Accounting Conservatism, Earnings Quality, and Stocks Mispricing

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DECLARATION

I, Batool Abdeldayem, declare that this thesis titled, "Accounting Conservatism, Earnings Quality, and Stocks Mispricing" and the work presented in it are my own and that appropriate credit has been given where reference has been made to the work of others.

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institutes of learning.

Batool Abdeldayem

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ABSTRACT

In this thesis, I investigate the relationship between conservatism and earnings quality and its consequences on stock pricing. The principle of conservatism plays a vital role in dealing with uncertainties in recognizing accounting transactions. Past literature emphasizes the important role of accounting conservatism in contracting, litigation, taxation, and regulatory environment. However, few studies attempted to explore the effect of accounting conservatism on the equity market. In this thesis, I provide evidence on how the relationship between conservatism and earnings attributes affects stock pricing in three pieces of empirical work.

First, I investigate the effect of accounting conservatism on earnings quality using investors' reaction to earnings news. To do so, I study the effect of accounting conservatism on the short-window returns and the long-window returns after earnings announcements. I find that, conditional on earnings surprise, higher accounting conservatism results in both a higher short-window earnings response (ERC) and a higher subsequent long-window earnings response (a larger post-earnings announcement drift (PEAD)). The results indicate that investors cannot understand the characteristics of earnings affected by accounting conservatism and need longer time to assimilate these earnings. My unified test complements the existing literature on studying the value relevance of conservative earnings by examining not only the short-term earnings response coefficient (e.g. D'Augusta et al. 2016) but also the PEAD, as I show that the use of PEAD can differentiate the information quality of conservative earnings that cannot be done when ERC alone is studied.

Second, I study the effect of accounting conservatism on investors' expectation errors. I find that high (low) conservatism stocks have higher (lower) returns on earnings announcement days compared to non-announcement days. This asymmetric effect cannot

be explained by changes in risk on announcement days, but can be explained by stock mispricing. That is, when forming their expectation, investors form downward (upward) expectations about high (low) conservative companies, which results in an upward (downward) price correction when earnings are released. In addition, I find that conservatism amplifies the expectation error of the other mispricing factors. This research is the first to find such a piece of evidence.

Third, I examine the role of conservatism in mispricing the growth of long-term assets. I show that asset write-downs decrease earnings persistence and result in stock mispricing. The higher the write-downs, the less the persistence of earnings and the larger stock underpricing. The results indicate that a significant portion of mispricing long-term assets' growth is attributed to accounting conservatism. This study extends Fairfield et al. (2003) and Richardson et al. (2005), who find that investors misprice the growth in long-term assets, by finding that asset write-downs are a major cause of long-term assets mispricing.

Overall, this research provides further evidence that accounting conservatism affects the capital market and leads to post-earnings announcement drift and mispricing. The source of such information inefficiency seems to be originated in the effect of conservatism on earnings continuity. Investors do not fully understand the nature of the conservatism practice and incorrectly extrapolate earnings, which leads to mispricing.

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1 INTRODUCTION

"Bias in estimating components of earnings, whether overly conservative or unconservative, usually influences the timing of earnings or losses rather than their aggregate amount. As a result, unjustified excesses in either direction may mislead one group of investors to the possible benefit or detriment of others". (FASB, 1980, paragraph 96).

This quote from the Financial Accounting Standards Board (FASB) shows that overly conservative earnings can have the same negative consequences on investors as aggressive (non-conservative) earnings. The following thesis is primarily motivated by the role of accounting conservatism in the equity markets. It examines the potential effect of accounting conservatism/aggressiveness on investors' use of earnings in three contexts: market reaction to earnings news, expectation error, and long-term accruals mispricing. It consists of three essay-style chapters in Chapters 2, 3, and 4.

1.1 Research background and motivation

Conservatism imposes more verification on gains than on losses which results in timely recognition of losses and delayed recognition of gains (Basu, 1997). Conservatism has increased over time (Givoly and Hyan, 2000; Ball et al., 2003; Bandyopadhyay et al., 2010), which renews the debate on whether it is a desirable characteristic of financial reports. In the past 25 years, especially after the work of Basu (1997), a considerable number of studies have examined the impact and the consequences of accounting conservatism in different settings. While prior literature suggests that conservatism is useful for debt holders and for contracting purposes (Ahmed et al., 2002, Watts, 2003a; Beatty et al., 2008, Zhang, 2008), its effect on the equity market and investors' valuation is still debated (Dechow et al., 2010; Garcia Lara et al., 2014; D'Augusta et al., 2016). In fact,

standard setters have been working to walk away from conservatism toward neutrality, suggesting that conservatism provides biased information to investors (Watts, 2003a; Mora and Walker, 2015).

The FASB's Conceptual Framework emphasizes the qualitative characteristics of accounting information that are needed to make the financial information useful. Nonetheless, according to the same conceptual framework conservatism can introduce bias into financial reporting and conflicts with significant qualitative characteristics, like representational faithfulness, neutrality, and comparability (including consistency). This means that such bias generated from conservatism can produce financial information that is not useful to investors as decision-makers. Consistent with this sentiment, the International Accounting Standards Board (IASB) and FASB issued a revision of the two sections of the Conceptual Framework in 2010, and the Chapter on Qualitative Characteristics does not include prudence (conservatism).[1] This opinion of standard setters is consistent with some earlier research suggesting that the lack of timeliness resulted from conservatism has adverse consequences on the usefulness of accounting information (Collins et al., 1994; Ryan and Zarowin, 2003; Bandyopadhyay et al., 2010). Such contrary claims make it necessary for further research on the consequences of conservatism on the stock market and the informational environment (Ruch and Tylor, 2015; Mora and Walker, 2015).

A few studies have been conducted that address this gap, especially after the year 2010. Garcia Lara et al. (2011) find that conservatism decreases the cost of capital, while Francis et al. (2004) find no conclusive evidence that conservatism affects the cost of equity. Balachandran and Mohanram (2011) find that unconditional conservatism increases the

[1] In 2018, the IASB clarify the role of prudence (conservatism) in their conceptual framework and states that "*Neutrality is supported by the exercise of prudence. Prudence is the exercise of caution when making judgements under conditions of uncertainty. Prudence does not allow for overstatement or understatement of assets, liabilities, income or expenses*." This shows that conservatism should be applied with cautious so it does not overstate or understate income statements or balance sheet accounts.

value relevance of accounting information. Kim et al. (2013) find that conservatism results in a less negative reaction to seasonal equity offering (SEO). Francis et al. (2013) find a positive relationship between conservatism and stock returns during the global financial crisis period. Garcia Lara et al. (2014) find that conservatism increases the analysts' forecast accuracy. Kim and Zhang (2016) find that conditional conservatism is associated with a lower likelihood of a firm's future stock price crashes. D'Augusta and DeAngelis (2020) find that conservatism constrains upward tone management (UTM) in the Management's Discussion and Analysis (MD&A) portion of the 10-K filing. Overall, these studies show that conservatism has a positive impact on the equity market and firm value. On contrary, other studies controvert these arguments and show that conservatism is not beneficial to equity holders. For example, Lev and Zarowin (1999) argue that the decline in value relevance is attributed to firms with increasing R&D intensity (unconditional conservatism). Mensah et al. (2004) find that higher conservatism results in higher forecasting error and forecast dispersion. Similar results are reported by Helbok and walker (2004) and Pae and Thornton (2010). Monhan (2005) shows that the conservative treatment of R&D in firms with high R&D growth results in a bias in the estimated values derived from the residual income valuation model. Chan et al. (2009) find that conditional conservatism increases the cost of capital. Chen et al. (2014) find that pricing multiples on more conservative earnings are smaller than pricing multiples on less conservative earnings.

However, these studies do not examine how investors react to earnings disclosure with different levels of conservatism. This is a key issue in market-based accounting research since the goal of financial reporting is to provide useful information for the users of financial reports. The failure to produce useful information that is neutral and consistent will affect investors' ability to take the right decision at the right time and leads to stock mispricing, as an example.

In this thesis, I focus on shareholders as the main users of financial statements, and how their reaction to earnings disclosures is impacted by accounting conservatism. I mainly argue that accounting conservatism affects earnings persistence and makes it difficult for shareholders to understand the time-series characteristics of these earnings. I examine how accounting conservatism affects the speed at which investors incorporate earnings information into stock prices, how conservatism leads to expectation errors and stock mispricing, and finally how the conservative procedure of "assets write-down" increases the mispricing of long-term accruals. Although the essays are independent, yet the concept of accounting conservatism and asset pricing keeps a coherent theme across all chapters.

1.2 Types of accounting conservatism

Past literature differentiates between two types of accounting conservatism: conditional and unconditional conservatism. Conditional conservatism, also known as ex-post conservatism, is defined as writing down the book value of assets under negative circumstances but not writing them up under positive ones, i.e. news dependent (Beaver and Ryan, 2005). Examples of conditional conservatism include building allowances for doubtful debts and "the lower of cost or market (LMC)" inventory valuation method. Differently, unconditional conservatism, also known as ex-ante conservatism, is defined as the application of conservative accounting practices in the measurement and evaluation of assets and liabilities, which results in unrecorded goodwill, i.e., news independent (Beaver and Ryan, 2005). An example of unconditional conservatism is the direct expense on R&D under GAAP.

In the first two essays, no differentiation is made between conditional and unconditional conservatism, and the measurements in use capture both types of conservatism, or total conservatism. According to Khan and Watts (2009), '*Labelling one as unconditional and the other as conditional emphasizes the mechanics used to identify conservatism, not the*

fundamental cause of the conservatism' P135. Besides, unconditional conservatism pre-empts conditional conservatism and the association between the two is negative (Ryan, 2006). However, in the third essay, asset write-downs fit the definition of conditional conservatism as write-downs happen after a deterioration in the future cash flow of the asset is confirmed. Therefore, the third essay captures conditional conservatism in evaluating long-term assets.

1.3 Measuring accounting conservatism

Prior literature has not identified one single and ideal firm-level measure of conservatism. However, the main measures of accounting conservatism include; 1) the asymmetric timeliness of earnings (Basu, 1997), 2) negative non-operating accruals (Givoly and Hyan, 2000), 3) negative skewness of earnings (Givoly and Hyan, 2000), 4) conservatism ratio (Callen et al., 2010), 5) asymmetric accruals to cash flow (Ball and Shivakumar, 2005), 6) hidden reserves measure (Penman and Zhang, 2002), and 7) book to market value (Beaver and Ryan, 2000).

The asymmetric timeliness of earnings (Basu, 1997) is the most widely used measurement of accounting conservatism (Ryan, 2006). It is built on the implication that earnings respond more completely or quickly to bad news than good news, and this asymmetric response is greater under greater degrees of conservatism. Basu (1997) uses the reverse regression in Beaver et al. (1980) to test the asymmetric response to return news, where earnings are regressed on returns and a dummy variable that reflects bad news. One of the main problems in this measure is the inability to use it on the firm-year level. Therefore, Khan and Watts (2009) develop Basu (1997) measure and create a *firm-year* measurement of asymmetric timeliness, where the timeliness of bad news is captured by C-Score and the timeliness of good news is captured by G-Score.

Negative non-operating accruals is proposed by Givoly and Hyan (2000). This measurement is based on their findings that the cumulative negative non-operating accruals are increasing over time and do not reverse to converge into cash flow over long periods. However, they find that this increase in cumulative negative non-operating accruals is not accompanied by a decline in company performance, which shows that firms recognize losses faster than gains and that this asymmetric recognition is reflected mainly in non-operating (non-current) accruals.

Negative skewness of earnings is proposed by Givoly and Hyan (2000), as well. Givoly and Hyan (2000) argue that the complete recognition of bad news and the delayed recognition of good news results in negatively skewed earnings. They find that earnings are negatively skewed compared to cash flow, and this negative skewness is increasing over time consistent with an increase in conservatism.

Another conservatism measure is the conservatism ratio (CR) proposed by Callen et al. (2010) based on the Vuolteenaho (2002) return-decomposition model. It captures the proportion of the total shock to current and expected future earnings recognized in current year. Despite its validity, I choose not to use the CR because both the negative values of CR and its outliers should be deleted according to the literature, which results in a significant reduction in the number of observations in the sample. The asymmetric accruals to cash flow by Ball and Shivakumar (2005) is created to measure the asymmetric timeliness in private firms as Basu (1997) measure needs stock prices to be calculated. The asymmetric accruals to cash flow uses cash flow as a proxy for news instead of stock return in Basu (1997). The hidden reserves measure by Penman and Zhang (2002) is based on the argument that accounting conservatism creates hidden reserves (cookie jars), where the higher the hidden reserves, the higher is the degree of conservatism. The hidden reserves measure requires complicated calculation methods and can reduce the sample significantly

due to missing variables needed to calculate the reserves. Book to Market value (BTM) in Beaver and Ryan (2000) is based on the idea that conservatism tends to depress the net book value of the firm relative to its market value, where the lower the BTM, the higher the degree of conservatism. Roychowdhury and Watts (2007) argue that BTM may be a biased estimator of the degree of conservatism due to the existence of economic rents in firms and suggest that the asymmetric timeliness measure of Basu (1997) is a better measurement than BTM over long estimation periods.

To increase the validity of the measures of conservatism used and to decrease the probability of measurement error, I use the average rank of three measurements of accounting conservatism in the first and second essay; C-score firm-year asymmetric timeliness measurement (Khan and Watts, 2009), the negative non-operating accruals (Givoly and Hyan, 2000), and the negative skewness of earnings relative to cash flow (Givoly and Hyan, 2000).[2] These measurements are used because 1) they are used widely in the previous literature (e.g., Beatty et al., 2008; Garcia Lara et al. 2011; Kim et al., 2013), especially the asymmetric timeliness measurement, which increases the ability to compare the findings with prior findings, 2) these measurements capture both conditional and unconditional conservatism and 3) these measurements are easy to calculate besides that the variables needed to calculate them are widely available, which results in a lower number of observations deleted due to missing variables compared to some other suggested measures.

In the third essay, I use the amount of assets write-downs as a measurement of conservatism in long-term assets evaluation. Asset write-downs are recognized when the company faces adverse events that are expected to negatively affect the future cash flow generated from an asset. This procedure is consistent with the complete recognition of

[2] C-score is used rather than G-score because G-score captures the timeliness of good news where C-score captures the timeliness of bad news.

losses under conservatism compared to gains, where the higher the degree of write-downs, the higher the degree of conservatism. It is also consistent with the finding of Givoly and Hyan (2000) that conservatism is mainly reflected in non-operating accruals.

1.4 Summary of the essays

1.4.1 *Accounting conservatism and Market Reaction to Earnings News*

In the first essay, I examine the effect of accounting conservatism on investors' reactions to earnings announcements. Particularly, I examine how investors understand and react to the nature of earnings quality driven by conservatism. This chapter is mostly motivated by the mixed results in past literature about the effect of conservatism on earnings quality. On one hand, prior literature argues that conservatism improves information quality (e.g., Watts, 2003a; Ahmed et al. 2002), enhances information environment (Garcia Lara et al. 2014), and is associated with positive economic outcomes (Garcia Lara et al. 2011). On another hand, conservatism is accused of decreasing earnings quality (Penman and Zhang, 2002) and decreasing the usefulness of earnings (Bandyopadhyay et al., 2010). In addition, conservatism results in higher earnings volatility and lower earnings persistence (Chen, 2004; Basu,1997; Givoly and Hyan, 2000; Dichev and Tang, 2008; Bandyopadhyay et al. 2010; Chen et al. 2014) and hence lower earnings quality.

I argue that whether conservatism enhances earnings quality through increasing earnings reliability or impairs earnings quality through decreasing earnings persistence, the short-term (initial) reaction of investors around earnings announcements should increase as accounting conservatism increases, conditional on earnings surprise. This is because higher conservatism has more information content in both cases. However, regarding the long-term (subsequent) reaction, I argue that if conservatism enhances the quality of earnings,

most of the information released in earnings announcements would be reflected in stock prices on the early days of earnings announcements, which would reduce the drift of returns subsequent to the earnings announcements. But, if accounting conservatism decreases the quality of earnings and makes it less understandable, investors need more time to understand the released earnings and reflect them in stock prices.

Using Fama and MacBeth (1973) regression, I investigate the effect of accounting conservatism on earnings surprise, the short-term investors' reaction to earnings announcements, and the long-term investors' reaction to earnings announcement (the post-earnings announcement drift, PEAD). The results show that higher conservatism results in lower absolute values of earnings surprises, and lower (more negative) standardized abnormal earnings. In addition, consistent with my argument, the results show that conditional on earnings surprise, the higher the accounting conservatism, the higher the initial reaction to earnings announcements. Regarding the long-term reaction, I find that conditional on earnings surprise, the higher the accounting conservatism, the higher the subsequent reaction to earnings announcements. Overall, the results of the first essay give evidence that higher levels of conservatism decrease the ability of investors to understand the time-series characteristics of earnings, resulting in a significant drift in post-earnings announcement abnormal returns.

1.4.2 *Accounting Conservatism and Stock Mispricing*

While the results in the first essay show that higher levels of conservatism result in higher abnormal returns around earnings announcements and post to earnings announcements, these results do not show if this relationship is because stocks with higher levels of conservatism have higher risk revealed on announcements days, or because these stocks are mispriced. This question is answered in the second essay.

In the second essay, I test the effect of accounting conservatism on stock mispricing. This essay is motivated by the lack of evidence on the role that conservatism plays in stock pricing. For example, Francis et al. (2004) and Garcia Lara et al. (2011) examine the effect of accounting conservatism on the cost of equity. Francis et al. (2013) investigate the effect of conservatism on firm returns during the global financial crisis. Barth et al. (2014) examine the effect of conservatism on the speed at which investors resolve their disagreement at earnings announcements. However, prior literature does not examine the effect of conservatism on stock mispricing. I argue that conservatism decreases earnings persistence and predictability (Kim and Kross, 2005; Dichev and Tang, 2008; Bandyopadhyay et al., 2010), which leads to investors having biased expectations. The pattern of earnings persistence is different between high and low conservatism firms. In high conservatism firms, investors do not take into consideration the reversal of losses, which results in a downward biased expectation. In low conservatism firms, investors fixate on the good news that firms aggressively recognize, not taking into consideration the reversal of these gains, which results in expectations that are biased upward. Therefore, I hypothesize that accounting conservatism results in stock pricing error, where the error is biased downward in high conservatism firms and upward in low conservatism firms.

The portfolio analysis shows that high (low) conservatism stocks generate positive (negative) returns, where these returns become more positive (negative) on earnings announcement days, which is consistent with the research hypothesis. In the regression analysis, I employ a panel data context that allows controlling for time fixed effects. The results show that firms applying higher levels of accounting conservatism yield higher returns on earnings announcement days compared to non-announcement days. Then, I test if the results are attributed to risk. Under the risk explanation, if high (low) conservatism stocks have high (low) betas, then an increase in the risk premium on earnings days would increase the return spread between high and low conservatism stocks. Alternatively, it

could be the case that when information is released, beta increases for high conservatism stocks and decreases for low conservatism stocks. Controlling for market risk and day fixed effects, the test shows that, first, consistent with the hypothesis, on announcement days, high conservative firms have higher positive returns and low conservative firms have more negative returns compared to non-announcement days. Second, the market risk does not change the return difference between high and low conservative firms on earnings days, which means that risk cannot explain the elevated return on earnings days.

Then I test if the elevated return on announcement days is attributed to biased expectations as expected in the research hypothesis. To do so, I use the "Mispricing Score" developed by Stambaugh et al. (2015). I regress the daily return on three-way interactions between each of the high and low conservatism variables, the direction of mispricing, and the earnings day dummy, controlling for the day fixed effects. I find that both high and low conservatism amplify the expectation error of the other mispricing factors. This research is the first to find such a piece of evidence. In addition, the results show that conservatism has a mispricing effect independent from the mispricing effect included in the mispricing score. Further analysis shows that the results are robust among small and large firms. Also, using other risk factors to examine the risk explanation yields similar results.

1.4.3 *Market Mispricing of Conservative Accruals*

In the third essay, I examine the effect of long-term assets impairment on earnings persistence and stock valuation. Assets impairment (or write-down) is chosen because it represents a conservative procedure that affects the persistence of long-term accruals, earnings persistence, and stock valuation. This chapter is motivated by the limited attention given to long-term accruals despite their significant impact on earnings persistence and stock pricing (see, for example, Larson et al., 2018 for a comprehensive definition of accruals and a survey of accruals used by prior literature). In this chapter, I extend Fairfield

et al. (2003) by disaggregating the growth in long-term net operating assets into asset write-downs and growth in long-term net investments. I argue that the non-recurring nature of asset write-downs and the subjectivity involved in estimating their amounts will result in lower earnings persistence. Therefore, the first hypothesis predicts that asset write-downs have a positive *incremental* relationship with one year ahead return on assets. This low persistence of asset write-downs is expected to result in stock mispricing, consistent with the argument in Richardson et al. (2005) that more subjective accruals have greater stock mispricing. Therefore, the second hypothesis states that write-downs are mispriced by the market. In the last hypothesis, I argue that the low persistence of asset write-downs compared to the other component of growth in long-term net operating assets, growth in long-term net investment, will make write-downs the main contributor to the mispricing of growth in long-term net operating assets. Therefore, my third hypothesis suggests that the mispricing of write-downs is larger than the mispricing of growth in long-term net operating assets.

To test the first hypothesis, the one-year-ahead return on assets (ROA) is regressed on earnings components at different levels of decomposition. The results show that write-downs have a positive incremental relationship with future profitability. In addition, further tests show that write-downs' incremental relationship with future ROA is equivalent to the incremental relationship of the growth in long-term net operating assets and the growth in long-term net investment with future ROA, indicating that the low persistence of the growth in long-term net operating assets is equally explained by its both components. To test the second hypothesis, Mishkin (1983) test is used. The results show that the coefficient of asset write-downs in the valuation equation is less than the coefficient of asset write-downs in the forecasting equation, which gives evidence that the market undervalues asset write-downs relative to their association with one year ahead earnings.

To test the third hypothesis, the one-year-ahead abnormal return is regressed on accrual earnings components at different levels of segregation. Consistent with existing literature, I show that the market overvalues growth in long-term net investment which results in a negative expected return in the future. Furthermore, I confirm that the market undervalues write-downs and stocks with high write-downs would have higher expected returns. When comparing the magnitude of the mispricing effect, the results show that the difference between the pricing coefficient of write-downs does not significantly differ from the pricing coefficient of long-term net operating assets, which means that both components of the growth in long-term net operating assets are equally mispriced by the market.

1.5 Research contribution

This thesis provides an opportunity to advance the understanding of the consequences of conservatism in the equity market. In their review of accounting conservatism literature, Mora and Walker (2015) show that the findings of conservatism literature in the capital market have yield mixed results, which indicates a need to understand further the various implications of conservatism exist in the equity market. This thesis also has implications for policymakers and standard setters and helps to resolve the debate of whether neutrality or conservatism is more useful for financial statement users.

The essays in this thesis make the following contribution to the literature. First, I examine earnings quality through a market-based measure: how fast is earnings information incorporated into the price. This complements the existing literature where accounting quality of conservative earnings are measured by the other earnings properties (e.g., Bandyopadhyay et al. (2010) use earnings persistence, Dechow and Dichev (2002) use the magnitude of accruals, and Tucker and Zarowin (2006) use earnings smoothness).

Relatedly, I extend the existing literature on studying the value relevance of conservative earnings by examining not only investors' short-term response (see D'Augusta et al., 2016) but also investors' long-term response (PEAD), as I show that the use of PEAD can differentiate the information quality of earnings affected by conservatism that cannot be done when ERC alone is studied. My examination of PEAD is different from Narayanamoorthy (2006), who examines how to gain abnormal return by exploiting the autocorrelation among the standardized unexpected earnings (SUE) caused by accounting conservatism. I complement Narayanamoorthy (2006) by examining the cross-sectional differences in conservatism and their effect on PEAD and presenting further evidence using specific firm-year measurements of conservatism that enable me to link the findings in the PEAD to the earnings quality debate.

Second, this thesis provides evidence that conservatism affects stock valuation through stock mispricing and does not agree with the evidence found before in Garcia Lara et al. (2011) that conservatism is a priced risk factor that decreases risk. To the best of the researcher's knowledge, this research is the first to show that conservatism leads to pricing error in the equity market.

Third, this study is the first to find that conservatism has an *asymmetric* effect on stock valuation. Previous literature usually compares high conservatism to low conservatism firms (e.g., Garcia Lara et al., 2014; D'Augusta et al., 2016); however, I show that the benchmark to compare highly conservative firms is neutral firms. I find that both high conservatism firms and low conservatism (aggressive) firms are mispriced by the market, which may have been overlooked in the previous literature.

Fourth, unlike previous literature that uses static risk models to examine the return predictability of conservatism (e.g., Garcia Lara et al., 2011), I use a dynamic risk model that allows for time-varying risks. After controlling for changes in risk, the effect of

conservatism still exists providing further support for the mispricing explanation. This research adds to the literature of asset pricing by finding that conservatism is a stand-alone and priced anomaly that is not reflected in other pricing anomalies. In addition, it is the first to find that both high and low levels of conservatism magnify stocks mispricing of stocks that are mispriced under other factors (the mispricing factors included in the mispricing score of Stambaugh et al., 2015).

Fifth, the third essay focuses on non-current accruals and adds to the limited literature that investigates the mispricing of non-current accruals. My examination of the non-current accruals is closely related to Fairfield et al. (2003). However, this study is different from theirs in several aspects. 1) Fairfield et al. (2003) argue that the procedures of conservatism result in new investments looking as if they are less profitable in early years than later years, which would drive the return on investments downward after making new investments. Nonetheless, I argue that conservatism decreases the persistence of the growth in long-term assets, which decreases the ability of investors to understand the implications of this low persistence on future stock return, resulting in stock mispricing. 2) Fairfield et al. (2003) attribute their results to conservatism, however, they do not measure conservatism or directly examine its impact on earnings persistence and accruals mispricing. 3) I extend Fairfield's findings by digging into the components of the growth in long-term operating assets and show that the least persistent component of it, i.e., asset write-downs, is one of the main causes of the mispricing of the growth in long-term operating assets.

Sixth, I provide direct evidence that the market underprices conservative accruals and adds to the limited evidence that links accounting conservatism to the accrual anomaly. Although Larson et al. (2018) argue that conditionally conservative accruals result in higher mispricing compared to other types of accruals, the measurement used by Larson et al.

(2018) is noisy and does not capture conservatism alone. I corroborate and extend Larson et al. (2018) by using a more accurate measure of accounting conservatism that can directly capture conservatism.

Finally, this research contributes to the debate among standard setters of whether neutrality or conservatism is more useful for financial statement users. In particular, I find that conservatism decreases the ability of investors to understand the time-series characteristics of earnings, which decreases the speed at which investors react to earnings and decreases their ability to make the right pricing decisions. These results indicate that neutral financial reporting might provide more useful information for investors. In addition, the findings recommend that policymakers mandate firms to disclose more information about the nature and effect of conservative accounting practices to bridge the information gap between the insiders and the outsiders and decrease the pricing error.[3]

The rest of the thesis proceeds as follows. In chapter 2, I examine the effect of accounting conservatism on earnings quality using the response to earnings announcements. In chapter 3, I examine the effect of accounting conservatism on stock mispricing. In chapter 4, I examine the mispricing of conservative accruals. Finally, chapter 5 offers concluding remarks and directions for further research.

[3] In mandating such a disclosure, policy makers should take into consideration the costs and benefits of disclosing information about applying accounting conservatism in order to determine the optimal level of disclosure. While the main benefit of such a disclosure is to reduce the pricing error, costs can include time and effort in addition to information overload that may affect the ability of the users of financial statements to process financial disclosures.

2 ACCOUNTING CONSERVATISM AND MARKET REACTION TO EARNINGS NEWS

2.1 Introduction

Accounting conservatism is a controversial topic, especially when discussing its effect on accounting information quality. On the one hand, conservatism is claimed to enhance information quality (e.g., watts, 2003a; Ahmed et al. 2002) and information environment (Garcia Lara et al. 2014), and associated with positive economic outcomes (Garcia Lara et al. 2011).[4] On the other hand, conservatism is accused of decreasing earnings quality (Penman and Zhang, 2002) and decreasing the usefulness of earnings (Bandyopadhyay et al., 2010).[5] This debate approaches the standard setters, too, as the International Accounting Standard Board (IASB) and the Financial Accounting Standard Board (FASB) are moving away from conservatism toward more 'neutral' financial reporting (Watts, 2003a; Mora and Walker, 2015)[6]. In fact, in 2010, FASB removed conservatism from the conceptual framework and justified it by stating that conservatism would conflict with the quality of neutrality. Accordingly, it is important to evaluate the impact of conservatism on earnings quality from the users' side.

The objective of this essay is to investigate the consequences of conservatism on earnings quality. This research adds to the debate upon the effect of accounting conservatism on earnings quality using evidence from the market reaction to earnings

[4] Ahmed et al. (2002) find that conservatism decreases the cost of debt, while Garcia Lara et al. (2014) find that conservatism decreases forecasting errors and return volatility, and Garcia Lara et al. (2011) find that conservatism decreases the cost of capital.

[5] Penman and Zhang (2002) measure the quality of earnings by its ability to predict future earnings, and Bandyopadhyay et al. (2010) measure usefulness by the ability of earnings to predict futures earnings and future operating cash flow, with conservatism found to decrease the ability to predict future earnings using current earnings.

[6] The debate against conservatism by regulators, standard setters and academics have begun long time ago (see Levitt, 1998; FASB, 1980; Dcvine, 1963, 127). For example, Levitt (1998) stated that the conservative estimation of restructuring charges will help in reversing these charges back into income when future earnings fall short.

news. I examine the initial market reaction and the subsequent market reaction to evaluate how investors react to the nature of earnings quality driven by conservatism. Regarding the initial reaction to earnings announcements, existing literature shows that conservatism leads to higher earning reliability and hence higher quality, according to Watts (2003a), which should lead to higher earnings response coefficient (ERC) as found by Chen et al. (2017). At the same time, conservatism results in higher earnings volatility and lower earnings persistence (Chen, 2004; Basu,1997; Givoly and Hyan, 2000; Dichev and Tang, 2008; Bandyopadhyay et al. 2010; Chen et al. 2014) and hence lower earnings quality. In this context, it is expected to result in higher ERC. Therefore, I hypothesize that conservatism results in higher ERC regardless of its effect on earnings quality.

Regarding the subsequent reaction, I investigate the effect of conservatism on the Post-Earnings Announcement Drift (PEAD). If more conservative earnings have higher quality, most of the new information would be consumed during the early days of earnings announcements, which will reduce the drift after the announcement. By contrast, earnings with lower information content (lower quality) need more time to be assimilated by the investors, resulting in a PEAD (Barth et al. 2014). Therefore, the impact of conservatism on PEAD will provide a piece of evidence about the effect of accounting conservatism on earnings quality.

The research hypotheses are tested using the decile average of three firm-specific proxies of conservatism, the C-Score of Khan and Watts (2009) based on Basu (1997), the negative non-operating accruals proposed by Givoly and Hyan (2000), and the negative skewness of earnings relative to cash flow proposed by Givoly and Hyan (2000). The main findings show that consistent with the first hypothesis, higher conservatism is associated with higher abnormal returns around an earnings announcement. This finding cannot differentiate whether conservatism results in higher or lower earnings quality as both

properties of earnings can result in higher abnormal returns around earnings announcements. To test the second hypothesis, I regress the subsequent size-adjusted stock return on the level of accounting conservatism and other control variables. The results show that conservatism is associated with higher abnormal returns post to earnings announcements, consistent with the evidence that conservatism decreases earnings persistence (Bandyopadhyay et al., 2010; Chen et al., 2014) and increases information risk (Chen et al., 2009). This finding also suggests that investors cannot fully adjust to information provided by conservative earnings (Barth et al., 2014). Overall, the results of this study give evidence that higher levels of conservatism decrease the ability of investors to understand the time-series characteristics of earnings, resulting in a significant drift in post-earnings announcement abnormal return. As a robustness check, the market-adjusted stock return is used as a dependent variable to measure the abnormal stock return instead of the size-adjusted stock return. The inference from the results remained unchanged.

This essay makes the following contribution to the literature. First, I examine the earnings quality through a market-based measure: how fast is earnings information incorporated into the price. This complements the existing literature where accounting quality of conservative earnings are measured by the earnings properties (e.g., Bandyopadhyay et al. (2010) use earnings persistence, Dechow and Dichev (2002) use the magnitude of accruals, and Tucker and Zarowin (2006) use earnings smoothness) by examining the economic consequences of conservative earnings as a measurement of earnings quality.

Relatedly, I extend the existing literature on studying the value relevance of conservative earnings by examining not only investors' short-term response (see D'Augusta et al., 2016) but also investors' long-term response (PEAD), as I show that the use of PEAD can differentiate the information quality of conservative earnings that cannot be

done when ERC alone is studied. My study of PEAD is closely related to Narayanamoorthy (2006), who examines how loss recognition in conservatism affects the autocorrelation among the standardized unexpected earnings (SUE) and how to gain abnormal return by exploiting this autocorrelation using the SUE based PEAD strategy. However, my study complements Narayanamoorthy (2006) by examining the cross-sectional differences in conservatism and their effect on PEAD and presenting further evidence with a wide range of conservatism measures that enable me to link the findings in the PEAD to the earnings quality debate. Moreover, by studying conservatism as one specific reporting policy that affects earnings quality, my evidence is consistent with the general evidence of Chen et al. (2017) that earnings quality has a role in explaining the market reaction.

This study also has implications for policymakers and standard setters and helps to resolve the debate of whether neutrality or conservatism is more useful for financial statement users. In particular, the findings show that conservatism affects investors' decisions in the equity market and decreases the speed at which investors react to earnings and make decisions, which indicates that at least for investors, as users of financial statements, neutral financial reporting might provide more useful information for them. In addition, the findings recommend that policymakers mandate firms to disclose more information about the nature and effect of conservative accounting practices to bridge the information gap between the insiders and the outsiders.

The rest of the chapter is organized as follows. Section 2.2 discusses the literature and hypotheses development; section 2.3 presents the research design and methodology; section 2.4 presents the sample and the descriptive statistics; section 2.5 discusses the hypotheses test and results, and section 2.6 presents concluding remarks.

2.2 Literature review and hypotheses development

FASB defines conservatism as "*a prudent reaction to uncertainty to try to ensure that uncertainty and risks inherent in business situations are adequately considered*" (FASB, 1980). In the literature, the definition of conservatism ranges from the extreme definition of "*anticipate all losses but anticipate no gains*" (Bliss, 1924, P.110) to other broad definitions like the tendency of accounting practices to impose a higher degree of verification to recognize gains than to recognize losses (Basu, 1997; Watts, 2003a), and the downward bias of the book value of net assets relative to their market value (Beaver and Ryan, 2005; Ruch and Tylor, 2015) [7]. The next sub-section explores how the asymmetric timeliness of earnings recognition results from conservatism affects the time series characteristics of earnings.

2.2.1 *Time series characteristics of conservatism and information quality*

Basu (1997) is one of the first papers to address the characteristics of earnings persistence arise from conservatism. He argues that timeliness implies that more value-relevant news is realized in current period earnings, and less value-relevant news will be realized in future earnings. However, persistence implies that news is recognized gradually over multiple time periods. Conservatism implies higher timeliness to bad news through reporting current earnings that anticipate the effect of this bad news on future cash flow. Therefore, next period earnings will not be affected by the current period's bad news. Giving that, bad news will appear as a transitory shock in earnings time-series that will

[7] Previous literature differentiates between conditional and unconditional conservatism. Conditional conservatism is known as writing down book value of assets under negative circumstances but not writing them up under positive ones, i.e. ex post or news dependent. Unconditional conservatism is known as the application of conservative accounting practices in the measurement and evaluation of assets and liabilities, which results in unrecorded goodwill, i.e. ex ante on news independent. For more information on the discrimination between the main types of conservatism, see Beaver and Ryan (2005). In this research, no distinction is used to discriminate between the two types of conservatism. According to Khan and Watts (2009), '*Labelling one as unconditional and the other as conditional emphasizes the mechanics used to identify conservatism, not the fundamental cause of the conservatism*' P135. Therefore, the goal of this research is to detect the effect of overall conservatism on earnings quality without discriminating between the two types, since the association between the two is negative as unconditional pre-empts conditional conservatism (Ryan, 2006).

reverse in the following period, whereas good news will be realized gradually over multiple periods of time, resulting in persistent positive shock to earnings series (Basu, 1997). In addition, Givoly and Hyan (2000) find that conservatism has increased the variability of earnings over time, and this variability is associated with the increased accumulation of negative accruals resulted from the asymmetric recognition of earnings.

Consistent with Givoly and Hayn (2000), Dichev and Tang (2008) find that over time, earnings volatility has increased, and the persistence of earnings has declined. In addition, they find an increased negative correlation between earnings changes, i.e., low earnings persistence, and a decreasing correlation between contemporary revenues and expenses over the 40 years preceding the study. The finding of declining the contemporaneous correlation between revenues and expenses is accompanied by an increase in the correlation between past expenses and current revenues. This means that the period relevant expenses are recognized directly while the revenues associated with these expenses are deferred to the next periods, which indicates asymmetric timeliness of recognizing news like accounting conservatism. Dichev and Tang (2008) conclude that earnings volatility is increasing because of poor matching, which is consistent with Givoly and Hayn (2000) that conservatism is increasing volatility of earnings. More evidence is reported by Chen et al. (2014), who find that the association between current year earnings and next year earnings is lower for a higher degree of conservatism.[8]

While the ability of current earnings to predict future earnings (persistence) has declined over time, the ability of earnings to predict one year ahead operating *cash flow* has increased over time (Kim and Kross, 2005). Bandyopadhyay et al. (2010) find that accounting conservatism results in earnings that are less persistent but more able to predict future cash flows. More interestingly, Bandyopadhyay et al. (2010) document that the

[8] Conservatism affects the time series of earnings and disturb the trend of earnings. Although it *may* create another trend, this trend is still not understandable by the users of financial statements.

usefulness of earnings to explain stock prices is positively attributed to persistence but not to the ability to predict future cash flows. Therefore, they conclude that conservatism may have a negative effect on earnings usefulness through a negative impact on persistence.

The above literature argues that accounting conservatism decreases earnings persistence and earnings usefulness. However, another stream of literature argues that conservatism enhances earnings quality and is necessary to ensure earnings reliability. For example, Watts (2003a, b) emphasizes the notion that conservatism is a useful tool to reduce information asymmetry and claims that conservatism enhances earnings quality by constraining managers' opportunistic behaviour. These claims are empirically supported by LaFond and Watts (2008), who find that conservatism reduces asymmetries between firm insiders and investors and that the need for conservatism increases whenever these asymmetries increase. In addition, Garcia Lara et al. (2020) find that conservatism is associated with less accrual earnings management. Moreover, Balachandran and Mohanram (2011) investigate the effect of conservatism on the value relevance of earnings and find no evidence that firms with growing unconditional conservatism suffer from declining in value relevance compared to firms with steady conservatism. Their results indicate that the reliability that arises from unconditional conservatism does not offset the financial information relevance.

To sum up, the past literature yields mixed results about the effect of conservatism on earnings quality and characteristics. From one side, conservatism is found to reduce the predictability of earnings, increase earnings volatility, decrease earnings persistence, and decrease the usefulness of earnings. From another side, conservatism is argued to enhance earnings quality by constraining earnings management, reducing asymmetries between the insiders and the outsiders, and produce more reliable earnings. Having these contradictory opinions, the net effect of conservatism on earnings quality is not conclusive. Therefore,

the main objective of this study is to examine the effect of accounting conservatism on earnings quality by examining its effect on the equity market. The next section explores how these characteristics of conservative earnings affect the significance and speed of market response to earnings news.

2.2.2 *Accounting conservatism in the equity market*

2.2.2.1 Accounting conservatism and earnings surprise

When addressing the market reaction to earnings announcements, it is important to take into consideration the value of deviation between actual and estimated earrings, i.e., the earnings surprise. Earnings persistence is one of the characteristics that can affect the value of the surprise. Low persistence earnings resulted from the asymmetric recognition of gains vs. losses, under accounting conservatism, should be more difficult to predict compared to neutral earnings unless the financial analysts can understand the time series properties of earnings under accounting conservatism.

The empirical evidence on the relationship between accounting conservatism and earnings surprise gains mixed results. For example, while Garcia Lara et al. (2014) find that conservatism has a negative association with absolute analysts' forecasting error, Mensah et al. (2004), Helbok and Walker (2004), and Louis et al. (2014) find that conservatism increase analysts' forecasting error. Therefore, I start the analysis section by examining the relationship between accounting conservatism and earnings surprise.

2.2.2.2 Accounting conservatism and market reaction to earnings news

2.2.2.2.1 The initial market reaction to earning news

Garcia Lara et al. (2014) explain that conservatism improves the information environment through several channels: directly by limiting earnings management and enhancing disclosure, and indirectly through increasing investment efficiency. As a result,

conservatism is expected to decrease information asymmetries between managers and investors, allowing investors to better assess the future firm performance. Their empirical evidence shows that conservatism reduces information asymmetries between the insiders and the outsiders. Consistent with Garcia Lara et al. (2014), D'Augusta et al. (2016) argue that conservatism decreases investor disagreement by enhancing the information environment through restricting earnings management and preventing managers from concealing negative information. D'Augusta et al. (2016) find that conservatism is negatively associated with the abnormal trading volume, and that this association is less (more) negative when the firm announces good (bad) news. They interpret these results as conservatism play a role in decreasing investor disagreement around earnings announcements.

While Garcia Lara et al. (2014) and D'Augusta et al. (2016) argue that conservatism enhances the information environment, Mensah et al. (2004) argue that conservatism results in more volatile earnings than under neutral accounting, which is expected to be associated with higher forecasting error and forecasting dispersion. Consistent with their argument, Mensah et al. (2004) find that higher conservatism is associated with higher absolute forecasting errors and forecasting dispersion over the period 1987-1999. Similar results are found by Helbok and Walker (2004) and Louis et al. (2014). These results are consistent with the findings that conservatism increases volatility and decreases earnings persistence (Chen, 2004; Basu,1997; Givoly and Hyan, 2000; Dichev and Tang, 2008; Bandyopadhyay et al. 2010; Chen et al. 2014), which results in information risk or uncertainty (Chan et al. 2009).

These conflicting effects of conservatism on the information environment should affect investors' response to earnings announcements. This is because the reaction to earnings announcements is associated with the quality of earnings. In this regard, Chen et al. (2017) provide one explanation about how earnings quality impacts the initial market

reaction (ERC) and the subsequent market reaction to earnings announcement (PEAD). They argue that accounting quality affects the market reaction through reducing accounting-associated liquidity risk. Their evidence shows that low accounting-associated liquidity risk, i.e., high earnings quality, results in higher initial marker reaction. This is consistent with the findings in Kim and Verrecchia (1991) and the disclosure theory of Verreccihia (2001) that show high-quality earnings results in higher market reaction around earnings announcements. Therefore, if conservatism results in high-quality earnings that are more reliable and verifiable to investors, higher accounting conservatism should be associated with higher ERC.

On the other side, conservatism increases earnings volatility and decreases earnings persistence, which are features of low quality earnings. These earnings characteristics are associated with higher information risk or uncertainty (Dichev and Tang, 2008; Chan et al., 2009) and raise uncertainty concerns among investors (Francis et al., 2004), which affect the market response to earnings announcements. The relationship between information risk and market reaction is explained by Zhang et al. (2013). In their information content hypothesis, they posit that higher information risk decreases the informativeness of prices and increases the importance of information release, and so market traders will react more strongly to surprising announcements of firms with high information risk. Consistent with their theory, the results show that higher information risk induces the initial market reaction (ERC). In the case of conservatism, the low persistence of conservative earnings makes these earnings less predictable to investors, and therefore they cannot highly depend on their predictions to make decisions, postponing their reaction until earnings announcement events. Building on this, if earnings affected by accounting conservatism are difficult to understand by investors, it will increase their uncertainty, therefore, higher accounting conservatism is expected to be associated with higher ERC.

Putting all together, the literature has two contradictory arguments about conservatism. On the one hand, conservatism is seen as a tool to enhance earnings quality and information environment and reduce information asymmetry. Based on this argument, conservatism is expected to induce the initial market reaction by providing a higher information quality. On the other hand, applying conservatism is found to increase earnings volatility and decrease earnings predictability and persistence. These earnings characteristics are known to be a source of information uncertainty and risk. Based on this argument, conservatism is expected to induce the initial market reaction for news announcements, too. Thus, whether conservatism enhances the information environment or increases pre-announcement information risk, it will result in a higher market reaction conditional on the earnings surprise. These contradictory arguments about the effect of conservatism on the information environment lead to the first research hypothesis.

H2.1: The higher the level of accounting conservatism, the higher the initial market reaction to earnings surprises, all else being equal.

Although testing the first theory will show how investors respond to earnings announcements, it cannot provide evidence about why investors react in such a way. To see whether the investors' response is based on the notion that accounting conservatism enhances earnings reliability or increases uncertainty, the relationship between conservatism and PEAD should be tested after.

2.2.2.2.2 The subsequent market reaction to earning news

The Efficient Market Hypothesis (EMH) states that stocks are traded at their fair value, making it impossible for investors to beat the market or gain an abnormal return. However, Ball and Brown (1968) are the first to report a drift in the abnormal return after earnings announcements. Thereafter, two main explanations were introduced by the

researchers to explain this drift that contradicts with the EMH; the misspecification of risk measurement and the delayed response to new information.

According to the misspecification of risk measurement explanation, or what is called 'the risk-based explanation', the capital asset pricing model (CAPM) used to calculate the risk is incomplete or misstated; consequently, the researchers cannot fully adjust the raw return to reflect risk. As a result, the alleged abnormal return is simply a reasonable compensation for the risk beared by investors but not priced with the CAPM (Bernard and Thomas, 1989). On the other hand, the delayed response explanation suggests that part of the response to the new information is delayed either because of the failure of the market participants to fully recognize the new information and reflect it in their decisions, or because of some costs, like the transaction costs, make it unfeasible to trade on this information.

The comprehensive work of Bernard and Thomas (1989) distinguishes between these explanations and suggests that another explanation stands behind the PEAD phenomenon. They conduct several tests to discriminate between the risk-based and the delayed response explanations. Most of their evidence supports the delayed response explanation, not the risk-based one. However, one of the tests suggests that the failure of investors to realize the serial correlation in unexpected earnings, i.e., market traders are unable to recognize the implications of current earnings for future earnings. Consistent with the third explanation, Narayanamoorthy (2006) find that conservatism affects the cross-sectional autocorrelation of the standardized unexpected earnings (SUE) and that quarters with losses and earnings decreases will lead to lower SUE autocorrelation, i.e., lower predictability, than quarters with profits and earnings increases. These results indicate that conservatism affects the predictability of earnings through affecting the cross-sectional autocorrelation of SUE,

especially in loss times, and hence the PEAD. However, Narayanamoorthy (2006) does not draw a directional relationship between accounting conservatism and PEAD.

Accounting conservatism can affect the PEAD by affecting earnings quality. Chen et al. (2017) explain that higher information quality results in less accounting-based liquidity risk and, consequently, less PEAD. In addition, high-quality information is expected to be assimilated faster by investors compared to low-quality information, resulting in less subsequent drift (Barth et al., 2014). Based on these arguments, if conservatism increases the quality of earnings, conservatism is expected to have a negative association with PEAD, after conditioning on earnings surprise.

However, as explained in the previous section, accounting conservatism produces low persistent and low predictable earnings, which consequently results in higher uncertainty and information risk. According to Zhang et al. (2013), this information risk affects the subsequent reaction indirectly by inducing the transaction cost (i.e., liquidity risk), which causes the delayed response[9]. In addition, it is expected that traders should react early to the high-quality forecasts that are associated with high-quality earnings preceding news announcements based on the EMH, leaving less reaction post to the earnings announcements. Besides, the quality of forecast is inversely related to earnings volatility, which means that low persistence earnings, as in the case of high conservatism, are expected to result in more dispersed forecasts that investors cannot rely on, and consequently result in higher reaction post to the announcement of actual earnings. Building on these arguments, if conservative earnings result in high information risk and uncertainty among investors, higher conservatism is expected to generate higher PEAD, conditioning on earnings surprise.

[9] This argument is consistent with Chen et al. (2017). However, while Zhang et al. (2013) focused on market-based liquidity risk, Chen et al. (2017) focused on the accounting-based liquidity risk and argue that accounting-based liquidity risk has more significant effect on market reaction than market-based liquidity risk.

To summarize, conservatism can have two competing effects on PEAD. First, if conservatism enhances earnings quality through imposing higher verifiability, higher conservatism is expected to result in lower PEAD. Second, if conservatism induces information uncertainty for investors through producing low persistence earnings, higher conservatism is expected to result in higher PEAD. Therefore, the net effect of conservatism on PEAD cannot be expected, and the second hypothesis is stated in the null form as follows,

H2.2: The subsequent market response per one unit of earnings surprise for conservative earnings is not different from the subsequent market response for less conservative earnings.

Testing the relationship between conservatism and the PEAD will give evidence about the effect of conservatism on earnings quality. It will also help to interpret the association found between conservatism and the initial market reaction (i.e., whether the association is driven by high quality or high information risk). The research hypotheses are summarized and illustrated in Figure 2.1.

[Insert Figure 2.1 about here]

2.3 Research Design

2.3.1 *Measures of Accounting Conservatism*

Prior literature has not identified one single and ideal firm-level measure of conservatism. Therefore, to increase the validity of the measures of conservatism used and to decrease the probability of measurement error, I used three firm-level measures of conservatism. The first measure is the C-score firm-year measurement of conservatism from Khan and Watts (2009), which is based on Basu's (1997) measure of asymmetric

timeliness. C-score measures the incremental timeliness of bad news compared to good news, where the higher the C-score, the higher the level of conservatism. Appendix A shows the derivation of the C-score.

Although C-score has been widely used by the literature to capture conservatism (e.g., Kim et al. 2013; Francis et al. 2013; Chen et al. 2014; Garcia Lara et al. 2014; D'Augusta et al. 2016), it has several limitations. For example, Givoly et al. (2007) find that Basu's (1997) measure of asymmetric timeliness *"is subject to considerable measurement error or to a downward bias"* and that it fails to detect conservatism in times where it is expected to exist[10]. Therefore, I use C-score along with other measures of conservatism as recommended by Givoly et al. (2007), Dietrich et al. (2007), and Ryan (2006). The second measure of conservatism is the negative non-operating accruals proposed by Givoly and Hyan (2000). Following Beatty et al. (2008) and Kim et al. (2013), I divide non-operating accruals by beginning of year total assets and use up to 20 quarters to calculate the average non-operating accruals, where at least 12 previous quarters are needed to calculate the average non-operating accruals for a certain year.[11] Average non-operating accruals are then multiplied by -1 to be in accordance with the other measurements, where the higher the average non-operating accruals, the higher the level of conservatism.

The third and the last measurement of conservatism is the negative skewness of earnings relative to cash flow proposed by Givoly and Hyan (2000). Following Beatty et al. (2008) and Kim et al. (2013), I calculate the difference between the skewness of cash flow from operation and the skewness of net income for up to 20 quarters prior to the year of measurement and then get the average of these differences[12]. As in the negative accruals, I

[10] For detailed discussion about the merits and demerits of Basu (1997) measure, see Givoly et al. (2007) and Wang et al. (2008).
[11] Minimum 12 previous quarters are required instead of restricting the requirements to 20 previous quarters to avoid big reduction in sample size, in addition that the time span of 12 quarters is enough to measure the level of accounting conservatism in a firm.
[12] Beatty et al. (2008) used net income while I use net income before extraordinary items. For robustness check, I calculate the skewness using net income and the results were the same.

require using at least 12 quarters to calculate the negative skewness of earnings for a certain year. Finally, one *firm-year* measure is constructed using the decile average of the three measures as each measure of conservatism capture distinct but overlapping traits of conservatism (Chen et al., 2014). To avoid look-ahead bias, I use a one-year-lagged measure of conservatism, i.e., the firm-year measure of conservatism for year t-1 is the proxy for conservatism that will affect the reaction to earnings in each quarter in year t.

2.3.2 *Research Methodology*

2.3.2.1 The Effect of Conservatism on Earnings Surprise

To examine the relationship between accounting conservatism and earnings surprise, the earnings surprise is regressed on the firm-year decile rank of accounting conservatism as follows:

$$\text{Surprise}_{i,qt} = \alpha_0 + \alpha_1 \text{CON}_{i,t-1} + \alpha_3 \Sigma \text{Controls}_{i,t-1} + \varepsilon_t \quad (2.1)$$

Where:

$\text{Surprise}_{i,qt}$	= the analyst-based earnings surprise (AS) calculated using earnings from I/B/E/S as actual $\text{EPS}_{i,qt}$ – estimated $\text{EPS}_{i,qt}$ for firm i at quarter q deflated by the beginning of quarter stock price, OR the standardized unexpected earnings (SUE) calculated using seasonal random walk model ($\text{EPS}_{i,q}$ – $\text{EPS}_{i,q-4}$) deflated by the beginning of quarter stock price.
$\text{CON}_{i,t-1}$	= the firm-year measure of conservatism for firm i at the beginning of year t calculated as the average decile rank of three conservatism measures (C-score, earnings skewness, and non-operating accruals), where 1 is the lowest and 10 is the highest.
$\text{Controls}_{i,t-1}$	= the decile rank control variables for firm i at the beginning of year t, including size, market to book value (MTB), and leverage, where 1 is the lowest and 10 is the highest.

Following the past literature (e.g., Barth et al. 2014; Garcia Lara et al. 2014; Garcia Lara et al. 2020; D'Augusta et al. 2016), size, leverage, and market to book value (MTB) are used as control variables since conservatism is found to vary with these variables (Khan and Watts, 2009), in addition to their impact on the market reaction to earnings announcement as risk factors (D'Augusta et al. 2016).

2.3.2.2 The Effect of Conservatism on Initial and Subsequent Market Reaction

To test the first and the second hypothesis, I regress abnormal return accumulated over [0,1][13] window and [2,60] window, respectively, on conservatism conditional on earnings surprise as follows:

$$CAR_{i,qt} = \alpha_0 + \alpha_1 Surprise_{i,qt} + \alpha_2 CON_{i,t-1} + \alpha_3 CON_{i,t-1}*Surprise_{i,qt} + \alpha_4 \Sigma Controls_{i,t-1} + \alpha_5 \Sigma Controls_{i,t-1}*Surprise_{i,qt} + \varepsilon_t \quad (2.2)$$

Where:

$CAR_{i,qt}$ = size adjusted abnormal return for firm i at quarter q, cumulated over [0,1] window (CAR^{EA}) OR cumulated over [2,60] window (CAR^{60}).

$Surprise_{i,qt}$ = is the decile rank of the analyst-based earnings surprise or the random-walk based surprise (SUE) for firm i at quarter q, which takes a value between -5 and 5.

Surprise is ranked between -5 and +5 to consider both the sign and value of earnings surprise. For example, if surprise is ranked from 1 to 10, a big negative surprise (far from zero) would take a value of 1, which would produce misleading results.

When regressing the short window's cumulative size-adjusted return (CAR^{EA}) on the level of accounting conservatism after conditioning on surprise, the sign of the coefficient α_3 is expected to be positive whether conservatism has a positive or a negative impact on earnings quality, as expected in H2.1. However, no directional expectation is made for α_3 when using the long window's cumulative size-adjusted return (CAR^{60}). If α_3 is negative, it means that investors value the benefits of conservatism in producing more reliable and verifiable earnings. If α_3 is positive, it means that accounting conservatism results in investors' uncertainty that outweigh the benefits generated from reliability and verifiability.

In Equation (2.2), size deciles are calculated using the firms listed in NYSE and then applied to the sample. Each day, the mean size decile return is subtracted from the daily

[13] In an untabulated analysis, I used [-1,+1] window and the main conclusion remained the same.

return of each firm in the same size decile, then added up around the earnings announcement window (days 0,1) or post to earnings announcement window (days 2 - 60).

2.4 Research Sample

Research hypotheses are tested using U.S. firms' data from the first quarter of 1990 until the fourth quarter of 2016. I started by selecting all Compustat firms in NYSE, AMEX, and Nasdaq over the study period, then all financial and utility firms (SIC 4000-4999 and 6000-6999) are deleted due to their special nature. In addition, firm-year observations with a negative total assets or equity or share price less than $1 are removed. To be able to test the research hypotheses, the sample is restricted to firms with non-missing analysts' forecast variables from Institutional Brokers' Estimate System (I/B/E/S), non-missing return variables from Center for Research in Security Prices (CRSP), and non-missing all other variables in Compustat. After that, all continuous variables are deleted at .5 and 99.5 percentiles. This provides a final sample of 137,264 firm-quarter observations representing 4,724 firms.

Table 2.1 shows the descriptive analysis of the main research variables. The two types of surprise are reported; the surprise calculated depending on the seasonal random walk model, denoted as (SUE), and the analysts' forecasting error, denoted as (AS). As in Chen et al. (2017), the mean and the median of both earnings surprises are close to zero: .001 (mean) and .001 (median) for the random-walk based earnings surprise (SUE); -.001 (mean) and .000 (median) for the analyst-based earnings surprise (AS). Table 2.1 also shows that the mean cumulative abnormal return over the earnings announcement window is small and positive (CAR^{EA}= .001) and converges to zero for the entire subsequent 60 days. The control variables size, leverage, and MTB have the means of 6.56, 0.19, and 3.01, consequently.

[Insert Table 2.1 about here]

2.5 Results and Discussion

Table 2.2 shows the correlation matrix for the main variables in the study. Consistent with the PEAD phenomenon, SUE and AS are positively correlated with CAR^{EA} and CAR^{60}. Conservatism (CON) is negatively correlated with SUE and AS, indicating that higher conservatism results in negative values of earnings surprise. In addition, conservatism shows a positive and significant association with both CAR^{EA} and CAR^{60}. This may give an indication that conservatism is related to lower earnings quality; however, no inference can be made before conditioning on earnings surprise. Regarding the control variables, contrary to the litigation demand for conservatism for firms with higher leverage (Watts 2003a), leverage is negatively correlated to conservatism, while size and MTB are negatively correlated to conservatism, as in Garcia Lara et al. (2020).

[Insert Table 2.2 about here]

2.5.1 *Earnings surprise*

To test the effect of accounting conservatism on earnings surprise, I regress both the earnings surprise and its absolute value on the decile rank of conservatism using Fama-MacBeth (1973) regression as in Equation (2.1). The results are reported in Table 2.3. Newey-West t-statistics are presented in parentheses. Examining the effect of conservatism on the absolute value of earnings surprise gives evidence of whether conservatism increases the frequency of surprise, i.e., whether higher conservatism decreases or increases the probability of generating a non-zero earnings surprise. However, examining the signed (raw) values of surprise gives evidence on the kind of surprise caused by conservatism, i.e., whether higher conservatism causes overestimating or underestimating of earnings.

Panel A shows the regression results using the absolute values of earnings, where column 1 represents the surprise calculated using seasonal random walk (SUE), and column 2 represents the analyst-based surprise (AS). As conservatism results in earnings that have low persistence and predictability, I expect that higher conservatism is associated with a higher frequency of earnings surprises. However, the coefficient of conservatism (α_1) is negative and significant using absolute SUE and AS as the independent variables, which means that earnings surprises are less likely to happen for firms applying a high level of conservatism. This finding is consistent with Garcia Lara et al. (2014).

[Insert Table 2.3 about here]

Panel B represents the regression results using the signed values of SUE in column 3 and AS in column 4. The results show that conservatism is negatively related to SUE (α_1= -.001, t-value= -3.75), which means that higher conservatism is more likely to generate negative surprises than positive surprises. This finding is consistent with conservatism increases the frequency of one-time big loss reported in Givoly and Hayn (2000). However, column 4 shows that there is no association between conservatism and AS, which indicates that the probability of generating a negative earnings surprise by the analyst is not different from the probability of generating a positive surprise. In other words, conservatism does not affect the value of analyst surprise.

To sum up, the results show that higher conservatism is negatively associated with the absolute value of earnings surprise. And while higher conservatism results in negative SUE, conservatism does not affect the sign of AS, which indicates that the sign of the analyst's surprise is not affected by the level of conservatism.

2.5.2 *Market initial reaction (ERC)*

In this section, I investigate the effect of accounting conservatism on the cumulative abnormal return around earnings announcement (CAR^{EA}), after controlling for earnings surprise. Table 2.4 reports the results of the portfolio analyses around earnings announcements. I sort the firms *independently* into 5 quantiles based on the level of conservatism (CON), where 1 is the lowest and 5 is the highest. Then I sort the firms *independently* into 5 quantiles based on the random-walk based earnings surprise (SUE) in Panel A and the analyst-based surprise (AS) in Panel B, where 1 is the most negative surprise, and 5 is the most positive surprise. After that, I report the mean values of CAR^{EA} for each of the 25 portfolios.

Table 2.4 shows that CAR^{EA} is increasing in SUE and AS within each quantile of CON. Panel A and Panel B show that CAR^{EA} is increasing in CON and goes from 0 in the first quantile of conservatism to .3% in the fifth quantile of conservatism, as the vertical average shows. When conditioning on the surprise, the difference between the high and low CON portfolio return is increasing as the level of surprise increases (the horizontal difference). The difference rises from .1% to .7% when conditioning on SUE (Panel A) and from -.1% to 1% when conditioning on AS (Panel B). The difference is more obvious and significant for positive and high surprise values, as observed from the t-values of the 4th and the 5th surprise quantile. This result gives a preliminary indication that higher accounting conservatism results in a higher initial market reaction after conditioning on surprise, as expected in H2.1.

[Insert Table 2.4 about here]

To test H2.1, I run Equation (2.2) using Fama and MacBeth (1973) regression, where CAR^{EA} is the dependent variable. Table 2.5 reports the regression results, where Panel A

tabulates the results when conditioning on SUE, while panel B tabulates the same coefficients when conditioning on AS. Newey-West t-statistics are presented in parentheses. The dependent variable, CAR^{EA}, is multiplied by 100 for readability. Conservatism shows a positive and significant association with CAR^{EA} in both panels, which confirms the correlation results in Table 2.2 and the portfolio analysis in Table 2.4. Size shows a significant positive association with CAR^{EA} ($\alpha_{5(size)}$= .061% and .059%) and a negative association when conditioning on SUE ($\alpha_{5(size)}$=-.018%), which is consistent with that big firms have fewer information asymmetries and more immune to external shocks (Francis et al. 2013). However, it has a positive association with CAR^{EA} when conditioning on AS ($\alpha_{5(size)}$=.007%), but the coefficient is too small.

[Insert Table 2.5 about here]

The main coefficient of interest is (α_3), which represents the association between accounting conservatism and CAR^{EA}, after controlling for earnings surprise. Panel A shows that (α_3) is positive but insignificant when the surprise is measured using SUE (α_3=.008% t-value=1.10). However, (α_3) is positive and significant when the surprise is measured using AS, as shown in panel B (α_3=.031% t-value=2.55). This means that consistent with H2.1, higher levels of conservatism generate higher abnormal return around earnings announcement, after controlling for earnings surprise.

The positive relationship between conservatism and CAR^{EA} reveals that accounting conservatism has an information content and affects the decision-making around earnings announcement, which is consistent with the findings of D'Augusta et al. (2016). However, the results of testing H2.1 cannot be used alone to make an inference about the effect of accounting conservatism on earnings quality. As explained before, the positive association with CAR^{EA} can result from high earnings quality, as in Chen et al. (2017), or high

information risk, as in Zhang et al. (2013). Therefore, the association between accounting conservatism and PEAD is examined next.

2.5.3 *Subsequent market reaction (PEAD)*

The results in Table 2.5 show a positive and significant relationship between accounting conservatism and CAR^{EA}. This can be interpreted in two contradictory ways; it can be interpreted as higher information quality that enhances the market reaction, or it can be interpreted as evidence about higher uncertainty and information risk as a result of low earnings persistence. To resolve this, in this section, I investigate the effect of accounting conservatism on the cumulative abnormal return post to earnings announcement (CAR^{60}), after controlling for earnings surprise. Table 2.6 reports the results of the portfolio analysis of returns post to earnings announcements. Firms are sorted according to their level of conservatism and earnings surprise the same way as in Table 2.4, then the mean values of CAR^{60} are reported for each of the 25 portfolios.

Table 2.6 shows that CAR^{60} is increasing in SUE and AS within each quantile of CON. Panel A and Panel B show that the absolute CAR^{60} average is 2 times more in the fifth quantile of conservatism compared to the first quantile of conservatism (|.002/-.001|). When conditioning on the surprise, the difference between the high and low CON portfolio return is increasing as the level of surprise is increasing (the horizontal difference). In Panel A, the difference increases from -0.2% to 1.4% when conditioning on SUE, while in Panel B, the difference increases from -0.3% to 1.7% when conditioning on AS. Surprisingly, the difference between conservatism quantiles is more significant in general in the fourth and fifth quantiles of earnings surprise than in the other quantiles as shown by the t-statistics, which means that conservatism increases the asymmetric reaction to earnings surprise by increasing the magnitude of the reaction to the positive surprise. The portfolio analysis gives a preliminary indication that higher accounting conservatism

results in a higher subsequent market reaction after conditioning on surprise, as expected in H2.2.

[Insert Table 2.6 about here]

In H2.2, no directional expectation is made about the association between accounting conservatism and the subsequent market reaction. To test H2.2, I run Equation (2.2) using Fama and MacBeth (1973) regression, where CAR^{60} is the dependent variable. The results are reported in Table 2.7. Newey-West t-statistics are presented in parentheses. The dependent variable, CAR^{60}, is multiplied by 100 for readability. Panel A tabulates the results when the surprise is calculated on a random-walk based surprise (SUE), while panel B tabulates the same coefficients when surprise represents the analyst-based surprise. As in CAR^{EA}, conservatism shows positive and significant associations with CAR^{60} in both panels, which confirms the correlation results in Table 2.2 and the portfolio analysis in Table 2.6. The main variable of interest is the interaction between conservatism and the surprise (α_3). In Panel A, (α_3) is insignificant when the surprise is measured by SUE, although it is positive (α_3= .005% t-value= .2). However, (α_3) is positive and significant at 90% level of confidence when the surprise is represented by AS in panel B (α_3= .046% t-value=1.9). This finding provides evidence that higher conservatism results in higher post-earnings announcement abnormal return after controlling for earnings surprise. Size-adjusted return is widely used by the literature as a measure of abnormal return. However, for robustness check, I re-estimate Equation (2.2) using the market adjusted CAR^{EA} and CAR^{60} instead of the size adjusted abnormal return in Appendix B. The results come to confirm the findings in Table 2.5 and Table 2.7, consequently.

[Insert Table 2.7 about here]

Having positive and significant associations between accounting conservatism and PEAD supports the argument that accounting conservatism results in higher information risk through generating low-persistent earnings (Chan et al., 2009) and that investors are unable to fully adjust for conservative earnings (Barth et al. 2014). In other words, conservatism results in low-persistent earnings that raise investors' uncertainty and decrease their abilities to make accurate earnings forecasts before earnings announcements, so they wait for the announcement of actual earnings to make their decision. Therefore, the return around earnings announcement CAR^{EA} increases as the level of conservatism increases. At the same time, investors are not able to quickly resolve this uncertainty and fully assimilate these earnings announcements, which results in post-earnings announcement drift.[14] While these results are consistent with the findings of Barth et al. (2014) that investors need longer time to react to earnings announcements with higher levels of conservatism, I disagree with Barth et al. (2014) argument that conservatism has low information content as they find that higher conservatism is associated with lower trading volume around earnings announcements. The positive association between conservatism and CAR^{EA} that I find shows that conservatism has information content; however, the abnormal return results from the surprising announcements is very low that it can be absorbed by investors using a low volume of transactions.

In addition, the findings of this study are inconsistent with D'Augusta et al. (2016). D'Augusta et al. (2016) find that the trading volume around earnings announcement decreases as the level of conservatism increases and interpret this finding as that conservatism helps to resolve investors' uncertainty around earnings announcement and plays a positive role in the equity market. However, D'Augusta et al. (2016) do not study

[14] Accounting conservatism results in high initial reaction and continues in the long window. This distorts market efficiency and shows that conservatism amplify the PEAD anomaly, which may result in stocks pricing error and abnormal return gained by investors. Therefore, it might be useful to take into consideration conservatism return when calculating the cost of capital.

the post-earnings announcement drift and build their conclusion depending on the market reaction around earnings announcement, which is expected to increase around earnings announcement whether conservatism affects the quality of earnings negatively or positively.

Although past literature emphasizes the role of accounting conservatism to produce reliable information, the results in this study give evidence that higher conservatism results in lower earnings quality as shown by investors' reaction to earnings affected by conservatism. Conservatism implies applying a higher level of verification on earnings, which decreases earnings manipulation and produces more reliable earnings. However, these reliable earnings suffer from low persistence and high volatility, which result in high uncertainty that outweighs the positive consequences of reliability. In other words, investors put more weight on pricing the risk results from uncertainty than the risk reduced by reliability.

2.6 Conclusion

The debate of the effect of accounting conservatism on earnings quality is still standing (see, for example, Ruch and Tylor (2015) for a literature review). Some studies use theory-based arguments to discuss the effect of conservatism on earnings quality (e.g., Watts, 2003a), while others use the characteristics of earnings like usefulness (e.g., Bandyopadhyay et al. 2010) and predictability (e.g., Penman and Zhang, 2002) to provide evidence about the effect of conservatism on earnings quality. However, there is inconsistent evidence about the effect of conservatism on earnings quality. This chapter investigates the effect of conservatism on earnings quality and contributes to the past literature by providing *market-based* evidence about the quality of conservative earnings, giving that shareholders are the main users of financial statements.

I argue that the effect of conservatism on earnings quality can be deduced from the relationship between conservatism and post-earnings announcement drift. Using Fama-MacBeth (1973) regression, I start by examining the effect of conservatism on earnings surprise and find that higher conservatism is associated with less frequency of earnings surprise and lower (more negative) standardized abnormal earnings. Then, I examine the effect of conservatism on abnormal return around earnings announcement, conditioning on earnings surprise, and find that a higher level of conservatism is associated with a higher abnormal return around earnings announcements. However, since no conclusion about the effect of conservatism on earnings quality can be drawn from this test, the association between conservatism and the post-earnings abnormal return is tested to get conclusive evidence. The results show that a higher level of conservatism is associated with higher abnormal return post to earnings announcements, consistent with the argument that the market is unable to fully adjust to information provided by conservative earnings (Barth et al., 2014). Overall, the results of this chapter give evidence that higher levels of conservatism negatively affect earnings quality, resulting in a positive drift in post-earnings announcement abnormal return.

Although conservatism plays an important role in producing reliable earnings, it decreases the persistence of these earnings. In other words, the high earnings reliability resulted from conservatism is offsetted by the low earnings relevance (predictability) resulted from conservatism. As the results show, investors put more weight on pricing the risk.

FIGURES AND TABLES

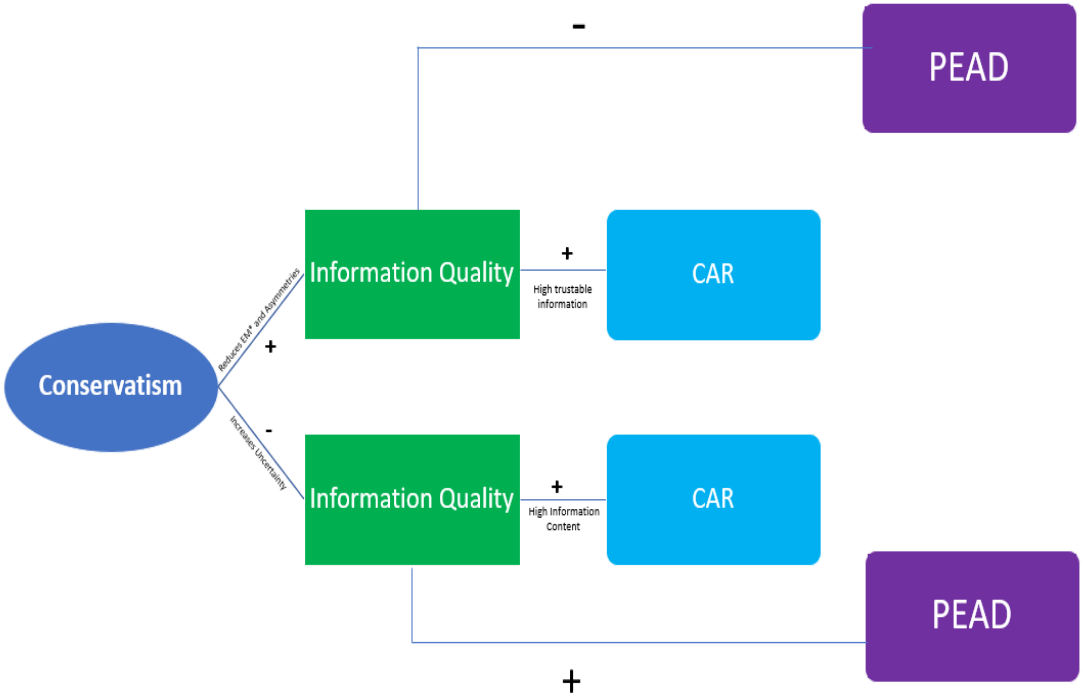

Figure 2.1: Research hypotheses development

Table 2.1: Descriptive statistics.

	Mean	StdDev	Q1	Median	Q3
CAR^{EA}	0.001	0.073	-0.036	0.001	0.040
CAR^{60}	0.000	0.178	-0.098	0.001	0.098
SUE	0.001	0.040	-0.003	0.001	0.004
AS	-0.001	0.018	-0.001	0.000	0.002
CON	5.469	1.579	4.333	5.333	6.667
Size	6.563	1.677	5.337	6.495	7.719
Leverage	0.185	0.168	0.014	0.163	0.304
MTB	3.010	2.581	1.456	2.239	3.579

This table shows descriptive statistics for 137,264 firm-quarters between Q1, 1990 and Q4,2016. The mean, standard deviation (StdDev), median, and first (Q1) and third (Q3) quartiles are reported. CAR^{EA} is the cumulative size-adjusted return over [0,1] window. CAR^{60} is the cumulative size-adjusted return over [2,60] window. SUE is the standardized unexpected return calculated using a random walk model. AS is the analyst-based earnings surprise. CON is the average decile of the three conservatism measures (C-Score; negative non-operating accruals; earnings skewness) measured at the beginning of the year. Size is the natural log of the beginning of the year market value of equity. Leverage is the sum of long-term and short-term debt deflated by the market value of equity, calculated at the beginning of the year. MTB is the beginning of the year market-to-book ratio.

Table 2.2: Correlation matrix.

	CAR^{EA}	CAR^{60}	SUE	AS	CON	Size	Leverage	MTB
CAR^{EA}	1.000	0.026	0.139	0.286	0.008	0.020	0.012	-0.005
CAR^{60}	0.030	1.000	0.015	0.042	0.004	0.008	-0.003	-0.005
SUE	0.141	0.018	1.000	0.413	-0.014	-0.035	0.038	0.007
AS	0.291	0.044	0.417	1.000	-0.002	-0.006	-0.002	-0.039
CON	0.009	0.006	-0.015	-0.006	1.000	-0.321	-0.010	-0.201
Size	0.027	0.012	-0.034	0.010	-0.321	1.000	0.192	0.377
Leverage	0.014	-0.001	0.038	-0.003	-0.014	0.192	1.000	-0.111
MTB	-0.001	-0.001	0.008	-0.025	-0.196	0.376	-0.111	1.000

This table shows the correlation coefficients for 137,264 firm-quarters between Q1, 1990 and Q4,2016. The upper right triangle of the matrix shows Pearson correlations, and the lower left triangle shows Spearman correlations. All values are significant at 90% or more. CAR^{EA} is the cumulative size-adjusted return over [0,1] window. CAR^{60} is the cumulative size-adjusted return over [2,60] window. SUE is the standardized unexpected return calculated using a random walk model. AS is the analyst-based earnings surprise. CON is the average decile of the three conservatism measures (C-Score; negative non-operating accruals; earnings skewness) measured at the beginning of the year. Size is the natural log of the beginning of the year market value of equity. Leverage is the sum of long-term and short-term debt deflated by the market value of equity, calculated at the beginning of the year. MTB is the beginning of the year market-to-book ratio.

Table 2.3: Fama-MacBeth regression results of regressing earnings surprises on conservatism.

Model: Surprise $_{i,qt} = \alpha_0 + \alpha_1$ **CON** $_{i,t-1} + \alpha_3$ **ΣControls** $_{i,t-1} + \varepsilon_t$

	Panel A		Panel B	
	(1)	(2)	(3)	(4)
VARIABLES	|SUE|	|AS|	SUE	AS
Constant	0.031***	0.016***	0.002	-0.003***
	(13.48)	(17.54)	(1.23)	(-3.94)
CON	-0.001***	-0.001***	-0.001***	0.000
	(-3.46)	(-6.31)	(-3.75)	(0.32)
Size	-0.002***	-0.001***	-0.001***	0.000***
	(-15.28)	(-15.99)	(-7.42)	(8.42)
Leverage	0.000***	0.000***	0.000***	-0.000**
	(4.83)	(4.63)	(4.96)	(-2.24)
MTB	-0.001***	-0.000***	0.001***	0.000**
	(-8.45)	(-8.95)	(4.84)	(2.29)
%Adjusted R^2	5.00	5.60	0.60	0.30
Observations	137,264	137,264	137,264	137,264

*** significant at 1%; ** significant at 5%; * significant at 10%.
This table shows the coefficient and Newey-West t-statistics from Fama-Macbeth regression of earnings surprise on conservatism and the control variables. The sample consists of 137,264 firm-quarter observations between Q1, 1990 and Q4,2016. SUE is the standardized unexpected return calculated using a random walk model. AS is the analyst-based earnings surprise. CON is the average decile of the three conservatism measures (C-Score; negative non-operating accruals; earnings skewness) measured at the beginning of the year. Size is the decile rank of the natural log of the beginning of the year market value of equity and takes a value between 1 and 10. Leverage is the decile rank of the sum of long-term and short-term debt deflated by the market value of equity, calculated at the beginning of the year and takes a value between 1 and 10. MTB is the decile rank of the beginning of the year market-to-book ratio and takes a value between 1 and 10.

Table 2.4: Portfolio analysis around earnings announcements.

Panel A: cumulative abnormal return during [0,+1] when surprise= SUE.

	SUE1	SUE2	SUE3	SUE4	SUE5	Average	high-low (5-1)	t-value
CON1	-0.015	-0.005	0.002	0.008	0.010	0.000	0.025	16.73***
CON2	-0.014	-0.006	0.003	0.011	0.013	0.001	0.027	17.50***
CON3	-0.016	-0.006	0.004	0.012	0.017	0.002	0.033	20.05***
CON4	-0.015	-0.006	0.005	0.012	0.018	0.003	0.033	22.22***
CON5	-0.014	-0.006	0.004	0.012	0.017	0.003	0.031	22.03***
Average	-0.015	-0.006	0.004	0.011	0.015			
high-low (5-1)	0.001	-0.001	0.002	0.004	0.007			
t-value	0.38	0.45	1.60*	2.62***	4.40***			

Panel B: cumulative abnormal return during [0,+1] when surprise= AS.

	AS1	AS2	AS3	AS4	AS5	Average	high-low (5-1)	t-value
CON1	-0.028	-0.013	0.004	0.016	0.022	0.000	0.050	34.29***
CON2	-0.031	-0.015	0.006	0.019	0.028	0.001	0.059	39.33***
CON3	-0.033	-0.015	0.007	0.020	0.033	0.002	0.066	41.46***
CON4	-0.032	-0.015	0.007	0.021	0.033	0.003	0.065	44.27***
CON5	-0.029	-0.015	0.005	0.020	0.032	0.003	0.061	44.24***
Average	-0.031	-0.015	0.006	0.019	0.030			
high-low (5-1)	-0.001	-0.002	0.001	0.004	0.010			
t-value	0.81	1.45*	0.60	3.26***	6.29***			

*** significant at 1%; ** significant at 5%; * significant at 10%.
This table shows portfolio analysis. The firms are sorted independently into 5 quantiles depending on the levels of conservatism and earnings surprise, and then the mean return around earnings announcements is calculated for each portfolio. CAR^{EA} is the cumulative size-adjusted return over [0,1] window. SUE is the quantile rank of the random-walk based earnings surprise that takes a value between 1 and 5. AS is the quantile rank of the analyst-based earnings surprise that takes a value between 1 and 5. CON is the average decile of the three conservatism measures (C-Score; negative non-operating accruals; earnings skewness) measured at the beginning of the year. Absolute t-values for the t-test are reported.

Table 2.5: Fama-MacBeth regression results of regressing CAR on conservatism.

$$CAR^{EA}_{qt}=\alpha_0 + \alpha_1 Surprise_{i,qt} + \alpha_2 CON_{i,t-1} + \alpha_3 CON_{i,t-1}*Surprise_{i,qt} + \alpha_4 \Sigma Controls_{i,t-1} + \alpha_5 \Sigma Controls_{i,t-1}*Surprise_{i,qt} + \varepsilon_t$$

	Panel A Surprise = SUE	Panel B Surprise = AS
VARIABLES	CAR^{EA}	CAR^{EA}
Constant	-0.169 (-0.78)	-0.416** (-2.05)
Surprise	0.364*** (4.47)	0.359*** (5.86)
CON	0.115*** (3.95)	0.123*** (3.62)
CON *Surprise	0.008 (1.10)	0.031** (2.55)
Size	0.061*** (3.51)	0.059*** (2.99)
Leverage	0.003 (0.13)	0.020 (1.17)
MTB	-0.025 (-1.26)	0.031* (1.66)
Size*Surprise	-0.018*** (-4.23)	0.007* (1.86)
Leverage *Surprise	-0.001 (-0.14)	-0.002 (-0.21)
MTB*Surprise	0.008 (1.32)	0.014*** (5.05)
%Adjusted R^2	0.40	8.50
Observations	137,264	137,264

*** significant at 1%; ** significant at 5%; * significant at 10%.

This table shows the coefficients and Newey-West t-statistics from Fama-Macbeth regression of the abnormal return around earnings announcement on conservatism and the control variables conditional on earnings surprise. The dependent variable is multiplied by 100. The sample consists of 137,264 firm-quarter observations between Q1, 1990 and Q4,2016. CAR^{EA} is the cumulative size-adjusted return over [0,1] window. SUE is the decile rank of the random-walk based earnings surprise and takes a value between -5 and +5. AS is the decile rank of the analyst-based earnings surprise and takes a value between -5 and +5. CON is the average decile of the three conservatism measures (C-Score; negative non-operating accruals; earnings skewness) measured at the beginning of the year. Size is the decile rank of the natural log of the beginning of the year market value of equity and takes a value between 1 and 10. Leverage is the decile rank of the sum of long-term and short-term debt deflated by the market value of equity, calculated at the beginning of the year and takes a value between 1 and 10. MTB is the decile rank of the beginning of the year market-to-book ratio and takes a value between 1 and 10.

Table 2.6: Portfolio analysis post to earnings announcement.

Panel A: cumulative abnormal return during [+2,+60] using SUE.

	SUE1	SUE2	SUE3	SUE4	SUE5	Average	high-low (5-1)	t-value
CON1	-0.007	0.000	0.007	-0.003	-0.004	-0.001	0.003	0.84
CON2	-0.010	0.000	0.005	-0.003	0.000	-0.001	0.010	2.84***
CON3	-0.003	0.002	0.008	0.003	0.003	0.003	0.007	1.7**
CON4	-0.004	0.005	0.006	0.001	0.005	0.002	0.009	2.45***
CON5	-0.009	-0.004	0.011	0.002	0.011	0.002	0.020	5.68***
Average	-0.007	0.000	0.007	0.000	0.003			
high-low (5-1)	-0.002	-0.004	0.004	0.006	0.014			
t-value	0.64	1.26	1.33*	1.88**	3.75***			

Panel B: cumulative abnormal return during [+2,+60] using AS.

	AS1	AS2	AS3	AS4	AS5	Average	high-low (5-1)	t-value
CON1	-0.012	-0.003	0.005	0.001	0.002	-0.001	0.014	3.66***
CON2	-0.011	-0.003	0.003	-0.001	0.005	-0.001	0.016	4.24***
CON3	-0.007	-0.002	0.006	0.006	0.011	0.003	0.017	4.46***
CON4	-0.009	-0.002	0.003	0.008	0.011	0.002	0.020	5.44***
CON5	-0.015	-0.006	0.005	0.006	0.019	0.002	0.034	9.59***
Average	-0.011	-0.003	0.004	0.004	0.010			
high-low (5-1)	-0.003	-0.004	0.000	0.005	0.017			
t-value	0.71	1.19	0.05	1.45*	4.52***			

*** significant at 1%; ** significant at 5%; * significant at 10%.
This table shows portfolio analysis. The firms are sorted independently into 5 quantile depending on the levels of conservatism and earnings surprise, and then the mean return post to earnings announcements is calculated for each portfolio. CAR^{60} is the cumulative size-adjusted return over [2,60] window. SUE is the quantile rank of the random-walk based earnings surprise that takes a value between 1 and 5. AS is the quantile rank of the analyst-based earnings surprise that takes a value between 1 and 5. CON is the average decile of the three conservatism measures (C-Score; negative non-operating accruals; earnings skewness) measured at the beginning of the year. Absolute t-values for the t-test are reported.

Table 2.7: Fama-MacBeth regression results of regressing PEAD on conservatism.

$$CAR^{60}_{qt}=\alpha_0 + \alpha_1 Surprise_{i,qt} + CON_{i,t-1} + \alpha_3 CON_{i,t-1}*Surprise_{i,qt} + \alpha_4 \Sigma Controls_{i,t-1} + \alpha_5 \Sigma Controls_{i,t-1}*Surprise_{i,qt} + \varepsilon_t$$

	Panel A Surprise = SUE	Panel B Surprise = AS
VARIABLES	CAR^{60}	CAR^{60}
Constant	-0.521 (-0.96)	-0.650 (-1.24)
Surprise	0.399** (2.58)	0.331* (1.98)
CON	0.163** (2.35)	0.185*** (2.88)
CON *Surprise	0.005 (0.20)	0.046* (1.90)
Size	0.075 (1.33)	0.122 (1.65)
Leverage	-0.014 (-0.24)	-0.013 (-0.21)
MTB	-0.112* (-1.89)	-0.128* (-1.88)
Size*Surprise	-0.059*** (-4.96)	-0.043*** (-4.16)
Leverage *Surprise	0.000 (0.02)	-0.014 (-0.47)
MTB*Surprise	-0.001 (-0.12)	-0.006 (-0.78)
%Adjusted R^2	2.6	2.5
Observations	137,264	137,264

*** significant at 1%; ** significant at 5%; * significant at 10%.

This table shows the coefficient and Newey-West t-statistics from Fama-Macbeth regression of abnormal return post to earnings announcement on conservatism and the control variables conditional on earnings surprise. The dependent variable is multiplied by 100. The sample consists of 137,264 firm-quarter observations between Q1, 1990 and Q4,2016. CAR^{60} is the cumulative size-adjusted return over [2,60] window. SUE is the decile rank of the random-walk based earnings surprise and takes a value between -5 and +5. AS is the decile rank of the analyst-based earnings surprise and takes a value between -5 and +5. CON is the average decile of the three conservatism measures (C-Score; negative non-operating accruals; earnings skewness) measured at the beginning of the year. Size is the decile rank of the natural log of the beginning of the year market value of equity and takes a value between 1 and 10. Leverage is the decile rank of the sum of long-term and short-term debt deflated by the market value of equity, calculated at the beginning of the year and takes a value between 1 and 10. MTB is the decile rank of the beginning of the year market-to-book ratio and takes a value between 1 and 10.

APPENDIX A: DERIVATION OF C-SCORE

Basu (1997) argues that conservatism operationalizes through the asymmetric recognition of economic news, where earnings reflect bad news more quickly than good news. Basu (1997) uses the following model to measure the asymmetric timeliness in news recognition:

$$X_{it}/P_{it-1} = \alpha_0 + \alpha_1 DR_{it} + \beta_0 R_{it} + \beta_1 R_{it}*DR_{it} \quad \text{(a)}$$

Where:

X_{it} is the earnings per share for firm i in fiscal year t, P_{it-1} is the price per share at the beginning of the fiscal year, R_{it} is the return on firm i from 9 months before fiscal year-end t to three months after fiscal year-end t, DR_{it} is a dummy variable that equals 1 if $DR_{it} < 0$, and 0 otherwise. Return is the proxy for news, where positive returns represent good news and negative returns represent bad news. β_0 is the good news timeliness measure, and $\beta_0 + \beta_1$ is the bad news timeliness measure.

According to Khan and Watts (2009), the industry year measure of Basu (1997) has the limitation of assuming the homogeneity among industry firms, and the individual firm measure does not fully reflect the timing of changes in the conservatism of individual firm's financial reports. Accordingly, Khan and Watts (2009) estimate a firm-level measure that both captures the timing of conservatism changes and the variation of conservatism across firms within an industry. To estimate this measure, Khan and Watts (2009) argue that three essential factors have to be controlled for in developing the firm-year measurement of conservatism; market to book ratio, size, and leverage. They specify Basu's (1997) measure as follows:

$$X_{it} = \beta_1 + \beta_2 D_{it} + \beta_3 R_{it} + \beta_4 D_{it} R_{it} + e_i \quad \text{(b)}$$

Where i indexes the firm, X is earnings, R is returns (measuring news), D is a dummy variable equal to 1 when R<0 and equal to 0 otherwise, and e is the residual. β_3 is the good news timeliness measure. β_4 is the measure of incremental timeliness for bad news over good news, or conservatism, and the total bad news timeliness is $\beta_3 + \beta_4$.

Then they specify the timeliness of good news (denoted as G_Score) and the incremental timeliness of bad news (denoted as C_Score) as a linear function of the firm-specific characteristics each year as follows:

$$G\_Score = \beta_3 = \mu_1 + \mu_2 Size_i + \mu_3 M/B_i + \mu_4 Lev_i \quad \text{(c)}$$

$$C\_Score = \beta_4 = \lambda_1 + \lambda_2 Size_i + \lambda_3 M/B_i + \lambda_4 Lev_i \quad \text{(d)}$$

Empirical estimators of μi and λi, i=1–4, are constant across firms, but vary over time since they are estimated from annual cross-sectional regressions.

To estimate the timeliness of good news and bad news on the firm level, Equations (c) and (d) are substituted in the regression Equation (b) to form the following annual cross-sectional regression model to estimate G_Score and C_Score:

$$X_t = \beta_1 + \beta_2 D_t + R_t (\mu_1 + \mu_2 Size_i + \mu_3 M/B_i + \mu_4 Lev_i) + D_t R_t (\lambda_1 + \lambda_2 Size_i + \lambda_3 M/B_i + \lambda_4 Lev_i)$$
$$+ (\delta_1 Size_i + \delta_2 M/B_i + \delta_3 Lev_i + \delta_4 D_t Size_i + \delta_5 D_t M/B_i + \delta_6 D_t Lev_i) + \varepsilon_t \quad \text{(e)}$$

Where: X_t is the annual earnings per share deflated by the market capitalization at the beginning of the year, R_t is the compounded monthly return for the last 9 months before the year end, $size_i$ is the log of the market value at the end of the year, Lev_i is the leverage, and M/B_i is the market to book value.

APPENDIX B: USING THE MARKET-ADJUSTED ABNORMAL RETURN AS A DEPENDENT VARIABLE.

In this Appendix, I use the markets-adjusted return instead of size-adjusted return to measure the abnormal return around earnings announcements and post to earnings announcements as s a robustness check. Table B1 reports the results of regressing the market-adjusted CAR^{EA} on the independent variables using Fama and MacBeth (1973) regression. Panel A tabulates the results when conditioning on SUE, while panel B tabulates the same coefficients when conditioning on AS. Similar to Table 2.5, conservatism shows a positive and significant association with CAR^{EA} in both panels. In addition, Panel A shows that (α_3) is positive but insignificant when the surprise is measured using SUE. However, Panel B shows (α_3) is positive and significant when the surprise is measured using AS (α_3=.033% t-value=3.11). These results match the findings in Table 2.5, where (α_3) is insignificant when using SUE, and α_3=.031% and t-value=2.55 when using AS.

Regarding the PEAD, Table B2 reports Fama and MacBeth (1973) regression results using the market-adjusted CAR^{60} as a dependent variable. Panel A tabulates the results when conditioning on SUE, while panel B tabulates the same coefficients when conditioning on AS. Consistent with the results in Table 2.7, (α_3) is insignificant when surprise= SUE and positive and significant when surprise= AS (α_3=.038%, t-value=1.71). Overall, using the market-adjusted returns to measure abnormal returns yields the same qualitative results when using the size-adjusted returns. In both cases, I find that a higher level of conservatism leads to a higher abnormal return around earnings announcements and a higher abnormal return post to earnings announcements.

Table B1: Fama-MacBeth regression results of the association between conservatism and CAR^{EA}, using the market-adjusted abnormal return as the dependent variable.

$$CAR^{EA}_{qt}=\alpha_0 + \alpha_1 Surprise_{i,qt} + \alpha_2 CON_{i,t-1} + \alpha_3 CON_{i,t-1}*Surprise_{i,qt} + \alpha_4 \Sigma Controls_{i,t-1} + \alpha_5 \Sigma Controls_{i,t-1}*Surprise_{i,qt} + \varepsilon_t$$

	Panel A Surprise = SUE	Panel B Surprise = AS
VARIABLES	CAR^{EA}	CAR^{EA}
Constant	-0.153 (-0.74)	-0.472** (-2.36)
Surprise	0.380*** (5.47)	0.335*** (4.58)
CON	0.113*** (3.84)	0.125*** (3.82)
CON *Surprise	0.007 (1.09)	0.033*** (3.11)
Size	0.062*** (4.45)	0.054*** (2.80)
Leverage	-0.000 (-0.00)	0.021 (1.22)
MTB	-0.031* (-1.89)	0.033* (1.67)
Size*Surprise	-0.016*** (-3.57)	0.008* (1.92)
Leverage *Surprise	-0.003 (-0.52)	-0.003 (-0.27)
MTB*Surprise	0.006 (1.22)	0.015*** (4.96)
%Adjusted R2	0.4	8.6
Observations	137264	137264

*** significant at 1%; ** significant at 5%; * significant at 10%.

This table shows the coefficients and Newey-West t-statistics from Fama-Macbeth regression of abnormal market-adjusted return around earnings announcement on conservatism and the control variables conditional on earnings surprise. The dependent variable is multiplied by 100. The sample consists of 137,264 firm-quarter observations between Q1, 1990 and Q4,2016. CAR^{EA} is the cumulative size-adjusted return over [0,1] window. SUE is the decile rank of the random-walk based earnings surprise and takes a value between -5 and +5. AS is the decile rank of the analyst-based earnings surprise and takes a value between -5 and +5. CON is the average decile of the three conservatism measures (C-Score; negative non-operating accruals; earnings skewness) measured at the beginning of the year. Size is the decile rank of the natural log of the beginning of the year market value of equity and takes a value between 1 and 10. Leverage is the decile rank of the sum of long-term and short-term debt deflated by the market value of equity, calculated at the beginning of the year and takes a value between 1 and 10. MTB is the decile rank of the beginning of the year market-to-book ratio and takes a value between 1 and 10.

Table B2: Fama-MacBeth regression results of the association between conservatism and CAR^{60}, using the market-adjusted abnormal return as the dependent variable.

$$CAR^{60}_{qt}=\alpha_0 + \alpha_1 Surprise_{i,qt} + CON_{i,t-1} + \alpha_3 CON_{i,t-1}*Surprise_{i,qt} + \alpha_4 \Sigma Controls_{i,t-1} + \alpha_5 \Sigma Controls_{i,t-1}*Surprise_{i,qt} + \varepsilon_t$$

	Panel A Surprise = SUE	Panel B Surprise = AS
VARIABLES	**CAR^{60}**	**CAR^{60}**
Constant	-0.262 (-0.34)	-0.427 (-0.60)
Surprise	0.413** (2.61)	0.270* (1.93)
CON	0.172** (2.11)	0.171*** (2.65)
CON *Surprise	0.008 (0.31)	0.038* (1.71)
Size	-0.239*** (-4.28)	-0.169*** (-2.63)
Leverage	-0.016 (-0.26)	0.001 (0.01)
MTB	-0.103* (-1.75)	-0.122* (-1.90)
Size*Surprise	-0.063*** (-3.89)	-0.033*** (-3.44)
Leverage *Surprise	-0.005 (-0.25)	-0.011 (-0.44)
MTB*Surprise	-0.003 (-0.37)	-0.005 (-0.69)
%Adjusted R2	2.9	2.4
Observations	137,264	137,264

*** significant at 1%; ** significant at 5%; * significant at 10%.

This table shows the coefficient and Newey-West t-statistics from Fama-Macbeth regression of abnormal market-adjusted return post to earnings announcement on conservatism and the control variables conditional on earnings surprise. The dependent variable is multiplied by 100. The sample consists of 137,264 firm-quarter observations between Q1, 1990 and Q4,2016. R_{60} is the cumulative market-adjusted return over [2,60] window. SUE is the decile rank of the random-walk based earnings surprise and takes a value between -5 and +5. AS is the decile rank of the analyst-based earnings surprise and takes a value between -5 and +5. CON is the average decile of the three conservatism measures (C-Score; negative non-operating accruals; earnings skewness) measured at the beginning of the year. Size is the decile rank of the natural log of the beginning of the year market value of equity and takes a value between 1 and 10. Leverage is the decile rank of the sum of long-term and short-term debt deflated by the market value of equity, calculated at the beginning of the year and takes a value between 1 and 10. MTB is the decile rank of the beginning of the year market-to-book ratio and takes a value between 1 and 10.

3 ACCOUNTING CONSERVATISM AND STOCK MISPRICING

3.1 Introduction

Past literature addresses the role of accounting conservatism in the equity market (e.g., Kim et al., 2013; Garcia Lara et al., 2014; Kim and Zhang, 2016). However, the evidence on the role of conservatism in stock pricing is limited. For example, Barth et al. (2014) find a positive association between accounting conservatism and returns subsequent to earnings announcements. In addition, Garcia Lara et al. (2011) find that conditional conservatism decreases the cost of capital, while Francis et al. (2004) find no association between conservatism and cost of capital. My study is different from theirs by examining stock mispricing as an explanation for return predictability under conservatism.

Past literature provides three main explanations for the cross-sectional predictability; systematic risk, mispricing due to biased expectations, and data mining (Engelberg et al. 2018). Under the risk explanation, return is predicted using the cross-sectional differences in risk that are reflected in discount rates (e.g., Fama, 1991). Under biased expectations, investors have biased expectations about company performance, and when actual information arrives, investors update their expectations and correct stock prices. Under the data mining explanation, stock predictability can result from multiple testing bias (see, for example, Linnainmaa and Roberts, 2018). In this research, I focus on mispricing due to biased expectations to explain conservatism returns.

The concept of biased expectations can be traced back to Basu (1977) who finds that going long on low P/E ratio stocks and short on high P/E ratio stocks results in earning excess return due to exaggerated investor expectations. Under biased expectations, stock pricing error happens when investors make forecasts about the stock performance that are too optimistic (too pessimistic), resulting in upward (downward) biased expectations. And

when actual information is released, investors adjust their beliefs and result in a downward (upward) correction in the stock price.

The time-series characteristics of earnings under conservatism can lead to stock mispricing. Conservatism results in timely recognition of bad news and delayed recognition of good news (Basu, 1997). This asymmetric recognition of gains vs. losses, implied by accounting conservatism, results in earnings being less persistent (Givoly and Hyan, 2000; Dichev and Tang, 2008; Chen et al. 2014), which decreases the predictability of earnings (Kim and Kross, 2005; Bandyopadhyay et al. 2010). Therefore, earnings affected by conservatism do not help investors to make accurate forecasts about future earnings. For example, Mensah et al. (2004) find that conservatism results in volatile earnings that result in higher forecasting errors. I argue that the pattern of earnings persistence is different between high and low conservatism firms. In high conservatism firms, investors do not take into account the reversal of losses, which results in a downward biased expectation. While, in low conservatism firms, investors fixate on the good news that firms aggressively recognize, not taking into consideration the reversal of these gains, which results in expectations that are biased upward. Therefore, I hypothesize that accounting conservatism results in stock pricing error, where the error is biased downward in high conservatism firms and upward in low conservatism firms.

To test the research hypothesis, I employ a panel data context that allows controlling for time fixed effects. The results show that firms with higher levels of accounting conservatism yield higher returns on earnings announcement days compared to non-announcement days. Then, I test if the results are attributed to risk. To do so, I use a dynamic risk framework as in Engelberg et al. (2018) and control for market risk. The results show that, first, consistent with the hypothesis, on announcement days, high conservative firms have higher positive returns and low conservative firms have more

negative returns compared to non-announcement days. Second, the market risk does not change the return difference between high and low conservative firms on earnings days, which means that risk cannot explain the elevated return on earnings days. As a robustness check, I use other asset pricing risk factors that include Fama and French (2015) five factors, the factors in *q*5 model in Hou et al. (2015) and Hou et al. (2020), and the mispricing factors in Stambaugh and Yuan (2017). The results show that the findings are robust to different risk factors and high (low) conservatism stocks have higher (lower) return on earnings announcement days.

Then I investigate if the elevated return on announcement days is attributed to biased expectations as expected in the research hypothesis. To do so, I use the mispricing score developed by Stambaugh et al. (2015) as a proxy for stock mispricing. I regress the daily return on three-way interactions between each of the high and low conservatism variables, the direction of mispricing, and the earnings day dummy, controlling for the day fixed effects. I find that high and low levels of conservatism amplify the expectation error of the other mispricing factors. This research is the first to find such a piece of evidence. In addition, I find that conservatism has an independent mispricing effect on stocks. These findings reveal that conservatism is not only a priced anomaly but also an anomaly that magnifies the effects of other anomalies.

Finally, I examine if the findings can be attributed to data mining. To do so, I divide the sample into big and small firms to examine if the return difference between the long and the short side of conservatism is attributed to firm size. The results show that large and small firms have similar returns on non-announcement days, while a significant difference in return happens on announcement days. This indicates that the elevated returns on earnings days for high and low conservatism firms are not driven by size.

This research contributes to the literature by the following. First: it provides an opportunity to advance the understanding of the consequences of conservatism in the equity market. In their review of accounting conservatism literature, Mora and Walker (2015) show that the conservatism literature findings in the capital market yielded mixed results, which indicates a need to understand further the various perceptions of conservatism exist in the equity market. Second, no attention has been paid to the exceptional error that may result from applying accounting conservatism. To the best of the researcher's knowledge, this research is the first to show that conservatism leads to pricing error in the stock market. In particular, this essay provides evidence that conservatism affects stock valuation through stock mispricing and does not agree with the evidence found before in Garcia Lara et al. (2011) that conservatism is a priced risk factor that decreases risk. Third, this study is the first to find that conservatism has an *asymmetric* effect on stock valuation. Contrary to previous literature, I show that the benchmark to compare highly conservative firms is neutral firms (neither conservative nor aggressive) not the least conservative (aggressive) firms. Fourth, this research adds to the literature of asset pricing by finding that conservatism is an independent and priced anomaly that is not incorporated in other pricing anomalies. Sixth, this study is the first to find that conservatism magnifies stock mispricings that result from other anomalies. Finally, this study has implications for policy makers and recommend that policymakers mandate firms to disclose more information about the nature and effect of conservative accounting practices to bridge the information gap between the insiders and the outsiders and decrease the pricing error.

The rest of the chapter is organized as follows. Section 3.2 discusses past literature and hypothesis development; section 3.3 discusses the variable measurement; section 3.4 discusses the sample and the descriptive statistics; section 3.5 discusses the portfolio

analysis; section 3.6 discusses the risk and mispricing explanations for conservatism return; section 3.7 discusses further analysis, and section 3.8 presents concluding remarks.

3.2 Literature review and hypothesis development

Exceptional error or stock pricing error happens when investors are too optimistic about some stocks and too pessimistic about others, and when actual information is announced, they update their beliefs resulting in a correction to the stock price (Engelberg et al., 2018). Along with risk premium, stock pricing error has been used in the literature to explain anomalies return (e.g., De Bondt and Thaler, 1985; Sloan, 1996; La porta et al., 1997; Fedyk et al., 2020). For example, Sloan (1996), Richarson et al. (2005), and Fedyk et al. (2020) find that investors fixate on earnings instead of cash flow when they make their expectations. In addition, La porta et al. (1997) find that higher returns earned by value stocks compared to growth stocks is due to investors' biased expectations. This essay examines if applying accounting conservatism increases stock mispricing when investors fixate on those earnings affected by accounting conservatism.

Accounting conservatism implies an asymmetric recognition of gains vs. losses, with more verification imposed to verify gains (Basu, 1997; Watts, 2003a). This asymmetric recognition leads to losses be more timely reported than gains and, therefore, affects the time series aspects of earnings. Basu (1997) is one of the first papers to explain how conservatism affects the time series characteristics of earnings. He explains that conservatism implies higher timeliness to bad news through reporting current earnings that anticipate the effect of bad news on future cash flow. Therefore, next period earnings will not be affected by the current period's bad news. Giving that, bad news will appear as a transitory shock in earnings time-series that will reverse in the following period, whereas good news will be realized gradually over multiple periods, resulting in *persistent positive shock* to earnings series. Later literature confirms the findings of Basu (1997) and finds that the

asymmetric timeliness implied by accounting conservatism negatively affects earnings persistence. For example, Givoly and Hyan (2000) find that conservatism has increased the volatility of earnings over time. In addition, Dichev and Tang (2008) find that earnings volatility has increased over the last 40 years preceding the study, and attribute this finding to the poor matching caused by accounting conservatism. Furthermore, Chen et al. (2014) find that the association between current year earnings and next year earnings is lower for higher levels of conservatism, consistent with the poor matching and low earning persistence found in Dichev and Tang (2008).

The above literature agrees that conservatism negatively affects earnings persistence. If earnings persistence declines, the ability of the financial statements' user to predict future earnings declines as well. In this regard, Kim and Kross (2005) and Bandyopadhyay et al. (2010) find that conservatism decreases the ability of current earnings to predict future earnings while it increases the ability to predict cash flow. However, Bandyopadhyay et al. (2010) note that the usefulness of earnings to explain stock prices is positively attributed to persistence, but not to the ability to predict future cash flows. This piece of evidence shows that low earnings persistence results from accounting conservatism decreases the ability of earnings to explain stock return, which may lead to expectational error as earnings persistence is positively associated with earnings predictability.

In addition to predictability, earnings persistence has a direct effect on valuation as well, as stakeholders use it to assess the recurring earnings components in their pricing decisions (Dechow et al. 2010). In the evaluation models in which firm value is a function of discounted future earnings (e.g., Ohlson, 1995), the persistence and predictability of earnings affect the timing and the forecast of these future earnings and affect the stock valuation as a result (Chen et al. 2014). In addition, high earnings persistence indicates more sustainable growth in earnings and residual earnings, and this growth is used by

investors to assess the stock price (La Porta et al., 1997). Therefore, earnings volatility that results from conservatism would affect the investors' ability to extrapolate the past growth rates into the future, which will result in an exceptional error.

While accounting conservatism affects overall earnings persistence, we should consider the patterns of earnings persistence under different levels of conservatism. Under high levels of conservatism, bad news is fully and completely recognized earlier than good news. Therefore, high conservatism would result in bad news earnings components being transitory, as bad news events are fully incorporated in current earnings, and good news earnings components to be more persistent over time as they are recognized gradually overtime. Differently, in aggressive firms, good news events are recognized earlier and more completely compared to bad news events. Thus, good news earnings components would be transitory in aggressive firms, as good news events are fully incorporated in current earnings, and bad news earnings components to be more persistent over time as they are recognized gradually overtime.

Having said that, the direction of the expectation error would be different among different levels of conservatism, as well. Firms that apply high levels of conservatism in their accounting procedures would have earnings that are characterized by big one-time losses and higher allowances taken to hedge against future losses[15]. These losses or allowances are bigger in highly conservative firms when compared to less conservative firms *that have the same performance*, and tend to reverse partially or completely in the future. Therefore, investors fixating on losses that happen in highly conservative firms would form expectations that are biased downwards[16], then they adjust these expectations upward when

[15] For example, Jackson and Liu (2010) find that firms with higher degrees of conservatism have higher balances of allowance of doubtful debts.

[16] In this example and the example about depreciation illustrated in Basu (1997) (P5), losses are presented as single loss that happens once in the current period and reverses over the upcoming periods. However, as the firm is growing, in a very conservative firm, losses can happen between time and time where the losses are recognized in a single period and reverse in the following periods. Therefore, this process of loss recognition

earnings are released, resulting in positive returns. Put it another way, investors that do not take into consideration the reversal of these losses will build forecasts that are too pessimistic or not optimistic enough forecasts about firms' earnings.

Differently, firms that are aggressive or apply low levels of accounting conservatism put less verifications on recognizing good news events. This leads to good news events that were previously aggressively recognized in one period to be reversed over the upcoming periods, resulting in a persistent negative shock to earnings series. Therefore, investors fixating on gains that happen in aggressive firms would form expectations that are biased upward, then they adjust these expectations downward when earnings are released, resulting in negative returns. In other words, investors that do not take into consideration the reversal of these gains will build forecasts that are too optimistic or not pessimistic enough about firms' earnings.

In addition to earnings persistence, accounting conservatism can be related to expectational error through accruals. Past literature shows that conservatism operates through accruals (e.g., Basu, 1997; Givoly and Hyan, 2000). For example, Givoly and Hyan (2000) argue that accruals are likely to reverse, and therefore net income before depreciation should converge into cash flow from operations over a sufficient period of time. However, they notice that negative accruals are persistent over time. In particular, they find that while the cumulative non-current accruals are decreasing over time, the cumulative current accruals are increasing over time but not to the level to offset the decline in non-current accruals, resulting in cumulative total accruals to be decreasing over time. This finding leads to Givoly and Hyan (2000) and later literature use the accumulation rate of negative accruals as a measure of accounting conservatism, where the higher the level of negative non-operating accruals, the higher the degree of conservatism.

and reversing is continuous as the firm is growing, making losses more frequent in firms that are growing and conservative, but not persistent.

Moreover, Givoly and Hyan (2000) find that the variability of earnings (return on assets ROA) is increasing over time. When they decompose the ROA into cash flow from operations and accruals, they find that the variance of cash is constant over time. However, they find that the variance of accruals has increased over time, and the covariance between accruals and cash flow from operations has decreased over time. Overall, the findings of Givoly and Hyan (2000) show that, in addition to high earnings volatility, conservatism leads to the accumulation of negative accruals and results in high accruals volatility. These low persistent accruals can lead to security mispricing (Richardson et al., 2005). In addition, Fedyk et al. (2020) find that the accruals anomaly proposed by Sloan (1996) is consistent with mispricing; investors overestimate the persistence of accruals relative to the persistence of cash flow which results in stock pricing error. Therefore, I argue that the effect of accounting conservatism on accruals persistence can lead to stock pricing error as in the accrual anomaly.

The relationship between anomaly returns and stock pricing error is investigated comprehensively in Engelberg et al. (2018). Engelberg et al. (2018) study 97 stock return anomalies, including event anomalies, market anomalies, valuation anomalies, and fundamentals anomalies, which include the accrual anomaly and any other anomalies that are based only on financial statements. Consistent with past literature, they classify the ability anomalies to predict cross-sectional stock return into three main explanations. First, predictability that results from cross-sectional differences in risk. Second, predictability that reflects mispricing. Third, predictability that is caused by data mining. Their findings show that anomaly returns are mainly explained by stock mispricing, although they can be partially explained by data mining.

To sum up, stock pricing error happens when investors make forecasts about the stock performance, especially earnings, that are too optimistic (too pessimistic), which

making upward (downward) biased expectations. And when actual information is released, investors adjust their expectations and result in a downward (upward) correction in the stock price. Conservatism affects the persistence of earnings and decreases earnings predictability, which increases the probability of stock pricing errors because of inaccurate earnings forecasts. The pattern of earnings persistence is different between high and low conservatism firms. In high conservatism firms, investors do not take into account the reversal of losses, which results in a downward biased expectation. In low conservatism firms, investors fixate on the good news that firms aggressively recognize, not taking into consideration the reversal of these gains, which results in expectations that are biased upward. Building on these arguments, I hypothesize that accounting conservatism results in stock pricing error, where the error is biased downward in high conservatism firms and upward in low conservatism firms. I state the research hypothesis as follows:

H3.1: Applying accounting conservatism results in expectation error in stock pricing, all else being equal.

H3.1 a: Under the highest levels of accounting conservatism, the expectations of stock pricing are biased downward which leads to a higher future expected return, all else being equal.

H3.1 b: Under the lowest levels of accounting conservatism, the expectations of stock pricing are biased upward which leads to a lower future expected return, all else being equal.

3.3 Measuring accounting conservatism

Prior literature has not identified one single and ideal firm-level measure of conservatism. Therefore, to increase the validity of the measures of conservatism used and to decrease the probability of measurement error, I use three firm-level measures of

conservatism. The first measure is the C-score firm-year measurement of conservatism from Khan and Watts (2009), which is based on Basu's (1997) measure of asymmetric timeliness. C-score measures the incremental timeliness of bad news compared to good news, where the higher the C-score, the higher the level of conservatism.

Although C-score has been widely used by the literature to capture conservatism (e.g., Kim et al., 2013; Francis et al., 2013; Chen et al., 2014; Garcia Lara et al., 2014; D'Augusta et al., 2016), it has several limitations. For example, Givoly et al. (2007) find that Basu's (1997) measure of asymmetric timeliness *"is subject to considerable measurement error or to a downward bias"* and that it fails to detect conservatism in times where it is expected to exist[17]. Therefore, I use C-score along with other measures of conservatism as recommended by Givoly et al. (2007), Dietrich et al. (2007), and Ryan (2006). The second measure of conservatism is the negative non-operating accruals proposed by Givoly and Hyan (2000). Following Beatty et al. (2008) and Kim et al. (2013), I divide non-operating accruals by beginning of year total assets and use up to 20 quarters to calculate the average non-operating accruals, where at least 12 previous quarters are used to calculate the average non-operating accruals for a particular year. Average non-operating accruals are then multiplied by -1 to be in accordance with the other measurements, where the higher the average non-operating accruals, the higher the level of conservatism.

The third and the last measurement of conservatism is the negative skewness of earnings relative to cash flow proposed by Givoly and Hyan (2000). Following Beatty et al. (2008) and Kim et al. (2013), I calculate the difference between the skewness of cash flow from operation and the skewness of net income for up to 20 quarters prior to the year of measurement, and then get the average of these differences. As in the negative accruals, I require using at least 12 previous quarters to calculate the negative skewness of earnings for

[17] For detailed discussion about the merits and demerits of Basu (1997) measure, see Ryan (2006) and Givoly et al. (2007).

a particular year. Finally, one *firm-year* measure is constructed using the decile average of the three measures as each measure of conservatism capture distinct but overlapping traits of conservatism (Chen et al., 2014). To avoid look-ahead bias, I use a one-year-lagged measure of conservatism, i.e., the firm-year measure of conservatism for year t-1 is the proxy for conservatism that will affect the event returns or the annual returns in year t.[18]

3.4 Research sample

The research hypothesis is tested using US firms' data over the period 1990:Q3 until 2016:Q4. I started by selecting all Compustat firms in NYSE, AMEX, and Nasdaq over the study period, then all financial firms and utilities (SIC 4000-4999 and 6000-6999) are deleted due to their unique nature. Besides, firm-year observations with negative total assets or equity or a share price less than $1 are removed. To be able to test the research hypothesis, the sample is restricted to firms with non-missing return variables from Center for Research in Security Prices (CRSP) and non-missing all other variables in Compustat. Then, Stambaugh et al. (2015) mispricing score is retrieved from Robert F. Stambaugh website and matched with the sample. Finally, all continuous variables are deleted at .5 and 99.5 percentiles. Table 3.1 shows the distribution of the main variables of interest.

[Insert Table 3.1 about here]

3.5 Portfolio analysis

The expectational error or stock mispricing means that investors, who are too optimistic or pessimistic in forecasting stock returns, will adjust their expectations as soon as actual information is released. Therefore, expectational error implies that a difference

[18] Another measurement that is used to capture accounting conservatism is the Conservatism Ratio (CR) developed by Callen et al. (2010). Although it is a perfectly valid measure, I choose not to use the CR because both the negative values of CR and its outliers should be deleted according to the literature, which results in a significant reduction in the number of observations in the sample.

between returns around earnings announcements and long-term returns would occur as a result of investors correcting their expectations. In this section, I examine the difference between returns around earnings announcements and long-term (annual) returns for each level of accounting conservatism. To do so, I construct 10 portfolios based on the decile rank of the average accounting conservatism measurements. These portfolios are reconstructed every year at the end of the firms' fiscal year and are assigned the numbers 1 to 10, where portfolio 1 contains firms that have the lowest level of conservatism, and portfolio 10 contains firms that have the highest level of conservatism.

For each portfolio, annual buy and hold returns and earnings announcement returns are calculated. The equally weighted annual buy and hold returns are calculated for 5 years after the portfolio construction starting four months after the fiscal year end. The returns around earnings announcements (event returns) are measured quarterly using a 3-day window (-1, 0, +1) around the earnings announcement date over 5 years after the portfolio construction. To calculate the event return, for each quarter, the 3-day buy and hold returns around the announcement date are equally weighted for all the stock in each portfolio. Finally, in the same manner, market-adjusted returns are also calculated to serve as a benchmark for the annual buy and hold return and the event return. The period of 5 years is used to check the error persistence and the time pattern of resolving the uncertainty about the stock with different levels of conservatism.[19]

Table 3.2 exhibits the average annual and event return for low and high conservatism portfolios. Return is reported in percentage. Comparing between the event and annual returns indicates whether there is a significant difference between the event return and the annual return. The existence of such a difference means that there is a different level of risk

[19] The characteristics of conservatism are not expected to change in these 5 years since conservatism is sticky and does not change easily each year (Givoly et al. 2007). Therefore, past literature use data of 3 to 5 previous years to calculate the firm-level conservatism (e.g. Beatty et al. 2008; Kim et al. 2013; Chen et al. 2014).

realized on event days, or that investors make an error through forecasting stocks' earnings and adjust their expectations later when the actual earnings are announced. Panel A presents the means of returns around earnings announcements over 5 years after the portfolios' construction. The 20 quarterly portfolio earnings announcement returns (Q01-Q20) are equally-weighted 3-day, buy-and-hold returns calculated on all stocks for which data are available for that quarter. These are aggregated into annual intervals by summing up the four quarterly earnings announcement returns in each of the five post-construction years. For example, Q01-Q04 is the sample average over 107 formation periods (1990:3 – 2016:4) of the sum of the 4 quarterly earnings announcement returns occurring in the first year after portfolio formation, while Q17-Q20 is the equivalent return for year 5 after portfolio formation.

Panel A shows that the event return is significantly higher in the high conservatism portfolio (portfolio 10) than in the low conservatism portfolio (portfolio 1). In year +1, the event return is 0.5% for the low conservatism portfolio and 3.3% for the high conservatism portfolio, indicating a higher positive surprise or a higher risk premium revealed for high conservatism portfolios in the announcement period. The difference of 2.8%, realized over 12 trading days, represents about 27.5% of the 10.2% total annual difference between the two extreme portfolios reported in Panel C.

Quantitatively, similar results can be seen in year +2, in which the difference in the event return accounts for about 34% of the difference in the annual return (1.9% / 5.6%). Interestingly, higher relative returns for the most conservative firms persist till the fifth year after the portfolio construction; however, the difference in year +5 is less than half of the difference in year +1. This decline in the return difference indicates that updating on the earnings expectation of most conservative firms compared to the least conservative firms happens pretty slowly, consistent with Barth et al. (2014). A similar trend can be found in the annual return in which a positive difference between the high and low conservatism

portfolios persists for the next five years after formulation, although the difference in year +4 is not statistically significant.

[Insert Table 3.2 about here]

Very similar inferences can be drawn from the market-adjusted abnormal return, with somewhat similar magnitudes in each year. Panel B shows that in year +1, the difference in the market-adjusted event returns between the two extreme portfolios is 3%, which accounts for about one-third of the 10% total difference in the market-adjusted annual returns in Panel D. Although the differences in the abnormal event return and the differences in the abnormal annual return are expected to vanish more quickly over time compared to the differences in raw return (La Porta et al. 1997), the differences in the abnormal event return show the same speed of petering out as the differences in raw return and persist even after controlling for the market return. This pattern can be attributed to the observation that the degree of conservatism in a firm is somewhat persistent and does not change easily over time (Givoly et al. 2007).

Overall, Table 3.2 shows that, *on average*, higher conservatism results in higher event day return, and this event return is higher than the annual return, which indicates that, on the event days, either risk premiums change or new information is revealed that is different from what is expected by investors. However, the research hypotheses expect that the relationship between conservatism and the direction of the expectation error is not linear. Therefore, I will focus next on the difference between event and non-event returns among the high and low conservatism portfolios only.

Table 3.3 exhibits the difference between the event and non-event returns for the high and low conservatism portfolios only. Returns are reported in percentage. In Table 3.2, raw returns and market-adjusted returns show a similar pattern, so market-adjusted returns only are reported in Table 3.3. Panel A shows the difference between the market-adjusted annual return and the market-adjusted *event* return for the high conservatism portfolio. The

event return is computed on an annualized basis by dividing the 12 days event return each year (from Table 3.2) by 12 then multiply it by 252 (average trading days). I do this for the next 5 years subsequent to the portfolio formation.

In years +1, to +5, the annualized event returns are substantially higher than the annual return and statistically significant. In year +1, the difference between the event return and the annual return is 42.1% and goes down to 31.3% in year +5, which is still considerably high. This is consistent with the expectation in H3.1a that investors make a downward bias in forecasting earnings of high conservatism groups which leads to higher future expected returns.

[Insert Table 3.3 about here]

Returns on the low conservatism portfolio tell a different story. Consistent with H3.1b, in years +1, to +5 the annualized event return is negative and less than the annual return; however, the difference is statistically significant in the first year, with 10.7% less market-adjusted returns are realized around earnings announcements compared to the rest of the year. Overall, the results in Table 3.3 indicate that accounting conservatism has an asymmetric effect on return on earnings days, where the return of the high conservatism portfolio increases on earning days while the return of the low conservatism portfolio decreases on earning days. These findings can be explained either by a higher risk realized on earning days that increases the spread between the two portfolios, or a positive (negative) surprise is released about high (low) conservatism stocks on earning days that increases (decreases) the stock return. In the next section, I am testing both explanations to see whether risk or mispricing can explain the difference between event and non-event returns.

3.6 Risk or mispricing, what does the return on earning days reflect?

In this section, I start by testing the difference between event and non-event returns across different levels of conservatism using regression analysis. Then I move to test whether the difference is caused by changes in risk premiums or expectation error.

To test the impact of conservatism on returns around earnings announcement, I regress the daily firm's return in the level of conservatism, a dummy variable that represents announcement days, and their interaction, after controlling for the time fixed effects and other control variables that may affect the return as well. Following Engelberg et al. (2018), I control for the lagged values of the last 10 days of return, volatility (return squared), and volume. The regression equation is as follows:

$$R_{i,t} = \alpha_t + \beta_1 \text{ Cons}_{i,t-1} + \beta_2 \text{ Cons}_{i,t-1} * D_{i,t} + \beta_3 D_{i,t} + \sum_{j=1}^{10} \gamma_j \text{ Lag Return}_{i,t-j} + \sum_{j=1}^{10} \delta_j \text{ Lag Return}^2_{i,t-j} + \sum_{j=1}^{10} \rho_j \text{ Lag Volume}_{i,t-j} + \varepsilon_{i,t} \quad (3.1)$$

Where:

$R_{i,t}$	= firm's daily return.
α_t	= day fixed effects.
$\text{Cons}_{i,t-1}$	= the decile rank of the firm-level measurement of conservatism, where 1 is the lowest and 10 is the highest.
$D_{i,t}$	= a dummy variable that equals 1 if the day is an earnings announcement day, and zero otherwise.
$\text{Lag Return}_{i,t-j}$	= firm's lag of daily return on the last 10 days before earnings announcements.
$\text{Lag Volume}_{i,t-j}$	= firm's lag of daily trading volume on the last 10 days before earnings announcements.

Table 3.4 reports the regression results. The coefficients are multiplied by 100 for readability. In Panel A, earnings days are identified as a one-day window. In the first regression, I run the regression without controlling for lagged returns, volatility, and volume. The results show that the coefficient of Cons (β_1) is about .4 basis points, while the coefficient of Cons*D (β_2) is about 4 basis points. This means that the return is 10 times higher on earnings announcement days compared to non-earnings announcement days. In the second regression, I include the control variables (lagged values for each of the

past 10 days of stock returns, stock returns squared, and trading volume) in the test. For brevity, I do not report the coefficients of these variables. The results after the inclusion of the control variables in the second regression are almost identical compared to the results of the first regression. In fact, the inclusion of the control variables slightly increases the slope coefficients and decreases the standard errors.

[Insert Table 3.4 about here]

Panel B reports similar results where earnings days are identified as a three-day window, that is days -1,0, and +1. The coefficient of Cons*D (β_2) is smaller compared to Panel A, which is consistent with that most earnings are reflected in prices the day that they are released (Engelberg et al., 2018).

The coefficients reported in both panels show a higher return on earnings days. This finding is consistent with the findings of the portfolio analysis, and consistent with the results documented in Lamont and Frazzini (2007) and Engelberg et al. (2018) that anomalies return is higher on earnings days. Higher returns on earnings days can result from higher risk recognized on earnings days, or because investors have mispriced the stock previously and they then correct their expectations when earnings are announced. The two explanations are tested in the next to see whether the results reflect risk or mispricing.

3.6.1 *Risk as an explanation*

The research hypothesis expects that investors make a downward (upward) bias in forecasting the earnings of high (low) conservatism stocks. In addition, the portfolio analysis shows that on earnings announcement days, the return is higher (lower) for the high (low) conservatism portfolios compared to non-announcement days. To test this asymmetry, instead of using the level of conservatism (Cons), I am using dummy variables;

High Cons and Low Cons, which represent stocks that rank in the top and bottom deciles of accounting conservatism, respectively.

Following Engelberg et al. (2018), I use a dynamic risk framework to explain the return on earnings days as follows:

$$E(r_{i,t}) = rf + Beta_{i,t} * E\ (Risk\ Premium_t) \quad (3.2a)$$

It is noted that the dynamic risk framework enables the potential time variation in beta and/or risk premium. The dynamic risk framework is used since conservatism predicts returns, and this predictability is elevated on earnings days. According to Engelberg et al. (2018), risk can explain the results if either risk premiums or beta change on information days. If high (low) conservatism stocks have high (low) betas, then an increase in the risk premium on earnings days would result in an increase in the return spread between high and low conservatism stocks. Alternatively, it could be the case that when information is released, beta increases for high conservatism stocks and decreases for low conservatism stocks.

In Table 3.5, I test if dynamic risk premiums or dynamic betas can explain the return on earnings days. In the first baseline regression, I regress the daily stock excess return on the High Cons and Low Cons dummies, the earnings-day dummy and the interaction between the earnings day dummy and the High and Low Cons dummies, and day fixed effects as follows:

$$R_{i,t} = \alpha_t + \beta_1\ High\ Cons_{i,t-1} + \beta_2\ Low\ Cons_{i,t-1} + \beta_3\ High\ Cons_{i,t-1}*D_{i,t} + \beta_4\ Low\ Cons_{i,t-1}*D_{i,t} + \beta_5 D_{i,t} + \varepsilon_{i,t} \quad (3.2b)$$

Where:

α_t = day fixed effects.

High Cons = a dummy variable that represents stocks that rank in the top decile of accounting conservatism.

Low Cons = a dummy variable that represents stocks that rank in the bottom decile

of accounting conservatism.

Using the day fixed effects means that the regression coefficients reflect differences in expected return across stocks on the same day. Table 3.5 reports the results. The dependent variable is multiplied by 100 so that the coefficients are easier to read. In this regression, the coefficient on High Cons is 0.034, while the coefficient on High Cons*D is 0.176. These results show that high conservatism decile stocks earn more than five times higher returns on earnings days than on non-earnings days. In other words, if there are two high conservatism stocks on day t, and one has an earnings announcement while the other does not, the stock with the earnings announcement has a return that is about 5.24 times higher.

[Insert Table 3.5 about here]

Similarly, the coefficient on Low Cons is -0.022 while the coefficient on Low Cons*D is about -0.317, which means that if there are two low conservatism stocks on day t, and one has an earnings announcement while the other does not, the stock with the earnings announcement has a return that is about 14.5 times lower. The coefficients in the first regression show that the results are asymmetric, i.e., stocks with a high (low) level of conservatism have higher (lower) returns on earnings days, which is consistent with the portfolio analysis in Table 3.3. To the best of the researcher's knowledge, this research is the first to show that conservatism has an asymmetric effect on return on earnings days. Overall, these results cannot be attributed to a daily change in risk premiums, because through using the day fixed effects, we are comparing returns across stocks with *the same beta (Cons) on the same day.*

In the second regression, I examine if risk premiums or betas can change on earnings announcement days. I add the market portfolio factor to Equation (3.2b) and interact it with the High and Low Cons dummies and the earnings day dummy as follows,

$$R_{i,t} = \alpha_t + \beta_1 \text{ High Cons}_{i,t-1} + \beta_2 \text{ Low Cons}_{i,t-1} + \beta_3 \text{ High Cons}_{i,t-1}*D_{i,t} + \beta_4 \text{ Low Cons}_{i,t-1}*D_{i,t} + \beta_5 D_{i,t} + \beta_6 \text{ High Cons}_{i,t-1}*\text{Market}_t + \beta_7 \text{ Low Cons}_{i,t-1}*\text{Market}_t + \beta_8 \text{ High Cons}_{i,t-1}*\text{Market}_t*D_{i,t} + \beta_9 \text{ Low Cons}_{i,t-1}*\text{Market}_t*D_{i,t} + \beta_{10} \text{ Market}_t*D_{i,t} + \varepsilon_{i,t} \quad (3.2c)$$

Where:

Market = the daily value-weighted market return from CRSP.

As in Engelberg et al. (2018) and Shanken (1990), the interactions are used to account for both the time-series and cross-sectional variations in beta. In the second regression, the coefficients on High Cons, Low Cons, and their interactions with the earnings days dummy are almost similar to their analogous coefficients in the first regression. In addition, the coefficients on High Cons*Market*D and Low Cons*Market*D are insignificant, which means that the market beta does not increase the spread between the high and low conservatism portfolios. Therefore, controlling for the market risk and having that the market risk can increase on earnings days does not explain the results. Moreover, the coefficient on High Cons*Market is negative, while the coefficient on Low Cons*Market is positive. This finding shows that High Cons stocks have lower beta than Low Cons stocks, and consistent with Engelberg et al. (2018) and other past literature (e.g., Fama and French, 1992 and Jegadeesh and Titman, 1993) that the long side of anomaly portfolios have lower beta than the short side of the anomaly portfolios. The coefficient on Market*D is positive and significant, which shows that, on average, betas are higher on earnings days across all stocks. This finding is consistent with Engelberg et al. (2018), Savor and Wilson (2016), and Patton and Verardo (2012). Overall, after controlling for the market beta, high (low)

conservatism stocks still have higher (lower) returns, and these returns are higher (lower) on earnings days. In Appendix C, I use other market pricing models to control for other risk factors. These pricing models are the Fama and French (2015) five factor model, the *q*5 model in Hou et al. (2015) and Hou et al. (2020), and the mispricing factors in Stambaugh and Yuan (2017). The results are robust after controlling for all these factors and qualitatively similar to the results in Table 3.5.

To sum up, the results of the first regression show that the dynamic risk premium cannot explain the higher (lower) returns of high (low) conservatism stocks on earnings days. And the results of the second regression show that the coefficients on High Cons and Low Cons remain unchanged after controlling for the market beta, which means that the increase in market betas on earnings days cannot explain the results.

3.6.2 *Stock mispricing as an explanation*

In the previous section, the analysis shows the stronger relationship between conservatism and return on earnings days cannot be attributed to risk. In this section, I examine stock mispricing or biased expectations as a cause for this relationship.

Under biased expectations, investors are too optimistic about some stocks and pessimistic about others and form biased expectations, and when earnings are released, investors adjust their expectations according to the actual information released. In other words, investors fixate on the past performance of the firm, and they put a lot of weight on it. The earlier results in this chapter show that high conservatism stocks (the long side) have higher returns on earnings days, while low cons stocks (the short side) have lower returns.

To test if high (low) conservatism stocks are underpriced (overpriced) as a result of biased expectations, I use the mispricing score developed by Stambaugh et al. (2015). This

mispricing score is a comprehensive measure of stock mispricing constructed using 11 anomalies return to represent overpriced and underpriced stocks. Therefore, using the mispricing score helps to examine two questions: 1) if conservatism has a marginal effect on stock mispricing above other mispricing factors or anomalies, 2) if conservatism is interacting with other mispricing factors in affecting the outcome of mispricing hence the expectation error correction.

The results reported in Tables 3.3 and 3.4 show that High (Low) Cons portfolios are underpriced (overpriced) and when actual earnings are released, investors correct their expectations which makes High (Low) Cons portfolios generate more positive (negative) returns around earnings announcements. Given this, I want to test if conservatism would also affect other stock mispricings, i.e., other anomalies. The anomalies used by Stambaugh et al. (2015) to construct the mispricing score include anomalies related to conservatism such as the accruals anomaly of Sloan (1996). If conservatism is captured indirectly by these anomalies, the mispricing resulted from conservatism should be absorbed by the mispricing score. However, if conservatism still results in stock mispricing after controlling for the mispricing factor, it means that conservatism has not been accounted for when stock mispricing has been examined using the existing factors. Furthermore, conservatism may play a role in amplifying the effects of other anomalies. To test if conservatism has explanatory power over the mispricing factors in explaining stock prices, I run the following regression,

$$R_{i,t} = \alpha_t + \beta 1 \text{ High Cons}_{,t-1} + \beta_2 \text{ Low Cons}_{,t-1} + \beta_3 \text{ High MIS}_{i,t} + \beta_4 \text{ Low MIS}_{i,t} + \beta_5 \text{ High Cons}_{i,t-1} * D_{i,t} + \beta_6 \text{ Low Cons}_{i,t-1} * D_{i,t} + \beta_7 \text{ High MIS}_{i,t} * D_{i,t} + \beta_8 \text{ Low MIS}_{i,t} * D_{i,t} + \beta_9 D_{i,t} + \beta_{10} \text{ High Cons}_{i,t-1} * \text{High MIS}_{i,t} + \beta_{11} \text{ Low Cons}_{i,t-1} * \text{High MIS}_{i,t} + \beta_{12} \text{ High Cons}_{i,t-1} * \text{Low MIS}_{i,t} + \beta_{13} \text{ Low Cons}_{i,t-1} * \text{Low MIS}_{i,t} + \beta_{14} \text{ High Cons}_{i,t-1} * \text{High MIS}_{i,t} * D_{i,t} + \beta_{15} \text{ Low Cons}_{i,t-1} * \text{High MIS}_{i,t} * D_{i,t} + \beta_{16} \text{ High Cons}_{i,t-1} * \text{Low MIS}_{i,t} * D_{i,t} + \beta_{17} \text{ Low Cons}_{i,t-1} * \text{Low MIS}_{i,t} * D_{i,t} + \varepsilon_{i,t} \quad (3.3)$$

Where:

High MIS = a dummy variable that reflects the most underpriced stocks depending on the mispricing score.

Low MIS = a dummy variable that reflects the most overpriced stocks depending on the mispricing score.

High MIS variable represents the most underpriced stocks, while the Low MIS represents the most overpriced stocks depending on the decile rank of the mispricing score.[20] Table 3.6 shows the results of estimating Equation (3.3). The dependent variable is multiplied by 100. The first column shows the regression results using the mispricing factor variables only. In this regression, the return on High (Low) MIS is positive (negative) and becomes more positive (negative) on earnings days. This finding is consistent with the behavioral explanation of return anomalies.

[Insert Table 3.6 about here]

In the second column, the coefficient on High MIS*D is 1.3 basis points, while the coefficient on High Cons* High MIS* D is 21.7 basis points which means that if there are two stocks with a high mispricing factor on announcement day t, and one of them is ranked within the high conservatism portfolio while the other is not, the stock with the high level of conservatism has earns higher return (21.7 - 1.3= 20.40). At the same time, the coefficient of Low Cons*High MIS*D is 21.9 basis points and the coefficient of High MIS*D is 1.3. This result means that if there are two stocks with a high mispricing factor on announcement day t, and one is ranked within the low conservatism portfolio while the other is not, the stock with the low conservatism earns higher returns (21.9-1.3=20.60).

[20] Stambaugh et al. (2015) give a value from 0 to 100 to the mispricing score, where the highest is the most overpriced and the lowest is the most underpriced, and represent the short and the long side of the anomalies, respectively. However, I denoted the lowest mispricing factors (most underpriced) as High MIS to be consistent with the long side of conservatism, and denoted the highest mispricing factors (most overpriced) as Low MIS to be consistent with the short side of conservatism. In other words, when I rank the portfolios from 1 to 10 depending on the original values of the mispricing score, portfolio 1 is the most underpriced but denoted as High MIS, while portfolio 10 is the most overpriced but denoted as Low MIS.

Therefore, comparing the High MIS portfolio conditional on conservatism to the unconditional return of High MIS portfolio at the announcement day t, both High Cons* High MIS*D and High Low Cons*MIS*D earn higher return than the unconditional High MIS return (High MIS*D). This finding means that both conservative and aggressive accounting amplify the underpricing of the already underpriced stocks.

Likewise, the same behavior can be seen in the Low MIS portfolios. The coefficient on Low MIS*D is -15.70 basis points, while the coefficient on High Cons* Low MIS* D is -5.10 basis points which means that if there are two stocks with a low mispricing factor on announcement day t, and one of them is ranked within the high conservatism portfolio while the other is not, the stock with the high level of conservatism has earns higher return (-5.10 - -15.70=10.60). At the same time, the coefficient of Low Cons*Low MIS*D is -3.50 basis points and the coefficient of Low MIS*D is -15.70. This result means that if there are two stocks with a low mispricing factor on announcement day t, and one is ranked within the low conservatism portfolio while the other is not, the stock with the low conservatism earns higher returns (-3.50 - -15.70=12.20). Therefore, comparing the Low MIS portfolio conditional on conservatism to the unconditional return of Low MIS portfolio at the announcement day t, both High Cons*Low MIS*D and Low Cons*Low MIS*D earn higher return than the unconditional Low MIS return (Low MIS*D). This finding means that both conservative and aggressive accounting amplify the overpricing of the already overpriced stocks.

In addition the results show that on the announcement day t, the unconditional return of high conservatism (High Cons*D) is higher than the unconditional return of low conservatism (Low Cons*D) 5.10 - -23.10= 28.28. This finding show that conservatism has a mispricing effect independent from the other anomalies mispricing included in the mispricing factor.

Overall, the results in Table 3.6 are consistent with H3.1a and H3.1b and show that the high (low) return of high (low) conservatism on announcement days documented in Table 3.5 result from mispricing. The results show that both high and low conservatism symmetrically amplify the mispricing of already mispriced stocks. Furthermore, conservatism interacts with mispricing in a manner that is consistent with the expectation error explanation of these existing mispricing factors. The error corrections on the earnings announcement days for these mispriced stocks are stronger when conditional on accounting conservatism. This research is the first to find such a piece of evidence. This finding reveals that conservatism is not only a standalone priced anomaly that is not included in other anomalies but also has an influence on other anomalies.[21]

3.7 Further analysis

Past literature argues that the anomaly return can exist as a result of data mining and that more anomaly factors are data mined over time (Harvey et al. 2016; Linnainmaa and Roberts, 2018). For example, McLean and Pontiff (2016) find that the long minus short anomaly return predictability is exaggerated in the in-sample analysis. In addition, Fama (1991) states that with many research attempts to examine the return predictability, it is expected to find variables that seem to be able to predict return that are in fact spurious.

In this section, I examine firm size as a potential driver for the results. Khan and Watts (2009) argue that the big firms have less information asymmetry and, therefore, they have less contracting needs for conservatism compared to small firms. In my research sample, the average size of firms for stocks in the top and bottom deciles of conservatism confirms the findings of Khan and Watts (2009) that conservatism is negatively associated with firm size. The results show that firms that rank in the top (bottom) decile of accounting

[21] Examples of anomalies that conservatism can amplify more than others are the accrual anomaly, which is included in the mispricing score, and the PEAD as shown in the second chapter.

conservatism have an average market value of $347.6 ($ 3,746.7) million. Therefore, one concern is that the return of long minus short on accounting conservatism portfolios is just a reflection of the Small minus Big anomaly documented in Fama and French (1993).

To test whether size is the main driver of the results, I divide the sample into two subsamples depending on the median of market capitalization each day, where big (small) stocks are those above (below) the median on day t. Then I estimate Equation (3.1) for each subsample.

Table 3.7 reports the results for big and small firms. The dependent variable is multiplied by 100. The first and second columns show the estimation for the big and small company samples, consequently, but without controlling for the lag returns, volatility, and volume. The coefficient of Cons in both size groups is positive and significant, which shows that in both size groups, high conservatism is positively associated with daily returns. Interestingly, the results show that the coefficient of Cons is equal in both size groups (Cons= 0.5 basis points). In column 1, the coefficient on Cons*D in the big stocks sample equals 0.027, while in column 2 the coefficient on Cons*D in the small stocks sample equals 0.053, or about 2 times higher for small stocks. These results show that all the difference in conservatism return between the big and small stocks happens on earnings days.

[Insert Table 3.7 about here]

In columns 3 and 4, I report the results of estimating the same equation for the big and small company samples; consequently, after controlling for the lag returns, volatility, and volume. As in the first two columns, the coefficient of Cons in both size groups is positive and significant. However, the coefficient of Cons is slightly higher in the small stocks group than in the big stocks group, where the difference is neglectable (=0.2 basis

points). The interaction coefficients are almost the same after and before adding the control variables, where Cons*D is about 2 times higher in small stocks compared to big stocks. Overall, the results of the size groups show that the return on conservatism is almost the same in both groups and that all the difference in return happens on earnings days. According to Engelberg e al. (2018), this huge difference between the big and small stocks cannot be explained by data mining; however, it can be explained using the mispricing theories. For example, Chan (2003) shows that small stocks tend to be more illiquid than large stocks, which makes the arbitrage costs significantly greater in small stocks. Therefore, earnings announcements have a greater effect in correcting the prices of mispriced small stocks compared to the mispriced big stocks as the mispricing in the small stocks greater.

3.8 Conclusion

Prior literature finds evidence that accounting conservatism results in higher future returns (e.g., Barth et al. 2014). The objective of this study is to examine if conservatism return results from stock mispricing.

Applying accounting conservatism decreases earnings persistence, which makes future earnings less predictable and decreases the accuracy of investors' forecasts. I argue that the pattern of earnings persistence is different among high and low conservatism firms and results in different directions stock mispricing. That is, in high conservatism firms, investors fixate on previous losses and naively ignore that these losses will reverse in the next period, which results in downward biased (pessimistic) earnings forecasts. Differently, in low conservatism firms, investors fixate on previous gains and naively ignore that these gains will reverse in the next period, which results in upward (optimistic) earnings forecasts. However, when actual earnings are released, investors in high (low) conservatism firms

adjust their beliefs upward (downward) to reflect the new information, which results in an upward (downward) correction in the stock price.

I hypothesize that in high (low) levels of conservatism, the expectations of stock pricing are biased downward (upward) which leads to higher (lower) returns on earnings announcement days compared to non-announcement days. I first test if these return attributes result from risk. The findings show that high (low) conservatism firms generate higher (lower) returns on earnings announcement days compared to non-announcement days, however, the results cannot be attributed to risk. Then, I test if stock mispricing can explain the results. I find that conservatism boosts the mispricing of the mispriced stocks classified in Stambaugh et al. (2015). This study is the first to find such evidence. Further analysis shows that the results are not driven by firm size. In addition, using other risk factors to examine the risk explanation yields the same inference. Overall, the findings are consistent with the biased expectations explanation of conservatism returns.

TABLES

Table 3.1: Descriptive statistics.

Variable	Mean	Median	StdDev	Q1	Q3
Cons	5.50	5.00	2.88	3.00	8.00
R_i	0.09	0.00	0.04	-1.45	1.44
Market	0.04	0.08	0.01	-0.45	0.57

This table shows descriptive statistics for the research sample between 1990:Q3 and 2016:Q4. The mean, standard deviation (StdDev), median and first (Q1) and third (Q3) quartiles are reported. Cons is the level of accounting conservatism at the begging of the year, measured as the average decile rank of the three measures of conservatism (C-score, negative non-opearting accruals, earnings skewness). R_i is the daily firm return. Market is the value-weighted daily market return from CRSP.

Table 3.2: Annual abnormal returns and cumulative abnormal earnings announcement returns on the portfolios classified by the level of conservatism.

Cons	1	2	3	4	5	6	7	8	9	10	Mean Difference (10-1)	t-Stat for the Difference
Panel A: Event Returns												
Q01-Q04	0.50	0.90	1.00	1.90	1.80	2.30	2.20	2.20	3.20	3.30	2.80***	6.92
Q05-Q08	0.40	1.00	0.90	1.60	1.90	2.00	2.40	1.80	2.70	2.40	1.90***	4.42
Q09-Q12	0.60	1.40	1.50	1.80	1.60	2.00	2.10	2.20	2.20	2.50	1.90***	3.92
Q13-Q16	0.70	1.40	1.60	1.80	2.00	3.10	2.00	1.80	2.90	2.40	1.70***	3.15
Q17-Q20	1.00	1.40	2.40	2.10	2.10	1.70	2.30	2.50	3.00	2.10	1.10**	2.03
Panel B: Market-Adjusted Event Returns												
Q01-Q04	-0.30	0.20	0.40	1.30	1.20	1.60	1.40	1.60	2.50	2.70	3.00***	7.27
Q05-Q08	-0.30	0.30	0.10	1.10	1.20	1.30	1.80	1.10	2.10	1.80	2.10***	4.77
Q09-Q12	-0.10	0.70	0.80	1.20	1.00	1.30	1.40	1.40	1.60	2.00	2.20***	4.47
Q13-Q16	0.00	0.80	0.90	1.10	1.40	2.40	1.30	1.10	2.50	1.70	1.80***	3.41
Q17-Q20	0.10	0.70	1.60	1.30	1.50	1.30	1.70	1.70	2.30	1.80	1.70***	3.03

Panel C: Annual Returns

Y1	16.00	16.60	13.00	20.50	17.70	17.00	19.40	18.10	23.00	26.20	10.20***	5.43
Y2	13.40	12.90	15.40	14.30	14.30	15.50	17.40	15.60	17.20	19.00	5.60***	3.73
Y3	13.60	15.40	15.00	13.40	15.00	12.90	14.80	17.60	17.60	17.60	4.00***	2.42
Y4	14.40	16.20	14.10	15.60	13.70	16.80	14.30	17.40	15.70	15.50	1.10	0.62
Y5	12.70	14.20	18.20	14.80	13.10	15.20	14.40	15.70	16.70	16.00	3.30**	1.70

Panel D: Market-Adjusted Annual Returns

Y1	5.00	5.50	4.30	8.20	6.70	6.40	8.00	7.80	11.50	15.10	10.00***	5.57
Y2	2.00	3.20	3.20	4.20	3.30	5.50	5.20	6.30	6.70	8.40	6.30***	4.48
Y3	3.30	4.60	3.70	3.30	4.30	2.40	4.20	7.70	5.80	7.30	4.10***	2.62
Y4	3.70	5.80	3.70	5.30	2.90	6.00	2.90	7.60	5.10	5.00	1.30	0.86
Y5	2.70	3.90	6.70	5.30	3.40	4.50	4.90	5.60	6.80	6.20	3.50**	1.91

*** significant at 1%; ** significant at 5%; * significant at 10%.

At the end of each fiscal year from 1990:Q3 to 2016:Q4, 10 decile portfolios are formed in ascending order based on the level of conservatism calculated using the past 12-20 quarters. Portfolio (1) refers to the decile portfolio containing stocks ranking the lowest on the level of conservatism. Portfolio (10) refers to the decile portfolio containing stocks ranking the highest on the level of conservatism. The returns presented in the table are averages over all formation periods. Panel A contains (equally-weighted) event return for each portfolio. These are measured quarterly over a 3-day window (-1,0,1) around the earnings announcement date and then summed up over the four quarters in each of the first five post-formation years (Q01-Q04,..., Q17-Q20). Panel B contains the (equally-weighted) market-adjusted event returns. For each stock in the portfolio, market-adjusted event returns are obtained by subtracting off the market return around earnings announcements from the stock return. Panel C contains (equally-weighted) annual portfolio returns in year t after formation, t = 1, 2, 3, 4, 5. Panel D contains (equally-weighted) market-adjusted annual portfolio returns. For each stock in the portfolio, market-adjusted annual returns are obtained by subtracting off the annual market return from the annual stock return. Returns are multiplied by 100 in both panels.

Table 3.3: Comparing the event and non-event earnings for high and low conservatism firms.

Cons	Year	Annual Return	Event Return	Difference	t-stat
(1)	(2)	(3)	(4)	(4-3)	(5)
Panel A: the difference between market-adjusted event return and market-adjusted annual return for the high conservatism portfolio					
10	Y1	15.10	56.80	42.10***	6.48
10	Y2	8.40	37.40	29.40***	4.23
10	Y3	7.30	42.60	35.10***	4.42
10	Y4	5.00	36.70	31.70***	3.65
10	Y5	6.20	37.90	31.10***	3.31
Panel B: the difference between market-adjusted event return and market-adjusted annual return for the low conservatism portfolio					
1	Y1	5.00	-5.50	-10.70**	-2.08
1	Y2	2.00	-5.90	-7.90	-1.48
1	Y3	3.30	-3.00	-6.30	-1.10
1	Y4	3.70	-0.80	-4.30	-0.71
1	Y5	2.70	2.00	-0.20	-0.03

*** significant at 1%; ** significant at 5%; * significant at 10%.

At the end of each fiscal year, 1990:Q3 to 2016:Q4, 10 decile portfolios are formed in ascending order based on the level of conservatism calculated using the past 12-20 quarters. Portfolio (10) refers to the decile portfolio containing stocks ranking highest on the level of conservatism. Portfolio (1) refers to the decile portfolio containing stocks ranking lowest on the level of conservatism. Panel A contains (equally-weighted) market-adjusted annual return and annualized market-adjusted returns around earnings announcement for the highest decile portfolio for 5 years after the portfolio's formation. The annualized earnings announcement returns are measured quarterly over a 3-day window (-1,0,+1) around the earnings announcement date and summed up over the four quarters, then divided by 12 and multiplied by the average trading days of 252 in each of the first five post-formation years. Panel B contains (equally-weighted) market-adjusted annual return and annualized market-adjusted earnings announcement returns for the lowest decile portfolio for 5 years after the portfolio's formation. The returns are calculated the same as in Panel A but for the lowest decile rank of conservatism portfolio. Returns are multiplied by 100 in both panels.

Table 3.4: Conservatism returns on earnings days.

$$R_{i,t} = \alpha_t + \beta_1 \text{ Cons}_{i,t-1} + \beta_2 \text{ Cons}_{i,t-1} * D_{i,t} + \beta_3 D_{i,t} + \sum_{j=1}^{10} \gamma_j \text{ Lag Return}_{i,t-j} + \sum_{j=1}^{10} \delta_j \text{ Lag Return}^2_{i,t-j} + \sum_{j=1}^{10} \rho_j \text{ Lag Volume}_{i,t-j} + \varepsilon_{i,t}$$

	Panel A. One-day window		Panel B. Three-day window	
	(1)	(2)	(1)	(2)
Cons	0.004	0.005	0.004	0.005
	(11.08)***	(13.5)***	(10.11)***	(12.27)***
Cons*D	0.039	0.037	0.020	0.021
	(11.91)***	(11.91)***	(10.47)***	(11.57)***
D	0.001	0.027	-0.006	0.007
	(0.06)	(1.43)	(-0.55)	(0.58)
Controls	NO	YES	NO	YES
Day Fixed Effects	YES	YES	YES	YES
	12,509,187	11,973,826	12,509,187	11,973,826

*** significant at 1%; ** significant at 5%; * significant at 10%.

This table reports results from a regression of daily returns on time fixed effects, the decile rank of conservatism (Cons), the earnings-day dummy variable, the interaction between Cons and the earnings-day dummy variable, and control variables (coefficients unreported). Daily return, the dependent variable, is multiplied by 100. Daily return is the daily return of each observation over one year starting 4 months after the conservatism portfolios are formed. Cons is the level of accounting conservatism at the begging of the year, measured as the average decile rank of the three measures of conservatism (C-score, negative non-operating accruals, earnings skewness). D is a dummy variable that equals 1 if the day belongs to the earnings announcement window, and zero otherwise. The control variables include lagged values for each of the past 10 days of stock returns, stock returns squared, and trading volume. Panel A contains the regressions where the announcement window is defined as one day window. Panel B contains the regressions where the announcement window is defined as three-day around earnings announcement (-1,0,+1). The sample period is 1990:Q3 to 2016:Q4. The no. of observations used is 12,509,187 daily observations.

Table 3.5: Conservatism returns and dynamic risk on earnings announcement days.

$R_{i,t} = \alpha_t + \beta_1$ High $Cons_{i,t-1}$ β_2 Low $Cons_{i,t-1}$ $+\beta_3$ High $Cons_{i,t-1}*D_{i,t}$ $+\beta_4$ Low $Cons_{i,t-1}*D_{i,t}$ $+\beta_5 D_{i,t} + \beta_6$ High $Cons_{i,t-1}*Market_t + \beta_7$ Low $Cons_{i,t-1}*Market_t + \beta_8$ High $Cons_{i,t-1}*Market_t*D_{i,t} + \beta_9$ Low $Cons_{i,t-1}*Market_t*D_{i,t} + \beta_{10}$ $Market_t*D_{i,t} + \varepsilon_{i,t}$

	(1)	(2)
High Cons	0.034	0.040
	(8.99)***	(10.7)***
Low Cons	-0.022	-0.028
	(-5.9)***	(-7.55)***
High Cons*D	0.176	0.177
	(5.26)***	(5.62)***
Low Cons*D	-0.317	-0.322
	(-10.17)***	(-10.30)***
D	0.229	0.226
	(21.67)***	(21.41)***
High Cons*Market		-15.405
		(-46.85)***
Low Cons*Market		15.288
		(46.71)***
High Cons*Market*D		2.649
		(1.02)
Low Cons*Market*D		-1.819
		(-0.69)
Market*D		5.467
		(6.19)***
Day Fixed Effects	YES	YES

*** significant at 1%; ** significant at 5%; * significant at 10%.

In this table, I examine whether risk premiums and betas change on earnings announcement days, and whether any such effects can explain why conservatism returns are higher on earnings days. Each year, firms are sorted depending on the level of conservatism (Cons) and classified into high and low deciles. High Cons is a dummy variable that represents stocks that rank in the top decile of accounting conservatism. Low Cons is a dummy variable that represents stocks that rank in the bottom decile of accounting conservatism. D is a dummy variable that equals 1 if the day is the earnings announcement day, and zero otherwise. Market represents the source of risk and is defined as the value-weighted daily market return. I interact Market with the earnings announcement dummy, and also include three-way interactions between each of the high and low Cons variables, Market, and the earnings-day dummy. The dependent variable, return, is multiplied by 100. The sample period is 1990:Q3 to 2016:Q4. The no. of observations used is 12,509,187 daily observations.

Table 3.6: Conservatism returns and mispriced stocks on earnings announcement days.

$R_{i,t} = \alpha_t + \beta 1$ High $Cons_{,t-1} + \beta_2$ Low $Cons_{,t-1} + \beta_3$ High $MIS_{i,t} + \beta_4$ Low $MIS_{i,t} + \beta_5$ High $Cons_{i,t-1}*D_{i,t} + \beta_6$ Low $Cons_{i,t-1}*D_{i,t} + \beta_7$ High $MIS_{i,t}*D_{i,t} + \beta_8$ Low $MIS_{i,t}*D_{i,t} + \beta_9 D_{i,t} + \beta_{10}$ High $Cons_{i,t-1}*$High $MIS_{i,t} + \beta_{11}$ Low $Cons_{i,t-1}*$High $MIS_{i,t} + \beta_{12}$ High $Cons_{i,t-1}*$Low $MIS_{i,t} + \beta_{13}$ Low $Cons_{i,t-1}*$Low $MIS_{i,t} + \beta_{14}$ High $Cons_{i,t-1}*$High $MIS_{i,t}*D_{i,t} + \beta_{15}$ Low $Cons_{i,t-1}*$High $MIS_{i,t}*D_{i,t} + \beta_{16}$ High $Cons_{i,t-1}*$Low $MIS_{i,t}*D_{i,t} + \beta_{17}$ Low $Cons_{i,t-1}*$Low $MIS_{i,t}*D_{i,t} + \varepsilon_{i,t}$

	(1)	(2)
High Cons		0.009
		(2.30)**
Low Cons		-0.008
		(-2.20)
High MIS	0.014	0.012
	(4.35)***	(3.30)***
Low MIS	-0.034	-0.027
	(-10.27)	(-7.10)***
High Cons*D		0.052
		(1.55)
Low Cons*D		-0.231
		(-7.60)***
High MIS*D	0.053	0.013
	(1.95)*	(0.42)
Low MIS*D	-0.184	-0.157
	(-6.66)***	(-4.92)***
D	0.164	0.183
	(17.88)***	(18.07)***
High Cons*High MIS		0.020
		(1.65)*
High Cons*Low MIS		-0.017
		(-1.43)
Low Cons*High MIS		0.007
		(0.56)

Low Cons*Low MIS		-0.027 (-2.98)**
High Cons*High MIS*D		0.217 (2.19)**
High Cons*Low MIS*D		-0.051 (-0.51)
Low Cons*High MIS*D		0.219 (2.19)**
Low Cons*Low MIS*D		-0.035 (-0.47)
Day Fixed Effects	YES	YES

*** significant at 1%; ** significant at 5%; * significant at 10%.

In this table, I examine if conservatism causes mispricing for already mispriced stocks. The dependent variable, return, is multiplied by 100. The mispricing score (MIS) is the mispricing score developed by Stambaugh et al. (2015) that ranks the stocks depending on their level of over-(under-) pricing. High MIS is a dummy variable that reflects the most underpriced stocks depending on the mispricing score. Low MIS is a dummy variable that reflects the most overpriced stocks depending on the mispricing score. High Cons is a dummy variable that represents stocks that rank in the top decile of accounting conservatism. Low Cons is a dummy variable that represents stocks that rank in the bottom decile of accounting conservatism. D is a dummy variable that equals 1 if the day is the day of earnings announcement, and zero otherwise. I interact both High and Low MIS with the earnings announcement dummy, and with High and Low Cons, and also include three-way interactions between each of the High and Low MIS variables, High and Low Cons variables, and the earnings-day dummy. The sample period is 1990:Q3 to 2016:Q4, and the no. of observations used is 9,337,446 daily observations.

Table 3.7: Conservatism returns on earnings days in big vs. small firms.

$$R_{i,t} = \alpha_t + \beta_1 \text{ Cons}_{i,t-1} + \beta_2 \text{ Cons}_{i,t-1} * D_{i,t} + \beta_3 D_{i,t} + \sum_{j=1}^{10} \gamma_j \text{ Lag Return}_{i,t-j} + \sum_{j=1}^{10} \delta_j \text{ Lag Return}^2_{i,t-j} + \sum_{j=1}^{10} \rho_j \text{ Lag Volume}_{i,t-j} + \varepsilon_{i,t}$$

	(1) Big	(2) Small	(3) Big	(4) Small
Cons	0.005	0.005	0.005	0.007
	(12.04)***	(8.22)***	(12.54)***	(11.46)***
Cons*D	0.027	0.053	0.026	0.051
	(7.93)***	(9.28)***	(7.47)***	(9.36)***
D	0.059	-0.088	0.068	-0.040
	(3.18)***	(-2.21)**	(3.59)***	(-1.06)
Controls	NO	NO	YES	YES
Day Fixed Effects	YES	YES	YES	YES

*** significant at 1%; ** significant at 5%; * significant at 10%.

In this table, I divide the sample into big and small firms to examine if the return difference between the long and the short side of conservatism is attributed to size. Big (small) firms are firms that rank above (below) the median of market capitalization on day t. Return, the dependent variable, is multiplied by 100. Daily return is the daily return of each observation over one year starting 4 months after the conservatism portfolios are formed. Cons is the level of accounting conservatism at the begging of the year, measured as the average decile rank of the three measures of conservatism (C-score, negative non-operating accruals, earnings skewness). D is a dummy variable that equals 1 if the day is the earnings announcement day, and zero otherwise. The control variables (coefficients unreported) include lagged values for each of the past 10 days of stock returns, stock returns squared, and trading volume. The sample period is 1990:Q3 to 2016:Q4. The no. of observations used is 12,509,187 daily observations.

APPENDIX C: USING OTHER RISK FACTORS TO TEST FOR THE CHANGE IN RISK ON EARNINGS ANNOUNCEMENT DAYS.

Table C1 shows the regression results of Equation (3.2c) using other risk factors in addition to the market risk factor. The dependent variable is multiplied by 100. Columns 1, 2, and 3 show the results using Fama and French (2015) five factors model, the *q*5 model in Hou et al. (2015) and Hou et al. (2020), and the mispricing factors in Stambaugh and Yuan (2017), consequently. Fama and French (2015) five factors are retrieved from Kenneth French data library, the *q*5 factors are retrieved from Global-q website, and the mispricing factors are retrieved from Robert F. Stambaugh website.

The coefficients of the risk factors and their interaction with the high and low of conservatism and the announcement day dummy variable are not reported for brevity. The first column shows the results using Fama and French (2015) five risk factors. The coefficient on High Cons is 0.037, while High Cons*D is 0.187 basis points, which means that high conservatism stocks earn about 5 times more on earnings announcement days. Similarly, the coefficient on Low Cons is -0.022 while the coefficient on Low Cons*D is about -0.332, which means that low conservatism stocks earn about 15 times less on earnings announcement days. These results show that after controlling for the Fama and French (2015) five risk factors, returns on High Cons and Low Cons are elevated on earnings days. The coefficients in the second and the third column are almost identical to the ones in the first column, and almost identical coefficients in Table 3.5. Overall, the results are robust to different risk factors and High (Low) Cons stocks have higher (lower) returns on earnings announcement days that cannot be explained by risk.

Table C1: Conservatism returns and dynamic risk on earnings announcement days using different risk factors.

$R_{i,t} = \alpha_t + \beta_1$ High $Cons_{i,t-1} + \beta_2$ Low $Cons_{i,t-1} + +\beta_3$ High $Cons_{i,t-1}*D_{i,t} + \beta_4$ Low $Cons_{i,t-1}*D_{i,t} + \beta_5 D_{i,t} + \beta_6$ High $Cons_{i,t-1}*\sum$Risk $Factors_t + \beta_7$ Low $Cons_{i,t-1}*\sum$Risk $Factors_t + \beta_8$ High $Cons_{i,t-1}*\sum$Risk $Factors_t*D_{i,t} + \beta_9$ Low $Cons_{i,t-1}*\sum$Risk $Factors_t*D_{i,t} + \beta_{10}*\sum$Risk $Factors_t*D_{i,t} + \varepsilon_{i,t}$

	(1)	(2)	(3)
	FF5 model	***q*5 model**	**Mispricing Factors**
High Cons	0.037	0.040	0.039
	(9.99)***	(10.57)***	(10.32)***
Low Cons	-0.022	-0.019	-0.021
	(-5.93)***	(-5.19)***	(-5.65)***
High Cons*D	0.187	0.189	0.183
	(5.95)***	(5.96)***	(5.81)***
Low Cons*D	-0.332	-0.321	-0.323
	(-10.62)***	(-10.17)***	(-10.31)***
D	0.228	0.229	0.228
	(21.61)***	(21.5)***	(21.59)***
Day Fixed Effects	YES	YES	YES

*** significant at 1%; ** significant at 5%; * significant at 10%.

In this table, I examine whether risk premiums and betas change on earnings announcement days, and whether any such effects can explain why conservatism returns are higher on earnings days. The first column shows the results of using the risk factors in Fama and French (2015) five risk factors model. The second column shows the results of using the *q*5 risk factors in Hou et al. (2015) and Hou et al. (2020). The third column shows the results of using the mispricing factors in Stambaugh and Yuan (2017). Each year, firms are sorted depending on the level of conservatism (Cons) and classified into high and low deciles. High Cons is a dummy variable that represents stocks that rank in the top decile of accounting conservatism. Low Cons is a dummy variable that represents stocks that rank in the bottom decile of accounting conservatism. D is a dummy variable that equals 1 if the day is the earnings announcement day, and zero otherwise. I interact each risk factor with the earnings announcement dummy, and also include three-way interactions between each of the high and low Cons variables, the risk factor, and the earnings-day dummy (not reported). The dependent variable, return, is multiplied by 100. The sample period is 1990:Q3 to 2016:Q4. The no. of observations used is 12,509,187 daily observations.

4 MARKET MISPRICING OF CONSERVATIVE ACCRUALS

4.1 Introduction

Accrual persistence and mispricing have been a subject of extensive research since Sloan (1996) (see, for example, Xie, 2001; Fairfield et al., 2003; Richardson et al., 2005; Allen et al., 2013; Larson et al., 2018; Fedyk et al., 2020). However, while a significant number of studies focus on current accruals, non-current accruals have limited attention. In this research, I shed light on the conservative procedure of long-term assets impairment as one of the accruals that can affect earnings persistence and, therefore, stock valuation.

In his seminal work, Sloan (1996) classifies earnings into accruals and cash flow and finds that low persistence of accruals compared to cash flow results in accruals having greater stock mispricing compared to cash flow. Fairfield et al. (2003) argue that current accruals are a component of *growth in net operating* assets and a component of earnings, and since earnings can be disaggregated into accruals and cash flow, growth in net operating assets can be disaggregated into current accruals and long-term net operating assets. They find that the growth in net operating assets has a negative incremental relationship with one-year-ahead return on assets, and that growth in net operating assets is mispriced by the market as much as current accruals. Richardson et al. (2005), show that low persistence of the accrual components of earnings is the main reason that causes accruals mispricing. In addition, Cooper et al. (2008) find that asset growth rates are strong predictors of cross-sectional returns, and the growth in non-current assets is as strong as the growth in current assets in predicting cross-sectional returns.

Applying accounting conservatism affects asset growth. Accounting conservatism imposes more verification on gains than on losses which results in timely recognition of

losses and delayed recognition of gains (Basu, 1997). This asymmetric recognition affects the accrual accounts. For example, the lower of cost or market in inventory evaluation is an example of a conservative procedure that results in writing down the value of inventories if their market value (or net realizable value) falls below their cost, but not writing them up if the opposite happens.[22] On the non-current assets side, goodwill should be written down if its fair value falls below its book value. Similarly, PP&E are tested for impairment when new events indicate that the carrying amount of the asset may not be recoverable (FASB ASC paragraph 360-10-35-21). In both goodwill and PP&E, the write-down amount cannot be recovered even if later evaluation shows an increase in their book values. While conservatism can affect both current and non-current accruals, its effect on non-current accruals is bigger. For example, Givoly and Hyan (2002) find that the aggregate amount of non-current accruals has decreased over time and attribute this to conservatism and argue that conservatism acts mainly through non-current accruals. They also find that conservatism decreases the persistence of these non-current accruals. Therefore, I focus on non-current accruals and examine how writing down non-current assets affects the ability of these assets to predict future earnings and future returns.

While past literature shows that non-current accruals are priced by the market and are associated with significant accrual anomaly returns, it does not dig deeper into the components of the non-current accruals to empirically show which components are the least persistent and mostly associated with the high anomaly returns non-current accruals. I extend Fairfield et al. (2003) by disaggregating the growth in long-term net operating assets into asset write-downs and growth in long-term net investments. I argue that the non-recurring nature of asset write-downs and the subjectivity involved in estimating their amounts result in lower earnings persistence. Low persistence of accruals is reflected as a

[22] Another example is the evaluation of accounts receivable. Accounting standards require recognizing an allowance for doubtful accounts in a contra account to accounts receivable when there is an uncertainty about its collectability and the amount can be estimated reasonably.

negative incremental association between current accruals and next year's earnings as proved by Richardson et al. (2005). However, as write-downs represent losses i.e., have an asset decreasing effect, low persistence is reflected as a positive incremental association between current write-downs and next year's earnings. In other words, current write-downs decrease current earnings, however, since write-downs are not persistent, they reverse in the next period resulting in higher earnings than the earnings predicted using the current year earnings. Therefore, the first hypothesis predicts that asset write-downs have a positive incremental relationship with one year ahead return on assets (ROA).

This low persistence of asset write-downs is expected to result in stock mispricing, consistent with the argument in Richardson et al. (2005) that more subjective accruals have greater stock mispricing. Therefore, the second hypothesis states that write-downs are mispriced by the market, where stocks with large amounts of write-downs are undervalued by the market. In the last hypothesis, I argue that the low persistence of asset write-downs compared to the other component of growth in long-term net operating assets, growth in long-term net investment, makes write-downs the main contributor to the mispricing of growth in long-term net operating assets. In other words, stocks ranked in the top decile of write-downs should be more undervalued by the market i.e., generate higher returns, than stocks ranked in the top decile of other accruals. Therefore, my third hypothesis conjecture that the mispricing of write-downs is larger than the mispricing of growth in long-term net operating assets.

To test the first hypothesis, the one-year-ahead ROA is regressed on earnings components at different levels of decomposition. The results show that write-downs have a positive incremental relationship with future profitability. In addition, further tests show that write-downs are as persistent as growth in long-term net operating assets and the growth in long-term net investment, indicating that the low persistence of the growth in

long-term net operating assets is equally explained by its both components. To test the second hypothesis, I apply Mishkin (1983) test, which is normally used to compare the subjective expectations of earnings in estimating the stock price to the objective estimation of earnings using past information. The results show that that the market undervalues asset write-downs *relative* to their association with one year ahead earnings. To test the third hypothesis, the one-year-ahead abnormal return is regressed on accrual earnings components at different levels of segregation. The results show that the difference between the pricing coefficient of write-downs does not significantly differ from the pricing coefficient of long-term net operating assets, which means that both components of the growth in long-term net operating assets are equally mispriced by the market.

This study contributes to the literature on conservatism and market efficiency in several ways. First, it provides direct evidence that the market underprices conservative accruals and adds to the limited evidence that links accounting conservatism to the accrual anomaly. Although Larson et al. (2018) argue that conditionally conservative accruals result in greater mispricing compared to other types of accruals, the measurement used by Larson et al. (2018) is noisy and does not capture conservatism alone. However, their results point out the importance of segregating conservative accruals when examining earnings persistence and mispricing. I extend Larson et al. (2018) by using a more accurate measure of accounting conservatism that can directly capture conservatism.

Second, most literature sheds light on short-term accruals or working capital accruals, but not enough attention has been given to the non-current accruals. This study focuses on non-current accruals because conservatism acts mainly through these accruals (Givoly and Hayn, 2000). However, while Fairfield et al. (2003) examine non-current assets, this study is different from theirs in several aspects. 1) Fairfield et al. (2003) argue that the procedures of conservatism result in new investments looking as if they are less profitable in early years

than later years, which would drive the return on investments downward after making new investments. Nonetheless, the argument in this research is different from theirs as I argue that conservatism decreases the persistence of the growth in long-term assets, which decreases the ability of investors to understand the implications of this low persistence on future stock return, resulting in stock mispricing. 2) Although Fairfield et al. (2003) attribute their results to conservatism, they do not measure conservatism or directly examine its impact on earnings persistence and accruals mispricing. 3) This study corroborates and extends Fairfield's findings regarding the importance of growth and conservatism in long-term assets when examining earnings persistence and accruals mispricing. I do so by digging into the components of the growth in long-term operating assets and show that the low persistence component of it, i.e., asset write-downs, is one of the main causes of the mispricing of the growth in long-term operating assets.

Finally, the findings in this essay suggest that mispricing of non-current assets is mainly because the market cannot correctly assess the low persistence of the write-downs component of these accruals. This indicates that investors may benefit from disclosures that help them evaluate the persistence of non-current accruals (Xie, 2001).

The remainder of the chapter is organized as follows. Section 4.2 reviews prior literature and discusses the hypothesis development; section 4.3 defines the variables and outlines the research methodology; section 4.4 presents the research sample; section 4.5 presents the hypotheses testing results and discussions, and section 4.6 presents the concluding remarks.

4.2 Literature review and hypotheses development

4.2.1 *Accruals related to accounting conservatism*

The non-operating accruals is a widely used measurement of conservatism since it was developed by Givoly and Hayn (2000), it mainly included all accruals other than working capital accruals. They explain that since accruals are likely to reverse, years in which net income exceeds cash flow from operations are anticipated to be followed by years with negative accruals, and vice versa. And since any diversion of earnings from operating cash flow should be transitory and mean-reverting, net income before depreciation should converge into cash flow from operations over a sufficient period of time. However, the persistence of negative accruals over time is an indication of conservatism, and the accumulation rate of these accruals reflects the degree of conservatism. Givoly and Hyan (2000) find evidence that cumulative non-operating (non-current) accruals are decreasing over time, and while the cumulative operating (current) accruals are increasing over time, their increase is not large enough to counteract the decrease in cumulative non-operating accruals, resulting in cumulative total accruals to be decreasing over time. This evidence shows that accounting conservatism acts initially through non-current accruals.

Moreover, Givoly and Hayn (2000) examine the variability of earnings (return on assets) using cross-sectional and time-series earnings[23]. They find that the variability of earnings is increasing over time, especially after 1988, while the variability of cash flow is somewhat constant, indicating that firms' performance does not cause this trend in earnings variability. To dig further into the causes of these properties, Givoly and Hayn (2000) decompose the variance of the return on assets (ROA) components into the variance of cash flow from operations (CFO), the variance of accruals, and the covariance

[23] Givoly and Hayn (2000) measure the variability of earnings using the standard deviation of earnings.

between CFO and accruals. They find that the variance of accruals has more than doubled between the 1960s and 1990s and the covariance between CFO and accruals has decreased over time. Together, the steady increase in the variance of accruals, in conjunction with the decreased covariance between CFO and accruals, increase the variability of earnings over time. Besides, further examinations by Givoly and Hayn (2000) reveals that non-operating accruals are the vast contributor to earnings variability, and that the increasing frequency of the *one-time big nonoperating accruals* is the main reason behind the higher earnings variability over time. This is consistent with conservatism is reflected mainly in non-current accruals (Basu, 1997).

Consistent with Givoly and Hayn (2000), Dichev and Tang (2008) find that over time, the volatility of earnings has increased, and the persistence of earnings has declined. In addition, they find an increasing negative correlation between earnings changes and a decreasing correlation between contemporary revenues and expenses over the 40 years preceding their study. The declining contemporaneous correlation between revenues and expenses is accompanied by an increase in the correlation between past expenses and current revenues. This means that the period-relevant expenses are recognized directly while the revenues associated with these expenses are deferred to the next periods which indicates asymmetric timeliness in recognizing news like in accounting conservatism. Dichev and Tang (2008) conclude that although their study shows that earnings volatility is increasing because of poor matching, their results are consistent with the Givoly and Hayn (2000) that conservatism is increasing the volatility of earnings. In particular, they state that conservatism can be seen as poor matching where expenses are realized faster than revenues, and to adopt one explanation over the other depends on users' needs. More evidence is reported by Chen et al. (2014) where they find that the association between current year earnings and next year earnings is lower for higher degrees of conservatism.

As previous literature shows, conservatism can affect earnings persistence through big infrequent losses. Examples include, the lower of cost or market rule for inventory valuation (LCM), accelerated depreciation methods, and assets impairment or write-downs for long-lived tangible and intangible assets (Beaver and Ryan, 2005; Dutta and Patatoukas, 2017). These infrequent big losses are conditional on economic news and represent the change in long-term net operating assets that results from conservatism. In this study, I focus on long-term asset write-downs as one form of applying accounting conservatism.[24]

Richardson et al. (2005) demonstrate that low persistence accruals are those characterized by low reliability.[25] They show that accruals that involve more subjective estimations are more subject to estimation errors, and these errors will reverse in the upcoming periods resulting in less persistent earnings. Using the level of accruals reliability classification in Richardson et al. (2005), I classify the accruals I am using in this study into high, medium, and low reliability accruals, where high (low) reliability accruals reflect the most (least) persistent accruals. Table 4.1 presents the summary of reliability assessment for each accrual category. The broad categories of accruals contain current accruals and growth in long-term net operating assets. Current accruals consist of the change in current assets and the change in current liabilities. The change in current assets consists mainly of receivables and inventory, which require using judgments in estimating their net values, while the change in current liabilities is dominated by payables that can be measured objectively. Therefore, the change in current assets is assessed with low reliability, the change in current liabilities is assessed with high reliability, and consequently, current accruals are assessed with medium reliability. I classify the change in long-term net assets into growth in long-term net investment and asset write-downs. The change in long-term

[24] The terms impairment and write-down will be used interchangeably in this chapter.
[25] SFAC No. 2 (10) defines reliability as "the quality of information that assures that information is reasonably free from error and bias and faithfully represents what it purports to represent". Therefore, the measurement error in reporting accruals decreases the ability of current earnings to predict future earnings and so decreases its reliability.

net assets investment consists of the change in long-term net assets excluding write-downs minus the change in other long-term liabilities with different degrees of reliability, therefore they are classified as medium reliability accruals. Asset write-downs are infrequent and estimated with high subjectivity, therefore they are classified as low-reliability accruals.

[Insert Table 4.1 about here]

Asset write-downs or asset impairment can be defined as reducing the book value of an asset when its fair value (FV) drops below its book value (BV). The amount to be written down is the difference between these two values. Accounts that are more likely to be written down include accounting receivables, inventory, and long-term assets like property, plant and equipment (PP&E), and goodwill. As this study focuses on long-term accruals, only write-downs resulted from PP&E and goodwill in addition to other fixed assets and other intangibles will be examined. According to the US GAAP, goodwill should be tested at least annually for impairment. This is done by identifying events and circumstances that may lead to goodwill impairment.[26] If these events exist, the company should compare the goodwill carrying value with its fair value to identify potential impairment, and whenever the FV falls below the BV, an impairment loss is calculated as the difference between the two values (ASC, 350-20-35). These guidelines apply to other intangibles other than goodwill. With regards to PP&E, the impairment test is not conducted unless new events or a change in circumstances indicate that the carrying amount of the asset may not be recoverable (ASC 360-10-35-21).[27] As in the intangibles, the impairment loss is recognized as the difference between the fair value and the book value of the asset.

[26] Examples of these event and circumstances, macro-economic conditions such as fluctuations in foreign exchange rates, industry and market considerations, cost factors such as increases in inputs costs, in addition to other examples that can be found in ASC 350-20-35-3C.

[27] Examples of these event and circumstances, a massive decrease in the MV of the asset, a significant change in the way in which the asset is used, in addition to other examples that can be found in ASC 360-10-35-21.

Asset write-downs affect both the income statement and balance sheet. The write-downs of long-term assets result in a recognition of impairment loss that decreases net income, and the book value of the affected assets is written down to the fair value. Therefore, asset impairment affects earnings persistence by resulting in non-recurring losses. In addition, impairment affects non-current accruals through a big sudden reduction in their carrying value and disruption in their growth figures. According to Richardson et al. (2005), non-current operating assets, which consist mainly of PP&E and intangibles, are characterized by low reliability. They attribute this to subjectivity in the initial recognition of these assets, subjectivity in calculating depreciation and amortization expenses, and periodic write-downs during the subsequent evaluation of these assets. The calculations of these write-downs are highly subjective, in addition, the one-time big losses of impairment cost result in periodic distortions in earnings figures (Richardson et al., 2005). Moreover, Fairfield et al. (2003) hypothesize and find that non-current operating accruals are equivalent to current accruals in having a negative relationship with future earnings. They argue that the negative relationship between non-current operating accruals and one-year-ahead earnings can be partially explained by accounting conservatism. However, they do not empirically test how conservatism can explain it.

To sum up, past literature shows that accounting conservatism acts mainly through non-current accruals (Basu, 1997; Givoly and Hayn, 2000). Also, the evidence shows that these non-current accruals decrease earnings persistence (Givoly and Hayn, 2000, Fairfield et al. 2003; Richardson et al. 2005). In this research, I focus on asset impairment and write-downs as the most obvious and significant conservative procedure that affects non-current accruals. The large discrete amounts that describe assets write-downs contribute significantly and negatively to non-current accruals reliability and decrease earning persistence, subsequently. Thus, I expect that higher asset write-downs will result in lower

earnings persistence. Fairfield et al. (2005) mathematically show that low accrual persistence is expressed as a negative association between current accruals and next period earnings, after controlling for current period earnings. However, because write-downs have an asset decreasing effect, the low persistence of write-downs is reflected as a positive association between current write-downs and next year's earnings, after controlling for the current year's earnings. Put it differently, higher current period write-downs would decrease current earnings, and will reverse in the next period resulting in high earnings in the next period. This reversal decreases the ability of current earnings to predict future earnings. Therefore, I formulate our first hypothesis as follows.

H4.1: asset write-downs have a positive incremental relationship with one year ahead ROA, after controlling for current ROA.

4.2.2 *Mispricing of conservative accruals*

Stock mispricing happens when investors are too optimistic (pessimistic) about company performance, and when the actual performance information is released, investors adjust their forecast downward (upward) resulting in a downward (upward) correction in the stock price. In other words, investors fixate on the past performance of the firm, and they put a lot of weight on it. In the case of accruals, high accruals in one period should result in low earnings performance in the next period. However, if investors naively fixate on the accruals, they will make optimistic forecasts and then get surprised when the actual earnings are released, resulting in a negative abnormal return. Therefore, the relationship between accruals and next period returns is negative in general, where the degree of this relationship (the degree of mispricing) is higher for less persistent accruals. Differently, in the case of write-downs, high write-downs in one period are expected to result in relatively high earnings in the next period as my first hypothesis development suggests. Nonetheless, if investors fixate on write-downs and fail to anticipate their low persistence nature, they

will make pessimistic forecasts and then get surprised when the actual earnings are released, resulting in a positive abnormal return. Therefore, the relationship between write-downs and next period returns is positive in general i.e., write-downs are underpriced by the market.

Past literature has investigated non-current accruals mispricing. For example, Richardson et al. (2005) argue that accruals that are less reliable (i.e., less persistent) lead to less persistent earnings and therefore greater mispricing. They decompose accruals into three main types of accruals; working capital accruals, non-current operating accruals, and financial accruals, then they classify these accruals into highly reliable and low reliable accruals depending on their persistence. Richardson et al. (2005) find that less reliable accruals are less able to predict future earnings and that investors do not consider the low persistence of less reliable accruals, resulting in a considerable pricing error.

Non-current accruals as defined by Richardson et al. (2005) contain non-current operating assets, such as accruals related to PP&E and intangibles, and non-current operating liabilities, such as long-term payables, and classify them as low and medium reliable accruals, respectively. Givoly and Hayn (2000) use to some extent a similar way to define the non-current accruals to measure accounting conservatism and find that these accruals are less persistent compared to working capital accruals. Interestingly, Richardson et al. (2005) find that non-current accruals have negative and significant persistence coefficients. But what is more interesting is that going long on low-accruals portfolio and short on high-accruals portfolio yielded the highest hedging return when the portfolios are constructed depending on the level of non-current accruals compared to portfolios constructed based on working capital accruals or financial accruals. Furthermore, when further decomposing these three main types of accruals into subgroups, accruals related to non-current assets that are part of the non-current accruals yield the highest hedge

portfolio return compared to the portfolios constructed depending on the other subgroups of accruals.

Moreover, a recent paper by Larson et al. (2018) comprehensively classifies accruals to include conditionally conservative accruals as one of the classifications. Consistent with Richardson et al. (2015), Larson et al. (2018) find that conditionally conservative accruals have the largest negative coefficient compared to other accruals when future return is regressed on accruals and, therefore, generates the greatest stock mispricing. They attribute this finding to investors' inability to realize the transitory nature of conditionally conservative accruals. In addition, Fairfield et al. (2003) find that the market overvalues both current accruals and growth in long-term net operating assets (non-current accruals) *relative* to their association with one year ahead ROA. Their evidence suggests that the accrual anomaly documented in Sloan (1996) is a special case of what could be viewed as a more general growth anomaly.

These findings show that the low persistence of non-current accruals results in higher accrual anomaly returns generated by these accruals. However, none of the reported literature digs deeper into the components of the non-current accruals to empirically show which components are mostly associated with the low reliability of non-current accruals and high anomaly returns. Richardson et al. (2005) point out that high judgment and large discrete losses are some reasons that can explain the low reliability of non-current accruals. This description can perfectly fit asset write-downs as they are large and infrequent losses. Therefore, if investors naively extrapolate on past asset write-downs without taking into consideration the low persistence of write-downs, they will get surprised when actual earnings are released. For example, a firm that has a large magnitude of write-downs this year is expected to have relatively high earnings performance next year. But if investors fixate on these large write-downs, they will form downward biased expectations about next

year's performance, and will get surprised when the actual earnings are released, resulting in a positive abnormal return. Having said that, I argue that the market undervalues write-downs relative to their implications for one-year-ahead ROA, resulting in stock mispricing. Therefore, the second hypothesis is formulated as the following.

H4.2: the market undervalues asset write-downs relative to their implications for one-year-ahead ROA.

The change or growth in long-term net assets results mainly from net investment activities in these assets (investing in or selling long-term assets) taking away the change in other non-current liabilities and from the impairments or write-downs of long-term assets.[28] According to Richardson et al. (2005), the change in other non-current liabilities can be classified as a medium reliable accrual, however, the change in net non-current assets including write-downs is classified as a low reliable accrual and write-downs is one of the reasons behind this classification. Therefore, the growth in long-term net operating assets can have higher reliability/persistence if it excludes write-downs. For example, suppose a company made a net asset investment of $10 million in new machines and equipment, and in the same year, the company impaired $7 million from its intangible assets. Although these transactions result in a net growth of $3 million, this $3 million does not reflect the sustainable growth in the company, in fact, it includes $10 million in sustainable growth and $7 million in non-recurring losses.

This example shows the importance of discriminating between new investments and one-time losses that affects assets' growth. In addition, it explains why the mispricing of growth in non-current assets is as significant as the mispricing of working capital accruals as shown by Fairfield et al. (2003). In other words, growth in long-term net assets should

[28] In this study net investment is calculated as the net change in non-current asset – the change in other non-current liabilities, where the net change in non-current asset refers to net balance of investment in asset minus divestment (selling off assets).

be more sustainable and less fluctuating when compared to the working capital accruals and should consequently result in less accrual mispricing, however, some nonrecurring components of non-current assets lead to the significant mispricing of these assets. Therefore, I expect that asset write-downs play a considerable role in increasing the mispricing of non-current assets.

Bringing all together, despite the limited evidence on the mispricing of non-current accruals, the evidence shows that non-current accruals are significantly mispriced because of the low persistence of these accruals. In this study, I focus on asset write-downs as a conservative procedure that significantly affects non-current assets persistence and subsequently mispricing. I argue that the growth in long-term net operating assets is mainly affected by two activities: net investing and impairments. And while the growth in long-term net investments is assumed to be relatively stable, assets impairments are known to be transitory. Accordingly, the impairment part of non-current accruals is expected to be the main reason behind the mispricing of long-term assets, and when growth in long term net operating assets (GrLTNOA) is decomposed into assets write-downs and growth in long-term net investment, impairment loss results in greater mispricing than the total growth in long term net operating assets. Therefore, the third hypothesis is formulated as the following.

H4.3: mispricing of long-term assets write-downs is larger than the mispricing of growth in long-term net operating assets.

4.3 Research Methodology

4.3.1 *Defining accruals and growth*

Accruals and asset growth are defined using the balance sheet method. I mainly follow the definitions used in Fairfield et al. (2003). Consistent with Sloan (1996), Fairfield et al. (2003), and Kraft et al. (2007), return on assets (ROA) is defined as follows:

$$ROA_t = \text{Operating income}_t \,/\, \text{Avg}\,(TA_{t-1} + TA_t) \tag{4.1}$$

where:

Operating income	= operating income after depreciation and amortization (Compustat item 178).
TA	= total assets (Compustat item 6).

Current accruals (ACC) are defined as the change in net working capital minus depreciation and amortization as follows.

$$ACC_t = GrWC_t - DEPAMORT_t \tag{4.2}$$

where:

$$GrWC_t = (\Delta AR_t + \Delta INV_t + \Delta OTHERCA_t) - (\Delta AP_t + \Delta OTHERCL_t) \tag{4.3}$$

and:

ΔAR	= change in accounts receivable (Compustat item 2).
ΔINV	= change in inventories (Compustat item 3).
ΔOTHERCA	= change in other current assets (Compustat item 68).
ΔAP	= change in accounts payable (Compustat item 70).
ΔOTHERCL	= change in other current liabilities (Compustat item 72).
DEPAMORT	= depreciation and amortization expense (Compustat item 14).

Then, the growth in net operating assets (GrNOA) is defined as the annual change in net operating assets:

$$GrNOA_t = NOA_t - NOA_{t-1} \quad (4.4)$$

where net operating assets (NOA) is operating assets (excluding cash) minus operating liabilities:

$$NOA_t = AR_t + INV_t + OTHERCA_t + PPE_t + INTANG_t + OTHERLTA_t - AP_t - OTHERCL_t - OTHERLTL_t \quad (4.5)$$

where:

PPE	= net property, plant, and equipment (Compustat item 8).
INTANG	= intangibles (Compustat item 33).
OTHERLTA	= other long-term assets (Compustat item 69).
AP	= accounts payable (Compustat item 70).
OTHERCL	= other current liabilities (Compustat item 72).
OTHERLTL	= other long-term liabilities (Compustat item 75).

After that, growth in long term net operating assets (GrLTNOA) is defined as growth in net operating assets other than current accruals:

$$GrLTNOA_t = GrNOA_t - ACC_t \quad (4.6)$$

Finally, I divide the growth in long term net operating assets (GrLTNOA) into two parts: growth in long-term net *asset* investment (GrLTNInvest) and long-term assets write-downs (Writedowns):

$$GrNOA_t = GrLTNInvest_t - Writedowns_t + ACC_t \quad (4.7)$$

where:

$GrLTNInvest_t$	= growth in long-term operating assets excluding assets impairment and write-downs ($GrLTNOA_t$ + $Writedowns_t$).
$Writedowns_t$	= the total write-downs in long term fixed assets and the impairments of goodwill and other intangibles

Following Fairfield et al. (2003) and Sloan (1996), all the variables are deflated by average total assets.

4.3.2 *Hypotheses testing methodology*

4.3.2.1 Hypothesis 4.1

To test the first hypothesis, I run one year ahead ROA on growth in net operating assets and current year ROA as follows:

$$ROA_{t+1} = \alpha_0 + \alpha_1 GrNOA_t + \alpha_2 ROA_t + e_{t+1} \quad (4.8a)$$

Then the same way is used to test the relation between accruals after decomposition and the next year ROA:

$$ROA_{t+1} = \beta_0 + \beta_1 GrLTNOA_t + \beta_2 ACC_t + \beta_3 ROA_t + \mu_{t+1} \quad (4.8b)$$

$$ROA_{t+1} = \gamma_0 + \gamma_1 GrLTNInvest_t + \gamma_2 Writedowns_t + \gamma_3 ACC_t + \gamma_4 ROA_t + u_{t+1} \quad (4.8c)$$

In Equation (4.8a), α_1 is expected to be negative as past literature widely documented a negative incremental relationship between accruals and one year ahead earnings. Regarding Equation (4.8b), Fairfield et al. (2003) find that both β_1 and β_2 are negative and equally significant. After further decomposition in Equation (4.8c), γ_3 is still expected to be negative, however, γ_2 is expected to be positive. As explained before, the transitory nature of asset write-downs will be reflected as a positive association between current write-downs and next year's earnings as write-downs have an asset decreasing effect. Regarding the sign of γ_1, it can be negative giving the subjectivity associated with recognizing and evaluating non-current assets, however, it can be insignificant if write-downs are the only driver of the negative sign of β_1, leaving no or little explanatory power for γ_1.

4.3.2.2 Hypothesis 4.2[29]

To test the second hypothesis, I use Mishkin (1983) test, hereafter MT. Mishkin (1983) develops a test to assess the ability of investors to price available information. In

[29] The discussion of Mishkin (1983) test in this section draws from section 2 in Kraft et al. (2007)

accounting, MT is used to "*test the hypothesis that the market's subjective expectation of earnings in setting security prices is identical to the objective expectation of earnings conditional on past information*" (Kraft et al. 2007; P 1086). MT is used in the accounting literature to test the rational pricing of earnings and its components. For example, Sloan (1996) uses MT to test the market pricing of accruals and cash flow, while Xie (2001) uses MT to test the rational pricing of abnormal accruals, and Fairfield et al. (2003) use MT to examine the mispricing of growth in long-term operating assets. The underlying rational expectations hypothesis of earnings of MT emphasizes:

$$E_m(Earnings_{t+1} | \theta_t) = E(Earnings_{t+1} | \theta_t) \quad \text{(a)}$$

Where θ_t is the information available at time t, $E_m(Earnings_{t+1} | \theta_t)$ the market subjective expectations of earnings for the period t+1 and $E(Earnings_{t+1} | \theta_t)$ is the objective information of earnings at t+1conditional on θ_t. Assuming market efficiency, we have:

$$E(R_{t+1}) = R_{t+1} - E_m(R_{t+1} | \theta_t) = 0 \quad \text{(b)}$$

Where R_{t+1} is the return in year t+1 and $E_m(R_{t+1} | \theta_t)$ is the market's subjective expectation of R_{t+1} conditional on information available at time t. From Equations (a) and (b) the efficient market conditions implies that:

$$R_{t+1} = \beta\,(Earnings_{t+1} - E(Earnings_{t+1} | \theta_t)) + e_{t+1} \quad \text{(c)}$$

Where e_{t+1} is the error term and $E(e_{t+1} | \theta_t)=0$.

In the context of this study, MT is used to compare the parameter estimate of market pricing of write-downs and the other accrual components of earnings to the ability of write-downs and the other components to forecast one-year-ahead ROA. Size-adjusted return is used in the valuation equation. Size deciles are calculated using the firms listed in NYSE and then applied to the sample. Each month, the mean size decile return is

subtracted from the monthly return of each firm in the same size decile, then accumulated for the next 12 months starting from the 4th month after the fiscal year-end. The forecasting and the valuation (pricing) equations are set as follows:

Forecasting Equation:

$$ROA_{t+1} = \gamma_0 + \gamma_1 GrLTNInvest_t + \gamma_2 Writedowns_t + \gamma_3 ACC_t + \gamma_4 ROA_t + u_{t+1} \quad (4.9a)$$

Valuation Equation:

$$RET_{t+1} = \alpha_0 + \delta\,(ROA_{t+1} - \gamma_0 - \gamma_1{}^* GrLTNInvest_t - \gamma_2{}^* Writedowns_t - \gamma_3{}^* ACC_t - \gamma_4{}^* ROA_t + u_{t+1}) \quad (4.9b)$$

where:

RET_{t+1} = the annual buy and hold size-adjusted return calculated 4 months after fiscal year-end.

The forecasting equation (4.9a) uses past information at time t, i.e., growth in long-term net investment, write-downs, accruals, and ROA, to predict future earnings (ROA) at time t+1. The parameter estimates in the forecasting equation (γ_1, γ_2, γ_3, γ_4) are *objective* measures of how these information variables are related to future earnings. The joint estimation of Equations (4.9a) and (4.9b) is used to compare the subjective estimate of how the market uses the past information to forecast future ROA to the objective forecast of ROA based on past information. Equation (4.9a) asserts that the market subjective estimation of earnings should be equal to the objective expectation of earnings. Therefore, if earnings components are correctly priced then $\boldsymbol{\gamma_q = \gamma_q{}^*}$, where q=1, 2, 3, or 4. If the valuation coefficient $\boldsymbol{\gamma_q{}^*}$ is significantly larger (smaller) than the forecasting coefficient $\boldsymbol{\gamma_q}$, it means that the earning component q is overpriced (underpriced) by the market. The analysis tests for $\boldsymbol{\gamma_q = \gamma_q{}^*}$, where q=1, 2, 3 or 4, with special attention to $\boldsymbol{\gamma_2 = \gamma_2{}^*}$ since write-downs are the main account we focus on in this research.

4.3.2.3 Hypothesis 4.3

To test the third hypothesis, the same Equations (4.8a), (4.8b), and (4.8c) are used to test the effect of accruals on stock mispricing after replacing the left side with one year ahead stock return as follows:

$$RET_{t+1} = \alpha_0 + \alpha_1 GrNOA_t + \alpha_2 ROA_t + e_{t+1} \quad (4.10a)$$

$$RET_{t+1} = \beta_0 + \beta_1 GrLTNOA_t + \beta_2 ACC_t + \beta_3 ROA_t + \mu_{t+1} \quad (4.10b)$$

$$RET_{t+1} = \gamma_0 + \gamma_1 GrLTNInvest_t + \gamma_2 Writedowns_t + \gamma_3 ACC_t + \gamma_4 ROA_t + u_{t+1} \quad (4.10c)$$

To test if write-downs have larger mispricing than the growth in long-term net operating assets (GrLTNOA), I run the regressions above and compare between γ_2 from Equation (4.10c) and β_1 from Equation (4.10b). The difference is tested using the likelihood ratio, if $-\gamma_2 > \beta_1$ and the test result is significant, the null hypothesis that $-\gamma_2 = \beta_1$ is rejected, which provides evidence that the mispricing of write-downs is greater than the mispricing of GrLTNOA and supports H4.3.[30]

4.4 Research Sample

The research hypotheses are tested using annual US firms' observations over the years from 2002 to 2016. Because future returns needed to be calculated 4 months after the year-end, returns are calculated up to year 2018. The sample starts from 2002 because the variables measuring the write-downs of fixed and intangible assets are collected from the Datastream, where the assets write-downs variables are not available before 2002. I started by selecting all Compustat firms in NYSE, AMEX, and Nasdaq over the study period, then all financial firms (SIC 6000-6999) are deleted due to their special nature. In addition, firm-year observations with negative total assets or equity are removed. To be able to test the

[30] Although the association between write-downs and return is expected to be positive while the association between the rest of the accruals and return is expected to be negative, it does not mean that they have an offsetting effect on return. This is because write-downs have a decreasing effect on earnings unlike other components (i.e., GrNOA = GrLTNInvest - Writedowns + ACC).

research hypotheses, the sample is restricted to firms with non-missing return variables from The Center for Research in Security Prices (CRSP) and non-missing all other variables in Compustat and Datastream. Finally, to avoid the effects of outliers all the variables are trimmed at 0.5 and 99.5 percentiles, resulting in 16,132 firm-year observations.

4.5 Results and discussion

4.5.1 *Descriptive statistics*

Table 4.2 shows the distribution of the major variables of interest. RET_{t+1} exhibits a mean (median) of 1.9% (−2.4%). The mean and the median of the ROA are 4.4% and 7.8%, respectively, which is comparable to the same statistics in Kraft et al. (2007) (5% and 8%). Consistent with previous literature (e.g., Sloan, 1996; Fairfield et al. 2003), accruals (ACC) have a negative mean and median (−3.7% for both), implying that, on average, accruals decrease earnings (Fairfield et al. 2003). GrNOA has a mean (median) of 3.8% (2.1%); GrWC has a mean (median) of 0.5% (0.2%); GrLTNOA has a mean (median) of 7.6% (5.1%).

Writedowns exhibit a mean of 0.9%. Writedowns for firm-year observations that have missing numbers of fixed assets impairment, goodwill impairment, or other intangibles impairment, is set as zero if all other variables are available. Therefore, the mean of write-downs is close to zero because a significant percentage of the sample firms have zero write-downs over the study period. However, in an untabulated analysis, the tests are replicated for firms that have at least one write-down transaction during the sample period, which results in 11,394 firm-year observations. The inference from the hypotheses testing results remained unchanged after restricting firms' inclusion criteria.

[Insert Table 4.2 about here]

Table 4.3 shows the *unconditional* correlation results between the main variables of interest. Table 4.3 exhibits a negative correlation between the magnitude of write-downs and current year ROA, which is consistent with the income decreasing nature of write-downs. The unconditional correlation between write-downs and one year ahead ROA is negative as well. This negative unconditional correlation is not inconsistent with that write-downs have a positive *incremental* relationship with one year ahead ROA, because the incremental relationship is conditional on controlling for the current ROA. Table 4.3 also shows a positive unconditional correlation between current accruals, growth in net operating assets, and growth in long-term operating assets from one side and one-year-ahead ROA from the other side. Again, this positive unconditional correlation is not inconsistent with that accruals have a negative *incremental* relationship with one year ahead ROA, because the incremental relationship is conditional on controlling for the current ROA. Consistent with Fairfield et al. (2003), Table 4.3 shows that firms with higher current profitability (ROA) tend to invest more in net operating assets and have a higher level of profitability the year after. At the same time, current ROA is negatively associated with write-downs. This can be attributed to the negative association between write-downs and net operating assets that is positively associated with current ROA.

One-year-ahead size-adjusted return (RET_{t+1}) is negatively associated with the accrual components of earnings (current accruals, growth in net operating assets, growth in long-term operating assets). RET_{t+1} is positively associated with write-downs, however, the correlation is not significant. The regression results of Equations (4.10a, 4.10b, and 4.10c) will provide clearer and more conclusive evidence about the relationship between write-downs and future return and whether write-downs are underpriced or not.

[Insert Table 4.3 about here]

4.5.2 *Testing hypothesis 4.1*

The first hypothesis expects that write-downs have an incremental effect on one-year-ahead earnings (ROA_{t+1}), after controlling for current ROA. Table 4.4 shows the OLS regression results of one-year-ahead ROA on earnings components at different levels of decomposition. The first column provides evidence on the relationship between GrNOA and one-year-ahead ROA after controlling for current profitability. Consistent with Fairfield et al. (2003), GrNOA has a negative and significant association with one-year-ahead ROA ($\alpha_1 = -0.06$). This is the opposite sign of the unconditional correlation between GrNOA and one-year-ahead ROA reported in Table 4.3, as the regression is measuring the *incremental* effect of GrNOA on one-year-ahead ROA, after *controlling* for current year ROA. This applies to the other accrual components in the second and third columns in Table 4.4.

[Insert Table 4.4 about here]

The negative incremental effect of GrNOA on one-year-ahead ROA means that for firms with the same level of profitability at time t, firms investing more in NOA encounter less profitability at time t+1. Fairfield et al. (2003) attribute this result to accounting conservatism and shrinking returns on new investments, however, I argue that conservatism affects this relationship through generating low persistence accruals. Column 2 in Table 4.4 shows the incremental effect of the growth in long-term operating assets and accruals on one-year-ahead ROA, after controlling for current ROA. Consistent with the previous literature (e.g., Sloan, 1996; Fairfield et al. 2003; Richardson et al. 2005),

GrLTNOA and ACC exhibit a negative and significant incremental association with one-year-ahead ROA.[31]

In the third column of Table 4.4, the growth in long-term operating assets is disaggregated into growth in long-term investments and write-downs, allowing each component to have a different coefficient. To test if write-downs have a positive incremental relationship with one year ahead ROA, as in H4.1, one year ahead ROA is regressed on GrLTNInvest, write-downs, and accruals after controlling for current ROA. Consistent with H4.1, the results show that write-downs have a positive and significant association with one-year-ahead ROA (γ_2= 0.05 and t-value = 5.63), while the other component of GrLTNOA, GrLTNInvest, has a negative and significant association with one-year-ahead ROA (γ_1= −0.04 and t-value=−7.02).

In Panel (B), the null hypothesis $\beta_1 = -\gamma_2$ is tested using the likelihood ratio. The results show that the difference between β_1 and γ_2 is not statistically significant. In addition, the difference between the magnitude of the coefficients of $GrLTNInvest_t$ (γ_1) and the coefficient of Writedowns (γ_2) in Equation (4.8c) is tested. Panel (C) shows that the difference between the γ_1 and $-\gamma_2$ is not statistically significant (Pr > ChiSq = 0.41), suggesting that both the growth in long-term investment and write-downs have equivalent incremental association with one-year-ahead ROA, after controlling for the current ROA.

To summarize, the results show that write-downs have a positive incremental relationship with future profitability, after controlling for the current profitability. Further tests show that the magnitude of write-downs' incremental relationship with future ROA is equivalent to the magnitude of the incremental relationship of GrLTNOA and GrLTNInvest with future ROA, indicating that writedowns play an as important role as

[31] The total effect of one dollar of ACC on one-year- ahead profitability is positive, since ACC are a component of both ROA and GrNOA, making the total effect equals 0.82 (0.95 - 0.13), however the total effect of one dollar of GrLTNOA is negative (-0.04).

GrLTNInvest in explaining the low persistence of GrLTNOA documented in previous literature (Sloan, 1996; Fairfield et al. 2003; Richardson et al. 2005).

4.5.3 *Testing hypothesis 4.2*

The second hypothesis expects that the market undervalues asset write-downs relative to their implications for one-year-ahead ROA, resulting in write-downs mispricing. To test H4.2, Mishkin Test is used. In the context of this study, MT is used to compare between the parameter estimate of the market pricing of assets write-downs from the valuation equation and the parameter estimate of the ability of assets write-downs to predict one-year-ahead ROA from the forecasting equation. If the Writedowns parameter estimate in the valuation equation is significantly lower than the Writedowns parameter estimate in the forecasting equation, then it indicates that write-downs are underpriced by the market. Following Sloan (1996) and Fairfield et al. (2003), the system equations are estimated using an iterative Generalized Nonlinear Least Squares estimation procedure and processed in two stages.

In the first stage, the forecasting equation (4.9a) and the valuation equation (4.9b) are estimated together without putting any constraints on the forecasting coefficients (γs) or the valuation coefficients (γ^*s). To test the difference between γ^*s and γs, in the second stage, Equations (4.9a) and (4.9b) are estimated together after imposing the rational pricing constraints, $\gamma^*_q = \gamma_q$, where = 1, 2, 3 or 4. Mishkin (1983) shows that the constraints can be tested using the likelihood ratio test, which is asymptotically distributed as $\chi^2(q)$ under the null hypothesis:

$$-2N \log (SSR^c / SSR^u)$$

where:

Q = number of rational pricing constraints.
N =the number of observations.
Log =natural logarithm operator.
SSR^c =the sum of squared residuals from the constrained weighted system.

SSR^u =the sum of squared residuals from the unconstrained weighted system.

Panel A in Table 4.5 shows the parameter estimates of both the forecasting equation and the valuation equation before imposing any restrictions on the coefficients. The forecasting coefficients are identical to the ones reported in Table 4.4 for Equation (4.8c). Panel B reports the tests of rational pricing. The likelihood ratio of the overall model is 1203.92 ($p < 0.001$), which means that the null hypothesis that the market rationally prices the components of GrNOA and current ROA is rejected.

[Insert Table 4.5 about here]

Consistent with Fairfield et al. (2003), the valuation coefficient on ACC is higher than its forecasting coefficient and has an opposite sign (0.07 vs. −0.13). This indicates that accruals are overvalued by the market as found by the past literature (e.g., Sloan, 1996; Fairfield et al. 2003; Richardson et al. 2005; Kraft et al. 2007).

Regarding the main variable of concern, Writedowns, the valuation coefficient on Writedowns ($\gamma_2^* = -0.09$) is smaller than its forecasting coefficient ($\gamma_2 = 0.05$) and has an opposite sign. This provides evidence that the market undervalues write-downs relative to their ability to predict one-year-ahead ROA. To test if the difference between γ_2^* and γ_2 is significant, Equations (4.9a) and (4.9b) are estimated jointly after imposing the rational pricing constraint (i.e., $\gamma_i^* = \gamma_i$). Panel B shows that after controlling for the valuation implications of ROA, the underpricing of write-downs is significant ($p=.003$), which means that the rational pricing of write-downs is rejected.[32]

Unlike write-downs, the valuation coefficient on GrLTNInvest ($\gamma_1^* = 0.05$) is higher than its forecasting coefficient ($\gamma_1 = -0.04$) and has an opposite sign. This provides

[32] Although write-downs tend to reverse in the next period, investors did not learn from this pattern. One reason behind this is that although the disclosures about write-downs are detailed, no prospects are provided about the next period write-downs, which may make the investors think that these write-downs will continue in the future.

evidence that the market overvalues GrLTNInvest relative to their ability to predict one-year-ahead ROA. Panel B shows that the difference is significant after controlling for the valuation implications of ROA (p=.002). This shows that the market misprices both write-downs and GrLTNInvest, which would result in mispricing the GrLTNOA as it will be shown in the next section. Moreover, consistent with Fairfield et al. (2003), the results show that the market undervalues ROA relative to its implications for one-year-ahead ROA, where the valuation coefficient on ROA (γ_4* = 0.87) is smaller than its forecasting coefficient (γ_4 = 0.95) and statistically significant (p<.0001).

Finally, I test if the degree of mispricing differs between GrLTNInvest and Writedowns. As Table 4.4 shows, there is no significant difference between the coefficients on GrLTNInvest and Writedowns. To test the difference in the magnitude of mispricing, I estimate the forecasting and valuation equations after simultaneously imposing the constraint that the coefficient on GrLTNInvest equals the coefficient on Writedowns in the forecasting equation and the valuation equation, so that $\gamma_1=-\gamma_2$ and $\gamma_1^*=-\gamma_2^*$. Panel B shows that the forecasting and valuation coefficients on GrLTNInvest are equivalent to the forecasting and valuation coefficients on Writedowns (p = 0.34), which shows that GrLTNInvest and Writedowns are equally mispriced by the market. More evidence on the difference in the magnitude of mispricing between different accruals is reported in the next section.

To sum up, consistent with H4.2, the results of Miskin's test show that the market misprices (undervalues) write-downs relative to its implication for one-year-ahead ROA, after controlling for current profitability. The same inference is applied to GrLTNInvest, ACC, and ROA, which are mispriced as well.

4.5.4 *Testing hypothesis 4.3*

This section reports the results of examining the association between write-downs and future abnormal stock return. The objective is to test if the mispricing of Writedowns is greater than the mispricing of GrLTNOA as hypothesized in H4.3. If investors understand the ability of accruals to predict future earnings, then no association should exist between accruals and future abnormal returns. However, if investors naively fail to understand the lower persistence of less reliable accruals, there will be a negative association between these accruals and future abnormal returns (Richardson et al. 2005), while if investors naively fail to understand the low persistence of write-downs, there will be a positive association between write-downs and future abnormal returns. As the association between accruals and future returns is expected to be stronger for less reliable accruals, I expect that write-downs will have a stronger association with future returns compared to GrLTNOA.

I use pooled OLS to regress the earnings components on future returns. Comparing OLS to MT, Mishkin (1983) and Abel and Mishkin (1983) show that estimated coefficients and test statistics are asymptotically equivalent.[33] Therefore, if the coefficient of a particular earnings component is significantly different from zero, it means that this earnings component is mispriced by the market, and it will be equivalent to rejecting the null hypothesis of $\gamma^*_q = \gamma_q$ in MT. In addition to leading to the same conclusions as in MT, using OLS makes the comparison between the mispricing of write-downs and GrLTNOA easy and straightforward.

Table 4.6 shows the OLS regression results of earnings components at different levels of decomposition on abnormal future returns. The first column provides evidence on the

[33] Kraft et al. (2007) formally demonstrates the equivalence between both methodology in Part 4 in their paper. They show that parameter estimates and testing the difference between the forecasting and valuation coefficient will yield equivalent results in large samples.

relationship between GrNOA and one-year-ahead abnormal return. Consistent with Richardson et al. (2005), GrNOA has a negative and significant association with future return ($\alpha_1 = -0.09$). Column (2) in Table 4.6 shows the relationship between GrLTNOA and ACC and future abnormal return. Consistent with the previous literature (e.g., Fairfield et al. 2003; Richardson et al. 2005), GrLTNOA and ACC exhibit a negative and significant association with future abnormal returns, $\beta = -0.08$ and -0.15, respectively. Column (3) in Table 4.6 exhibits the association between accruals earnings components and future return after decomposing GrLTNOA into growth into long-term net investments and write-downs. Consistent with the results in Table 4.5, the growth in long-term net investments (write-downs) is overpriced (underpriced) by the market as it shows a significant negative (positive) association with future returns, where $\gamma = -0.07$ (0.10). Overall, the results are consistent with the naïve investor hypothesis.

[Insert Table 4.6 about here]

H4.3 expects that mispricing of long-term assets write-downs exceeds the mispricing of growth in long-term net operating assets. The difference between the magnitude of the pricing coefficient of Writedowns in Equation (4.10c) and the magnitude of the pricing coefficient of GrLTNOA in Equation (4.10b) equals 0.02 ($|0.10| - |-0.08|$), suggesting that the mispricing of Writedowns exceeds the mispricing of GrLTNOA.[34] To test if the difference is significant, the likelihood ratio (LR) is used to test the null hypothesis of $-\gamma_2 = \beta_1$. Panel B shows that the likelihood ratio failed to reject the null hypothesis that $-\gamma_2 = \beta_1$, which is not consistent with the expectation in H4.3. However, the failure to reject the null hypothesis suggests that write-downs and GrLTNOA are equally mispriced. Therefore, although the mispricing of write-downs is not greater than the mispricing of GrLTNOA,

[34] The test aims to test the difference in the magnitude of the mispricing of the two components. It tests the null hypothesis $-\gamma_2 = \beta_1$ not $|\gamma_2| = |\beta_1|$. However, the absolute notation is used to make the results discussion more convenient.

the results show that write-downs play an essential role in the mispricing of GrLTNOA as write-downs and GrLTNOA are equivalently mispriced by the market.

Furthermore, I test the difference in the pricing coefficients between the growth in long-term investment (γ_1) in Equation (4.10c) and the pricing coefficient of GrLTNOA (β_1) in Equation (4.10b). The difference between the magnitude of the two coefficients is 0.01= $|-0.08| - |-0.07|$, suggesting that the mispricing of GrLTNOA exceeds the mispricing of GrLTNInvest. Panel B shows that the difference between the two coefficients is insignificant, which provides evidence that GrLTNOA and GrLTNInvest are equivalently mispriced by the market. The difference between write-downs (γ_2) and the growth in long-term investment (γ_1) in Equation (4.10c) is also tested to see which one of these two elements contributes more to the mispricing of GrLTNOA. Panel B shows that the null hypothesis of $-\gamma_2 = \gamma_1$ cannot be rejected, which means that write-downs and GrLTNInvest are equivalently mispriced. The inference of these tests suggests that although the mispricing of write-downs does not exceed the missing of GrLTNOA, and both write-downs and growth in long-term investment play a significant role in mispricing GrLTNOA as they are equivalently mispriced.

To sum up, the regression results do not support the expectation that write-downs have a greater level of mispricing compared to GrLTNOA. However, the results show that write-downs significantly contribute to the mispricing GrLTNOA.

4.6 Conclusions

Previous research finds that the change in long-term net operating assets is significantly mispriced by the market (Fairfield et al. 2003; Richardson et al. 2005). In this research, I disaggregate the change in long-term net operating assets into growth in long-term net investment and assets write-downs. I argue that the non-recurring nature of asset

write-downs decreases their persistence and, therefore, decreases the persistence of the growth in long-term net operating assets.

In the first hypothesis, I argue that asset write-downs have a positive incremental relationship with one year ahead return on assets, after controlling for current return on assets. Using a US sample between 2001 and 2016, the results show that write-downs have a significant positive incremental association with one-year-ahead return on assets, consistent with the argument that write-downs decrease earnings persistence. In the second hypothesis, I argue that the low persistence of write-downs is reflected as stock mispricing in the market. Using Mishkin (1983) test, the results show that the market misprices write-downs resulting in write-downs being underpriced by the market.

In the last hypothesis, I argue that the low persistence of asset write-downs compared to the other component of growth in long-term net operating assets, growth in long-term net investment, makes write-downs the main reason for mispricing of growth in long-term net operating assets. Therefore, the last hypothesis predicts that the mispricing of write-downs exceeds the mispricing of growth in long-term net operating assets. The regression results show that both write-downs and growth in long-term net operating assets are equally mispriced by the market.

TABLES

Table 4.1: Reliability assessment by accrual category.

Accrual Category	Components	Reasons behind reliability assessment	Component's reliability assessment	Overall reliability assessment
ACC	**Δcurrent operating assets**	Component is dominated by receivables and inventory. Receivables need appraisals of bad debts and can be used in accruals earnings management. Inventory accruals require judgments in cost valuation.	Low	Medium
	Δcurrent operating liabilities	Component is dominated by payables that can be measured with a high degree of reliability.	High	
GrLTNOA	**GrLTNInvest**	Component is dominated by PPE and intangibles *excluding* write-downs, in addition to other liabilities. PPE and internally generated intangibles involve subjective capitalization decisions. Other liabilities include long-term payables, deferred taxes, contingent liabilities in addition to other accruals with varying degrees of reliability.	Medium	Low/ Medium
	Writedowns	Component is estimated in high subjectivity.	Low	

This table presents the classification of accrual categories depending on their reliability. It is based on the classification suggested by Richardson et al. (2005). ACC = current accruals, defined as the change in current operating assets minus the change in current operating liabilities (excluding tax liabilities) minus depreciation and amortization expense. Δcurrent operating assets=change in receivables, inventories, and other current assets. Δcurrent operating liabilities=change in payables and other current liabilities. GrLTNOA =one-year growth in long-term net operating assets. Writedowns= the total write-downs in long terms fixed assets and the impairments of goodwill and other intangibles. GrLTNInvest= growth in long-term net operating assets excluding assets impairment and write-downs (GrLTNOA + Writedowns). Δcurrent operating assets=change in receivables, inventories, and other current assets. Δcurrent operating liabilities=change in payables and other current liabilities.

Table 4.2: Descriptive statistics.

Variable	Mean	StdDev	Q1	Median	Q3
ROA_t	**0.044**	**0.184**	**0.024**	**0.078**	**0.131**
ROA_{t+1}	**0.041**	**0.198**	**0.023**	**0.077**	**0.130**
ACC_t	**-0.037**	**0.062**	**−0.068**	**−0.037**	**−0.008**
$GrNOA_t$	**0.038**	**0.144**	**−0.029**	**0.021**	**0.084**
$GrWC_t$	**0.005**	**0.055**	**−0.019**	**0.002**	**0.027**
$GrLTNOA_t$	**0.076**	**0.130**	**0.014**	**0.051**	**0.106**
$Writedowns_t$	**0.009**	**0.110**	**0.000**	**0.000**	**0.000**
$GrLTNInvest_t$	**0.086**	**0.164**	**0.019**	**0.055**	**0.112**
RET_{t+1}	**0.019**	**0.375**	**−0.208**	**−0.024**	**0.176**

This table shows descriptive statistics for 16,132 firm-year observations between 2002 and 2016. The mean, standard deviation (StdDev), median, and first (Q1) and third (Q3) quartiles are reported.
ROA_t = return on assets, defined as operating income after depreciation and amortization at time t divided by average total assets at time t.
ACC_t = current accruals, defined as the change in current operating assets minus the change in current operating liabilities (excluding tax liabilities) minus depreciation and amortization expense, divided by average total assets.
$GrNOA_t$ = one-year growth in net operating assets, where net operating assets equals operating assets minus operating liabilities, divided by average total assets.
$GrWC_t$ = one-year growth in non-cash working capital, where working capital is defined as current operating assets minus current operating liabilities, divided by average total assets.
$GrLTNOA_t$ =one-year growth in long-term net operating assets, divided by average total assets.
$Writedowns_t$= the total write-downs in long terms fixed assets and the impairments of goodwill and other intangibles, divided by average total assets.
$GrLTNInvest_t$= growth in long-term operating assets excluding assets impairment and write-downs (GrLTNOAt + $Writedowns_t$), divided by average total assets.
RET_{t+1} = the annual buy and hold size-adjusted return calculated 4 months after fiscal year-end.

Table 4.3: Correlation matrix between the tested variables.

	ROA_t	ROA_{t+1}	ACC_t	$GrNOA_t$	$GrWC_t$	Gr $LTNOA_t$	Write $downs_t$	GrLTN $Invest_t$	RET_{t+1}
ROA_t	-	**0.85**	**0.13**	**0.25**	**0.17**	**0.23**	**−0.08**	**0.19**	**0.06**
ROA_{t+1}	**0.87**	-	**0.07**	**0.16**	**0.11**	**0.16**	**−0.07**	**0.13**	**0.19**
ACC_t	**0.08**	**0.03**	-	**0.48**	**0.84**	**−0.05**	**−0.15**	**−0.09**	−0.01
$GrNOA_t$	**0.16**	**0.10**	**0.42**	-	**0.55**	**0.78**	**−0.16**	**0.73**	**−0.02**
$GrWC_t$	**0.13**	**0.08**	**0.90**	**0.47**	-	**0.10**	**−0.08**	**0.08**	0.00
$GrLTNOA_t$	**0.14**	**0.10**	−0.01	**0.90**	**0.09**	-	**−0.10**	**0.96**	−0.01
$Writedowns_t$	**−0.02**	−0.01	**−0.03**	**−0.07**	−0.01	**−0.07**	-	**−0.04**	0.01
$GrLTNInvest_t$	**0.10**	**0.07**	**−0.03**	**0.66**	**0.06**	**0.74**	**−0.62**	-	0.00
RET_{t+1}	**0.03**	**0.11**	**−0.02**	**−0.03**	**−0.02**	**−0.02**	0.01	−0.01	-

This table shows the correlation coefficients of 16,132 firm-year observations between 2002 and 2016. The upper right triangle of the matrix shows Spearman correlations, and the lower left triangle shows Pearson correlations. Values in bold are significant at 90% or more.
All the variables are defined in Table 4.2.

Table 4.4: OLS regression of growth in net operating assets and its decompositions on next year ROA.

Eq4.8a: $ROA_{t+1} = \alpha_0 + \alpha_1 GrNOA_t + \alpha_2 ROA_t + e_{t+1}$.

Eq4.8b: $ROA_{t+1} = \beta_0 + \beta_1 GrLTNOA_t + \beta_2 ACC_t + \beta_3 ROA_t + \mu_{t+1}$.

Eq4.8b: $ROA_{t+1} = \gamma_0 + \gamma_1 GrLTNInvest_t + \gamma_2 Writedowns_t + \gamma_3 ACC_t + \gamma_4 ROA_t + u_{t+1}$.

Panel A: Estimation Results for Each Equation

	Eq. 4.8a	Eq. 4.8b	Eq. 4.8c
Intercept	**0.00**	**0.00*****	**0.00*****
	(1.47)	**(−2.62)**	**(−2.70)**
ROA_t	**0.95*****	**0.95*****	**0.95*****
	(228.07)	**(228.41)**	**(228.41)**
$GrNOA_t$	**−0.06*****		
	(−10.74)		
ACC_t		**−0.13*****	**−0.13*****
		(−10.48)	**(−10.45)**
$GrLTNOA_t$		**−0.04*****	
		(−7.11)	
$GrLTNInvest_t$			**−0.04*****
			(−7.02)
$Writedowns_t$			**0.05*****
			(5.63)

Panel B: Tests of Differences in Coefficients

Null Hypotheses	*Likelihood Ratio Statistic*	*Marginal Significance Level*
$Writedowns_t$=$GrLTNOA_t$ ($-\gamma_2 = \beta_1$)	**0.25**	**0.62**
$GrLTNInvest_t$= $GrLTNOA_t$ ($\gamma_1 = \beta_1$)	**0.00**	**0.96**
$Writedowns_t$=$GrLTNInvest_t$ ($-\gamma_2 = \gamma_1$)	**0.66**	**0.41**

*** significant at 1%; ** significant at 5%; * significant at 10%.

This table shows the coefficient and t-statistics from OLS regression of the one-year-ahead return on assets (ROA) on the accruals components of earnings in addition to the current year's ROA of 16,132 firm-year observations between 2002 and 2016. In the first column, the independent variable is the growth in net operating assets (GrNOA). In the second column, GrNOA is decomposed into current accruals (ACC) and growth in long-term operating assets (GrLTNOA). In the third column, GrLTNOA is further decomposed into growth in long-term net investment (GrLTNIvest) and asset write-downs (Writedowns).

Panel B contains the results for testing the difference in coefficient estimates. The null hypothesis is tested using the likelihood ratio.

All variables are defined in Table 4.2.

Table 4.5: Nonlinear Generalized Least Squares Estimation (Mishkin Test) of the market pricing of growth in net operating assets and ROA with respect to their implications for one-year-ahead ROA.

Forecasting equation:

$$ROA_{t+1} = \gamma_0 + \gamma_1 GrLTNInvest_t + \gamma_2 Writedowns_t + \gamma_3 ACC_t + \gamma_4 ROA_t + u_{t+1}$$

Valuation equation:

$$RET_{t+1} = \alpha_0 + \delta\,(ROA_{t+1} - \gamma_0 - \gamma_1{*}GrLTNInvest_t - \gamma_2{*}Writedowns_t - \gamma_3{*}ACC_t - \gamma_4{*}ROA_t + u_{t+1})$$

Panel A: market pricing of growth in net operating assets and ROA with respect to their implications for one-year-ahead ROA

Forecasting Coefficients			*Valuation Coefficients*		
Parameter	*Estimate*	*Std. Error*	*Parameter*	*Estimate*	*Std. Error*
γ_1(GrLTNInvest$_t$)	**−0.04**	**0.006**	**γ_1*(GrLTNInvest$_t$)**	**0.05**	**0.031**
γ_2 (Writedowns$_t$)	**0.05**	**0.009**	**γ_2*(Writedowns$_t$)**	**−0.09**	**0.046**
γ_3(ACC$_t$)	**−0.13**	**0.012**	**γ_3*(ACCt)**	**0.07**	**0.063**
γ_4(ROA$_t$)	**0.95**	**0.004**	**γ_4*(ROAt)**	**0.87**	**0.022**

Panel B: tests of rational pricing of current year's GrLTNInvest, Writedowns, ACC, and ROA

Null Hypotheses	*Likelihood Ratio Statistic*[a]	*Marginal Significance Level*
GrLTNInvest, Writedowns, ACC, ROA:		
γ_1= γ_1* and γ_2= γ_2* and γ_3= γ_3* and γ_4= γ_4*	**1203.92**	**<.0001**
GrLTNInvest: γ_1= γ_1*	**9.26**	**0.0023**
Writedowns: γ_2= γ_2*	**8.72**	**0.0032**
ACC: γ_3= γ_3*	**9.94**	**0.0016**
ROA: γ_4= γ_4*	**15.19**	**<.0001**
GrLTNInvest. Writedowns:		
γ_1= −γ_2 and γ_1*= −γ_2*	**0.90**	**0.3439**

This table shows the results of Mishkin Test. Panel A contains the results of jointly estimating the forecasting equation and the valuation equation using an iterative generalized nonlinear least square estimation for 16,132 firm-year observations between 2002 and 2016. Panel B tests rational pricing of current year's GrLTNInvest, Writedowns, ACC, and ROA using the likelihood ratio
All variables are defined in Table 4.2.

[a] The likelihood ratio statistic for the full model [−2n log (SSRc/SSRu)] = −2 * 16132 * ln(2175.2/2257.9) =1,203.92

Table 4.6: Comparison between the mispricing of GLTNOA and Writedowns.

Eq(4.10a): $RET_{t+1} = \alpha_0 + \alpha_1 GrNOA_t + \alpha_2 ROA_t + e_{t+1}$.

Eq(4.10b): $RET_{t+1} = \beta_0 + \beta_1 GrLTNOA_t + \beta_2 ACC_t + \beta_3 ROA_t + \mu_{t+1}$.

Eq(4.10c): $RET_{t+1} = \gamma_0 + \gamma_1 GrLTNInvest_t + \gamma_2 Writedowns_t + \gamma_3 ACC_t + \gamma_4 ROA_t + u_{t+1}$.

Panel A: Estimation Results for Each Equation

	Eq. 4.10a	Eq. 4.10b	Eq. 4.10c
Intercept	**0.02*** (5.80)**	**0.01*** (3.78)**	**0.01*** (3.68)**
ROA_t	**0.07*** (4.55)**	**0.07*** (4.56)**	**0.07*** (4.57)**
$GrNOA_t$	**−0.09*** (−4.28)**		
ACC_t		**−0.15*** (−3.22)**	**−0.15*** (−3.18)**
$GrLTNOA_t$		**−0.08*** (−3.28)**	
$GrLTNInvest_t$			**−0.07*** (−3.20)**
$Writedowns_t$			**0.10*** (3.06)**

Panel B: Tests of Differences in Coefficients

Null Hypotheses	*Likelihood Ratio Statistic*	*Marginal Significance Level*
$Writedowns_t$=$GrLTNOA_t$ ($-\gamma_2 = \beta_1$)	**0.26**	**0.61**
$GrLTNInvest_t$= $GrLTNOA_t$ ($\gamma_1 = \beta_1$)	**0.00**	**0.96**
$Writedowns_t$=$GrLTNInvest_t$ ($-\gamma_2 = \gamma_1$)	**0.67**	**0.41**

*** significant at 1%; ** significant at 5%; * significant at 10%.

This table shows the results from OLS regression of one-year-ahead abnormal returns (RET) on the accruals components of earnings in addition to the current year's ROA for 16,132 firm-year observations between 2002 and 2016. Panel A shows the coefficient and t-statistics. In the first column, the independent variable is the growth in net operating assets (GrNOA). In the second column, GrNOA is decomposed into current accruals (ACC) and growth in long-term operating assets (GrLTNOA). In the third column, GrLTNOA is further decomposed into growth in long-term net investment (GrLTNIvest) and asset write-downs (Writedowns). Panel B contains the results for testing the difference in coefficient estimates. The null hypothesis is tested using the likelihood ratio.
All variables are defined in Table 4.2.

5 CONCLUSION AND DIRECTIONS FOR FURTHER RESEARCH

5.1 Conclusion

This thesis examines the consequences of accounting conservatism in the equity market. It consists of three essay-style chapters. Chapter 2 examines the effect of conservatism on market reaction to earnings news. In doing so, I test the effect of accounting conservatism on investors' reaction to earnings news in the short and long earnings response windows, using Fama and MacBeth (1973) regression. The research hypotheses are based on prior findings that conservatism has opposite effects on earnings quality, where conservatism decreases earnings persistence but increases their reliability. I argue that conservatism is positively associated with the initial reaction to earnings news regardless of its effect on earnings quality; however, it is positively (negatively) associated with the subsequent reaction if it decreases (increases) earnings quality. Therefore, the first hypothesis predicts that conservatism is positively associated with the short-window announcement return. Concurrently, the second hypothesis draws no direction of the association between conservatism and the long-window announcement return. The results show that conservatism is positively associated with abnormal returns both around earnings announcements and subsequent to earnings announcements, which indicates that conservatism decreases earnings quality.

Chapter 3 extends chapter 2 and investigates the reasons behind the return attributes of accounting conservatism. In particular, I examine if stock mispricing can explain returns predictability under different levels of accounting conservatism. I argue that the low earnings persistence resulted from earnings conservatism leads to stock mispricing, where the prices of high (low) conservatism stock are biased downward (upward). The findings

can be summarized as follows. High (low) conservatism stocks have higher (lower) returns on earnings announcement days compared to non-announcement days. This asymmetric effect cannot be explained by changes in risk on announcement days, but can be explained by stock mispricing. In addition, both high and low conservatism amplify the expectation error of the other mispricing factors, and conservatism is and has an independent mispricing effect.

Chapter 4 examines the effect of long-term asset write-downs, as a conservative procedure, on earnings persistence and stock valuation. I extend Fairfield et al. (2003) by disaggregating the growth in long-term net operating assets into asset write-downs and growth in long-term net investments. I argue that the non-recurring nature of asset write-downs and the subjectivity involved in estimating their amounts will result in lower earnings persistence and, consequently, stock mispricing. I also argue that the low persistence of asset write-downs would make the mispricing of write-downs larger than the mispricing of growth in long-term net operating assets. The results can be summarized as follows. Write-downs have a negative incremental relationship with future profitability. In addition, the market undervalues asset write-downs relative to their association with one year ahead earnings. Moreover, the regression results show that both components of the growth in long-term net operating assets are equally mispriced by the market.

5.2 Contributions and Implications of this study

This thesis provides an opportunity to advance the understanding of the consequences of conservatism in the equity market. In their review of accounting conservatism literature, Mora and Walker (2015) and Ruch and Tylor (2015) show that we need to understand further the various implications of conservatism exist in the equity market. This thesis has the following implications.

5.2.1 *Contributions to academic research*

This research shows that both high conservatism firms and low conservatism firms are mispriced by the market, while firms that apply neutral accounting are not. This asymmetric effect on stock valuation has been overlooked by previous literature. Therefore, future academic research can consider the asymmetric effect of conservatism when examining other areas and try to find an optimal level of conservatism that maximizes the benefits generated by the firm.

This research also provides a new angle to examine the consequences of conservatism on the equity market by focusing on the time-series properties of earnings affected by accounting conservatism. While these time-series characteristics are used mainly in the literature to discuss the predictability of earnings, this study shows that time-series characteristics also affect stock pricing and shows that information reliability resulted from accounting conservatism is not the only player in the equity market. In fact, this study shows that while conservatism provides highly verifiable earnings, investors do not fully understand the time-series implications of these earnings. This requires academic research to consider other aspects of conservatism in addition to verifiability, such as persistence, when examining its consequences on equity markets.

Another observation when reviewing the literature on accounting conservatism is that most of the studies seem to focus on the positive side of conservatism. There are relatively fewer published studies that stand against conservatism or the excessive application of it. This may be because of the rooted idea that conservatism is a desirable accounting policy in the firm and the long traditional implementation of conservatism that makes it a primary principle in applying accounting standards and procedures. Therefore, academic research

should shed light on different aspects and consequences of conservatism. For example, the benefits of applying conservatism to debt contracting cannot be generalized to other areas.

5.2.2 *Implications for standard setters*

This thesis has implications for standard setters and helps to resolve the debate of whether neutrality or conservatism is more useful for financial statement users. In evaluating accounting standards, standard setters should follow a cost-benefit approach (Schipper, 2010) and use this approach to evaluate the benefits of conservatism relative to neutrality, taking into consideration various areas that conservatism can affect. In doing so, it is important that standard setters should be aware that current standards embody significant commitments to conservatism (Mora and Walker, 2015). My study demonstrates the potential drawback of allowing conservative or aggressive treatment of the account relative to a neutral treatment. While this may evocate for a more neutral accounting standard, improved statement user education may also mitigate the misvaluation associated with conservative/aggressive financial reporting. In addition, standard setters should take into account that the optimal level of conservatism may differ across firms and circumstances.

5.2.3 *Implications for investors*

I mainly argue that conservatism impacts stock pricing by affecting earnings persistence. Investors need to understand the time-series characteristics of earnings under accounting conservatism and be able to differentiate between persistent and transitory losses. Recognizing these earnings properties helps investors to predict earnings more objectively. In addition, understanding the stock mispricing patterns documented by this research can help investors to gain an abnormal return whenever this return exceeds the transaction cost. If more investors do so, this would improve the efficiency of the pricing

for these conservative/aggressive reports. Moreover, I find that conservatism is a priced return anomaly, which means that investors should take into consideration this anomaly return in calculating the cost of capital and assessing investment opportunities since this return 'premium' is long-lasting in the market.

5.2.4 *Implications for policymakers*

Policymakers need to bridge the information gap between internals and externals in a way that provides the users of financial statements with useful information for decision making. And as conservatism implications on earnings are not fully understood by investors, a clear and appropriate disclosure policy is needed to provide more information about the nature and effect of conservative accounting practices.

Accounting conservatism is needed to decrease the agency costs related to moral hazard and adverse selection, at the same time it leads to stock mispricing. Accordingly, policymakers are required to decrease the information asymmetry between the insiders and the outsiders without increasing the agency cost. This can be done through more credible disclosures. Firms that apply high levels of conservatism may find it beneficial to disclose good news not recognized in the financial statements to correct the bias perceived by the users, for example, through the management discussion and analysis (MD&A) section in the financial report. Therefore, policymakers can obligate the firms to disclose information about the degree of prudence that they are applying in recognizing losses and gains. In addition, the disclosure policy can require the firms to additionally report the analogous financial statements neutrally, so they provide a benchmark to compare the conservatively/ aggressively reported financial statements. In this way, firms would not need to eliminate conservatism, but rather enhance the quality of information disclosed to the users, which would decrease the stock mispricing.

5.3 Directions for further research

I now discuss some directions for future research that extend the work that has been done in this thesis.

5.3.1 *Accounting conservatism and the environmental, social, and governance (ESG) risk*

Past literature find that conservatism is needed in times of high uncertainty. For example, Basu (1997) finds that conservatism has increased in the regimes of high auditor liability i.e., high litigation risk. In addition, Lafond and Watts (2008) find that the information asymmetry between firm insiders and outside equity investors generates conservatism as conservatism reduces the manager's incentives and ability to manipulate accounting numbers. Moreover, Garcia Lara et al. (2009) find that the implementation of stronger corporate governance provisions results in increased conditional conservatism. Furthermore, Balakrishnan et al. (2016) find that firms with less conservative financial reporting experienced a sharper decline in investment activity during the global financial crisis compared to firms with more conservative financial reporting. These examples show the need for conservatism in times of uncertainty. Therefore, firms with high exposure to environmental, social, and governance (ESG) risk may need to apply high levels of conservatism, an issue that future research can investigate.

5.3.2 *Accounting conservatism and earnings management*

Past literature argues that accounting conservatism constrains managers' opportunistic behavior and decreases earnings manipulation. However, Garcia Lara et al. (2020) is the only published study that examines the effect of accounting conservatism on accrual and real earnings management. Future research can investigate the effect of accounting conservatism on other earnings management tools like earnings smoothing and big-bath

accounting. This can be done using specific accounts in the financial statements that are directly affected by conservatism as in Jackson and Liu (2010).

5.3.3 *Tone management and stock mispricing*

A recent paper by D'Augusta and DeAngelis (2020) finds that conservatism constrains upward tone management (UTM) in the Management's Discussion and Analysis (MD&A) portion of the 10-K filing. However, although conservatism mitigates managers from opportunistically downplay bad news and magnify good news in the MD&A (D'Augusta and DeAngelis, 2020), managers may want to use the upward tone to reflect the transitory nature of losses caused by high accounting conservatism. Therefore, using the upward tone along with high conservatism levels can dampen the stock mispricing caused by accounting conservatism. This provides a research opportunity for future studies.

5.3.4 *Error creation vs. error correction in earnings news*

In general, an earnings announcement contains new information that 1) corrects any errors in previous expectations, 2) helps to form new expectations, and 3) may result in new expectation errors at the same time. Future studies can try to discriminate the error correction from the error creation caused by the earnings news. To do so, suggestions can include examining the short-window and the long-window reaction to earnings announcements to disentangle these earnings news applications.

5.4 Limitations of the study

This research has some limitations within which the findings need to be interpreted carefully. First, while using C-score, negative accruals, and negatives skewness to measure accounting conservatism is justified, they are not the only measurements of accounting

conservatism, therefore, using other measurements may cover other aspects of conservatism.

Second, in the first essay, I find that the effect of conservatism on stocks abnormal return continues until 60 days after the earnings are announced. I do not examine exactly when the effect disappears post to earning announcements.

Third, in the third essay, the sample time is shorter than the other two essays and starts from 2002 because the variables measuring the write-downs of fixed and intangible assets are collected from the Datastream, where the assets write-downs variables are not available before 2002.

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