other accruals = (IB-CFO)-WAC+DP-NSI .

Note that all accounting variables are scaled by current sales (SA_t)

TABLE 3
RELATION TO FUTURE CASH FLOWS, ACCRUALS AND EARNINGS – AGGREGATE VERSUS ACCRUAL COMPONENTS

Panel A: Pooled Analysis with Industry and Year Dummies

	Predicting CFO_{t+1}		Predicting TAC_{t+1}		Predicting $Earnings_{t+1}$	
Adjusted R^2	57.5%	60.5%	21.8%	27.8%	55.53%	58.08%
CFO_t	0.807 ***	0.880 ***	0.086 ***	0.052 ***	0.893 ***	0.932 ***
TAC_t	0.201 ***		0.310 ***		0.511 ***	
WAC_t		0.595 ***		0.154 ***		0.750 ***
$-DP_t$		-0.175 ***		1.191 ***		1.016 ***
NSI_t		-0.197 ***		0.021		-0.176 ***
OAC_t		0.167 ***		0.238 ***		0.405 ***

An intercept and 65 industry intercept dummies added into the regression, however we do not report them. ***1% significance two tails; **5% significance two tails; *10% significance two tails; !10% significance one-tail.

TABLE 4
RELATION TO CASH FLOWS – CURRENT AND FUTURE THREE PERIODS

Panel A: Without Control for High DP Observations								
	CFO_t		CFO_{t+1}		CFO_{t+2}		CFO_{t+3}	
N	32.011		32.011		28.003		24.435	
Adjusted R^2	19.4%		60.5%		40.2%		27.1%	
CFO_t			0.880	***	0.779	***	0.727	***
WAC_t	-0.620	***	0.595	***	0.609	***	0.411	***
$-DP_t$	0.570	***	-0.175	***	-0.343	***	-0.487	***
NSI_t	0.710	***	-0.197	***	-0.173	***	-0.154	***
OAC_t	-0.067	***	0.167	***	0.104	***	0.152	***
Panel B: With Control for High DP Observations								
Adjusted R^2	21.5%		60.6%		40.2%		27.1%	
CFO_t			0.878	***	0.777	***	0.728	***
WAC_t	-0.624	***	0.594	***	0.608	***	0.412	***
$-DP_t$	**1.183**	***	**-0.130**	***	**-0.290**	***	**-0.511**	***
NSI_t	0.662	***	-0.199	***	-0.175	***	-0.153	***
OAC_t	-0.091	***	0.166	***	0.102	***	0.153	***
$HDP*-DP_t$	-0.860	***	-0.062	***	-0.072	**	0.032	
$-DP_t+HDP*-DP_t$	**0.323**	***	**-0.192**	***	**-0.362**	***	**-0.478**	***

An intercept and 65 industry intercept dummies added into the regression, however we do not report them. ***1% significance two tails; **5% significance two tails; *10% significance two tails; !10% significance one-tail.

TABLE 5
RELATION TO TOTAL ACCRUALS – CURRENT AND FUTURE THREE PERIODS

Panel A: Without Control for High DP Observations								
	TAC_t		TAC_{t+1}		TAC_{t+2}		TAC_{t+3}	
N	32.011		32.011		28.003		24.435	
Adjusted R^2	26.3%		27.8%		13.4%		10.3%	
CFO_t			0.052	***	0.112	***	0.010	
WAC_t			0.154	***	0.139	***	0.103	***
$-DP_t$	1.484	***	1.191	***	1.309	***	1.197	***
NSI_t			0.021		-0.124	***	0.106	***
OAC_t			0.238	***	0.204	***	-0.003	
Panel B: With Control for High DP Observations								
Adjusted R^2	27.0%		28.5%		14.2%		10.5%	
CFO_t			0.039	***	0.092	***	0.000	
WAC_t			0.145	***	0.123	***	0.095	***
$-DP_t$	**1.762**	***	**1.492**	***	**1.821**	***	**1.481**	***
NSI_t			0.007		-0.149	***	0.088	**
OAC_t			0.225	***	0.182	***	-0.015	
$HDP*-DP_t$	-0.399	***	-0.413	***	-0.698	***	-0.385	***
$-DP_t+HDP*-DP_t$	**1.363**	***	**1.079**	***	**1.123**	***	**1.096**	***

An intercept and 65 industry intercept dummies added into the regression, however we do not report them. ***1% significance two tails; **5% significance two tails; *10% significance two tails; !10% significance one-tail.

TABLE 6
RELATION TO EARNINGS –CURRENT AND FUTURE THREE PERIODS

Panel A: Without Control for High DP Observations								
	IB_t		IB_{t+1}		IB_{t+2}		IB_{t+3}	
N	32.011		32.011		28.003		24.435	
Adjusted R^2	19.7%		58.1%		28.8%		19.7%	
CFO_t			0.932	***	0.891	***	0.738	***
WAC_t			0.750	***	0.748	***	0.514	***
$-DP_t$	2.091	***	1.016	***	0.967	***	0.710	***
NSI_t			-0.176	***	-0.297	***	-0.048	
OAC_t			0.405	***	0.308	***	0.149	***
Panel B: With Control for High DP Observations								
Adjusted R^2	22.8%		58.4%		29.4%		19.8%	
CFO_t			0.917	***	0.868	***	0.728	***
WAC_t			0.739	***	0.731	***	0.507	***
$-DP_t$	**2.987**	***	**1.362**	***	**1.531**	***	**0.970**	***
NSI_t			-0.193	***	-0.324	***	-0.064	!
OAC_t			0.391	***	0.284	***	0.138	***
HDP^*-DP_t	-1.286	***	-0.474	***	-0.770	***	-0.353	***
$-DP_t+HDP^*-DP_t$	**1.700**	***	**0.888**	***	**0.761**	***	**0.617**	***

An intercept and 65 industry intercept dummies added into the regression, however we do not report them. ***1% significance two tails; **5% significance two tails; *10% significance two tails; !10% significance one-tail.

TABLE 7
RELATION TO CURRENT RETURN

	Return$_t$			Abnormal Return$_t$		
Panel A: Without Control for High DP Observations						
N	29.440	28.202	25.280	22.446	21.514	19.286
Adjusted R^2	8.8%	9.0%	10.1%	6.4%	7.06%	8.45%
IB_t	0.302 ***			0.345 ***		
CFO_t		0.212 ***	0.278 ***		0.420 ***	0.479 ***
TAC_t		0.383 ***			0.449 ***	
WAC_t			0.550 ***			0.585 ***
$-DP_t$			0.278 ***			0.922 ***
NSI_t			0.933 ***			1.140 ***
OAC_t			0.274 ***			0.300 ***
Panel B: With Control for High DP Observations						
Adjusted R^2	9.0%	9.3%	10.1%	6.8%	7.27%	8.68%
IB_t	0.329 ***			0.366 ***		
CFO_t		0.263 ***	0.281 ***		0.424 ***	0.484 ***
TAC_t		0.407 ***			0.455 ***	
WAC_t			0.554 ***			0.592 ***
$-DP_t$			**0.165 !**			**0.607 *** **
NSI_t			0.933 ***			1.125 ***
OAC_t			0.274 ***			0.294 ***
HDP^*-DP_t	0.040	-0.022	0.286 **	0.554 ***	0.523 ***	0.695 ***
$-DP_t+HDP^*-DP_t$			**0.451 *** **			**1.302 *** **

An intercept and 65 industry intercept dummies added into the regression, however we do not report them. ***1% significance two tails; **5% significance two tails; *10% significance two tails; !10% significance one tail.

TABLE 8
EARNINGS PERSISTENCE AND VALUE-RELEVANCE OF EARNINGS – EFFECT OF HDP

Panel A: The Persistence and Value-Relevance of Earnings - Without Control for Other Effects

	IB_{t+1}				$Return_t$				Abnormal $Return_t$			
N	32.011		32.011		29.440		29.440		22.446		22.446	
Adjusted R^2	52.3%		52.8%		8.8%		8.9%		6.43%		6.61%	
ΔIB_t+IB_t	0.744	***	0.797	***	0.302	***	0.247	***	0.345	***	0.269	***
$HDP*(\Delta IB_t+IB_t)$			-0.164	***			0.163	***			0.189	***

Panel B: Value-Relevance of Earnings - With Control for Other Effects

	$Return_t$											
N	29.103		29.030		22.401		29.440		29.145		21.814	
Adjusted R^2	9.2%		9.0%		10.8%		9.2%		8.94%		11.46%	
ΔIB_t+IB_t	0.245	***	0.216	***	0.386	***	0.212	***	0.315	***	0.463	***
$HDP*(\Delta IB_t+IB_t)$	**0.134**	***	**0.148**	***	**0.210**	***	**0.145**	***	**0.150**	***	**0.139**	***
$HSG*(\Delta IB_t+IB_t)$	0.105	***									0.072	**
$HCapExp*(\Delta IB_t+IB_t)$			0.094	***							0.070	**
$HBeta*(\Delta IB_t+IB_t)$					-0.155	***					-0.229	***
$HSize*(\Delta IB_t+IB_t)$							0.425	***			0.565	***
$HPPEAge*(\Delta IB_t+IB_t)$									-0.101	***	-0.217	***

An intercept and 65 industry intercept dummies added into the regression, however we do not report them. ***1% significance two tails; **5% significance two tails; *10% significance two tails; !10% significance one-tai

TABLE 9
ROBUSTNESS TESTS AND ADDITIONAL ANALYSIS

Panel A: Fama-MacBeth Cross-sectional Regressions (average of 17 years)

	With Industry Dummies		
	IB_{t+1}	$Return_t$	Abn. $Return_t$
Adjusted R^2	50.2%	8.0%	7.9%
Intercept	0.003	0.100 !	0.055
ΔIB_t+IB_t	0.784 ***	0.390 ***	0.427 ***
$HDP*(\Delta IB_t+IB_t)$	-0.172 ***	0.226 **	0.311 ***

Panel B: Fama-MacBeth Cross-sectional Regressions (average of 17 years)

	Without Industry Dummies		
	IB_{t+1}	$Return_t$	Abn. $Return_t$
Adjusted R^2	48.7%	4.1%	4.1%
Intercept	0.003	0.163 ***	0.008
ΔIB_t+IB_t	0.791 ***	0.400 ***	0.440 ***
$HDP*(\Delta IB_t+IB_t)$	-0.174 ***	0.223 **	0.332 ***

Panel C: Use Beginning Price as the Scalar

	IB_{t+1}		Abnormal $Return_t$	
N	29.250	29.030	22.347	19.064
Adjusted R^2	0.196	0.249	0.112	0.183
ΔIB_t+IB_t	0.457 ***		0.629 ***	
$HDP*(\Delta IB_t+IB_t)$	-0.093 ***		0.063 !	
CFO_t		0.591 ***		1.403 ***
WAC_t		0.490 ***		1.328 ***
$-DP_t$		0.850 ***		-0.011
NSI_t		0.048 ***		0.268 ***
OAC_t		0.339 ***		0.610 ***
$HDP*-DP_t$		-0.155 ***		0.861 ***

An intercept and 65 industry intercept dummies added into the regression, however we do not report them.
***1% significance two tails; **5% significance two tails; *10% significance two tails; !10% significance one-tail.