Advances in Accounting 40 (2018) 76–88

Contents lists available at ScienceDirect

Advances in Accounting

journal homepage: www.elsevier.com/locate/adiac

# Accounting conservatism: A life cycle perspective

James C. Hansen[a,*], Keejae P. Hong[b], Sang-Hyun Park[c]

[a] School of Accounting and Taxation, Goddard School of business and Economics, Weber State University, Ogden, UT 84408, United States
[b] Turner School of Accountancy, Belk College of Business, University of North Carolina Charlotte, Charlotte, NC 28223, United States
[c] Knox School of Accountancy, Hull College of Business, Augusta University, Augusta, GA 30912, United States

ARTICLE INFO

*Keywords:*
Accounting conservatism
Conditional conservatism
Unconditional conservatism
Firm life cycle

*JEL classification:*
M21
M41

ABSTRACT

This paper investigates whether a firm's life cycle stage affects its reporting conservatism in the cross-section. We use two measures of reporting conservatism used in Givoly and Hayn (2000): the level of non-operating accruals and the market-to-book ratio (unconditional conservatism); and the conservatism measure suggested by Basu (1997) (conditional conservatism). Firms are classified annually into life cycle stages using procedures proposed by Dickinson (2011). We find that *unconditional* reporting conservatism decreases over life cycle stages, but do not find evidence that *conditional* reporting conservatism is associated with life cycle stages. Our findings complement Givoly and Hayn (2000) and have implications for financial statement analysis and future research on accounting conservatism.

## 1. Introduction

This paper investigates whether a firm's life cycle stage affects its reporting conservatism in the cross-section.[1] Our inquiry is motivated by and closely related to Givoly and Hayn (2000) in which they document that financial reporting in the U.S. has become more conservative in the past four decades based on four sets of empirical measures of accounting conservatism that they develop. We argue that reporting conservatism not only can vary over time as documented in Givoly and Hayn (2000) but it can also vary in the cross-section in any given year. More specifically, we examine the cross-sectional variation in reporting conservatism in this paper from a life cycle perspective, and thus complement Givoly and Hayn's (2000) time-series evidence on reporting conservatism.

The life cycle theory of firms prescribes that firms evolve through several distinct life cycle stages. Firms in different life cycle stages exhibit different financial characteristics and require different management skills, priorities and strategies. In particular, the life cycle theory prescribes that a firm should maximize revenue growth early in its life cycle stages in order to create permanent demand or cost advantages over its competitors, which implies that firms would show different cash flow patterns across their life cycle stages. For example, a firm would have negative cash flows from investing and operating activities in the introduction stage as the firm enters the market. However, as the firm reaches the growth and mature stages, the firm would have a positive cash flow from operating activities. Based on the intuition above, Dickinson (2011) develops a proxy for firm life cycle using a firm's cash flow patterns from operating, investing and financing activities.

Conservatism is a long-standing convention in financial reporting, and a multi-dimensional concept. A variety of definitions and measures of accounting conservatism have been developed. For example, Givoly and Hayn (2000) define conservatism as "a selection criterion between accounting principles that lead to the minimization of *cumulative* reported earnings by slower revenue recognition, faster expense recognition, lower asset valuation, and higher liability valuation." Basu (1997), on the other hand, defines conservatism as an asymmetry in reported earnings that respond more quickly and completely to "bad news" than to "good news."

These measures of accounting conservatism can be categorized into two groups: conditional and unconditional conservatism (Beaver & Ryan, 2005). *Unconditional* conservatism (or news independent) means that at the initial recording of assets and liabilities, the accounting process will lead to expected unrecorded goodwill (e.g. accelerating deprecation of property, plant, and equipment above that of economic depreciation). *Conditional* conservatism (or news dependent) means that under negative conditions book values are written down, but under favorable conditions the book values are not written up (e.g. the use of lower of cost or market in inventory valuation).

Givoly and Hayn (2000) develop four measures of accounting conservatism, and demonstrate that financial reporting in the U.S. has become more conservative in the last four decades. Their evidence, however, cannot explain the cross-sectional variation in reporting conservatism in a given

* Corresponding author.
*E-mail addresses:* jameshansen2@weber.edu (J.C. Hansen), khong5@uncc.edu (K.P. Hong), sapark@augusta.edu (S.-H. Park).
[1] See Section 2 of this paper, Beaver and Ryan (2005), and Qiang (2007) for a discussion of *Conditional* vs. *Unconditional* Conservatism.

http://dx.doi.org/10.1016/j.adiac.2017.10.001
Received 17 January 2017; Received in revised form 13 September 2017; Accepted 2 October 2017
Available online 04 November 2017
0882-6110/ 

year. We hypothesize that life cycle stages of firms affect the degree of *unconditional* reporting conservatism of these firms in the cross-section, but the association between life cycle stages and *conditional* reporting conservatism is unclear. Following Dickinson (2011), we classify firm-years into five different stages of their life cycle: Introduction, Growth, Mature, Shake-out and Decline Stage. Our hypothesis is based on the life cycle theory of firms, which suggests that firms should invest more heavily in early life cycle stages (Introduction and Growth Stage) than late stages (Decline Stage) because the marginal return or the market reward to the investment diminishes over life cycle stages. We, thus, believe that firms in the introduction stage are likely to invest proportionately more heavily in research & development (R & D), human capital, organizational change, and capital expenditures than firms in mature or decline stages to create permanent demand and cost advantages.[2] Current U.S. GAAP requires immediate expensing of expenditures on R & D, human capital, and organizational change. This conservative accounting rule hits firms in the introduction stage more severely than it does firms in the mature or decline stages because firms in the introduction stage invest proportionately more in these items than firms in the mature or decline stages *and* because firms in the introduction stage are more likely to increase their investments in these items whereas firms in mature or decline stages are in a steady or declining state. Thus, the book value of equity of firms in the introduction stage likely will be more severely depressed than that of firms in mature or decline stages.[3]

Based on Givoly and Hayn (2000), we measure accounting conservatism using i) the level of negative non-operating accruals; ii) the market-to-book ratio; and iii) a *conditional* measure used in Basu (1997) (detailed below). We, then, compare annual measures of conservatism for each life cycle stage in the cross-section of firms to examine whether accounting conservatism decreases over the life cycle stages as we hypothesize. In addition to the Dickinson (2011) life cycle stages measure, we use firm age as a robustness check.

We conduct our univariate (multivariate) tests on a large sample of 106,874 (106,577) firm-year observations. Our sample spans 25 years from 1988 to 2012. In Fig. 1, we show the annual cross-sectional mean and median conservatism measures for both non-operating accruals and book-to-market. During our sample period, financial reporting in the U.S. has become more conservative up until the late 1990's as suggested by Givoly and Hayn (2000). We find that the mean and median annual non-operating accruals of all firms in each year are negative. Moreover, the mean and median market-to-book ratios of all firms in each year are steadily increasing up until the late 1990's. However, we do not see an obvious trend since the start of the new millennium. Especially during the dotcom bubble and crash period (1999–2000) and the global financial crisis period (2007–2008), conservatism seems to have decreased. Fig. 1 suggests that the time-series changes of conservatism documented in Givoly and Hayn (2000) cannot fully explain the variation in conservatism.

We compare our measures of *unconditional* conservatism annually between firms in different life cycle stages. We find that the mean and median non-operating accruals of introduction stage firms are more negative than those of mature stage firms, which, in turn, are more negative than those of decline stage firms. Similarly, we find that the mean and median market-to-book ratios of introduction stage firms are larger than those of mature stage firms, which, in turn, are larger than those of shake-out stage firms. However, the market-to-book ratios of decline stage firms are larger than those of mature stage firms.[4] These findings are generally consistent with our hypothesis that the degree of

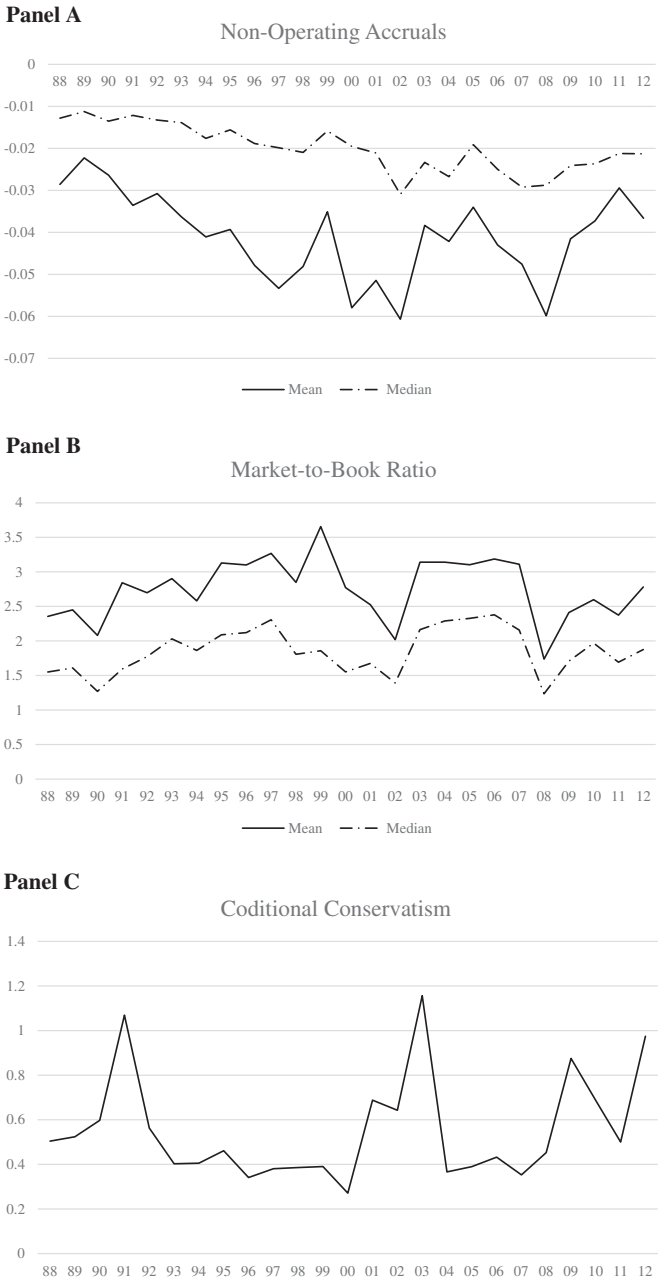


**Fig. 1.** Intertemporal changes of accounting conservatism.
Panel A: Accounting conservatism measured by non-operating accruals.
Panel B: Accounting conservatism measured by market-to-book ratio over time.
Figures in Panel A and Panel B report conservatism over the sample period from 1988 to 2012. The horizontal axis represents year, and vertical axis represents the mean and median conservatism measured by non-operating accruals (Panel A) and by market-to-book ratio (Panel B).
Panel C: Conditional Conservatism measured by Basu (1997) over time.
The figure in Panel C reports conditional conservatism over the sample period from 1988 to 2012. The horizontal axis represents year, and vertical axis represents the coefficient $\beta_1$, a proxy for accounting conservatism, based on the Basu's (1997) following equation:

$$\frac{EPS_{i,t}}{P_{i,t-1}} = \alpha_0 + \alpha_1 {}^{*}DRET_{i,t} + \beta_0 {}^{*}RET_{i,t} + \beta_1 {}^{*}RET_{i,t} {}^{*}DRET_{i,t} + \varepsilon_{i,t}$$

The variables from the equation are defined in Appendix A. The coefficient $\beta_1$ measures incremental response to bad news relative to good news. A positive $\beta_1$ indicates accounting conservatism. Reported coefficients are cross-sectional regression coefficients for each year.

[2] We omit the comparison for two of the intermediate life cycle stages, growth and shake-out, for brevity and to increase the power of the tests.

[3] A heavy investment in capital expenditures tends to reduce current earnings through depreciation expenses, which in turn reduce current book value of equity.

[4] However, in a multivariate analysis after controlling for other known factors that affect a firm's degree of reporting conservatism, we find evidence supporting an association between a firm's life-cycle stages and conservatism.

reporting conservatism decreases over life cycle stages. However, our results using the *conditional* measure of conservatism (Basu, 1997) are inconsistent with our hypothesis. In other words, Basu's measure of conservatism does not appear to be systematically related to life cycle stages.

Our paper contributes to the literature on accounting conservatism in several important ways. First, we demonstrate that the degree of *unconditional* reporting conservatism, in the sense of under-recording of net assets, varies in the cross-section where accounting standards are held constant, and that the cross-sectional variations in *unconditional* reporting conservatism is systematically related to the life cycle stages of firms. This is because the same accounting standards (e.g., expensing of R & D), would have differential impact on firms in different life cycle stages. Our findings of cross-sectional variation in accounting conservatism complement the time-series variation of accounting conservatism documented by Givoly and Hayn (2000). Second, our findings indicate that in addition to considering the inter-temporal trend of accounting conservatism, an analysis of financial statements should consider the impact of a firm's life cycle stage on financial ratios. Third, our findings support that accounting conservatism is a multi-dimensional concept. Different measures of conservatism likely capture different aspects of conservatism, and hence, may or may not move in the same direction in response to certain changes in firm characteristics or in accounting standards. Thus in future research, researchers need to be specific as to which aspects of conservatism they try to measure and test. Finally, our findings also should be of interest to contracting parties (e.g., debt contracts) whose contracts are based on accounting numbers. Watts (1993) argue that conservatism evolves from accounting's contracting role in debt markets. Therefore, a firm's life cycle should be considered in debt contracting as our evidence suggests that a firm's life cycle stage affects accounting conservatism or accounting numbers.

The remainder of the paper proceeds as follows. In Section 2, we discuss prior research on both the firm life cycle and conservatism measures, and develop our hypothesis on how a firm's life cycle will affect different types of conservatism measures. Section 3 describes the research design in terms of sample selection, life cycle descriptors, and conservatism measures. Section 4 presents the empirical findings. Section 5 discusses our robustness tests, and Section 6 concludes the paper.

## 2. Prior research and hypothesis development

### 2.1. Firm life cycle

As hypothesized by the life cycle theory of firms, firms evolve through several distinct life cycle stages. Firms exhibit different financial characteristics and require different management skills, priorities and strategies in these different life cycle stages. To create permanent demand or cost advantages over its competitors, the life cycle theory prescribes that a firm should maximize revenue growth early in its life cycle stages (e.g., Boston Consulting Group, 1972; Karnani, 1984; Porter, 1980; Spence, 1977, 1979, 1981; Wernerfelt, 1985). This prediction of the life cycle theory is based on the premises that the reward for acquiring market share to create demand advantages or for building capacity to create cost advantages diminishes over a firm's life cycle stages. That is, the reward is the largest (smallest) in a firm's early (late) life cycle stage, which implies firms would show different cash flow patterns across their life cycle stages.[5] Dickinson (2011) uses this intuition to develop a proxy for a firm's life cycle using a firm's cash flow patterns from operating, investing and financing activities. We discuss in detail the measure developed by Dickinson (2011) to classify firms into different life cycle stages in Section 3.2.

There is little research about the effect of the firm's life cycle on a firm's reporting behavior or accounting information system with only a few exceptions. Anthony and Ramesh (1992) was one of the first studies that examine how firm life cycle stages affect the relation between stock market responses to accounting performance measures. They document that the response coefficients of unexpected sales growth and unexpected capital investment decrease as firms evolve from the growth to the decline stages. Liu (2006) focuses on examining how accounting accruals varies over a firm's life cycle. She provides evidence that accounting accruals (a proxy for a firm's accounting quality) vary with changes in a firm's operating environment over its life cycle, and suggests a method to mitigate incorrect inferences about accounting quality. Through a mail survey and field studies of firms, Moores and Yuen (2001) examine how and why a firm's life cycle stage affects the changes in a firm's management accounting system (MAS), and document that the influence of a MAS is more important for growth firms. In addition, Silvola (2008) extends Moores and Yuen (2001) by examining how a firm's management control systems vary with the firm's life cycle, and the impact of venture investors on such variations. As expected, she documents that a firm's life cycle, as well as venture investors, are an important factor that explains variations in management control systems.

### 2.2. Conservatism: unconditional vs. conditional

Despite its central importance in accounting theory and practice, there is no authoritative definition of conservatism in the accounting literature. Consequently, researchers have developed a variety of definitions of accounting conservatism, each capturing certain aspects of conservatism. In addition to the definitions from Givoly and Hayn (2000) and Basu (1997) mentioned above, Feltham and Ohlson (1995) characterize conservative or “biased” accounting as an expectation that market value of equity exceeds book value of equity in the long run. Beaver and Ryan (2005, pp. 269–270) describe the multi-dimensional nature of conservatism and state that conservatism can be *conditional* or *unconditional*.[6] *Unconditional* conservatism, which is news independent, means that when assets or liabilities are initially recorded (i.e. inception), the accounting process will lead to expected unrecorded goodwill. Two examples of *unconditional* conservatism are (1) accelerating deprecation of property, plant, and equipment above what the economic depreciation should be and (2) immediate expensing of intangibles internally created by companies. *Conditional* conservatism, which is news dependent, means that under negative conditions, book values are written down. Under favorable conditions, the book values are not written up. Two examples of *conditional* conservatism are (1) using the lower of cost or market when accounting for inventory and (2) recording impairments for long-life tangible/intangible assets when conditions exist for this.

### 2.3. Hypothesis development

Based on their own definition of conservatism as well as those of Basu (1997) and Feltham and Ohlson (1995), Givoly and Hayn (2000) develop four measures of accounting conservatism, and demonstrate that financial reporting in the U.S. has become more conservative in the last four decades. However, we argue that this inter-temporal change in accounting conservatism documented in Givoly and Hayn (2000) alone does not explain the cross-sectional variation in accounting

[5] As mentioned above, a firm would have negative cash flows from investing and operating activities in the introduction stage as the firm enters the market. However, as the firm reaches the growth and mature stages, the firm would have a positive cash flow from operating activities.

[6] Qiang (2007) examines whether contracting, litigation, regulation, and tax costs affect both *conditional* and *unconditional* conservatism. Similarly, Heltzer (2010) examines whether a specific accounting change, the adoption of SFAS 123(R), affects both conservatism measures.

conservatism. This study extends Givoly and Hayn (2000) by arguing a firm's life cycle stage also affects accounting conservatism.

The life cycle theory of firms suggests that firms should invest more heavily in early life cycle stages than late stages because the marginal return or the market reward to the investment diminishes over life cycle stages. Therefore, to create permanent demand and cost advantages, firms in the introduction stage are likely to invest proportionately more heavily in R & D, human capital, organizational change, and capital expenditures than firms in mature or decline stages. As current U.S. GAAP requires immediate expensing of R & D, human capital, and organizational change expenditures, these conservative accounting rules will affect firms in the introduction stage more severely than firms in the mature or decline stages. This leads to the book value of equity of firms in the introduction stage to be more severely depressed than that of firms in mature or decline stages.

In addition, the life cycle theory suggests that the market reward to an equal amount of investment in R & D, human capital and organizational change, and capital expenditures is higher for introduction stage firms than for mature or decline stage firms. That is, the market value of equity for introduction stage firms likely will be proportionately more elevated than that of mature or decline stage firms. We, therefore, expect that the degree of reporting conservatism be most severe for introduction stage firms and decrease as firms evolve into mature and decline stages. In this sense, these differing levels of investment in life cycle stages are news independent and should be associated with our measures of *unconditional* conservatism. Based on the discussion above, we formally state our hypothesis 1 as follows:

**H1.** A firm's *unconditional* reporting conservatism decreases as the firm evolves into more mature or decline stages from the growth stage.

The asymmetry in reported earnings in reflecting "bad news" versus "good news" as characterized by Basu (1997) captures the *conditional* aspect of conservatism. This aspect is quite different from the other aspects of *unconditional* conservatism captured by our first two measures of conservatism, namely, the level of non-operating accruals and the market-to-book ratio. These two measures capture accountants' tendency to under-record firm's net assets by lower revenue recognition, faster expense recognition, lower asset valuation and higher liability valuation. Ryan (2006, p. 519) states that:

> "The build-up of negative accruals and extent to which the market-to-book ratio exceeds one are perhaps the most natural ways to assess overall conservatism. However, these measures are likely to be primarily driven by *unconditional* conservatism, which preempts *conditional* conservatism, and so they are likely not useful for assessing *conditional* conservatism unless researcher are able to identify specific portions of negative accruals or market-to-book ratios attributable to *conditional* conservatism."

Therefore, we expect our results to hold for our measure of *unconditional* conservatism. However, we are unclear about whether *conditional* conservatism would be correlated with life cycle stages. For this reason, we do not make a formal hypothesis on *conditional* conservatism and life cycle stages.

## 3. Research design

### 3.1. Life cycle descriptor (Dickinson, 2011)

There is very little research on proxies for a firm's life cycle stage. Prior studies have used a combination of sales growth, capital expenditures, dividend payout ratios, and firm age as a proxy for life cycle stage (Anthony & Ramesh, 1992; Black, 1998). However, Dickinson (2011) criticizes this single variable approach for its strong assumption of a uniform distribution of firm-observations across life cycle stage, and she develops a new proxy for life cycle stage based on the cash flow pattern classification. One benefit of such a cash flow pattern approach is that it uses the entire financial information set contained in operating, investing, and financing cash flows, and the resulted life cycle stage classification proxy is more consistent with economic theory of firms' life cycle stage.[7] For the reasons discussed above, we mainly use the life cycle proxy proposed by Dickinson (2011). Since the three types of cash flows can have either positive or negative cash flows, there could be eight possible cash flow patterns. Dickinson (2011) combines these eight possible combinations into five stages as follows:

| Dickinson (2011) | 1 Introduction | 2 Growth | 3 Mature | 4 Shake-out | 5 Shake-out | 6 Shake-out | 7 Decline | 8 Decline |
|---|---|---|---|---|---|---|---|---|
| Anthony and Ramesh (1992) | Growth | Growth/ mature | Mature | Mature/ stagnant | Mature/ stagnant | Mature/ stagnant | Stagnant | Stagnant |
| CFO | − | + | + | − | + | + | − | − |
| CFI | − | − | − | − | + | + | + | + |
| CFF | + | + | − | − | + | − | + | - |

where CFO = cash flows from operating activities (Compustat Annual Data Item (hereafter CDI) *oancf*), CFI = cash flows from investing activities (CDI *ivncf*), CFF = cash flows from financing activities (CDI *fincf*).

As a robustness check, we also use a life cycle proxy based on a non-financial measure: firm age as used in both Anthony and Ramesh (1992) and Black (1998).

### 3.2. Measures of accounting conservatism

Givoly and Hayn (2000) develop four measures of accounting conservatism: (1) the level and rate of accumulation of negative non-operating accruals over time; (2) measures based on Basu's (1997) asymmetric earnings-return association during good and bad news periods; (3) measures based on the *time-series* properties such as skewness and variability of earnings and cash flows; and (4) the market-to-book ratio. Since the purpose of this paper is to examine the relation between the degree of reporting conservatism and life cycle stages of firms in the *cross-section* in any given year, our measures of conservatism must be based on accounting or market data in a year, rather than over a period of time. Givoly and Hayn's (2000) measure (3) above utilizes time-series data, and thus is not appropriate as a measure of reporting conservatism in this study. We, therefore, adopt the level of non-operating accruals and the market-to-book ratio as our *unconditional* measure of reporting conservatism. We use a regression coefficient used in Basu (1997) as our measures of *conditional* reporting conservatism in this paper.

#### 3.2.1. Level of non-operating accruals

Following Givoly and Hayn (2000), we use the level of negative

[7] See section two of Dickinson (2011) for more discussion of drawbacks of other life cycle stage proxies based on a single variable and advantages of her proposed new proxy for a firm's life cycle stage.

non-operating accruals as a measure of reporting conservatism. Non-operating accruals ($NOACCR_{it}$) are defined as follows:

$$NOACCR_{it} = TACCR_{it} - OACCR_{it}$$

where:

$TACCR_{it}$
= Total accruals (before depreciation) defined as net income (CDI *ni*)
+ depreciation (CDI *dp*) − cash flow from operations (CDI *oancf*)

$OACCR_{it}$ = Operating accruals defined as Δaccounts receivable (CDI *rect*)
+ Δinventories (CDI *invt*) + Δprepaid expenses (CDI *xpp*)
− Δaccounts payable (CDI *ap*) − ΔTaxes payable (CDI *txp*)

Givoly and Hayn (2000) calculate non-operating accruals each year for their *constant sample*.[8] They then aggregate non-operating accruals across all firms in each year and accumulate over time. They find that the *cumulative* aggregated non-operating accruals become more and more negative at an increasing rate over the last four decades (p. 303), which they interpret as evidence that accounting reporting has become more conservative over time.

Since we examine the cross-sectional variation in reporting conservatism in a year, we focus on annual non-operating accruals instead of a cumulative measure like in Givoly and Hayn (2000). In addition, our sample changes in its composition each year (i.e., not a constant sample). To control for differences in the scale of operations, we deflate $NOACCR_{it}$ by beginning-of-the-year total assets ($TA_{it-1}$, CDI *at*).[9] Therefore, our first measure of accounting conservatism is annual non-operating accruals scaled by total assets ($NOACCR_{it}/TA_{it-1}$).

### 3.2.2. Market-to-book ratio

Givoly and Hayn (2000) use the market-to-book ratio as another measure of reporting conservatism. The theoretical support for using this ratio as a measure of conservatism can be found in Feltham and Ohlson (1995) where they characterize conservative or "biased" accounting as an expectation that market value of equity exceeds book value of equity in the long run. We calculate the market-to-book ratio ($MTB_{it}$) as follows:

$$MTB_{it} = MVE_{it}/BVE_{it}$$

where $MVE_{it}$ is the market value of equity in year t (CDI *prcc_f* × *csho*) and $BVE_{it}$ is book value of equity (CDI *ceq*).

### 3.2.3. Basu (1997) measure

Basu (1997) characterizes conservatism as an asymmetry in the timeliness of incorporating "bad news" versus "good news" in reported earnings. That is, conservative accounting incorporates "bad news" in reported earnings more promptly than it does "good news." Based on this characterization, Basu (1997) develops several measures of conservatism. These measures of conservatism are used in several studies to examine the existence of and cross-country differences in accounting conservatism (e.g., Ball, Kothari, & Robin, 2000; Bushman & Piotroski, 2006; Holthausen & Watts, 2001; Pope & Walker, 1999). Givoly and Hayn (2000) use the Basu (1997) measures to examine the inter-temporal change in accounting conservatism in the U.S.

Following Basu (1997), we estimate the regression below to examine the extent to which "bad news" is more promptly reflected in earnings than "good news":

**Table 1**
Sample selection process.

| | |
|---|---|
| Firm-year observations from Compustat annual database over fiscal years 1988–2012 | 281,105 |
| *minus*: Utilities (SIC 4900–4999) and financial services firms (SIC 6000–6999) | (82,447) |
| *minus*: Firm-years missing net income (CDI *ni*), total assets (CDI *at*), sales (CDI *sale*), or market value of equity (CDI *prcc_f***csho*) | (49,629) |
| *minus*: Firm-years missing net cash flow from operations (CDI *oancf*) | (4,745) |
| *minus*: Firm-years missing stock return data from CRSP | (37,410) |
| Sample for summary statistics | 106,874 |
| *minus*: Firm-years not meeting additional data restriction for multivariate analysis | (297) |
| Sample for multivariate analysis | 106,577 |
| *minus*: Firm-years missing write-down after tax (CDI *wdp*) and other special item after tax (CDI *spiop*) | (35,624) |
| Sample for additional multivariate analysis | 70,963 |

$$EPS_{i,t}/P_{i,t-1} = \alpha_0 + \alpha_1{}^{*}DRET_{i,t} + \beta_0{}^{*}RET_{i,t} + \beta_1{}^{*}RET_{i,t}{}^{*}DRET_{i,t} + \varepsilon_{i,t} \quad (1)$$

where $EPS_{it}$ is earnings including extraordinary items per share (CDI *epspi*), adjusted for stock splits and dividends, in year *t*;[10] $P_{i,t-1}$ is stock price per share, adjusted for stock splits and dividends, at the end of year $t-1$ (CDI *prcc_f*); $RET_{it}$ is the stock return over 12 months ending three months after the fiscal year-end; and $DRET_{it}$ is a dummy variable that is equal to 1 if $RET_{it}$ is negative (i.e., "bad news"), and 0 otherwise (i.e., "good news"). The coefficient $\beta_1$ measures the incremental response to bad news relative to good news. A positive $\beta_1$ indicates accounting conservatism.[11]

In summary, we use three measures of conservatism to examine whether accounting conservatism is systematically related to life cycle stages in the cross-section:

1. The level of non-operating accruals, scaled by total assets ($NOACCR_{it}/TA_{it-1}$).
2. The market-to-book ratio ($MVE_{it}/BVE_{it}$).
3. The measure of asymmetric responses of earnings to bad news versus good news ($\beta_1$ from Eq. (1))

## 4. Analysis of results

### 4.1. Sample selection and descriptive statistics

We summarize our sample selection process in Table 1. Our sample starts in 1988, when the cash flows from operations measure is first available (CDI *oancf*), and covers up to 2012. Our sample is made up of firm-years observations from the intersection of the COMPUSTAT and CRSP databases with non-missing net income (CDI *ni*), total assets (CDI *at*), sales (CDI *sale*), market value of equity (CDI *prcc_f***csho*), net cash flow from operations (CDI *oancf*), and CRSP stock returns data. We exclude utilities (SIC 4900–4999) and financial service (SIC 6000–6999) firms which yields an initial sample with 106,874 firm-year observations. With the additional data restrictions for multivariate analysis, our sample becomes 106,577 for the main analysis, and 70,963 for the additional analysis. Table 2 provides descriptive statistics for the firm-year observations in each life cycle stage. Both the mean and median of firm size ($MVE_{it}$ and $BVE_{it}$) increase as firms approach the mature stage and then declines as they approach the decline

[8] Most of Givoly and Hayn's (2000) analyses are based on a constant sample of 896 firms. Firms in the constant sample exist for the entire period of 1968 to 1998.

[9] The level of accruals is related to the scale of operations. It is conceivable that large firms have large total accruals or more negative non-operating accruals. Deflating the level of accruals by total assets is common in the accounting literature (e.g., Jones, 1991 and Sloan, 1996).

[10] Using earnings before extraordinary items (*epspx*) yields qualitatively identical results.

[11] Givoly and Hayn (2000) also used as conservatism measures: (1) the relative sensitivity of earnings to bad news compared with their sensitivity to good news, measured by $(\beta_0 + \beta_1)/\beta_0$, and (2) the relative explanatory power of equation (1) in periods of bad news ($DRET_{it} = 1$) and good news ($DRET_{it} = 0$), measured by the ratio of $R^2$ in bad news periods to $R^2$. However, since the use of those two measures as conservatism is less conventional in the literature, we do not adopt them in this study.

**Table 2**
Summary statistics.

| | Introduction (A) | | Growth (B) | | Mature (C) | | Shake-out (D) | | Decline (E) | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median |
| $MVE_{it}$ | 300 | 50 | 2212 | 301 | 3865 | 340 | 1714 | 95 | 252 | 45 | 2314 | 164 |
| $BVE_{it}$ | 99 | 17 | 823 | 132 | 1391 | 161 | 656 | 59 | 106 | 18 | 844 | 78 |
| $CEV_{it}$ | 0.09 | 0.05 | 0.13 | 0.08 | 0.09 | 0.07 | 0.06 | 0.04 | 0.06 | 0.03 | 0.09 | 0.06 |
| $EBXI_{it}$ | − 18.57 | − 3.44 | 79.13 | 7.81 | 200.31 | 13.79 | 61.93 | 0.77 | − 26.71 | − 7.61 | 98.35 | 2.90 |
| $NOACCR_{it}$ | − 0.07 | − 0.03 | − 0.06 | − 0.03 | − 0.03 | − 0.02 | − 0.01 | 0.00 | − 0.02 | − 0.01 | − 0.04 | − 0.02 |
| $R\&D_{it}$ (%) | 0.17 | 0.01 | 0.06 | 0.00 | 0.05 | 0.00 | 0.09 | 0.00 | 0.26 | 0.10 | 0.09 | 0.00 |
| $MTB_{it}$ (%) | 3.64 | 2.12 | 2.80 | 2.02 | 2.50 | 1.80 | 2.19 | 1.46 | 3.00 | 1.67 | 2.78 | 1.86 |
| $LEV_{it}$ (%) | 0.71 | 0.15 | 0.66 | 0.23 | 0.59 | 0.18 | 0.88 | 0.15 | 0.68 | 0.05 | 0.66 | 0.18 |
| $RET_{it}$ (%) | 0.03 | − 0.20 | 0.18 | 0.04 | 0.18 | 0.07 | 0.12 | − 0.03 | 0.01 | − 0.22 | 0.14 | 0.00 |
| $AGE_{it}$ | 8.72 | 6.00 | 12.37 | 9.00 | 16.41 | 13.00 | 13.97 | 10.00 | 9.73 | 7.00 | 13.23 | 9.00 |
| # of obs. | 17,202 | | 30,801 | | 39,919 | | 10,185 | | 8,767 | | 106,874 | |

The table reports summary statistics by a firm's life cycle stages. Firms are annually classified into different life cycle stages based on the cash flow patterns proposed by Dickinson (2011). The reported numbers are after winsorizing the most extreme (1%) of the observations at either end of the distribution of variables in each year. Variables are defined in Appendix A.

stage. The earnings ($EBXI_{it}$) follow a similar pattern. Investment in R & D ($R\&D_{it}$) and capital expenditures ($CEV_{it}$), in general, show a steady decrease after the introduction stage. That is, *introduction stage (mature)* firms invest proportionately more in R & D and capital expenditures than *mature stage (decline)* firms do. This is consistent with our argument based on the life cycle theory of firms that firms spend proportionately more on R & D and capital expenditures in order to grow or to sustain the growth. Although *introduction stage* firms tend to be relatively young, firm age ($AGE_{it}$) in the decline stage tends to be small as well. This is consistent with the findings of Dickinson (2011).

### 4.2. Conservatism over life cycle stages

In this section, we compare measures of conservatism across firm's life cycle stages to examine whether the degree of reporting conservatism decreases over life cycle stages.

#### 4.2.1. Level of non-operating accruals (scaled by total assets)

Table 3, Panel A reports the mean and median of non-operating accruals deflated by beginning-of-the-year total assets in each sample period by a firm's life cycle stage. Columns A, B, C, D and E report the mean and median of non-operating accruals for firms in the introduction, growth, mature, shake-out, and decline stages, respectively for each period.[12] As we compare columns A with C, columns C with E, and columns A with E, we observe that non-operating accruals do vary over life cycle stages in each period. The comparisons for two intermediate stages, growth and shake-out, are omitted to increase the power of tests and for brevity. More importantly, column A–C shows that the differences in means and medians, respectively, between the introduction stage and mature stage are negative in each of the five periods (with the exception of the median for the 1988–1992 period). That is, non-operating accruals in the introduction stage are more negative (i.e., more conservative) than those in the mature stage. In addition, two-tailed t-statistics (Wilcoxon rank sum Z-statistics) suggest that the difference in the means (medians) is significantly negative at the 0.05 level or better in all five sub-periods. Column C–E of Table 3, Panel A suggests that the difference in the means (medians) of non-operating accruals between the mature stage and decline stage is significantly negative only in one (two) out of five sample sub-periods.[13] However, in no sub-periods is the difference in the means (median) significantly positive. Column A–E reports the difference in the means (medians) between the introduction stage and decline stage, which is significantly negative in all five periods at the 0.05 level or better.

Finally, we treat the difference in the means or medians in each year as one observation in a 25-year time-series and calculate the average of the differences in the means (medians) over the 25 sample years. The "Pooled Sample" row of Table 3, Panel A reports our findings. The average of the differences in the means (-0.046) and that of the medians (-0.015) over our 25 sample years between the introduction stage and the mature stage are significantly negative, and so are the averages of the differences in means (C–E = − 0.008; A–E = − 0.054) and the medians(C–E = − 0.007; A–E = − 0.022) between the mature stage and the decline stage and between the introduction stage and the decline stage, except that the mean difference between the mature and decline stage (Column C–E) is not statistically different. Overall, Table 3, Panel A supports the notion that accounting conservatism (measured by non-operating accruals) decreases as firms become more mature and reach the decline stage in their life cycle.

#### 4.2.2. Market-to-book ratio

We present the results for the market-to-book ratio ($MTB_{it}$) across firms' life cycle stages by sub-period in Table 3, Panel B.[14] The mean and median market-to-book ratios in each year for firms in the introduction, growth, mature, shake-out, and decline stages are reported in columns A, B, C, D, and E, respectively. As we expected, both mean and median market-to-book ratios change systematically over life cycle stages in each period. Column A–C reports the difference in mean (median) market-to-book ratios between firms in introduction and mature stages. During our sample period, the mean (median) market-to-book ratio of introduction stage firms is significantly larger (i.e., more conservative accounting) than that of mature firms in three (two) out of five sub-periods at the 0.05 level or better.

The difference in means (medians) between mature stage firms and decline stage firms is *not* consistent with our expectation. Specifically, column C–E suggests that the mean (median) market-to-book ratio of decline firms is significantly larger than its counterpart of decline firms in 2 (0) out of 5 sample sub-periods. However, column A–E indicates that the mean (median) market-to-book ratio of introduction stage firms is larger than that of decline stage firms in 1 (3) out of 5 sample sub-periods.

We summarize our annual results in the "Pooled Sample" row. The average of twenty-five annual differences in mean (median) market-to-book ratio between introduction and mature stages (i.e. column A–C),

[12] We divide the sample period of 25 years into five equal periods.

[13] When we compare the mean and median difference in non-operating accruals each year, in 11 (7) out of 25 years the mean (median) difference is negative.

[14] Unlike Givoly and Hayn (2000) who compute an *aggregate* market-to-book ratio in each year (i.e., aggregated market values of all firms in a year divided by aggregated book values), we calculate the mean market-to-book ratio of all firms in each life cycle stage in each year. Calculating the aggregate market-to-book ratio using Givoly and Hayn's approach would generate a slightly larger ratio than the mean market-to-book ratio. The pattern of the aggregate market-to-book ratios over time, however, is qualitatively identical to the pattern of the mean market-to-book ratio reported.

**Table 3**
Accounting conservatism and firm life cycle.

| Period | Introduction (A) | | Growth (B) | | Mature (C) | | Shake-out (D) | | Decline (E) | | A–C | | C–E | | A–E | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median |
| Panel A: Non-operating accruals as a conservatism measure over life cycle stages based on Dickinson (2011) | | | | | | | | | | | | | | | | |
| 1988–1992 | **−0.045**[a] | **−0.014**[a] | **−0.048** [a] | **−0.022** [a] | **−0.024** [a] | **−0.012** [a] | 0.008 | **0.004** [a] | 0.007 | 0.005 | ***−0.021***[b] | −0.002 | *−0.032*[c] | **−0.017** [a] | ***−0.053***[b] | **−0.019** [a] |
| | (−7.60) | (−7.39) | (−21.69) | (−27.66) | (−16.29) | (−24.88) | (1.81) | (4.79) | (0.52) | (1.59) | (−3.38) | (−0.95) | (−2.21) | (−5.21) | (−3.38) | (−5.06) |
| 1993–1997 | **−0.072** [a] | **−0.021** [a] | **−0.059** [a] | **−0.027** [a] | **−0.026** [a] | **−0.014** [a] | −0.002 | 0.003 | ***−0.019***[b] | −0.004 | **−0.046** [a] | *−0.008*[c] | −0.007 | ***−0.010***[b] | **−0.053** [a] | **−0.018** [a] |
| | (−11.41) | (−6.45) | (−11.8) | (−12.26) | (−29.29) | (−20.95) | (−0.55) | (1.65) | (−4.02) | (−1.22) | (−7.27) | (−2.27) | (−1.46) | (−3.42) | (−6.79) | (−4.05) |
| 1998–2002 | **−0.095** [a] | **−0.039** [a] | **−0.060** [a] | **−0.031** [a] | **−0.028** [a] | **−0.015** [a] | −0.014 | −0.004 | −0.037 | −0.014 | **−0.067** [a] | **−0.024** [a] | 0.009 | −0.001 | ***−0.058***[b] | ***−0.025***[b] |
| | (−9.50) | (−9.31) | (−16.36) | (−17.19) | (−6.61) | (−4.90) | (−1.12) | (−0.74) | (−1.96) | (−1.77) | (−6.14) | (−4.64) | (0.45) | (−0.10) | (−2.73) | (−2.76) |
| 2003–2007 | **−0.080** [a] | **−0.040** [a] | **−0.054** [a] | **−0.035** [a] | **−0.028** [a] | **−0.021** [a] | **−0.017** [a] | **−0.011** [a] | **−0.020** [a] | ***−0.014***[b] | **−0.052** [a] | ***−0.019***[b] | −0.008 | −0.006 | **−0.060** [a] | ***−0.026***[b] |
| | (−8.35) | (−5.71) | (−30.54) | (−38.46) | (−14.42) | (−12.85) | (−6.43) | (−6.66) | (−5.72) | (−3.03) | (−5.32) | (−2.69) | (−1.90) | (−1.32) | (−5.84) | (−3.07) |
| 2008–2012 | **−0.075** [a] | **−0.043** [a] | **−0.053** [a] | **−0.032** [a] | **−0.032** [a] | **−0.020** [a] | ***−0.026*** | **−0.014** [a] | −0.028 | ***−0.021***[b] | **−0.043** [a] | **−0.023** [a] | −0.004 | 0.000 | ***−0.047***[b] | ***−0.023***[b] |
| | (−9.39) | (−9.44) | (−9.14) | (−17.90) | (−8.37) | (−27.02) | (−3.57) | (−6.29) | (−2.09) | (−3.42) | (−4.90) | (−4.95) | (−0.29) | (0.06) | (−3.05) | (−2.98) |
| Pooled sample | **−0.074** [a] | **−0.031** [a] | **−0.055** [a] | **−0.030** [a] | **−0.028** [a] | **−0.016** [a] | ***−0.010*** | ***−0.004*** | **−0.019** [a] | **−0.009** [a] | **−0.046** [a] | **−0.015** [a] | −0.008 | ***−0.007***[b] | **−0.054** [a] | **−0.022** [a] |
| | (−15.58) | (−10.42) | (−29.46) | (−25.77) | (−21.89) | (−16.65) | (−2.71) | (−2.26) | (−3.26) | (−3.31) | (−9.39) | (−4.78) | (−1.38) | (−2.27) | (−7.17) | (−5.30) |
| Panel B: Market − to − book as a conservatism measure over life cycle stages based on Dickinson (2011) | | | | | | | | | | | | | | | | |
| 1988–992 | **3.851** [a] | **1.890** [a] | **2.362** [a] | **1.739** [a a] | **2.030** [a] | **1.514** [a] | **1.841** [a] | **1.098** [a] | **2.972** [a] | **1.323** [a] | **1.821** [a] | 0.376 | *−0.942*[c] | 0.191 | 0.879 | *0.567*[c] |
| | (10.34) | (9.45) | (19.68) | (19.87) | (29.74) | (22.85) | (12.00) | (17.04) | (8.48) | (9.63) | (4.81) | (1.78) | (−2.64) | (1.25) | (1.72) | (2.34) |
| 1993–1997 | **3.872** [a] | **2.437** [a] | **2.943** [a] | **2.193** [a] | **2.619** [a] | **1.973** [a] | **2.183** [a] | **1.637** [a] | **3.450** [a] | **2.086** [a] | **1.253** [a] | **0.464** [a] | ***−0.831***[b] | −0.114 | 0.422 | ***0.351***[b] |
| | (28.05) | (22.82) | (24.28) | (28.40) | (21.11) | (24.36) | (16.85) | (40.82) | (15.14) | (20.01) | (6.75) | (3.46) | (−3.20) | (−0.86) | (1.58) | (2.35) |
| 1998–2002 | **3.361** [a] | **1.855** [a] | **2.902** [a] | **1.877** [a] | **2.470** [a] | **1.601** [a] | **2.015** [a] | **1.240** [a] | **2.998** [a] | **1.624** [a] | 0.892 | 0.254 | −0.528 | −0.023 | 0.364 | 0.231 |
| | (6.72) | (8.38) | (10.61) | (25.67) | (17.42) | (25.60) | (9.51) | (13.48) | (5.99) | (6.16) | (1.72) | (1.10) | (−1.02) | (−0.08) | (0.51) | (0.67) |
| 2003–2007 | **3.897** [a] | **2.599** [a] | **3.057** [a] | **2.365** [a] | **3.021** [a] | **2.243** [a] | **2.795** [a] | **1.928** [a] | **3.121** [a] | **2.038** [a] | **0.875** [a] | ***0.356***[b] | −0.099 | 0.205 | ***0.776***[b] | **0.561** [a] |
| | (32.73) | (22.95) | (56.74) | (86.39) | (40.79) | (34.40) | (14.65) | (22.89) | (13.95) | (21.49) | (6.24) | (2.73) | (−0.42) | (1.78) | (3.06) | (3.80) |
| 2008–2012 | **2.808** [a] | **1.676** [a] | **2.345** [a] | **1.749** [a] | **2.344** [a] | **1.761** [a] | **2.112** [a] | **1.411** [a] | **2.551** [a] | **1.517** [a] | 0.464 | −0.085 | −0.207 | 0.244 | 0.257 | 0.159 |
| | (9.67) | (8.45) | (12.44) | (11.51) | (20.64) | (17.12) | (14.11) | (18.98) | (6.98) | (8.37) | (1.49) | (−0.38) | (−0.54) | (1.17) | (0.55) | (0.59) |
| Pooled sample | **3.558** [a] | **2.091** [a] | **2.722** [a] | **1.985** [a] | **2.497** [a] | **1.818** [a] | **2.189** [a] | **1.463** [a] | **3.018** [a] | **1.718** [a] | **1.061** [a] | ***0.273***[b] | **−0.522** [a] | 0.101 | ***0.540***[b] | **0.374** [a] |
| | (22.79) | (20.44) | (29.32) | (31.16) | (31.25) | (29.18) | (22.86) | (21.82) | (19.57) | (18.74) | (6.05) | (2.28) | (−3.00) | (0.91) | (2.46) | (2.72) |

The table reports the mean and median conservatism measured by non-operating accruals (Panel A) and market-to-book ratios (Panel B) by a firm's life cycle stages. Firms are annually classified into five different life cycle stages based on the cash flow patterns proposed by Dickinson (2011): growth, growth, mature, shake-out, and decline stages. The mean and median numbers in the pooled sample row represent the mean and the median of 25 annual conservatism measures. All variables are as previously defined and can be found in Appendix A. T-statistics (z-statistics) are reported in parentheses for the means and differences in means (medians and differences in medians). Means and medians in Columns A, B, C, D and E, and differences in means and medians in Columns A–C, C–E, and A–E that are italicized (c superscript), bolded and italicized (b superscript), and bolded (a superscript) are significantly different from zero at least at the 10%, 5%, and 1% levels, respectively.

**Table 4**
Conditional conservatism measure by Basu (1997) and firm life cycle.

| Period | Introduction (A) | | Growth (B) | | Mature (C) | | Shake-out (D) | | Decline (E) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median |
| 1988–1992 | **0.362**[a] | **0.353** [a] | ***0.475***[b] | **0.513** [a] | ***0.612***[b] | **0.659** [a] | ***0.713***[b] | **0.753** [a] | **0.582** [a] | **0.591** [a] |
| | (15.07) | (32.35) | (4.34) | (10.82) | (4.47) | (7.53) | (3.10) | (5.09) | (4.79) | (17.37) |
| 1993–1997 | **0.339** [a] | **0.339** [a] | **0.252** [a] | **0.264** [a] | **0.329** [a] | **0.343** [a] | **0.434** [a] | **0.447** [a] | **0.248** [a] | **0.240** [a] |
| | (19.46) | (27.69) | (9.62) | (9.89) | (6.37) | (17.40) | (8.45) | (16.12) | (10.10) | (14.58) |
| 1998–2002 | ***0.249***[b] | **0.340** [a] | **0.271** [a] | **0.305** [a] | **0.344** [a] | **0.356** [a] | ***0.512***[b] | **0.526** [a] | 0.267 | **0.407** [a] |
| | (3.21) | (7.88) | (6.75) | (10.41) | (5.91) | (5.69) | (4.45) | (7.19) | (1.65) | (5.01) |
| 2003–2007 | **0.343** [a] | **0.363** [a] | **0.213** [a] | ***0.371***[b] | **0.232** [a] | **0.311** [a] | **0.374** [a] | **0.407** [a] | **0.304** [a] | ***0.527***[b] |
| | (6.46) | (19.53) | (5.00) | (2.71) | (8.57) | (4.72) | (11.66) | (12.54) | (16.34) | (2.18) |
| 2008–2012 | ***0.364***[b] | **0.785** [a] | **0.304** [a] | **0.328** [a] | **0.346** [a] | **0.464** [a] | **0.543** [a] | **0.693** [a] | **0.562** [a] | **0.559** [a] |
| | (3.95) | (12.38) | (13.34) | (4.95) | (10.67) | (11.55) | (8.78) | (8.73) | (4.72) | (8.19) |
| **1988–2012** | **0.324** [a] | **0.436** [a] | **0.279** [a] | **0.356** [a] | **0.375** [a] | **0.427** [a] | **0.551** [a] | **0.565** [a] | **0.390** [a] | **0.465** [a] |
| | (6.46) | (7.12) | (10.18) | (7.45) | (8.21) | (8.16) | (8.84) | (9.31) | (4.78) | (6.82) |
| ***Controlled fixed effect*** | Firm & year | Year | Firm & year | Year | Firm & year | Year | Firm & year | Year | Firm & year | Year |
| ***# of Obs.*** | 16,977 | | 30,214 | | 39,014 | | 9,987 | | 8,678 | |
| ***Adj R-Sqr*** | 0.030 | | 0.063 | | 0.065 | | 0.070 | | 0.026 | |

The table reports the coefficient $\beta_1$, a proxy for conditional accounting conservatism, based on the Basu (1997) equation:

$$\frac{EPS_{i,t}}{P_{i,t-1}} = \alpha_0 + \alpha_1{}^{*}DRET_{i,t} + \beta_0{}^{*}RET_{i,t} + \beta_1{}^{*}RET_{i,t}{}^{*}DRET_{i,t} + \varepsilon_{i,t}$$

The coefficient $\beta_1$ measures incremental response to bad news relative to good news. A positive $\beta_1$ indicates accounting conservatism. Reported coefficients are the averages of five-year annual regression coefficients for each sub-period. Firms are annually classified into five different life cycle stages based on the cash flow patterns proposed by Dickinson (2011): growth, growth, mature, shake-out, and decline stages. All other variables are as previously defined and can be found in Appendix A. T-statistics (z-statistics) are reported in parentheses for the means (medians). Means and medians in Columns A, B, C, D and E that are italicized (c superscript), bolded and italicized (b superscript), and bolded (a superscript) are significantly different from zero at least at the 10%, 5%, and 1% levels, respectively.

and between introduction and decline stages (i.e. column A–E) are, respectively, 1.061 (0.273), and 0.540 (0.374). These differences are statistically significant at the 0.05 or better level.

Overall, Table 3, Panel B shows that the accounting conservatism measured by the market-to-book ratio decreases monotonically from the introduction stage to the shake-out stage. However, the market-to-book ratio actually increases in the decline stage, which is not consistent with our hypothesis. The increase in the market-to-book ratio during the decline stage may be due to more asset write-downs during this period, which depresses the book value of equity more than the market value, and in turn increases the market-to-book ratio. To address this issue, we examine the association between a firm's life cycle stages and conservatism in multivariate regressions after controlling for the firm's asset write-downs (see Additional Tests—Section 5).

To summarize, our findings in Table 3 generally support our hypothesis that accounting conservatism decreases over firm's life cycle stages even though our results are sensitive to our choice of conservatism proxies.

#### 4.2.3. Conditional conservatism measure - Basu (1997)

We first estimate Eq. (1) in each year during our sample period (1988 to 2012) by a firm's life cycle stage, and examine whether the measure proposed by Basu (1997) changes systematically across life cycle stages. We report $\beta_1$ in Table 4. Basu's (1997) measure of conservatism, $\beta_1$, exhibits a mixed pattern during our sample periods. For example, $\beta_1$ increases monotonically from 0.362 in the introduction stage to 0.713 in the shake-out stage for the 1988–1992 sub-period. This finding is opposite to our expectation. On the other hand, $\beta_1$ decreases from the introduction to mature stages, but increases over the last two life cycle stages for the 2008–2012 sub-period. Overall, evidence in Table 4 suggests that the Basu (1997) measure of conservatism is not systematically related to life cycle stages, and thus fails to support our hypothesis.

As noted previously, conservatism is a multi-dimensional concept. Our first two sets of measures of conservatism capture accountants' tendency to under-record net assets whereas our third set of measures, the Basu (1997) measures, captures the asymmetry in earnings that reflect "bad news" more promptly than "good news". Our prediction that reporting conservatism decreases over life cycle stages of firms is more closely related to the under-recording of net assets aspect of conservatism than the asymmetry in earnings aspect of conservatism. Thus, our finding that the Basu (1997) measures of conservatism are not systematically related to life cycle stages is not totally surprising.

To summarize, evidence in Tables 3 and 4 suggests that reporting conservatism in the sense of under-recording of net assets (*unconditional* conservatism) decreases over life cycle stages as we hypothesized. However, reporting conservatism in the sense of an asymmetric incorporation of "bad news" versus "good news" in reported earnings (*conditional* conservatism) is not systematically related to life cycle stages of firms.

#### 4.2.4. Multivariate analysis

Results reported in Table 3 are based on univariate tests. In this section, we test our hypothesis in a multivariate setting to control for potential factors that are known to affect a firm's level of accounting conservatism. We estimate the following two OLS regressions independently to test how the conservatism changes over a firm's life cycle stages.

$$MTB_{i,t} = \alpha_0 + \alpha_1{}^{*}FLC_{i,t} + \alpha_2{}^{*}NOACCR_{i,t} + \alpha_3{}^{*}MktCap_{i,t} + \alpha_4{}^{*}LEV_{i,t} + \alpha_5{}^{*}RET_{i,t} \quad (2a)$$

$$NOACCR_{i,t} = \alpha_0 + \alpha_1{}^{*}FLC_{i,t} + \alpha_2{}^{*}MTB_{i,t} + \alpha_3{}^{*}MktCap_{i,t} + \alpha_4{}^{*}LEV_{i,t} + \alpha_5{}^{*}RET_{i,t} \quad (2b)$$

$$Basu\ Coeff_{i,t} = \alpha_0 + \alpha_1{}^{*}FLC_{i,t} + \alpha_2{}^{*}NOACCR_{i,t} + \alpha_3{}^{*}MTB_{i,t} + \alpha_4{}^{*}MktCap_{i,t} + \alpha_5{}^{*}LEV_{i,t} + \alpha_6{}^{*}RET_{i,t} \quad (2c)$$

where $FLC_{i,t}$ is a firm's life cycle measure and is assigned a value of 0, 0.25, 0.5, 0.75 or 1 for introduction, growth, mature, shake-out, and decline stages, respectively for firm *i* at time *t* following Dickinson (2011). $MTB_{i,t}$

**Table 5**
Regression analysis of conservatism on firm life cycle.

| Variables | Dependent variable | | | | | |
|---|---|---|---|---|---|---|
| | MTB | | NOACCR | | BasuCoeff | |
| Intercept | 2.046*** | 2.307*** | 0.089*** | 0.094*** | 0.061 | 0.065 |
| | (10.58) | (12.31) | (15.00) | (15.68) | (1.47) | (1.66) |
| FLC | − 0.192*** | − 0.238*** | − 0.016*** | − 0.017*** | 0.004 | 0.003 |
| | (− 7.64) | (− 9.49) | (− 11.46) | (− 11.70) | (0.40) | (0.31) |
| NOACCR | − 2.651*** | | | | − 0.071 | |
| | (− 8.99) | | | | (− 0.84) | |
| MTB | | | 0.002*** | | | 0.001 |
| | | | (7.87) | | | (0.61) |
| MktCap | 0.234*** | 0.227*** | − 0.002*** | − 0.002** | − 0.005 | − 0.005 |
| | (7.24) | (7.24) | (− 3.87) | (− 3.18) | (− 1.01) | (− 1.09) |
| LEV | − 0.275*** | − 0.271*** | 0.002* | 0.001 | 0.021*** | 0.021*** |
| | (− 5.49) | (− 5.33) | (2.32) | (1.42) | (3.55) | (3.60) |
| Ret | 0.808*** | 0.795*** | − 0.005 | − 0.004 | 0.021 | 0.021 |
| | (4.85) | (4.76) | (− 1.83) | (− 1.23) | (1.68) | (1.61) |
| Firm and year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| R-Sqr | 0.065 | 0.058 | 0.028 | 0.022 | 0.001 | 0.001 |
| # of Obs | 104,770 | 106,577 | 104,770 | 104,804 | 73,294 | 74,603 |

The table reports the results of the regression of accounting conservatism on a firm's life cycle stages. FLC is a proxy for a firm's life cycle stage and is defined in Appendix A. All other variables are as previously defined and can also be found in Appendix A. *, **, *** represents significance at the 0.05, 0.01 and 0,001 levels, respectively.

and $NOACCR_{i,t}$ are two conservatism measures defined previously. However, we use the negative value of $NOACCR_{i,t}$ (i.e. $-1 * NOACCR_{i,t}$) as the dependent variable for (2b) so that the interpretation of coefficients in (2b) will be consistent with that in (2a), that is, a negative coefficient on FLC will mean more conservatism in earlier stages of a firm's life cycle. $BasuCoeff_{i,t}$ represents the firm specific $\beta_1$ at time $t$ in Basu's (1997) equation
$(EPS_{i,t}/P_{i,t-1} = \alpha_0 + \alpha_1{}^{*}DRET_{i,t} + \beta_0{}^{*}RET_{i,t} + \beta_1{}^{*}RET_{i,t}{}^{*}DRET_{i,t} + \varepsilon_{i,t})$ using a 5 year rolling window. All other variables are as previously defined. To control for possible correlation between unconditional conservatism measures, each regression equation includes one conservatism measure as a control variable while another conservatism measure is the dependent variable. We include two other control variables ($MktCap_{i,t}$ and $Lev_{i,t}$) that are known to affect a firm's accounting conservatism (Khan & Watts, 2009) plus the return variable. $MktCap_{i,t}$ is the natural log of market value of equity ($MVE_{it}$). $Lev_{i,t}$ is leverage defined as borrower's book value of total debt (CDI *dltt* + CDI *dlc*) divided by market value of equity (MktCap) for firm $i$ at time $t$. $RET_{i,t}$ is the stock return over 12 months ending three months after the fiscal year-end.

Table 5 reports the regression results of Eqs. (2a), (2b) and (2c). In the first and second columns, we report the regression of MTB on FLC. The first (second) column coefficient for FLC is − 0.192 (− 0.238) with a t-statistic of − 7.64 (− 9.49) indicating that MTB, our first proxy for *unconditional* conservatism, is negatively associated with life cycle stage. The result is consistent with our hypothesis that a firm's accounting conservatism decreases as a firm life cycle changes from the introduction to decline stages. All control variables are highly associated with MTB as expected. In the third (fourth) column, our second proxy for *unconditional* conservatism, NOACCR, is also highly associated with our proxy for life cycle stage with a negative coefficient of − 0.016 (− 0.017) and a t-statistic of − 11.46 (− 11.70). This is also consistent with our hypothesis. However, *BasuCoeff,* our proxy for conditional conservatism, and life cycle proxy do not seem to be associated (t-statistics = 0.40 or − 0.31) at the 10% significance level. In addition, the adjusted R-squares for the regressions with *BasuCoeff* are 0.1%, which indicates that the firm life cycle can explain very little of the variation in conditional conservatism.

Overall, the multivariate analysis reported in Table 5 complement our findings in Tables 3 and 4, and support the hypothesis that *unconditional* reporting conservatism decreases over life cycle stages. We do not find evidence to support that *conditional* reporting conservatism is related to life cycle stages.

## 5. Additional tests

### 5.1. Asset write-down

Lawrence, Sloan, and Sun (2013) argue that the accounting conservatism can arise due to an unbiased application of current GAAP, not because of manager's discretion. They provide evidence that asset write-downs (an example of the GAAP compliance) is negatively associated with the Book-to-Market ratio, which is one of our conservatism measures. Therefore, if our life-cycle measure is positively correlated with the asset write-downs, we suffer from an omitted correlated variable issue. To rule out this possibility, in untabulated results, we test and find that asset write-down amounts are not correlated with our life-cycle measures. The spearman rank correlation between our life cycle measure and the asset write-down amount is not statistically significant. In Table 6, we also include measures of asset write-downs after tax (WD) and other special items after tax (SPI) and results are consistent with those found in Table 5.

### 5.2. Alternative measures of a firm's life cycle

We have used a measure developed by Dickinson (2011) as a proxy for firm's life cycle stage to test our hypothesis. In this section, we follow Anthony and Ramesh (1992) and Black (1998) and use firm age as an alternative proxy for life cycle stage, and redo our analyses.[15] We rank firms annually into quintiles on $AGE_{i,t,}$ and classify firms into the five life cycle stages. The smallest quintile firms are in the introduction stage, the largest quintile firms are in the mature stage, and other quintiles are in the three remaining life cycle stages. $AGE_{i,t,}$ is defined as

[15] Anthony and Ramesh (1992) and Black (1998) use firm age as well as sales growth, dividend payout ratio, and capital expenditures as a life cycle proxy. As we discuss in section 3.1, the single variable approach these studies adopt is based on a strong assumption, which can be problematic. When we classify firms into different life cycle stages based on sales growth and dividend payout ratios, we do not find any evidence of an association between reporting conservatism and life cycle stages (not reported). Unlike other variables used in prior studies, we believe firm age is unique in a sense that it is not based on a firm's financial information, which is the main reason we choose firm age as an alternative proxy for a firm's life cycle stage to conduct our robustness test.

**Table 6**
Regression analysis of conservatism on firm life cycle with additional controls.

| Variables | Dependent variable | | | | | |
|---|---|---|---|---|---|---|
| | MTB | | NOACCR | | BasuCoeff | |
| Intercept | 1.518*** | 1.813*** | 0.103*** | − 0.107*** | 0.034 | 0.036 |
| | (7.67) | (8.68) | (17.88) | (17.43) | (0.82) | (0.92) |
| FLC | − 0.165*** | − 0.213*** | − 0.017*** | − 0.018*** | 0.017 | 0.016 |
| | (− 5.19) | (− 6.27) | (− 9.64) | (− 9.69) | (1.88) | (1.89) |
| NOACCR | − 2.752*** | | | | − 0.050 | |
| | (− 8.55) | | | | (− 0.58) | |
| MTB | | | 0.002*** | | | 0.001 |
| | | | (7.32) | | | (0.71) |
| MktCap | 0.307*** | 0.299*** | − 0.004*** | − 0.003*** | − 0.006 | − 0.006 |
| | (9.51) | (9.09) | (− 6.89) | (− 5.57) | (− 1.37) | (− 1.44) |
| LEV | − 0.262*** | − 0.259*** | 0.002* | − .001 | 0.020** | 0.020** |
| | (− 3.95) | (− 3.85) | (2.19) | (1.30) | (2.83) | (2.90) |
| Ret | 0.745*** | 0.736*** | − 0.005 | − 0.003 | 0.028* | 0.027 |
| | (3.71) | (3.64) | (− 1.68) | (− 1.10) | (2.01) | (1.90) |
| WD | 3.550*** | 1.276 | − 0.829*** | − 0.826*** | 0.800 | 0.753 |
| | (4.99) | (1.78) | (− 11.01) | (− 10.94) | (1.78) | (1.60) |
| SPI | − 0.348*** | − 0.500*** | − 0.054** | − 0.055** | − 0.423 | − 0.452 |
| | (− 4.56) | (− 6.01) | (− 3.06) | (− 3.10) | (− 0.68) | (− 0.74) |
| Firm and year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| R-Sqr | 0.071 | 0.065 | 0.056 | 0.049 | 0.001 | 0.001 |
| # of Obs | 70,953 | 70,953 | 70,953 | 70,963 | 50,903 | 50,911 |

The table reports the results of the regression of accounting conservatism on a firm's life cycle stages with additional control variables. Dependent variables are the unconditional conservatism measures, proxied by market-to-book ratios (MTB) and non-operating accruals (NOACR), and the Basu (1997) conditional accounting conservatism measure (BasuCoeff). All other variables are as previously defined and can be found in Appendix A. *, **, *** represents significance at the 0.05, 0.01 and 0.001 levels, respectively.

$YR_{i,t,} - BYR_{i,}$ where $YR_{i,t,}$ is year *t*, and $BYR_{i,}$ is the first year in which firm's stock is traded as reported in CRSP.[16]

In Table 7, we report results based on the univariate analysis similar to those in Table 3. When non-operating accruals are used as a proxy for reporting conservatism (Panel A), accounting conservatism decreases over firms' life cycle stages. For example, firms in introduction stages have more negative accruals (or more conservative) than those in mature stages (Column A–C), and firms in mature stages have more negative accruals than those in decline stages (Column C–E). In panel B, we report a firm's market-to-book ratio, our second proxy for a firm's reporting conservatism over life cycle stages. The results are slightly weaker with market-to-book ratios, consistent with evidence in Table 3. In Panel C, we report results using the conditional accounting conservatism measure proposed by Basu (1997). Unlike unconditional conservatism measures reported in Panels A and B, there are no sample periods where we observe different levels of conditional conservatism over the life cycle stages.[17] Overall, the unconditional reporting conservatism decreases over the life cycle stages. We also report similar results from the multivariate analysis in Table 8. For example, in Table 8 the significant negative coefficient of FLC (− 0.309, t-statistic = − 10.85) in the first Column and the significant negative coefficient of FLC (− 0.010, t-statistic = − 11.42) in the third Column support our hypothesis that the reporting conservatism decreases over the life cycle stages. However, when the conditional conservatism measure (i.e. *BasuCoeff*) is used, our hypothesis is not supported (consistent with Table 7, Panel C).

Overall, when we classify firms into different life cycle stages using a simple measure of life cycle stage—firm age, we obtain similar results to our main findings based on measures developed by Dickinson (2011).

## 6. Conclusion

We examine the relation between life cycle stages of firms and the degree of *unconditional* reporting conservatism of these firms in the cross-section. Our inquiry is motivated by Givoly and Hayn (2000) and the life cycle theory of firms. Givoly and Hayn (2000) document that financial reporting in the U.S. has become more conservative in the last four decades. Their evidence, however, cannot explain the cross-sectional variation in the degree of reporting conservatism in a given year. The life cycle theory of firms predicts that firms in the introduction stage would invest more heavily in R & D, human capital, organizational change, and capital expenditures to create permanent demand and cost advantages as compared to firms in the mature or decline stage. The immediate expensing of investment in R & D and other intangibles as required by current GAAP, thus, depresses book value of equity of introduction stage firms more severely than that of mature or decline stage firms. On the other hand, the market reward to an equal amount of investment in R & D and capital expenditures is larger for firms in the introduction stage than firms in the mature or decline stage. We, therefore, hypothesize that *unconditional* reporting conservatism decreases over life cycle stages in the cross-section.

We adopt three sets of measures of conservatism from Givoly and Hayn (2000). The first two sets of measures are the level of non-operating accruals scaled by total assets and the market-to-book ratio. These two measures capture accountants' tendency to under-record net assets and reflect *unconditional* conservatism. The third measure is based on Basu (1997), which captures an asymmetry in reported earnings that reflect "bad news" more promptly than "good news" and reflects *conditional* conservatism. We classify firms into life cycle stages annually using procedures developed by Dickinson (2011).

When we compare the degree of reporting conservatism between firms in different life cycle stages in the cross-section, we find that *unconditional* reporting conservatism (under-recording of net assets captured by our first two sets of measures) decreases over life cycle stages as we expected. However, *conditional* reporting conservatism (asymmetric incorporation of "bad" versus "good" news in reported

[16] Ideally, we should use firm's year of incorporation as the base year to calculate the firm's age. However, firm's year of incorporation is not readily available in a machine-readable format. We use the first year in which a firm's stock is traded, as reported by CRSP, as a proxy for its year of incorporation.

[17] The coefficient from the Basu (1997) regression, a proxy for conditional conservatism, requires one negative return during the 5-year rolling window period at the firm level. However, for many firms in our sample (about 37% of firm-year observations), there are no years with negative returns. For those firms, the estimated coefficient will be zero. That is why many of the Basu coefficients are zero in Panel C, and t-statistics are not available (reported as N/A).

**Table 7**
Accounting conservatism and firm life cycle based on firm ages.

| Period | Introduction (A) | | Growth (B) | | Mature (C) | | Shake-out (D) | | Decline (E) | | A–C | | C–E | | A–E | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median |
| Panel A: Non-operating accruals as a conservatism measure | | | | | | | | | | | | | | | | |
| 1988–1992 | **−0.043** [a] | **−0.018** [a] | **−0.031** [a] | **−0.015** [a] | **−0.030** [a] | **−0.013** [a] | **−0.017** [a] | **−0.009** [a] | **−0.016** [a] | **−0.009** [a] | *−0.013*[c] | **−0.005** [a] | ***−0.014***[b] | ***−0.004***[b] | **−0.027** [a] | **−0.009** [a] |
| | (−11.08) | (−28.52) | (−10.15) | (−21.45) | (−11.23) | (−29.09) | (−23.71) | (−13.29) | (−5.06) | (−8.93) | (−2.75) | (−6.23) | (−3.29) | (−3.73) | (−5.30) | (−7.52) |
| 1993–1997 | **−0.067** [a] | **−0.027** [a] | **−0.056** [a] | **−0.022** [a] | **−0.042** [a] | **−0.017** [a] | **−0.032** [a] | **−0.014** [a] | **−0.014** [a] | **−0.009** [a] | ***−0.025***[b] | ***−0.010***[b] | **−0.028** [a] | **−0.008** [a] | **−0.053** [a] | **−0.018** [a] |
| | (−13.44) | (−11.65) | (−21.97) | (−12.33) | (−9.36) | (−9.48) | (−6.99) | (−13.41) | (−56.14) | (−14.89) | (−3.78) | (−3.36) | (−6.19) | (−4.16) | (−10.60) | (−7.43) |
| 1998–2002 | **−0.084** [a] | **−0.037** [a] | **−0.057** [a] | **−0.024** [a] | **−0.047** [a] | **−0.024** [a] | **−0.036** [a] | **−0.019** [a] | **−0.018** [a] | ***−0.010***[b] | ***−0.037***[b] | ***−0.013***[b] | ***−0.029***[b] | **−0.014** [a] | **−0.066** [a] | **−0.027** [a] |
| | (−8.60) | (−9.47) | (−11.42) | (−8.74) | (−8.25) | (−9.28) | (−8.13) | (−8.57) | (−4.86) | (−3.44) | (−3.29) | (−2.73) | (−4.28) | (−3.49) | (−6.33) | (−5.42) |
| 2003–2007 | **−0.060** [a] | **−0.032** [a] | **−0.046** [a] | **−0.030** [a] | **−0.039** [a] | **−0.028** [a] | **−0.036** [a] | **−0.024** [a] | **−0.018** [a] | **−0.015** [a] | ***−0.021***[b] | −0.005 | **−0.020** [a] | **−0.012** [a] | **−0.042** [a] | **−0.017** [a] |
| | (−11.09) | (−10.79) | (−14.47) | (−15.69) | (−16.20) | (−15.96) | (−11.92) | (−13.81) | (−6.11) | (−7.79) | (−3.61) | (−1.33) | (−5.32) | (−4.75) | (−6.75) | (−4.76) |
| 2008–2012 | **−0.060** [a] | **−0.037** [a] | **−0.048** [a] | **−0.029** [a] | **−0.039** [a] | **−0.025** [a] | **−0.032** [a] | **−0.021** [a] | **−0.020** [a] | **−0.014** [a] | *−0.022*[c] | ***−0.012***[b] | ***−0.019***[b] | **−0.011** [a] | **−0.040** [a] | **−0.023** [a] |
| | (−10.05) | (−13.36) | (−5.98) | (−9.78) | (−6.04) | (−10.73) | (−6.62) | (−14.32) | (−9.20) | (−16.99) | (−2.44) | (−3.33) | (−2.77) | (−4.55) | (−6.31) | (−8.05) |
| Pooled sample | **−0.063** [a] | **−0.030** [a] | **−0.048** [a] | **−0.024** [a] | **−0.039** [a] | **−0.021** [a] | **−0.031** [a] | **−0.017** [a] | **−0.017** [a] | **−0.012** [a] | **−0.024** [a] | **−0.009** [a] | **−0.022** [a] | **−0.010** [a] | **−0.046** [a] | **−0.019** [a] |
| | (−16.81) | (−16.48) | (−17.45) | (−17.46) | (−17.90) | (−15.84) | (−14.44) | (−14.63) | (−14.50) | (−13.21) | (−5.46) | (−3.87) | (−8.78) | (−6.16) | (−11.60) | (−9.22) |
| Panel B: Market-to-book as a conservatism measure | | | | | | | | | | | | | | | | |
| 1988–1992 | **3.291**[a] | **2.004** [a] | **2.717** [a] | **1.564** [a] | **2.504** [a] | **1.440** [a] | **1.890** [a] | **1.412** [a] | **1.771** [a] | **1.463** [a] | ***0.787***[b] | ***0.564***[b] | ***0.732***[b] | −0.023 | **1.519** [a] | ***0.541***[b] |
| | (17.29) | (14.44) | (12.56) | (16.45) | (14.55) | (16.12) | (21.07) | (21.30) | (20.31) | (18.91) | (3.07) | (3.42) | (3.80) | (−0.20) | (7.26) | (3.40) |
| 1993–1997 | **3.528** [a] | **2.495** [a] | **3.285** [a] | **2.179** [a] | **3.011** [a] | **2.010** [a] | **2.533** [a] | **1.852** [a] | **2.457** [a] | **1.979** [a] | *0.516*[c] | **0.485** [a] | ***0.554***[b] | 0.031 | **1.071** [a] | **0.517** [a] |
| | (21.00) | (26.05) | (29.78) | (41.56) | (27.46) | (27.04) | (23.72) | (32.44) | (19.52) | (20.85) | (2.57) | (4.00) | (3.32) | (0.26) | (5.10) | (3.83) |
| 1998–2002 | **3.183** [a] | **1.769** [a] | **2.761** [a] | **1.640** [a] | **2.569** [a] | **1.628** [a] | **2.537** [a] | **1.590** [a] | **2.545** [a] | **1.652** [a] | 0.614 | 0.141 | 0.023 | −0.024 | 0.638 | 0.117 |
| | (7.16) | (10.45) | (10.25) | (15.55) | (9.30) | (16.99) | (15.09) | (35.39) | (18.23) | (39.30) | (1.17) | (0.72) | (0.08) | (−0.23) | (1.37) | (0.67) |
| 2003–2007 | **3.677** [a] | **2.559** [a] | **3.160** [a] | **2.250** [a] | **2.932** [a] | **2.197** [a] | **3.050** [a] | **2.220** [a] | **2.723** [a] | **2.103** [a] | **0.745** [a] | ***0.361***[b] | 0.209 | 0.095 | **0.954** [a] | **0.456** [a] |
| | (47.92) | (29.20) | (83.14) | (57.61) | (26.82) | (67.63) | (38.04) | (38.57) | (55.38) | (45.64) | (5.58) | (3.87) | (1.74) | (1.68) | (10.47) | (4.61) |
| 2008–2012 | **2.584** [a] | **1.670** [a] | **2.559** [a] | **1.777** [a] | **2.281** [a] | **1.706** [a] | **2.166** [a] | **1.642** [a] | **2.275** [a] | **1.705** [a] | 0.303 | −0.036 | 0.006 | 0.001 | 0.309 | −0.035 |
| | (11.35) | (10.47) | (11.66) | (10.70) | (13.56) | (13.37) | (12.75) | (13.53) | (18.22) | (19.32) | (1.07) | (−0.18) | (0.03) | (0.01) | (1.19) | (−0.19) |
| Pooled Sample | **3.252** [a] | **2.099** [a] | **2.896** [a] | **1.882** [a] | **2.659** [a] | **1.796** [a] | **2.435** [a] | **1.743** [a] | **2.354** [a] | **1.780** [a] | **0.593** [a] | ***0.303***[b] | ***0.305***[b] | 0.016 | **0.898** [a] | **0.319** [a] |
| | (25.26) | (22.65) | (30.13) | (26.56) | (29.04) | (27.02) | (25.43) | (27.21) | (29.33) | (31.94) | (3.75) | (2.66) | (2.50) | (0.18) | (5.92) | (2.95) |
| Panel C: Basu coefficient as a conservatism measure | | | | | | | | | | | | | | | | |
| 1988–1992 | −0.176 | 0.000 | 0.085 | 0.000 | 0.113 | 0.000 | 0.067 | 0.000 | ***0.092***[b] | 0.000 | −0.290 | 0.000 | 0.021 | 0.000 | −0.268 | 0.000 |
| | (−0.51) | N/A | (1.32) | N/A | (1.59) | N/A | (0.98) | N/A | (3.45) | N/A | (−0.82) | N/A | (0.28) | N/A | (−0.77) | N/A |
| 1993–1997 | −0.090 | 0.000 | 1.811 | 0.000 | 0.082 | 0.000 | 0.043 | 0.000 | −0.005 | 0.000 | −0.172 | 0.000 | 0.087 | 0.000 | −0.085 | 0.000 |
| | (−0.28) | N/A | (1.09) | N/A | (1.5) | N/A | (1.32) | N/A | (−0.13) | N/A | (−0.53) | N/A | (1.33) | N/A | (−0.26) | N/A |
| 1998–2002 | −0.107 | 0.000 | 0.087 | 0.000 | 0.026 | 0.000 | ***0.031***[b] | 0.000 | 0.032 | 0.000 | −0.133 | 0.000 | −0.006 | 0.000 | −0.139 | 0.000 |
| | (−0.92) | N/A | (0.74) | N/A | (0.73) | N/A | (2.54) | N/A | (1.53) | N/A | (−1.1) | N/A | (−0.14) | N/A | (−1.18) | N/A |
| 2003–2007 | 0.682 | 0.000 | 0.026 | 0.000 | 0.073 | 0.000 | **0.109** [a] | 0.000 | 0.028 | 0.000 | 0.609 | 0.000 | 0.045 | 0.000 | 0.654 | 0.000 |
| | (1.02) | N/A | (0.26) | N/A | (1.67) | N/A | (5.16) | N/A | (1.17) | N/A | (0.91) | N/A | (0.9) | N/A | (0.98) | N/A |
| 2008–2012 | −0.425 | 0.000 | *0.147*[c] | 0.000 | ***0.140***[b] | 0.000 | **0.203** [a] | 0.000 | ***0.116***[b] | 0.000 | −0.565 | 0.000 | 0.024 | 0.000 | −0.541 | 0.000 |
| | (−0.87) | N/A | (2.74) | N/A | (3.72) | N/A | (11.93) | N/A | (3.61) | N/A | (−1.15) | N/A | (0.48) | N/A | (−1.1) | N/A |
| Pooled sample | −0.023 | 0.000 | 0.431 | 0.000 | **0.087** [a] | 0.000 | **0.091**[a] | 0.000 | **0.053** [a] | 0.000 | −0.110 | 0.000 | 0.034 | 0.000 | −0.076 | 0.000 |
| | (−0.12) | N/A | (1.29) | N/A | (3.94) | N/A | (4.64) | N/A | (3.59) | N/A | (−0.57) | N/A | (1.29) | N/A | (−0.4) | N/A |

The table reports mean and median unconditional conservatism, as measured by non-operating accruals (Panel A) and market-to-book ratios (Panel B), and conditional accounting conservatism, using the measure proposed by Basu (1997) (Panel C), by a firm's life cycle stages based on the firm age. Firms are annually classified into five different life cycle stages based on a firm age: growth, growth, mature, shake-out, and decline stages. The mean and median numbers in the pooled sample row represent the mean and the median of 25 annual conservatism measures. Variables are as previously defined and can be found in Appendix A. T-statistics (z-statistics) are reported in parentheses for the means and differences in means (medians and differences in medians). Means and medians in Columns A, B, C, D and E, and differences in means and medians in Columns A–C, C–E, and A–E that are italicized (c superscript), bolded and italicized (b superscript), and bolded (a superscript) are significantly different from zero at least at the 10%, 5%, and 1% levels, respectively.

**Table 8**
Regression analysis of conservatism on firm life cycle based on firm age.

| Variables | Dependent variable | | | | | |
|---|---|---|---|---|---|---|
| | MTB | | NOACCR | | BasuCoeff | |
| Intercept | 2.211*** | 2.387*** | 0.068*** | 0.073*** | 0.065 | 0.062 |
| | (11.40) | (12.67) | (11.01) | (11.86) | (1.43) | (1.43) |
| AGE | − 0.309*** | − 0.329*** | − 0.010*** | − 0.011*** | 0.002 | 0.003 |
| | (− 10.85) | (− 11.21) | (− 11.42) | (− 11.78) | (0.30) | (0.46) |
| NOACCR | − 2.493*** | | | | − 0.068 | |
| | (− 8.60) | | | | (− 0.85) | |
| MTB | | | 0.002*** | | | 0.001 |
| | | | (7.64) | | | (0.63) |
| MktCap | 0.278*** | 0.272*** | − 0.001 | − 0.000 | − 0.005 | − 0.005 |
| | (8.75) | (8.74) | (− 1.23) | (− 0.18) | (− 1.07) | (− 1.16) |
| LEV | − 0.264*** | − 0.259*** | 0.002** | 0.002 | 0.021*** | 0.021*** |
| | (− 5.48) | (− 5.34) | (2.74) | (1.87) | (3.54) | (3.60) |
| Ret | 0.799*** | 0.786*** | − 0.006* | − 0.004 | 0.021 | 0.021 |
| | (4.74) | (4.64) | (− 2.11) | (-1.47) | (1.70) | (1.62) |
| Firm and year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| R-Sqr | 0.071 | 0.065 | 0.021 | 0.015 | 0.001 | 0.001 |
| # of Obs | 104,770 | 106,577 | 104,770 | 104,804 | 73,294 | 74,603 |

The table reports the results of the regression of accounting conservatism on a firm's life cycle stages. Dependent variables are the unconditional conservatism measures proxied by market-tooo-book ratios (MTB) and non-operating accruals (NOACR). The final dependent variable is the conditional accounting conservatism measure proposed by Basu (1997) (BasuCoeff). AGE is a proxy for a firm's life cycle stage and is defined in Appendix A. All other variables are as previously defined and can also be found in Appendix A. *, **, *** represents significance at the 0.05, 0.01 and 0.001 levels, respectively.

earnings captured by our third measure) does not appear to be systematically related to life cycle stages.[18]

This paper contributes to the literature on accounting conservatism in several important ways. First, we demonstrate that *unconditional* reporting conservatism (under-recording of net assets) is systematically related to life cycle stages of firms in the cross-section in any given year when accounting standards are held constant. This complements the evidence in Givoly and Hayn (2000) that financial reporting has become more conservative over time. Second, our findings suggest that, besides considering the time-series trend of accounting conservatism as suggested in Givoly and Hayn (2000), one also needs to consider the impact of life cycle stages on reporting conservatism and financial ratios in financial statement analyses. Finally, we support the results of Collins, Hribar, and Tian (2014) and find that different measures of conservatism may or may not respond in the same way to changes in firm characteristics or in accounting standards. This cautions future researchers to be more precise as to which aspects of conservatism they measure and test.

## Appendix A. Definition of variables

| Variable | Definition |
|---|---|
| $Age_{it}$ | The age of the firm. Computed as the difference between the current year and the year in which a firm begins to be traded on an exchange, as recorded by CRSP. |
| $BasuCoeff_{it}$ | $BasuCoeff_{it}$ represents a firm specific $\beta_1$ at time $t$ in Basu's (1997) equation ($EPS_{i,t}/P_{i,t-1} = \alpha_0 + \alpha_1{}^{*}DRET_{i,t} + \beta_0{}^{*}RET_{i,t} + \beta_1{}^{*}RET_{i,t}{}^{*}DRET_{i,t} + \varepsilon_{i,t}$) using a 5 year rolling window. |
| $BVE_{it}$ | Book value of equity in millions (CDI *ceq*). |
| CDI | Compustat Annual Data Item |
| $CEV_{it}$ | Capital expenditures (CDI *capx*) deflated by [book value of equity (CDI *ceq*) + long term debt (CDI *dltt*)]. |
| $DR_{it}$ | A dummy variable that is equal to 1 if $RET_{it}$ is negative, i.e., "bad news," and 0 otherwise, i.e., "good news." |
| $EBXI_{it}$ | Earnings before extraordinary items and discontinued operations in millions (CDI *ib*). |
| $EPS_{it}$ | Earnings including extraordinary items per share (CDI *epspi*), adjusted for stock splits and dividends, in year *t*. |
| $FLC_{it}$ | A firm *i*'s life cycle stage in year *t*. Firms are annually classified into five different life cycle stages based on the cash flow patterns proposed by Dickinson (2011): introduction, growth, mature, shake-out, and decline stages, which take a value of 0, 0.25, 0.50, 0.75 and 1.00, respectively. |
| $LEV_{it}$ | Leverage. Defined as borrower's book value of total debt (CDI *dltt* + CDI *dlc*) divided by market value of equity ($MVE_{it}$). |
| $MktCap_{it}$ | Natural log of Market value of equity ($MVE_{it}$). |
| $MVE_{it}$ | Market value of equity in millions. Defined as fiscal year closing price (CDI *prcc_f*) ∗ shares outstanding (CDI *csho*). |
| $MTB_{it}$ | Market-to-book ratio. Defined as market value of equity ($MVE_{it}$) divided by book value of equity ($BVE_{it}$). |
| $NOACCR_{it}$ | Non-operating accruals. It is defined as total accruals before depreciation ($TACCR_{it}$) minus operating accruals ($OACCR_{it}$), where $TACCR_{it}$ = net income (CDI *ni*) + depreciation (CDI *dp*) − cash flow from operations (CDI *oancf*) and $OACCR_{it}$ = ΔAccounts receivable (CDI *rect*) + ΔInventories (CDI *invt*) + ΔPrepaid expenses (CDI *xpp*) − ΔAccounts payable (CDI *ap*) − ΔTaxes payable (CDI *txp*). |
| $P_{i,t-1}$ | Stock price per share, adjusted for stock splits and dividends, at the end of year $t$ _ 1 (CDI *prcc_f*). |

[18] Dietrich et al. (2007, p. 96) question the appropriateness of using stock returns to construct 'bad' versus 'good' news sub-samples and "demonstrate that the asymmetric timeliness research design induces biases in coefficient estimates and R2 measures except under very restrictive conditions".

| | |
|---|---|
| $R\&D_{it}$ | R & D expense (CDI *xrd*) deflated by book value of equity (CDI *ceq*). |
| $RET_{it}$ | Return over 12 months ending three months after the fiscal year-end. |
| $SPI_{it}$ | Other special item after tax (CDI *spioa*) deflated by lagged assets (CDI *at*). |
| $WD_{it}$ | Write-down after-tax (CDI *wda*) deflated by lagged assets (CDI *at*). |

## References


Anthony, R., & Ramesh, K. (1992). Association between accounting performance measures and stock prices: A test of the life cycle hypothesis. *Journal of Accounting and Economics, 15*(2–3), 203–227.

Ball, R., Kothari, S. P., & Robin, A. (2000). The effect of international institutional factors on properties of accounting earnings. *Journal of Accounting and Economics, 29*(1), 1–51.

Basu, S. (1997). The conservatism principle and the symmetric timeliness of earnings. *Journal of Accounting and Economics, 24*(1), 3–37.

Beaver, W. H., & Ryan, S. G. (2005). Conditional and unconditional conservatism: Concepts and modeling. *Review of Accounting Studies, 10*(2–3), 269–309.

Black, E. (1998). Life-cycle impacts on the incremental value-relevance of earnings and cash flow measures. *Journal of Financial Statement Analysis, 4*(1), 40–56.

Boston Consulting Group (1972). *Perspectives on experience.* Boston: Boston Consulting Group.

Bushman, R., & Piotroski, J. (2006). Financial reporting incentives for conservative accounting: The influence of legal and political institutions. *Journal of Accounting and Economics, 42*(1–2), 107–148.

Collins, D. W., Hribar, P., & Tian, X. (2014). Cash flow asymmetry: Causes and implication for conditional conservatism research. *Journal of Accounting and Economics, 58*(2–3), 173–200.

Dickinson, V. (2011). Cash flow patterns as a proxy for firm life cycle. *The Accounting Review, 86*(6), 1969–1994.

Dietrich, J. R., Muller, K. A., III, & Riedl, E. J. (2007). Asymmetric timeliness tests of accounting conservatism. *Review of Accounting Studies, 12*(1), 95–124.

Feltham, G., & Ohlson, J. (1995). Valuation and clean surplus accounting for operating and financial activities. *Contemporary Accounting Research, 11*(2), 689–731.

Givoly, D., & Hayn, C. (2000). The changing time-series properties of earnings, cash flows and accruals: Has financial reporting become more conservative? *Journal of Accounting and Economics, 29*(3), 287–320.

Heltzer, W. (2010). The impact of SFAS No. 123(R) on financial statement conservatism. *Advances in Accounting, 26*, 227–235.

Holthausen, R., & Watts, R. (2001). The relevance of value-relevance literature for financial accounting standard setting. *Journal of Accounting and Economics, 31*(1–3), 3–75.

Jones, J. (1991). Earnings management during import relief investigation. *Journal of Accounting Research, 29*(2), 193–228.

Karnani, A. (1984). The value of market share and the product life cycle – A game-theoretical model. *Management Science, 30*(6), 696–712.

Khan, M., & Watts, R. (2009). Estimation and empirical properties of a firm-year measure of accounting conservatism. *Journal of Accounting and Economics, 48*(2–3), 132–150.

Lawrence, A., Sloan, R., & Sun, Y. (2013). Non-discretionary conservatism: Evidence and implications. *Journal of Accounting and Economics, 56*(2–3), 112–133.

Liu, M. M. (2006). *Accruals and managerial operating decisions over the firm life cycle.* Massachusetts Institute of Technology (Doctoral dissertation).

Moores, K., & Yuen, S. (2001). Management accounting systems and organizational configuration: A life-cycle perspective. *Accounting, Organizations and Society, 26*(4-5), 351–389.

Pope, P., & Walker, M. (1999). International differences in timeliness, conservatism and classification of earnings. *Journal of Accounting Research, 37*(Suppl), 53–99.

Porter, M. E. (1980). *Competitive strategy: techniques for analyzing industries and competitors.* New York: Free Press.

Qiang, X. (2007). The Effects of contracting, litigation, regulation, and tax costs on conditional and unconditional conservatism: Cross-sectional evidence at the firm level. *The Accounting Review, 82*(3), 759–796.

Ryan, S. G. (2006). Identifying conditional conservatism. *The European Accounting Review, 15*(4), 511–525.

Silvola, H. (2008). Do organizational life-cycle and venture capital investors affect the management control systems used by the firm? *Advances in Accounting, 24*(1), 128–138.

Sloan, R. G. (1996). Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review, 71*(3), 289–315.

Spence, A. M. (1977). Entry, capacity, investment and oligopolistic pricing. *Bell Journal of Economics, 8*(2), 534–544.

Spence, A. M. (1979). Investment strategy and growth in a new market. *Bell Journal of Economics, 10*(1), 1–19.

Spence, A. M. (1981). The learning curve and competition. *Bell Journal of Economics, 12*(1), 49–70.

Watts, R. L. (1993). A proposal for research on conservatism. *Working Paper FR: 93-13.* University of Rochester.

Wernerfelt, B. (1985). The Dynamics of prices and market shares over the product life cycle. *Management Science, 31*(8), 928–939.