ACCOUNTING CONSERVATISM OR EARNINGS MANAGEMENT: A STUDY OF THE ALLOWANCE FOR DOUBTFUL ACCOUNTS

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Abstract

This paper empirically examines the relationship between conservatism and earnings management in chemical and allied products manufacturers via an analysis of the allowance for doubtful accounts and bad debt expense. Data used in the study included total accounts receivable, the total allowance for uncollectible accounts, total assets, and other firm-level data from the COMPUSTAT database of North American firms for companies with the standardized industry code (SIC) of 28 which represents chemical and allied products manufacturers. Chemical and allied products manufacturers were deemed an ideal target for the study because the industry typically has large balances in accounts receivable and allowance for doubtful accounts. Bad debt expense and write-offs were also used; these were obtained from the firms' forms 10K Schedule II filed with the Securities and Exchange Commission (SEC) during the study period from 2005-2017. Analysts reports were also used, as obtained from Bloomberg for each firm. Results from subsequent regression analyses indicate that firms utilized excessive conservatism within the allowance for doubtful accounts to manage earnings to achieve earnings goals throughout the study period.

Keywords: Accounting Conservatism, Earnings Management, Conditional Conservatism, Asymmetry, Manipulation, Allowance for Doubtful Accounts, Bad Debt Expense, Auditor

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1. INTRODUCTION

This research investigates earnings management for firms that are poorly performing or close to meeting or beating analysts' projections. Few have researched the allowance for doubtful accounts even though accounts receivable is a material balance sheet account for numerous companies. McNichols and Wilson (1988) modeled bad debt expense based on economic determinants that explain significant portions of bad debt expense. Others found that firms manage earnings using receivables (Teoh, Wong, & Rao, 1998; Marquardt & Wiedmand, 2004; Caylor, 2010). Jackson and Liu (2010) performed extensive research on the allowance for doubtful accounts through 2004. However, no research has

been conducted since. Also, their research did not consider the allowance for doubtful accounts as a percentage of the accounts receivable balance.

Prior research has considered the reasonableness of bad debt expense as a percentage of sales but did not consider the reasonableness of the allowance for doubtful accounts as a percentage of outstanding receivables (Jackson & Liu, 2010). Given that firms estimate bad debts using one of two methods and both the balance sheet and income statement are impacted, this research will add to the body of knowledge by investigating both the income statement impact and the balance sheet impact.

Our general research question is, *"Do firms utilize the allowance for doubtful accounts to manage earnings?".* The question is split into three categories: poorly performing firms, firms close to meeting analysts' projections, and firms close to exceeding analysts' projections. In addition, we had quality audit firms as a potential mitigating factor to firms managing their earnings.

We study the chemical and allied manufacturing industry for several reasons. First, the industry is relatively large and is often followed by numerous analysts and investors. Next, the industry typically has large balances in accounts receivable and allowance for doubtful accounts. In addition, several firms within the industry are geographically located close to the authors, so they are of interest. Finally, one large industry group allowed for the timely completion of the study.

The present research begins with a review of relevant literature, followed by the hypotheses developed for the study in Section 2, and, subsequently the methodology in Section 3. Next reported are the study results in Section 4, as well as the conclusion in Section 5. The final section of the research presents the limitations of the study as well as some opportunities for future related research.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Unconditional conservatism is based on information known at the beginning of an asset's life while conditional conservatism is based on information obtained in future periods (Basu, 2005). Unconditional conservatism, as the name suggests, does not occur after a specific economic event. Rather, unconditional conservatism is an accounting principle being applied consistently and regularly (Ruch & Taylor, 2015).

Conditional conservatism happens when an event triggers significant negative news to be recognized in financial statements; however, similar significant positive news does not trigger recognition in the financial statements. Information leading to the belief that fixed assets are impaired would result in a loss being recorded; however, information leading to the belief that fixed assets have significantly appreciated would not result in a gain being recorded (Financial Accounting Foundation, 2017a).

Earnings that repeat over time are persistent. Applying conservatism, however, results in an asymmetry in the timeliness of information and persistence of earnings. Further, the bad news is timelier, yet less persistent, while the good news

is less timely but more persistent (Basu, 1997). Research has indicated that conservatism understates accounting values of equity compared to fair values of equity. That is, assets and revenues are understated, and liabilities and expenses are overstated (Ruch & Taylor, 2015; Bryan, McKnight, & Houmes, 2021).

The Financial Accounting Standards Board (FASB) includes predictive and confirmatory values as relevant characteristics of financial information in the Financial Accounting Concepts (FASB, 2010). Predictive value means that a decision-maker can use the information to help forecast future outcomes (Gordon, Raedy, & Sannela, 2016). One element of accruals that investors will look toward is cash flows. Cash flows are often lagged by one or more periods from resulting accruals (Houmes & Skantz, 2010). In the case of applying conservatism, the bad news is recorded before the resulting decrease in cash flows or expenditure (Byzalov & Basu, 2016).

Confirmatory value means information provides feedback to allow a decision-maker to evaluate prior predictions (Gordon et al., 2016). The extent to which accounting information has predictive and confirmatory value to investors is known as value relevance. Balachandran and Monhanram (2011) observe that the utilization of conditional and unconditional conservatism has increased. They note a general trend of declining value relevance during the same period. However, they find no evidence of a decline in value relevance of accounting information in firms that also had increased conservatism.

Linking these two concepts of predictive value and confirmatory value, when investors can accurately identify earnings persistence using accounting information, accounting information is more relevant. However, conditional conservatism can reduce earnings persistence and predictive value and increase earnings volatility (Dichev & Tang, 2008; Chen, Folsom, Perek, & Sami, 2014). Dichev and Tang (2008) reported in a study covering 40 years that conditional conservatism increased volatility and reduced persistence confirming an earlier study by Givoly and Hayn (2000). Chen et al. (2014) add that conditional conservatism resulted in not only reduced earnings persistence but also lower pricing multiples for firms. Others find that while earnings are less persistent or more difficult to predict when conditional conservatism is present, the ability for analysts to predict future cash flows increases (Kim & Kross, 2005; Bandyopadhyay, Chen, Huang, & Jha, 2010). These studies confirm that conditional conservatism, which is conservatism applied due to an event occurring, reduces persistence.

Unconditional conservatism may or may not have a similar impact on earnings persistence, depending on the nature of the unconditional accounting practice employed. Applying accelerated depreciation could cause earnings persistence to decline due to expensing more depreciation early in an asset's life and less later (Bryan et al., 2021). However, it could increase persistence by having lower repairs and maintenance expenses early on when depreciation is higher and then higher repairs and maintenance expenses later in an asset's life when depreciation is lower. Penman and

Zhang (2002) found expenditures related to research and development and advertising reduce earnings persistence to the extent firms had temporary fluctuations in these expenditures.

While persistence, predictive value and confirmatory value are desirable characteristics of quality accounting information, earnings management in the name of conservatism is objectionable. Earnings management represents management's intentional manipulation of accounting information to achieve targeted earning (Schipper, 1989; Habib & Hansen, 2008; Ruch & Taylor, 2015). The financial statements submitted by management do not reflect the actual economic transactions that have occurred during the period. The FASB in the now superseded SFAC No. 2 recognized the potential of utilizing conservatism to understate income in a current period and then overstate in another period. In the concept statement, they specifically state conservatism should not be utilized to rationalize understatement of earnings (FASB, 1980). Prior research identifies earnings thresholds that could trigger management's manipulation of earnings: no earnings surprise (meeting analysts' forecasts), positive earnings (exceeding analysts' forecasts), and earnings increase (initial earning below analysts' forecasts) (Burgstahler & Dichev, 1997; Degeorge, Patel, & Zeckhauser, 1999). Francis, Hasan, and Wu (2013) find that earnings manipulation increased among firms during and immediately following the financial crisis.

Firms utilize earnings management because the market reacts negatively to missing analysists' forecasts (Lopez & Rees, 2002). However, stock returns are significantly higher for those companies that report earnings that meet or exceed analysts' forecasts (Bartov, Givoly, & Hayn, 2002; Kasznic & McNichols, 2002). Studies find that firms seek to achieve no earnings surprise by both guiding analysts' forecasts lower and manipulate earnings higher (Matsumoto, 2002; Burgstahler & Eames, 2006).

Executives utilize active earnings management through conservatism in three basic forms: 1) big bath charge where bad news is intentionally made worse, 2) inappropriate valuation of or expensing acquisitions, and 3) miscellaneous "cookie jar reserves" (Watts, 2003b). Managers justify their overstating liabilities by stating it is conservatism; however, occasionally, asset write-downs or increased liabilities are performed so managers may inflate earnings in the future (Watts, 2003b). Levitt (1998) concludes that companies intentionally create reserves, understate their assets, or overstate their liabilities during good times and then reverse the adjustments to intentionally overstate income. Bryan et al. (2021) find that firms have increasingly understated their accounts receivable balances.

Degeorge et al. (1999) observe that bad news write-downs associated with conditional conservatism may be excessive and refer to this as big bath theory. The term "big bath" is used to describe an accounting methodology whereby a firm overstates losses in a period of poor economic status (Kwon & Lee, 2016). The effect of a big bath is current profits during the bad time are reduced more than the actual economic events allowing for future profits to be higher through reversals or lower than actual expenses (Lee, Chun, Park, & Choi, 2009; Kim, Kim, & Kwan, 2012). Stein and Wang (2016) find that firms facing high levels of negative uncertainty report more negative accruals and opportunistically manage earnings downward. They conclude that investors are likely to attribute the poor performance to the economic conditions rather than the firm performance. Their findings continue by showing firms managed earnings upward during more certain times because investors expected persistent earnings during better times (Stein & Wang, 2016).

Many studies suggest that management uses conservatism as a methodology to manage a firm's earnings (Devine, 1963; FASB, 1980; Levitt, 1998; Penman & Zhang, 2002; Jackson & Liu, 2010; Ghyasi, 2017). Most studies have focused on estimates related to bad debts, estimated percentage complete, and other areas where a year-by-year comparison of estimated and actual can be made. Penman and Zhang (2002) report that the application of unconditional conservatism can create hidden reserves that can be released into income that distorts reported performance. Jackson and Liu's (2010) research in conservatism studied conservatism and earnings management. "Accounting slack", or hidden reserves as noted above, is created when unconditional conservatism is applied (Jackson & Lui, 2010). Bad economic news losses can be mitigated by this accounting slack. Jackson and Liu (2010) concluded that companies manage earnings through the allowance for bad debts. They investigated temporal changes in the allowance for doubtful accounts, whether bad debt expense appears to be managed, and if the conservative accounting is related to earnings management. However, they did not consider the possibility of firms utilizing consistent allowance for doubtful accounts as a percentage of accounts receivable.

Jackson and Liu (2010) were the first to assess conservatism on an individual accrual account, the allowance for doubtful accounts. In their study of firms from 1980 through 2004, they developed two measures of conservatism related to the allowance for doubtful accounts (Jackson & Liu, 2010):

$$CON1_{it} = \frac{ALLOW_{it}}{WO_{it+1}} \qquad (1)$$

$$CON2_{it} = (ALLOW_{it} - WO_{it+1})/SALE_{it} \qquad (2)$$

$ALLOW_{it}$ is the allowance for doubtful accounts.
WO_{it+1} is write-offs of uncollectible accounts.
$SALE_{it}$ is net sales; *i* and *t* are subscripts representing firm and year, respectively.

$CON1_{it}$ measures the conservative nature of the allowance for doubtful accounts by creating a ratio of the allowance for doubtful accounts for one year divided by the write-offs by the firm in the next year. If the firm has perfect information, the ratio will approximate one. If the allowance account is conservative the ratio will be greater than one. Their study finds that between 1980 and 2004, *CON1* averaged 2.54 for their sample of over 10,000 firm years (Jackson & Liu, 2010). Bryan et al. (2021) find that 92.9 percent of firms in their study have a *CON1* of greater than one. In addition, they find the level of understatement of accounts receivable has increased since Jackson and Liu's (2010) study to 3.81 or almost four years of write-offs in the allowance for doubtful accounts.

$CON2_{it}$ measures essentially the same thing as $CON1_{it}$, but here they utilize the difference between the allowance and the next year's write-offs divided by sales. Again, if the firm has perfect information, the difference between the allowance and next year's write-offs would be zero, so $CON2_{it}$ would be zero. Jackson and Liu (2010) find the ratio averaged 0.0027 for firms from 1980 to 2004. Their measures only consider the allowance as it relates to the income statement rather than also reviewing the balance sheet impact. Bryan et al. (2021) find 58.23 percent of firms have $CON2$ greater than zero. In addition, they find firms have been increasingly understating accounts receivable by reviewing both $ALLOW_{it}/WO_{it+1}$ and $BDE_{it} - WO_{it+1}$ from 2005 through 2017 (Bryan et al., 2021).

Previous studies did not address the possibility of a "big bath". Kwon and Lee (2016) found that banks will use big baths in poor economic times to allow for reversal later (Lee et al., 2009; Kim et al., 2012). We assert that when a firm's losses are so severe that their recognition is unavoidable, managers eschew upward earnings management and overstate bad debt expense and corresponding provisions under the allowance account. Therefore, hypothesis one is as follows:

H1a: Chemical and allied products manufacturers with severe losses or are substantially underperforming will report higher bad debt expense.

Research has linked large audit firms and internal control quality within firms (Beneish & Press, 1993; Ge & McVay, 2005). Ge and McVay (2005) found large audit firms do a better job assessing internal controls and adapting audit procedures due to more experienced auditors. Vann and Presley (2018) concluded that Big 4 auditors are better able to detect and prevent earnings management. Therefore, hypothesis 1b is:

H1b: Audit quality attenuates the tendency for manufacturers with severe losses or is substantially underperforming to report higher bad debt expense.

Jackson and Liu (2010) and McNichols and Wilson (1988) have found that firms manage earnings through the allowance for doubtful accounts and bad debts. While Jackson and Liu (2010) compared analysts' earnings projections, they attempted to model based on the highest performing and lowest performing and found no statistical significance in how far the firms were from estimates. Firms attempt to have zero earnings surprises between analysts' projections and actual – or meeting the projection (Burgstahler & Dichev, 1997; Degeorge et al., 1999; Neifar, Halioui, & Ben Abdelaziz, 2016). Exceeding analysts' projections, or what has been described as positive, results in the highest upward reaction by the markets (Bartov et al., 2002; Kasznic & McNichols, 2002; Neifar et al., 2016). A firm may manage earnings to achieve a few cents improvement in earnings per share, but more might be viewed as fraud rather than earnings management. It appears that high-quality audit firms do a better job of preventing earnings management. Therefore, hypotheses two and three are:

H2a: Chemical and allied products manufacturers will manage earnings by reducing bad debt expense, to even revenue-producing, when earnings per share before bad debt expense is at or slightly higher than analysts' projections to obtain zero surprise or positive surprise.

H2b: Audit quality attenuates the tendency for manufacturers to manage earnings by reducing bad debt expense, to even revenue-producing, when earnings per share before bad debt expense is at or slightly higher than analysts' projections to obtain zero surprise or positive surprise.

H3a: Chemical and allied products manufacturers will manage earnings by reducing bad debt expense, to even revenue-producing, when earnings per share before bad debt expense are slightly lower than analysts' projections to obtain zero surprise.

H3b: Audit quality attenuates the tendency for manufacturers to manage earnings by reducing bad debt expense, to even revenue-producing, when earnings per share before bad debt expense are slightly lower than analysts' projections to obtain zero surprise.

3. METHODOLOGY

The following variables were utilized in linear regression models. All continuously measured variables were winsorized to remove the impact of outliers at the 1 and 99 levels. The potential for the effect of within-firm correlation and heteroscedasticity was mitigated using clustered robust standard error clustering on gvkeynum. Utilizing Stata, the firm ID (gvkey) variable was destrung into a numerical variable – *gvkeynum*.

BOT_DEC_{it} represents firms i in the bottom decile of performance for period t. These are firms that could utilize a big bath to manipulate earnings.

Prior studies document that large audit firms with greater resources and reputation perform higher audits. *AUDIT* will be used to indicate audit firm size is included. *AUDIT* coded 1 for the audit firm being one of the "Big 4" or 0 otherwise.

Consistent with findings by Bartov et al. (2002), *EPS_CLOSE_OVER,* and *EPSBELOW* look to identify firms that are close to either meeting or beating analysts' forecasts because doing so is rewarded in the markets. Since they are close to meeting analysts' projections or they are very close to exceeding analysts' projections, firms may manage earnings.

EPS_CLOSE_OVER is coded 1 for firms that have pre-bad debt expense earnings per share that was no more than three percent above analysts' forecast and 0 otherwise. Bad debt expense is expected to be lower.

EPSBELOW is coded 1 for firms that have pre-bad debt expense earnings per share that was no more than three percent below analysts' forecast and 0 otherwise. Bad debt expense is expected to be lower, so the firms can meet expectations.

Large firms with more sophisticated financial reporting and internal controls should produce higher financial reporting quality. Hence the tendency to manage earnings should be less for large companies. We control for this result by including the variable, *LogASSETS* defined as the log of total firm assets.

Highly levered companies with greater financial risk have incentives that include contractual obligations related to fixed debt costs as well as the potential avoidance of debt covenant violations to manage earnings. To control for these effects we include *LEV* and measure it as total long-term debt divided by total assets.

CASHFLOW/ASSETS is the firm's net cash flow from operations divided by total assets. Highly liquid firms may have fewer incentives to manage earnings through bad debts expense.

Prior studies document that managers of high price-earnings (PE) growth firms use accruals to manage earnings higher. Hence highly valued high PE firms with incentives to meet analysts' predicted earnings may be more likely to use bad debts expense to manage earnings. We further include the control, *PE,* and measure it as the company's price-earnings ratio for the prior period or lagged one period. PE_{it-1} is the firm's price-earnings ratio lagged one period.

Also included is *CURRENT,* the firm's current ratio.

ALT is the firm's Altman Z-score which is a measure of a firm's credit quality (Altman, 1968). Prior literature, such as Bhagat and Bolton (2008) and Ashbaugh-Skaife, Collins, Kinney, and Lafond (2009), have used Altman's Z-score as a measure of credit quality. Credit quality could impact the firm's decision to manipulate the allowance for bad debts. It is measured as:

$$Z = 1.2A \times 1.4B \times 3.3C \times 0.6D \times 0.99E \qquad (1)$$

A = Working capital/Total assets [measures the relative amount of liquid assets];
B = Retained earnings/Total assets [determines cumulative profitability];
C = Earnings before interest and taxes/Total assets [measures earnings away from the effects of taxes and leverage];
D = Market value of equity/Book value of total liabilities [incorporates the effects of a decline in the market value of a company's shares];

E = Sales/Total assets [measures asset turnover].
The Altman's (1968) Z-score is interpreted as:
$Z > 2.99$ – "Safe" zone;
$1.81 < Z < 2.99$ – "Grey" zone;
$Z < 1.81$ – "Distress" zone.

BANKRUPT is the total number of business bankruptcies in the country (American Bankruptcy Institute, 2019). Firms may have incentives to change their bad debt expense based on the business' economic condition or the general economic condition of the nation. Of interest is the period of the financial crisis of 2007-2008. Consistent with Stein and Wang (2016), downward earnings management or a big bath is more likely during the financial crisis and *BANKRUPT* is a measure of financial uncertainty. It is included as a possible alternative explanation for changes in bad debt expense. The magnitude of a firm's cash flow may affect the need to manage earnings. More specifically, companies with greater (less) cash flow should have lower (greater) incentives to manage earnings.

LogBANKRUPT represents the log of the number of firms declaring bankruptcy during the year.

3.1. Models

H1a states that companies with severe losses or poor performing firms will increase their bad debt expense or take a "big bath". *H1b* states that audit quality attenuates the tendency for manufacturers with severe losses of are substantially underperforming to report high bad debt expense. Both were tested using the following regressions:

Model 1a. Regressing bad debt expense as a percentage of sales

$$\frac{BDE_{it}}{Sale_{it}} = \beta_0 + \beta_1 BOTDEC_{it} + \beta_2 logASSETS_{it} + \beta_3 LEV_{it} + \beta_4 \frac{CASHFLOW}{ASSETS}_{it} + \beta_5 PE_{it-1} + \beta_6 CURRENT_{it} + \beta_7 ALT_{it} + \beta_8 logBANKRUPT_{it} + \beta_9 AUDIT_{it} + \beta_{10} AUDIT_{it} * BOTDEC_{it} + \varepsilon_{it} \qquad (3)$$

Model 1b. Regressing the allowance for doubtful accounts as a percentage of accounts receivable

$$\frac{ALLOW_{it}}{AR_{it}} = \beta_0 + \beta_1 BOTDEC_{it} + \beta_2 logASSETS_{it} + \beta_3 LEV_{it} + \beta_4 \frac{CASHFLOW}{ASSETS}_{it} + \beta_5 PE_{it-1} + \beta_6 CURRENT_{it} + \beta_7 ALT_{it} + \beta_8 logBANKRUPT_{it} + \beta_9 AUDIT_{it} + \beta_{10} AUDIT_{it} * BOTDEC_{it} + \varepsilon_{it} \qquad (4)$$

Initially, *H2a* and *H3a* will be tested by looking for significant changes in bad debt expense as a percentage of sales and allowance for a doubtful account as a percentage of accounts receivable for an indication of manipulation.

Models for *H2a, H2b, H3a,* and *H3b* will focus on variables of interest described above. *H2a* postulates that firms' with earnings before bad debt expense that is slightly over analysts' projections will manage earnings by reducing bad debt expense. *H2b* states that audit quality attenuates the tendency for manufacturers to manage earnings by reducing bad debt expense, to even revenue-producing, when earnings per share before bad debt expense are at or slightly higher than analysts' projections to obtain zero surprise or positive surprise.

Models proposed to test these hypotheses are Models 2a and 2b.

Model 2a. Model of bad debt expense to sales

$$\frac{BDE_{it}}{Sale_{it}} = \beta_0 + \beta_1 EPS\_CLOSE\_OVER_{it} + \beta_2 logASSETS_{it} + \beta_3 LEV_{it} + \beta_4 CASHFLOW/ASSETS_{it} + \beta_5 PE_{it-1} + \beta_6 CURRENT_{it} + \beta_7 ALT_{it} + \beta_8 logBANKRUPT_{it} + \beta_9 EPS\_CLOSE\_OVER_{it} * AUDIT_{it} + \beta_{10} AUDIT_{it} + \varepsilon_{it} \qquad (5)$$

Model 2b. Model of allowance for doubtful accounts as a percentage of accounts receivable

$$\frac{ALLOW_{it}}{AR_{it}} = \beta_0 + \beta_1 EPS\_CLOSE\_OVER_{it} + \beta_2 logASSETS_{it} + \beta_3 LEV_{it} + \beta_4 CASHFLOW/ASSETS_{it} + \beta_5 PE_{it-1} + \beta_6 CURRENT_{it} + \beta_7 ALT_{it} + \beta_8 logBANKRUPT_{it} + \beta_9 EPS\_CLOSE\_OVER_{it} * AUDIT_{it} + \beta_{10} AUDIT_{it} + \varepsilon_{it}$$ (6)

H3a postulates that firms with earnings before bad debt expense that is slightly under analysts' projections will manage earnings by reducing bad debt expense. *H3b* states that audit quality attenuates the tendency for manufacturers to manage earnings by reducing bad debt expense, to even revenue-producing, when earnings per share before bad debt expense are slightly lower than analysts' projections to obtain zero surprise.

Models proposed to test this hypothesis are Models 3a and 3b.

Model 3a. Model of bad debt expense as a percentage of sales

$$\frac{BDE_{it}}{Sale_{it}} = \beta_0 + \beta_1 EPSBELOW_{it} + \beta_2 logASSETS_{it} + \beta_3 LEV_{it} + \beta_4 CASHFLOW/ASSETS_{it} + \beta_5 PE_{it-1} + \beta_6 CURRENT_{it} + \beta_7 ALT_{it} + \beta_8 logBANKRUPT_{it} + \beta_9 EPSBELOW_{it} * AUDIT_{it} + \beta_{10} AUDIT_{it} + \varepsilon_{it}$$ (7)

Model 3b. Model of allowance for doubtful accounts as a percentage of accounts receivable

$$\frac{ALLOW_{it}}{AR_{it}} = \beta_0 + \beta_1 EPSBELOW_{it} + \beta_2 logASSETS_{it} + \beta_3 LEV_{it} + \beta_4 CASHFLOW/ASSETS_{it} + \beta_5 PE_{it-1} + \beta_6 CURRENT_{it} + \beta_7 ALT_{it} + \beta_8 logBANKRUPT_{it} + \beta_9 EPSBELOW_{it} * AUDIT_{it} + \beta_{10} AUDIT_{it} + \varepsilon_{it}$$ (8)

Traditionally, the allowance for doubtful accounts has been viewed as unconditional conservatism (Ruch & Taylor, 2015). However, unconditional conservatism is based on information known at the beginning of an asset's life while conditional conservatism is based on information obtained future periods (Basu, 2005). Changes in the methodology for determining bad debt expense based on current conditions rather than consistently applied processes would indicate that the allowance for doubtful accounts is conditional conservatism.

The dependent variables noted above $BDE_{it}/Sales_{it}$ and $ALLOW_{it}/AR_{it}$ are measures of consistency in determining the allowance for doubtful accounts. One methodology for determining the allowance for doubtful accounts is as a percentage of accounts receivable (Gordon et al., 2016). Prior research has only considered the income statement impact, bad debt as a percentage of sales and not the balance sheet impact; therefore, it is believed this research should measure the allowance as a percentage of accounts receivable as a measure of reasonableness and consistency in addition to bad debt as a percentage of sales. Significant changes in these ratios would indicate the allowance for doubtful accounts is conditional conservatism. If *H1a, H2a,* and *H3a* hold to be true, this is further evidence that bad debt expense is conditional (as opposed to unconditional) conservatism.

3.2. Data

In gathering the data, this study obtained total accounts receivable, the total allowance for uncollectible accounts, total assets, and other firm-level data from the COMPUSTAT database of North American firms for companies with the standardized industry code (SIC) of 28 which represents chemical and allied products manufacturers. Bad debt expense and write-offs are not reported by COMPUSTAT, so they were obtained from the firms' forms 10K Schedule II filed with the Securities and Exchange Commission (SEC) during the study period from 2005 (the period after the Jackson & Liu, 2010, research) through 2017. Analysts' reports for the period were obtained from Bloomberg for each firm.

3.3. Sample

The initial extraction from COMPUSTAT of firms with the SIC of 28 from 2005 through 2017 with accounts receivable balances and allowance for doubtful accounts resulted in 285 firms and 4,128 total observations. As noted earlier, utilizing Stata, the firm ID (gvkey) variable was destrung into a numerical variable – *gvkeynum*. The resulting companies were sorted by gvkeynum and fiscal year. Included in these companies were foreign registered firms that do not report a Schedule II (or equivalent) for disclosures in changes of valuation accounts, which were dropped for lack of data needed for the study. Also dropped were all firms that did not have an allowance for doubtful accounts. Finally, the EDGAR database was searched and Forms 10K were reviewed for bad debt expense (*BDE*) and net write-offs (*WO*) for each firm-year. Those firms that did not disclose these changes in their allowance for doubtful accounts, typically citing immateriality, were also dropped. The resulting sample was 88 total firms representing 795 firm years. Of the 88 firms, 30 had data for the entire period from 2005 through 2017.

The manual entries of *BDE* and *WO* were reviewed to reduce researcher error by a research assistant reading the amounts back to the researcher for confirmation with the 10K. Subsequent verification of amounts by starting with the beginning of the year allowance for doubtful accounts adding bad debt expense and then subtracting net recoveries, as has been referenced in earlier research (Jackson & Liu, 2010), is impossible because virtually 100 percent of the companies have other activity in the allowance for doubtful accounts, such as acquisitions, divestitures, and most commonly, foreign currency changes. In addition,

prior research has indicated the use of gross write-offs and gross recoveries in modeling (Jackson & Liu, 2010). Again, this was not possible. Substantially all companies reported net write-offs or recoveries. Table 1 presents the summary descriptive statistics for the sample companies.

Table 1. Summary statistics for the sample

Total observations: 795	*Mean*	*Standard deviation*	*Minimum*	*Maximum*
Total assets (millions)	9,356	18,395	38	192,164
Sales (millions)	6,234	10,532	5	71,312
Market value (millions)	13,949	28,557	0	258,341
Accounts receivable to total assets	0.91%	2.0%	0.0%	13.9%
Accounts receivable to current assets	2.36%	4.9%	0.0%	34.5%
Bad debt expense to net income	1.10%	165.2%	4345.5%	1009.1%
Write-offs to net income	1.18%	173.0%	4436.4%	1100.0%

4. RESULTS

H1a states that companies with severe losses or significantly underperforming will increase their bad debt expense or take a "big bath". *H3b* states that audit quality attenuates the tendency for manufacturers with severe losses of are substantially underperforming to report high bad debt expense. Both *H1a* and *H1b* were tested using Model 1a and Model 1b (see equations (3), (4)).

Table 2. Summary statistics for independent variables (Model 1a and 1b)

Independent variable	*Mean*	*Standard deviation*	*Minimum*	*Maximum*
BOT_DEC	0.0866	0.2814	-	1.0000
logAssets	8.070	1.530	3.640	11.778
LEV	0.293	0.232	-	1.386
CASHFLOW/ASSETS	0.096	0.067	(0.203)	0.392
Lagged PE	13.819	48.029	(317.000)	149.167
CURRENT	2.325	1.4320	0.682	9.406
ALT	3.936	3.649	0.272	22.510
logBANKRUPT	10.548	0.327	10.091	11.016
AUDIT	0.930	0.256	-	1.000
*AUDIT*BOT_DEC*	0.048	0.213	-	1.000

The following Pearson correlation matrix in Table 3 indicates that the Altman Z-score is correlated with both leverage and the current ratio. This is expected since all measure the financial condition of a firm. In addition, *AUDIT*BOT_DEC* and *BOT_DEC* are also correlated as is expected and part of the hypothesis.

Table 3. Pearson correlation matrix for Models 1a and 1b

	Variables	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1	*BOT_DEC*	1.000									
2	*logAssets*	0.179	1.000								
3	*LEV*	0.042	0.346	1.000							
4	*CASHFLOW/ASSETS*	-0.352	0.078	-0.233	1.000						
5	*Lagged PE*	0.043	-0.010	-0.074	0.060	1.000					
6	*CURRENT*	-0.040	-0.268	-0.324	0.122	0.031	1.000				
7	*ALT*	-0.103	-0.275	-0.537	0.491	0.060	0.548	1.000			
8	*logBANKRUPT*	-0.041	-0.154	-0.327	0.129	0.074	0.115	0.094	1.000		
9	*AUDIT*	-0.165	0.376	0.327	0.177	0.011	-0.361	-0.058	-0.045	1.000	
10	*AUDIT*BOT_DEC*	0.8777	-0.048	0.1162	-0.262	0.0686	-0.045	-0.068	-0.035	0.0755	1.000

The regressions produced the following results:

Table 4. Regression results for Model 1a: Dependent variable – Bad Debt Expense to Sales

(Observations: 491)	*Pred. sign*	*Coefficient*	*Robust Std. err.*	*t-stat*	*p-value*	*95% Confidence interval*	
Constant	?	0.0102	0.0302	0.56	0.574	0.0431	0.0771
BOT_DEC	+	**0.0875**	**0.1282**	**6.82**	**0.000**	**0.6193**	**0.1130**
logAssets	-	-0.0013	0.0010	-1.25	0.216	-0.0033	0.0008
LEV	+	0.0055	0.0057	0.97	0.334	-0.0058	0.0167
CASHFLOW/ASSETS	-	-0.0143	0.0143	-1.00	0.323	-0.4282	0.0143
Lagged PE	-	0.0000	0.0000	-0.99	0.324	0.0000	0.0000
CURRENT	+	0.0015	0.0012	1.27	0.209	-0.0009	0.0038
ALT	+	0.0013	0.0007	1.85	0.069	-0.001	0.0027
logBANKRUPT	-	-0.0009	0.0024	-0.37	0.716	-0.0056	0.0038
AUDIT	-	-0.0018	0.0074	-0.24	0.811	-0.0165	0.0130
AUDIT*BOT_DEC	-	**-0.0880**	**0.0125**	**-7.06**	**0.000**	**-0.1129**	**-0.0632**
R^2	0.4218						
F	15.500						
Prob > *F*	0.0000						

These results show that the worst performing firms tend to increase their bad debt expense; however, this is mitigated by quality audit firms. With *p-values* of zero, the results have a 99 percent confidence level. Prior studies have researched bad debt expense as a percentage of sales. Model 1b expands this prior research to analyze the allowance for doubtful accounts as a percentage of accounts receivable shown in Table 5.

These results provide support for *H1a* and *H1b*. The estimates for our BOT_DEC_{it} and $AUDIT*BOT\_DEC_{it}$ interaction term are significantly positive and negative respectively. Companies that are unable or unwilling to avoid large losses will report higher bad debt expense, but high-quality auditors attenuate this positive relation. With *p-values* of 0.002, the results have a 95 percent confidence level.

H2a and *H3a* posit that firms with earnings per share close to analysts' projected earnings per share will utilize bad debt expense to manipulate earnings per share to either meet or beat the analysts' projections following the financial crisis of 2007-2008. Analysts' projections were obtained through the Bloomberg Terminal. The analysts represented a variety of sources and not just one analyst for the entire sample of companies. Analyst projections were obtained for 458 of the 543 firm years from 2009 through 2017, mostly due to analysts not following particular stocks.

In addition to modeling attempts, we reviewed companies reporting negative, or income-producing, bad debt expense. These were compared to those companies reporting negative bad debt expense with either a near miss (over or under) analysts' projections. Table 6 illustrates those findings.

Table 5. Regression results Model 1b: Dependent variable – Allowance as Percentage of Accounts Receivable

(Observations: 491)	Pred. sign	Coefficient	Robust Std. err.	t-stat	p-value	95% Confidence Interval	
Constant	?	0.2362	0.2101	1.12	0.264	-0.1822	0.6545
BOT_DEC	**+**	**0.5353**	**0.1683**	**3.18**	**0.002**	**0.2003**	**0.8704**
logAssets	-	-0.0150	0.0068	-2.21	0.030	-0.2857	-0.0015
LEV	+	-0.0136	0.0407	-0.33	0.740	-0.0945	0.0674
CASHFLOW/ASSETS	-	0.1318	0.0970	1.36	0.178	-0.0612	0.3248
Lagged PE	-	-0.0001	0.0689	-1.32	0.190	-0.0002	0.0000
CURRENT	+	-0.0048	0.0082	-0.58	0.562	-0.2110	0.1156
ALT	+	-0.0001	0.0038	-0.03	0.974	-0.0076	0.0074
logBANKRUPT	-	-0.0009	0.0156	-0.06	0.954	-0.0319	0.0301
AUDIT	-	-0.0661	0.0568	-1.16	0.248	-0.1791	0.0470
AUDIT*BOT_DEC	**-**	**-0.5244**	**0.1656**	**-3.17**	**0.002**	**-0.8541**	**-0.1948**
R^2	0.5256						
F	10.290						
Prob > F	0.0000						

Table 6. Near miss companies and negative bad debt expense

Year	Negative bad debt expense (Companies reporting)		Near miss before BDE		Near miss & neg. BDE
	Number	Percentage	Under	Over	
2009	5	7.69%	1	2	0
2010	8	12.50%	6	3	2
2011	8	13.56%	3	0	0
2012	2	3.08%	5	4	0
2013	6	9.68%	2	2	1
2014	7	11.11%	4	3	3
2015	0	0.00%	2	3	0
2016	3	5.66%	5	3	0
Total	39		28	20	6

Of the 39 companies reporting negative bad debt expense during the study period, only six (15.4%) also had near misses from analysts' projections. Six companies reported both near misses and negative bad debt expense. Each of those

six companies also had near misses under analysts' projections or 21.4% of the near misses under.

Statistics related to the variables from Model 2a and Model 2b (see equations (5) and (6)) are as follows:

Table 7. Summary statistics for independent variables (Model 2a and 2b)

Independent variable	Mean	Standard deviation	Minimum	Maximum	Expected sign
EPS_CLOSE_OVER	0.062	0.240	-	1.000	-
logASSETS	8.167	1.616	3.640	11.778	-
LEV	0.256	0.162	-	0.830	+
CASHFLOW/ASSETS	0.103	0.065	(0.203)	0.392	-
Lagged PE	12.356	49.268	(317.000)	149.167	-
CURRENT	2.429	1.478	0.682	9.406	-
ALT	3.819	3.426	0.272	22.510	+
logBANKRUPT	10.550	0.330	10.091	11.016	-
*EPS_CLOSE_OVER*AUDIT*	0.059	0.236	-	1.000	+
AUDIT	0.927	0.261	-	1.000	+

The following Pearson correlation matrix for these variables indicates *AUDIT* and *EPS_CLOSE_OVER* are highly correlated. This is consistent with the expectation that high-quality auditors have an impact on unreasonable accruals such as modifications to bad debt expense. Also, the *ALT* is correlated with both *LEV* and *CURRENT*. Again, this is expected because all are measures of a firm's financial stability.

Table 8. Pearson correlation matrix for Model 2a and 2b: Independent variables

	Variables	1	2	3	4	5	6	7	8	9	10
1	EPS_CLOSE_OVER	1.000									
2	logASSETS	0.033	1.000								
3	LEV	-0.027	0.346	1.000							
4	CASHFLOW/ASSETS	0.157	0.078	-0.233	1.000						
5	Lagged PE	0.033	0.034	-0.079	0.088	1.000					
6	CURRENT	0.004	-0.268	-0.324	0.122	0.012	1.000				
7	ALT	0.091	-0.275	-0.537	0.191	0.090	0.548	1.000			
8	logBANKRUPT	-0.044	-0.154	-0.327	0.129	0.052	0.115	0.094	1.000		
9	EPS_CLOSE_OVER*AUDIT	0.039	0.376	0.327	0.177	0.072	-0.361	-0.058	-0.045	1.000	
10	AUDIT	0.982	0.042	0.020	0.164	0.031	-0.003	0.094	-0.033	0.071	1.000

The regression of bad debt expense to sales with Model 2a produced the following results:

Table 9. Model 2a regression results: Dependent variable – Bad Debt Expense to Sales

(Observations: 491)	Pred. sign	Coefficient	t-statistic	p-value
Constant	?	0.071055	1.14	0.026
EPS_CLOSE_OVER	-	**-0.031667**	**-2.28**	**0.026**
logASSETS	-	-0.022941	-1.94	0.055
LEV	+	0.003268	0.38	0.704
CASHFLOW/ASSETS	-	-0.036182	-2.12	0.037
Lagged PE	-	-0.000008	-0.54	0.591
CURRENT	-	-0.000139	-0.09	0.925
ALT	+	0.001327	1.45	0.151
logBANKRUPT	-	-0.002430	-0.5	0.618
EPS_CLOSE_OVER*AUDIT	+	**0.030340**	**2.15**	**0.034**
AUDIT	+	-0.024156	-1.82	0.073
R^2	0.2151			

While the explanatory power is not high, companies that are close to analysts' projections and only slightly over tend to lower their bad debt expense, and the result is statistically significant. However, that tendency is mitigated by quality audit firms which is again statistically significant. With *p-values* of less than 0.05, the results have a 95 percent confidence level.

The same variables were utilized to regress the allowance for doubtful accounts as a percentage of accounts receivable or Model 2b. Since the ratio is also used as a calculation for bad debt expense and others have not studied it, the results add additional robustness.

Table 10. Model 2b regression results: Dependent variable – Allowance as % of Accounts Receivable

(Observations: 491)	Pred. sign	Coefficient	t-statistic	p-value
Constant	?	0.573044	1.31	0.193
EPS_CLOSE_OVER	-	**-0.246515**	**-2.69**	**0.009**
logASSETS	-	-0.021464	-2.83	0.006
LEV	+	-0.025113	-0.4	0.689
CASHFLOW/ASSETS	-	-0.020020	-0.13	0.896
Lagged PE	-	-0.000054	-0.63	0.533
CURRENT	-	-0.014853	-1.15	0.253
ALT	+	0.000094	0.02	0.986
logBANKRUPT	-	-0.010773	-0.31	0.759
EPS_CLOSE_OVER*AUDIT	+	**0.239293**	**2.59**	**0.011**
AUDIT	+	-0.202975	-2.19	0.032
R^2	0.3058			

The regression also identified that when companies are just slightly over analysts' projections the allowance account as a percentage of accounts receivable is lower at a 95 percent significant level. As was the case with the previous regression, this tendency is mitigated by high-quality audit firms again with *p-values* of less than 0.05, the results are significant at the 95 percent level.

Companies that were only slightly under analysts' projections were used to produce regression of bad debt expense to sales and regression of the allowance for doubtful accounts to accounts receivable to test *H3a* and *H3b* using Models 3a and 3b.

Statistics related to the variables (see equations (7) and (8)) are as follows:

Table 11. Summary statistics for independent variables (Model 3a and 3b)

Independent variable	Mean	Standard deviation	Minimum	Maximum	Expected sign
EPSBELOW	0.041	0.198	-	1.000	-
logASSETS	8.167	1.616	3.640	11.778	-
LEV	0.256	0.162	-	0.830	+
CASHFLOW/ASSETS	0.103	0.065	(0.203)	0.392	-
Lagged PE	12.356	49.268	(317.000)	149.167	-
CURRENT	2.429	1.478	0.682	9.406	-
ALT	3.819	3.426	0.272	22.510	+
logBANKRUPT	10.550	0.330	10.091	11.016	-
EPSBELOW*AUDIT	0.039	0.193	-	1.000	+
AUDIT	0.927	0.261	-	1.000	+

Table 12. Model 3a and 3b: Independent variable – Pearson correlation matrix

	Variable	1	2	3	4	5	6	7	8	9	10
1	EPSBELOW	1.000									
2	logASSETS	0.031	1.000								
3	LEV	0.029	0.346	1.000							
4	CASHFLOW/ASSETS	0.097	0.078	-0.233	1.000						
5	Lagged PE	0.038	0.034	-0.079	0.088	1.000					
6	CURRENT	0.023	-0.268	-0.324	0.122	0.012	1.000				
7	ALT	0.023	-0.275	-0.537	0.191	0.090	0.548	1.000			
8	logBANKRUPT	-0.053	-0.154	-0.327	0.129	0.052	0.115	0.094	1.000		
9	EPSBELOW*AUDIT	0.974	0.042	0.041	0.103	-0.041	-0.030	0.024	0.040	1.000	
10	AUDIT	0.018	0.376	0.020	0.164	0.031	-0.003	0.094	-0.033	0.071	1.000

Correlations are virtually identical to the previous matrix. The following table reports the results of the regression of bad debt expense to sales, Model 3a.

Table 13. Model 3a regression results: Dependent variable – Bad Debt Expense to Sales

(Observations: 491)	Pred. sign	Coefficient	t-statistic	p-value
Constant	?	0.071055	1.14	0.026
EPS_CLOSE_OVER	**-**	**-0.031667**	**-2.28**	**0.026**
logASSETS	-	-0.022941	-1.94	0.055
LEV	+	0.003268	0.38	0.704
CASHFLOW/ASSETS	-	-0.036182	-2.12	0.037
Lagged PE	-	-0.000008	-0.54	0.591
CURRENT	-	-0.000139	-0.09	0.925
ALT	+	0.001327	1.45	0.151
logBANKRUPT	-	-0.002430	-0.5	0.618
EPS_CLOSE_OVER*AUDIT	**+**	**0.030340**	**2.15**	**0.034**
AUDIT	+	-0.024156	-1.82	0.073
R^2	0.2151			

The regression of bad debt expense to sales utilizing these independent variables produced statistically significant results. Firm's with earnings slightly below analysts' forecasts were likely to lower their bad debt expense, which was statistically significant. This tendency to lower bad debt expense was offset by high-quality audit firms.

Model 3b modeling the allowance for doubtful accounts as a percentage of accounts receivable produced the following regression.

Table 14. Model 3b regression results: Dependent variable – Allowance for Doubtful Accounts as % of Accounts Receivable

(Observations: 491)	Pred. sign	Coefficient	t-statistic	p-value
Constant	?	0.57429	1.32	0.192
EPSBELOW	**-**	**(0.25197)**	**(2.70)**	**0.008**
logASSETS	-	(0.02146)	(2.83)	0.006
LEV	+	(0.25500)	(0.41)	0.684
CASHFLOW/ASSETS	-	(0.02249)	(0.15)	0.882
Lagged PE	-	(0.00006)	(0.65)	0.520
CURRENT	-	(0.01498)	(1.16)	0.249
ALT	+	0.00013	0.02	0.981
logBANKRUPT	-	(0.01083)	(0.03)	0.758
EPSBELOW*AUDIT	**+**	**0.24768**	**2.67**	**0.009**
AUDIT	+	(0.20344)	(2.19)	0.031
R^2	0.306			

Consistent with firms that were only slightly over analysts' projections, firms slightly under analysts' projections resulted in a coefficient of negative 0.25197 and with *p-values* of less than 0.05 are statistically significant at the 95 percent level. This negative tendency was again significantly attenuated by high-quality audit firms also statistically significant at the 95 percent level.

The market fluctuations during the study period mirror the fluctuations in $BDE_{it}/Sales_{it}$ and $ALLOW_{it}/AR_{it}$ which provides further evidence that companies react to conditions in the environment when recording bad debt expense.

Robustness

An estimation of bad debt expense (*estBDE*) as a percent of sales for each year was calculated using the following:

$$\frac{estBDE_{it}}{SALE_{it}} = \beta_0 + \frac{\beta_1 AR_{it}}{SALE_{it}} + \varepsilon_{it} \qquad (9)$$

Upon obtaining the coefficients for each year, estimated bad debt as a percentage of sales was calculated for each year. Following those annual calculations of estimated bad debt as a percentage of sales for each year, abnormal bad debt as a percentage of sales (*ABNBDE*) was calculated using actual bad debt as a percentage of sales less estimated bad debt as a percentage of sales. A regression model was run again using *ABNBDE* as the dependent variable rather than $BDE_{it}/Sales_{it}$ and $ALLOW_{it}/AR_{it}$.

H1a and *H1b* were further tested using three additional models for robustness.

Abnormal bad debt was also regressed using the same independent variables that were used for the testing of bad debt expense to sales and the allowance for doubtful accounts to accounts receivable as follows for Model 1R1:

Model 1R1. Regression results using Abnormal Bad Debt as dependent variable

$$ABNBDE = \beta_0 + \beta_1 BOTDEC_{it} + \beta_2 logASSETS_{it} + \beta_3 LEV_{it} + \beta_4 \frac{CASHFLOW}{ASSETS}_{it} + \beta_5 PE_{it-1} + \beta_6 CURRENT_{it} +$$
$$\beta_7 ALT_{it} + \beta_8 logBANKRUPT_{it} + \beta_9 AUDIT_{it} + \beta_{10} AUDIT_{it} * BOTDEC_{it} + \varepsilon_{it} \qquad (10)$$

The regression produced the following results:

Table 15. Regression results of Abnormal Bad Debt Expense (Model 1R1)

(Observations: 491)	Pred. sign	Coefficient	t-stat	p-value
Constant	?	0.0142	0.45	0.652
BOT_DEC	+	**0.0707**	**5.21**	**0.000**
logAssets	-	-0.0013	-1.45	0.150
LEV	+	0.0052	0.91	0.366
CASHFLOW/ASSETS	-	-0.0012	-0.08	0.937
Lagged PE	-	0.0000	-1.09	0.279
CURRENT	+	0.0087	0.75	0.455
ALT	+	0.0015	2.20	0.030
logBANKRUPT	-	-0.0015	-0.57	0.572
AUDIT	-	0.0019	0.25	0.801
AUDIT*BOT_DEC	-	**-0.0702**	**-5.28**	**0.000**
R^2	0.3209			
F	22.670			
Prob > F	0.0000			

These results are also consistent with the initial regressions. Underperforming firms increase bad debt expense; however, audit quality attenuates this tendency with both independent variables having *p-values* of zero are at the 99 percent confidence level.

An estimation of the allowance for doubtful accounts (*estALLOW*) as a percentage of accounts receivable for each year was calculated using the following:

$$\frac{estALLOW_{it}}{AR_{it}} = \beta_0 + \frac{\beta_1 AR_{it}}{SALE_{it}} + \varepsilon_{it} \qquad (11)$$

Upon obtaining the coefficients for each year, the estimated allowance for doubtful accounts as a percentage of accounts receivable was calculated for each year. Following those annual calculations of estimated allowance for doubtful accounts as a percentage of accounts receivable for each year, abnormal allowance for doubtful accounts as a percentage of accounts receivable (*ABNALLOW*) was calculated using actual bad debt as a percentage of sales less estimated bad debt as a percentage of sales. A regression Model 1R2 was run again using *ABNALLOW* as the dependent variable.

Model 1R2. Regression results using Abnormal Allowances as dependent variable

$$ABNALLOW = \beta_0 + \beta_1 BOTDEC_{it} + \beta_2 logASSETS_{it} + \beta_3 LEV_{it} + \beta_4 \frac{CASHFLOW}{ASSETS}_{it} + \beta_5 PE_{it-1} + \beta_6 CURRENT_{it} +$$
$$\beta_7 ALT_{it} + \beta_8 logBANKRUPT_{it} + \beta_9 AUDIT_{it} + \beta_{10} AUDIT_{it} * BOTDEC_{it} + \varepsilon_{it} \qquad (12)$$

The regression results of abnormal allowance   for doubtful accounts produced the following:

Table 16. Regression results of Abnormal Allowance for Doubtful Accounts (Model 1R2)

(Observations: 491)	Pred. sign	Coefficient	t-stat	p-value
Constant	?	0.3054	1.31	0.193
BOT_DEC	**+**	**0.4582**	**2.73**	**0.008**
logAssets	-	-0.0149	-2.39	0.019
LEV	+	0.0142	-0.33	0.742
CASHFLOW/ASSETS	-	0.1943	1.75	0.083
Lagged PE	-	-0.0001	-1.28	0.203
CURRENT	+	-0.0068	-0.87	0.385
ALT	+	0.0008	0.21	0.837
logBANKRUPT	-	-0.0137	-0.74	0.461
AUDIT	-	-0.0511	-0.96	0.339
AUDIT*BOT_DEC	**-**	**-0.4392**	**-2.65**	**0.010**
R²	0.4279			
F	10.180			
Prob > F	0.0000			

Once again, these results are consistent with the initial regressions. Underperforming firms increase bad debt expense (higher allowance for doubtful accounts); however, audit quality attenuates this tendency with both independent variables having *p-values* of less than 0.05 are statistically significant at the 95 percent confidence level.

H2a and *H2b* are also further tested by regressing abnormal bad debt and abnormal allowance as described above.

Model 2R1 using abnormal bad debt as the dependent variable is as follows:

Model 2R1. Regression results using Abnormal Allowances as dependent variable

$$ABNBDE = \beta_0 + \beta_1 EPS\_CLOSE\_OVER_{it} + \beta_2 logASSETS_{it} + \beta_3 LEV_{it} + \beta_4 CASHFLOW/ASSETS_{it} + \beta_5 PE_{it-1} + \beta_6 CURRENT_{it} + \beta_7 ALT_{it} + \beta_8 logBANKRUPT_{it} + \beta_9 EPS\_CLOSE\_OVER_{it} * AUDIT_{it} + \beta_{10} AUDIT_{it} + \varepsilon_{it}$$ (13)

The results of the regressions produced the following results:

Table 17. Model 2R1 regression results: Dependent variable – Abnormal Bad Debt

(Observations: 491)	Coefficient	t-statistic	p-value
Constant	0.057988	0.99	0.325
EPS_CLOSE_OVER	**-0.027056**	**-2.55**	**0.013**
logASSETS	-0.002120	-2.15	0.034
LEV	0.003605	0.44	0.658
CASHFLOW/ASSETS	-0.020220	-1.28	0.206
Lagged PE	-0.000012	-0.77	0.442
CURRENT	-0.000454	-0.30	0.762
ALT	0.001537	1.79	0.077
logBANKRUPT	-0.002713	-0.58	0.565
EPS_CLOSE_OVER*AUDIT	**0.231049**	**2.42**	**0.018**
AUDIT	-0.016113	-1.60	0.113
R²	0.1662		

The variables of interest are significant. Firms just over analysts' projections decrease bad debt expense. Again, this is mitigated by quality auditors.

Both variables have *p-values* less than 0.05 and are significant at the 95 percent level.

Model 2R2 using abnormal allowance as the dependent variable is as follows:

Model 2R2. Regression results using Abnormal Allowances as dependent variable

$$ABNALLOW = \beta_0 + \beta_1 EPS\_CLOSE\_OVER_{it} + \beta_2 logASSETS_{it} + \beta_3 LEV_{it} + \beta_4 CASHFLOW/ASSETS_{it} + \beta_5 PE_{it-1} + \beta_6 CURRENT_{it} + \beta_7 ALT_{it} + \beta_8 logBANKRUPT_{it} + \beta_9 EPS\_CLOSE\_OVER_{it} * AUDIT_{it} + \beta_{10} AUDIT_{it} + \varepsilon_{it}$$ (14)

Table 18. Model 2R2 regression results: Dependent variable – Abnormal Allowance

(Observations: 491)	Coefficient	t-statistic	p-value
Constant	0.593387	1.42	0.158
EPS_CLOSE_OVER	**-0.217381**	**-2.88**	**0.005**
logASSETS	-0.020562	-3.01	0.003
LEV	-0.022560	-0.04	0.719
CASHFLOW/ASSETS	0.051408	0.33	0.740
Lagged PE	-0.000075	-0.79	0.432
CURRENT	-0.155183	-1.26	0.211
ALT	0.001029	0.2	0.840
logBANKRUPT	-0.022010	-0.63	0.528
EPS_CLOSE_OVER*AUDIT	**0.212850**	**2.80**	**0.006**
AUDIT	-0.167402	-2.15	0.034
R^2	0.2504		

The results of this regression are also consistent with prior models. Underperforming firms increase bad debt expense (higher allowance for doubtful accounts); however, audit quality attenuates this tendency with both independent variables having *p-values* of less than 0.05 are significant at the 95 percent confidence level.

H3a states that firms with net income before bad debt expense that is just under analysts' projections modify bad debt expense to meet expectations. *H3b* states that this tendency is attenuated by high-quality audits. *H3a* and *H3b* are also further tested using abnormal bad debt expense and abnormal allowance as dependent variables.

Model 3R1. Using abnormal bad debt as the dependent variable

$$ABNBDE = \beta_0 + \beta_1 EPSBELOW_{it} + \beta_2 logASSETS_{it} + \beta_3 LEV_{it} + \beta_4 CASHFLOW/ASSETS_{it} + \beta_5 PE_{it-1} + \beta_6 CURRENT_{it} + \beta_7 ALT_{it} + \beta_8 logBANKRUPT_{it} + \beta_9 EPSBELOW_{it} * AUDIT_{it} + \beta_{10} AUDIT_{it} + \varepsilon_{it} \quad (15)$$

Table 19. Model 3R1 regression results: Dependent variable – Abnormal Bad Debt Expense

(Observations: 491)	Coefficient	t-statistic	p-value
Constant	0.057829	0.98	0.328
EPSBELOW	**-0.024388**	**-2.29**	**0.025**
logASSETS	-0.002118	-2.15	0.034
LEV	0.003663	0.45	0.654
CASHFLOW/ASSETS	-0.020203	-1.27	0.207
Lagged PE	-0.000012	-0.87	0.423
CURRENT	-0.004694	-0.31	0.754
ALT	0.001543	1.81	0.075
logBANKRUPT	-0.002702	-0.57	0.568
EPSBELOW*AUDIT	**0.022643**	**2.1**	**0.039**
AUDIT	-0.016061	-1.59	0.115
R^2	0.1662		

This regression shows those firms with net income before bad debt expense that is just under analysts' projections are a significant factor in creating abnormal bad debt expense – lower bad debt expense. This tendency is attenuated by quality audit firms. Both independent variables have *p-values* of less than 0.05 are significant at a 95 percent confidence level.

Model 3R2. Using Abnormal Allowance as the dependent variable

$$ABNALLOW = \beta_0 + \beta_1 EPSBELOW_{it} + \beta_2 logASSETS_{it} + \beta_3 LEV_{it} + \beta_4 CASHFLOW/ASSETS_{it} + \beta_5 PE_{it-1} + \beta_6 CURRENT_{it} + \beta_7 ALT_{it} + \beta_8 logBANKRUPT_{it} + \beta_9 EPSBELOW_{it} * AUDIT_{it} + \beta_{10} AUDIT_{it} + \varepsilon_{it} \quad (16)$$

The regression produced the following results:

Table 20. Model 3R2 regression results: Dependent variable – Abnormal Allowance

(Observations: 491)	Coefficient	t-statistic	p-value
Constant	0.596567	1.43	0.156
EPSBELOW	**-0.232600**	**-3.04**	**0.003**
logASSETS	-0.020549	-3.01	0.003
LEV	-0.023012	-0.37	0.713
CASHFLOW/ASSETS	0.050273	0.33	0.743
Lagged PE	-0.000076	-0.80	0.426
CURRENT	-0.156419	-1.27	0.070
ALT	0.001063	0.21	0.835
logBANKRUPT	-0.222317	-0.64	0.524
EPSBELOW*AUDIT	**0.229152**	**3.01**	**0.004**
AUDIT	-0.168074	-2.14	0.033
R^2	0.2513		

As was the case with Model 3R1, this regression also shows that those firms with net income before bad debt expense that is just under analysts' projections are a significant factor in creating abnormal bad debt expense – lower bad debt expense. This tendency is attenuated by quality audit firms. Both independent variables have *p-values* of less than 0.05 and significant at a 95 percent confidence level. All the above are consistent with earlier findings.

In addition to the above alternative models, the study included both measures of bad debt expense as a percentage of the sale and the allowance for doubtful accounts as a percentage of accounts receivable.

5. CONCLUSION

H1a states that companies with severe losses or severely underperforming will increase their bad debt expense or take a "big bath" to build an excessive allowance for doubtful accounts. In testing this, the poorest performing firms, those whose net income to assets, were in the bottom decile of the sample (*BOT_DEC*) were the variable of interest. The null hypothesis is rejected. Poorest performing firms increase their bad debt expense. *H1b* states that high-quality audits attenuate the tendency for firms with severe losses or substantially underperforming to report high bad debt expense. This null hypothesis is also rejected. High quality auditors attenuate the tendency for underperforming firms to increase bad debt expense.

Stated simply, *H2* and *H3* provide an answer to why companies have overstated their allowance for doubtful accounts as Bryan et al. (2021) have reported. We postulated that companies would utilize their excess reserves created through either cookie jar reserves (excessive conservatism applied over time) or a big bath charge (making the allowance even larger during the crisis) (Watts, 2003b), by reversing them when earnings are slightly below analysts' expectations (*H2a*) to create zero surprise or when earnings before bad debt expense are slightly above analysts' projections to create positive surprise. In addition, *H2b* and *H2b* state that high-

quality audits attenuate the tendency for firms in these circumstances to understate bad debt expense.

The results of Models 2a, 2b, 3a, and 3b provide significant results. These results were confirmed via robustness testing of Models 2R1, 2R2, 3R1, and 3R2 where abnormal bad debt and abnormal allowance were regressed. Companies whose net income before bad debt expense that was either slightly over or slightly under analysts' projections reduced their bad debt expense. *H2b* and *H3b* state that high-quality audits reduce the tendency for forms described above to reduce their bad debt expense to meet or beat analysts' projection. Companies that are close to meeting or beating analysts' projections will, relative to other firms, report lower bad debt expense, but high-quality auditors attenuate this negative relation. Therefore, the null hypotheses for *H2b* and *H3b* are rejected.

The data only looked at companies in the chemical and allied products manufacturing industry; therefore, the results may not hold true for other industries. Only a small percentage of companies met the thresholds for earnings manipulation. With such a small sample, even if misses had been significant, conclusions of earnings manipulation would be difficult to generalize. Also, models had low R^2 results due to the small percentage of companies meeting the criteria.

Since the study is in only one industry, additional research into other industries should be completed to determine to what extent results can be generalized. Other valuation accounts, such as those for inventory and taxes, are also required by generally accepted accounting principles. These accounts could be subject to manipulation by management and are worthy of study. As is the case with the allowance for doubtful accounts, both the inventory reserve account and the income tax valuation account require disclosure of activity in Schedule II. Inventory valuation reserves would change in a manner like the allowance for doubtful accounts. The current period's reserve should be realized as losses in the next period. Therefore, the methodology utilized in this study could be modified to test inventory valuations in companies with significant inventories.

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