Unfaithful Representation: Understating Accounts Receivable In The Name Of Conservatism

Timothy Gordon Bryan, DBA, CPA
Assistant Professor of Accounting
Lewis College of Business, Brad Smith Schools of Business
Marshall University, USA

Mark A. McKnight, Ph.D., CFE
Associate Professor of Accounting
Romain College of Business, University of Southern Indiana, USA
Email: mamcknight@usi.edu

Robert Houmes, Ph.D., Professor of Accounting,
Thomas R. McGehee Endowed Chair of Accounting
Davis College of Business, Jacksonville University, USA

Abstract

This research empirically examines the relationship between conservatism in accounting and the allowance for doubtful accounts. A sample of companies' financial data related to the allowance for doubtful accounts and bad debt expense in the chemical and allied products manufacturers industry, SIC 28, for the period from 2005 through 2017 was obtained. The results of analysis of this data indicate that the allowance for doubtful accounts is overstated in these firms and has become more overstated since 2004. This research is important as few have researched the allowance for doubtful accounts, and that research has not considered the allowance for doubtful accounts as a percentage of the accounts receivable balance.
Keywords: bad debt, allowance for doubtful accounts, conservatism, write-off, cookie-jar reserves

Introduction

Conservatism permeates accounting standards. Generally, conservatism provides that accountants tend to wait until virtual certainty for recording good events while merely probable for recording bad events. Statement of Financial Accounting Concepts (SFAC) No. 2 states that conservatism is a reasonable reaction to unknown, and if multiple equally possible estimates are available then the less optimistic estimate should be recognized (FASB, 1980). Conservatism refers to the adage "anticipate no profits and provide for all probable losses" (Bliss, 1924). This definition of conservatism has been restated to report the lowest possible alternative value for assets but the highest possible value among alternatives for liabilities (Watts and Zimmerman, 1986).

The research focuses on conservatism as it relates to the allowance for doubtful accounts in the chemical and allied products manufacturers (SIC 28) industry due to the number of publicly traded firms in the industry and their relatively large accounts receivable balances. The U.S. Department of Labor indicates that businesses in this group include those producing:

- Industrial inorganic chemicals
- Plastics and resins
- Drugs
- Soaps, detergents, cleaning preparations and toiletries
- Paint, varnishes, lacquers and enamels
- Industrial organic chemicals
- Agricultural chemicals, and
- Miscellaneous chemical products

This research studies the understatement of accounts receivable and the continually increasing level of understatement. This research is important because only a 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) model bad debt expense based on three economic determinants that explain a significant portion of bad debt expense. Others find that firms manage earnings using receivables (Teoh *et al.*, 1998; Marquardt and Wiedmand, 2004; Caylor, 2010). Jackson and Liu (2010) performed extensive research on the allowance for doubtful accounts across broad industries from 1980 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.

Accounts receivable represents amounts due from customers because of credit sales to the customers and is typically recorded as a current asset on the balance sheet (Financial Accounting Foundation, 2017e). For companies that typically extend such credit to customers, accounts receivable can be material to their financial statements. Accounts receivable are reported on the balance sheet at net realizable value, which is the estimated amount a firm can expect to collect from its customers (Gordon *et al.*, 2016). The net realizable value is reported as the asset account of accounts receivable less a contra-asset account of allowance for doubtful accounts on the balance sheet (Gordon *et.al.*, 2016). Therefore, the allowance for doubtful accounts is an estimate by the firm of the amounts it will not collect from customers.

Accounting standards generally accepted in the United States require companies to estimate losses (in this instance bad debt expense) when it is probable that a loss has occurred, and the amount of the loss can be reasonably estimated (Financial Accounting Foundation, 2017e). Estimating the probable bad debt should be based on the company's prior experience, information about customers, current economic conditions, or industry standards (Financial Accounting Foundation, 2017e). Companies record bad debt related to accounts receivable with a debit to bad debt expense (an income statement account) and a credit to allowance for doubtful accounts (a balance sheet account) (Gordon *et.al.*, 2016). When conditions become known that a customer will not pay an outstanding receivable, the company will "write-off" the receivable or remove the balance from the balance sheet. Since the dollar amount of write-offs related to accounts receivable has already been estimated through the allowance for doubtful accounts, the method of recording the write-off is to reduce the

accounts receivable balance by the now known unpaid account through a credit to the account and reduce the allowance for doubtful accounts through a debit by the same amount (Gordon *et.al.*, 2016).

There are generally two broad methods of estimating probable bad debt based on prior experience: one is based on a percentage of the current period's credit sales and the other is based on a percentage of outstanding receivables (Gordon *et.al.*, 2016). 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 and 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.

Literature Review
Conservatism is studied and utilized in two forms: conditional and unconditional. The significant difference between the two is 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).

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. As an example, 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). Another example of conditional conservatism would include lower of cost or market for inventory. In this practice, inventory value is lowered if market conditions indicate the original cost exceeds current replacement cost (Financial Accounting Foundation, 2017b). The opposite is not reported when inventory replacement costs become higher than the original cost of inventory (Financial Accounting Foundation, 2017b).

Another example of conditional conservatism would be loss contingencies. Loss contingencies result when the likelihood of a future event related to a current or prior period will cause economic loss to an entity is probable (Financial Accounting Foundation, 2017c). If the amount of the loss can be reasonably estimated and the likelihood of the loss is probable, then the entity should record a charge (loss) to income (Financial Accounting Foundation, 2017c). However, a gain contingency that meets all the same requirements of a loss contingency, except it results in probable economic benefit, is not recorded (Financial Accounting Foundation, 2017d). This contrasting treatment is conservatism.

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 and Taylor, 2015). An example of

unconditional conservatism would be the last in first out (LIFO) method of inventory cost flow. Under a typical inflationary environment, LIFO results in lower inventory values than other inventory cost flow methodologies because it expenses the most recent costs and values inventory at the oldest costs (Gordon *et.al.*, 2016). Accelerated depreciation expenses most of an asset's value early in the asset's useful life and represents unconditional conservatism. Other examples of unconditional conservatism would include expensing research and development costs and expensing advertising costs (Ruch and Taylor, 2015).

Conservatism in accounting is an almost ancient practice. Sterling (1967) believes conservatism in accounting is the most widespread and oldest accounting principle. An analysis of Italian and German merchant records dating as far back as the early fifteenth century describes applying conservatism primarily to reduce taxes (Penndorf, 1930). In the late 16th century, Benedictine monks published accounting guidelines including accounting for inventory, their guidance was that goods should always be valued at a standard price lower than market to always sell at a profit (Vance, 1943). In the late 18th century, Prussia required valuation of inventory at (lower of) cost or market to combat fraudulent over-reporting of inventory (Vance, 1943). Vance (1943) concludes his historical research of inventory cost methods that they grew out of the needs of businessmen. Watts (2003a) believes conservatism has arisen out of four business needs: contracting, litigation avoidance, taxes and regulation.

Basu (1997) explains that conservatism arises naturally between parties in a contractual arrangement. The natural tendency toward conservatism stems from opposing benefits from contracting parties or asymmetry. Conservatism is a means of addressing the differing information available to contracting parties, asymmetric payoffs, varying time frames and limited liability or benefits (Watts, 2003a).

Several have suggested the benefit of accounting conservatism for efficiency in contracting debt specifically (Watts, 2003a; Watts, 2003b; Basu, 1997; Zhang, 2008). The general idea with lending is lenders do not benefit from better than expected news; however, they do benefit from conservatism being applied by signaling potential default (Zhang, 2008; Basu, 1997). Another way of looking at this is debt holders do not benefit if a firm does very well and produces higher than expected net assets (Watts, 2003a). The debt holders only receive the re-payment of their loan to the firm. However, if a firm has lower than anticipated net assets (an amount insufficient to re-pay the debt), the debt holders lose. This asymmetric benefit for debt holders causes the creditors to be more concerned with bad news resulting in inadequate net assets (Watts, 2003a). Therefore, creditors benefit from firms employing conservatism. Creditors also tend to place some type of lower limit on net assets that allows the creditors to call the debt and restrict management's actions that could lower net assets (Beneish and Press, 1993), (Watts, 2003a). The financial crisis and credit crunches led to firms needing to raise financing (Ivanshina and Scharstein, 2010), and several have found that firms employing conservatism enjoy lower financing costs (Ahmed *et al.*, 2002; Zhang, 2008; Francis *et al.*, 2013).

Positive accounting theorists attempt to explain and forecast actual accounting practices by firms rather than prescribe what should be done (Watts and Zimmerman, 1978). Positive accounting theory believes that conservatism in accounting is an efficient mechanism for contracting and governing firms to address information asymmetry and agency problems (Watts, 2003a; LaFond and Watts, 2008). This means boards can govern firm management better using accounting conservatism (Ahmed and Duellman, 2007). Agency costs happen when managers or other firm-related parties consider or maximize their own payoffs instead of the firm's (Watts, 2003a). Contracts between the parties requiring certain conservative accounting methodologies can help firms reduce these agency costs (Watts and Zimmerman, 1986). Managers naturally have motivations to prevent losses (or even hide them) to avoid being reprimanded, have bonuses reduced or being fired. Basu (1997) believes managers utilize conservative accounting to avoid compensation losses due to their own bias. Yao and Deng (2018) find that managers will manipulate working capital components, including accounts receivable, for managing earnings and resulting incentives. Also, earnings that have been measured conservatively can result in future, long-term benefits to managers through deferred compensation plans at retirement (Smith and Watts, 1982).

Watts (2003a) believes all types of conservatism benefit contracting by constraining management's behavior. Some believe that only conditional conservatism improves contracting efficiency because it provides parties with new information; however, unconditional conservatism does not provide outside parties with new information (Ball and Shivakumar, 2005).

Firms that utilize conservative accounting can have reduced litigation costs because a firm is more likely to face shareholder litigation by overstating net assets than by understating net assets through conservatism (Watts, 2003a). Watts (2003a) also believes conservatism reduces the possibility of regulators and standard setters being criticized by placing value on conservatism as a constraint to managers. Leftwich (1995) found that most of the FASB agenda items and decisions from the mid-seventies to the mid-nineties resulted in delayed income recognition and increased liabilities. Givoly and Hayn (2002) believe this focus by the FASB was due to the ever-increasing litigious environment in the United States. Even earlier, Skinner (1994) found managers are more likely to let investors know about bad news than good news to avoid litigation.

Similar to the Italian merchants trying to lower their *ad valorem* taxes, Basu (1997) asserts most forms of unconditional conservatism arose from tax benefits. In the early 20th century, U.S. tax law provided for deductions of reasonable amounts for the exhaustion or wear and tear of property used in business (Saliers, 1939). Saliers (1939) points out that not long after this, businesses started utilizing the conditional conservatism of lower of cost or market for inventories more frequently and the unconditional conservative double declining balance method of depreciation. Double declining balance method of depreciation uses a rate that is double the straight-line rate applied to the book value (cost less accumulated depreciation) of an asset resulting in much higher depreciation early in an asset's life and lower depreciation later (Gordon *et.al.*, 2016). The inventory cost flow method of LIFO developed out of an older

inventory method referred to as base stock method which was not allowed for calculating income taxes (Davis, 1982). The use of LIFO by firms increased substantially following World War II in response to higher inflation and to lower income taxes (Davis, 1982). Since income taxes were not introduced until the late 18th century, the use of unconditional conservatism methods such as these is relatively new compared with some conditional conservatism like the lower of cost or market for inventory (Basu, 2005). This leads to the assumption that income taxes have played a major role in the acceptance and use of unconditional conservatism in accounting. Firms can lower their taxes by employing conservatism because conservatism recognizes expenses relatively early and delays revenues.

In some cases, conservatism arose out of regulatory environment. Boockholdt (1978) notes that nineteenth and early twentieth century rail companies in the United States were subject to tremendous regulation by the federal government. Much of the regulation had to do with logs of shipments, but railroad companies also had to report results of operations and financial condition in voluminous annual reports. To reduce the likelihood of valuation adjustments being made by examiners or auditors for reasonable valuation of assets and because rail companies had tremendous investments in fixed assets, most railroad companies adopted the double declining balance method for depreciation (Boockholdt, 1978).

Earnings that repeat over time are persistent. Applying conservatism, however, results in asymmetry in the timeliness of information and persistence of earnings. Further, bad news is timelier, yet less persistent, while good news is less timely but more persistent (Basu, 1997). Another way to put this is bad news does not necessarily repeat; goods news often repeats. 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 and Taylor, 2015). However, as noted above, accounting practices and standards still utilize the concept of conservatism as the reasoning.

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 and Skantz, 2010). In the case of applying conservatism, the bad news is recorded before the resulting decrease in cash flows or expenditure (Byzalov and Basu, 2016).

Balachandran and Monhanram (2011) observe that 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.

In its supersession of SFAC No. 2 through SFAC No. 8, the Financial Accounting Standards Board (FASB) comments that conservatism is excluded from the new financial accounting concepts because it directly conflicts with neutrality (FASB, 2010). Conservatism has deep roots in accounting perhaps dating back hundreds of years (Basu, 1997; Watts, 2003a). Under the concept of neutrality, conservatism has no

place in accounting standards (FASB, 2010). Conservatism is an intentional understatement of a firm's net worth which is not a neutral viewpoint. In establishing SFAC No. 8, the FASB believes financial information should be neither understated nor overstated (FASB, 2010). Both understatement and overstatement impair outside users' ability to make decisions related to a firm which is the ultimate objective of financial reporting. Conservatism, by definition, can understate income and assets. The FASB conclusion was this is not faithful representation. They believe neutrality should be the goal of financial reporting. It should be noted, however, that a SFAC is a guideline for establishing standards and not a standard in and of itself. Generally accepted accounting principles in the United States still contain conservatism across many areas as discussed above and many would argue is a necessary part of accounting standards (Watts, 2003a; Watts, 2003b; Francis *et al.*, 2013).

Since conservatism is so much a part of accounting standards and the resulting financial reporting, many have attempted to measure the level of conservatism employed by firms. Generally, conservatism is measured using one of three methods: net assets, earnings and accrual methods, and earnings related to stock returns. Net asset models attempt to measure the extent that assets are undervalued due to the application of conservatism (Watts, 2003b). Earnings measures generally hold that losses are more likely to reverse in future periods than gains (Watts, 2003b; Jackson and Liu, 2010). The measures attempt to estimate the lag in this reversal. Accrual methodologies attempt to measure negative accruals over a long period of time (Givoly and Hayn 2002). Stock return methodology starts with the assumption that losses are typically reflected in the stock price during the same period reported. However, gains are recognized in stock prices earlier than they are ultimately reported through financial statements (Basu, 1997).

The overwhelmingly most widely used measure of conservatism is Basu's (1997) asymmetric timeliness of earnings measure (AT) (Wang, et.al., 2009). Asymmetric timeliness means that, due to conservatism, earnings reflect bad news quicker than good news (Basu,1997). The regression estimates a slope coefficient on how timely stock return is recognized in earnings based on the type of news utilizing the dummy variable to distinguish between the news (Basu, 1997). As the most often cited measure of conservatism, the Basu regression obviously has strengths (Wang, *et.al.*, 2009). It has been widely used for over twenty years; many researchers utilizing the AT measure have produced results that are consistent with their predictions increasing both the confidence in the model and the theory; and the Basu regression works well with large cross-sectional analysis (Ryan, 2006).

Another methodology used to measure conservatism is the market-to-book or book-to-market ratio. This methodology utilizing the assumption that all other things being equal, conservatism in accounting depresses the book value of a firm relative to the true economic value of the firm (Givoly *et.al.*, 2007). This general methodology is based on the residual income valuation model whereby Feltham and Ohlson (1995) incorporated accounting conservatism in a valuation context (Givoly *et.al.*, 2007). Beaver and Ryan

(2000) later developed a model utilizing six years of lagged stock returns in a panel data regression.

Givoly and Hayn's (2000) negative accrual measure uses non-operating accruals as a subset of book value. By deferring gains and accelerating recognition of losses, this model measures the general increase in conservatism over time (Givoly and Hayn, 2000). A similar methodology is the hidden reserve (or cookie jars) method developed by Penman and Xiao-Jun (2002). Their model creates a *C score* that consists of the estimated hidden reserve divided by the net operating assets of the firm (operating assets minus operating liabilities, excluding financing liabilities). Givoly *et al.*, (2007) point out that the estimated reserve method involves a lot of estimation to derive another estimation. It is also apparent the model does not apply to firms who do not utilize LIFO but may have significant lower of cost or market adjustments in their inventory. The model also does not take into consideration any other potential "cookie jars" such as the allowance for doubtful accounts and inventory obsolescence.

The Basu regression, AACF, market-to-book ratio, negative accrual measure, and *C Score* utilize aggregate accounting measures and end up with the conclusion that accounting is conservative and has become more conservative over time (Watts, 2003a). 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 and Liu, 2010). Their study finds that between 1980 and 2004 the average firm had amounts in its allowance for doubtful accounts enough to cover two and a half years of write-offs.

Their measures only look at the allowance as it relates to the income statement rather than also reviewing the balance sheet impact. Although they did report an average of the allowance account as a percentage of the total accounts receivable, they did not comment on the conservative nature of the ratio.

Hypotheses

As Jackson and Liu (2010) and others have indicated, excessive conservatism can be prevalent because auditors view overstatement of assets or understatement of liabilities as a higher risk than understatement of assets or overstatement of liabilities (Arens *et al.*, 2012). There is evidence in numerous studies that indicates auditors are permissive on the overstatement of the allowance for doubtful accounts and resulting understatement of net accounts receivable (Francis and Krishnan, 1999; Kinney and Martin, 1994; Nelson *et al.*, 2002). In fact, Nelson *et al.* (2002) find that auditors only adjust for overstated liabilities approximately 37% of the time. Jackson and Liu (2010) found that the allowance for doubtful accounts was conservative in a study of companies from 1980 through 2004. Therefore, hypothesis one is as follows:

> *H1*: The allowance for doubtful accounts is overstated by chemical and allied products manufacturers.

Repeated application of unconditional conservatism can create hidden reserves that can be released into income that distorts reported performance (Penman and Xiao-Jun, 2002). Jackson and Liu's (2010) illustration in Table 1, below, provides a vivid illustration of how these hidden reserves can build over time like the following:

Table 1 – Build-up of Cookie Jar Reserves in Allowance for Doubtful Accounts

Year	Beginning Allowance for Doubtful Accounts	Bad Debt Expense	Write-offs	Ending Allowance for Doubtful Accounts
1	-	1,000	-	1,000
2	1,000	1,000	900	1,100
3	1,100	1,000	900	1,200
4	1,200	1,000	900	1,300
5	1,300	1,000	900	1,400
6	1,400	1,000	900	1,500
7	1,500	1,000	900	1,600
8	1,600	1,000	900	1,700
9	1,700	1,000	900	1,800
10	1,800	1,000	900	1,900
11	1,900	1,000	900	2,000

This illustrates a company that is likely simply recording bad debt expense of $1,000 per year and only writing off $900 per year. In short time, the allowance account represents 2.2 years' worth of bad debts, or net accounts receivable is now understated by $1,100. Jackson and Liu (2010) found that on average firms had about 3.2 years' worth of bad debt in their allowance for doubtful accounts. Others have observed that in general conservatism has increased in accounting over the years (Watts, 2003a; Givoly and Hayn, 2000). Therefore, hypothesis two is as follows:

> *H2*: Chemical and allied products manufacturers have increasingly overstated their allowance for doubtful accounts since 2004.

Data and Methodology
A temporal analysis of bad debt expense has been performed.   *H1 and H2* are both measures of the size of the allowance for doubtful accounts as they would relate to reasonableness and consistency. Therefore, they are tested with the following:

$CON\_1 = ALLOW_{it}/WO_{it+1}$
$CON\_2 = BDE_{it} - WO_{it+1}$

ALLOW is the allowance for uncollectible accounts. *WO* is write-offs of uncollectible accounts. *BDE* is bad debt expense. *i* and *t* are firm and year subscripts.

In auditing these would be described as analytical procedures (Arens *et al.*, 2012). An analytical procedure is designed to allow an auditor to estimate what the dollar amount

of an account should be or set an expectation (Arens *et al.*, 2012). The expected value of *CON 1* is one. The allowance account should represent the amount of bad debt in accounts receivable that will not be collected. Since forms 10K do not indicate which sales year a write-off relates to, all the write-offs in year *t+1* will be assumed to be from year *t*. A value of greater than one indicates the allowance for doubtful accounts is overstated. Similarly, the expected values of *CON 2* is zero because the bad debt expense for period *t* is expected to equal the write-offs for period *t+1*. Values higher than these would indicate the allowance account is overstated.

We further test these assertions by empirically temporally examining the yearly medians for *CON_1* and *CON_2* over the years of this study (*YR*). This research assigns numbers for each year that increase sequentially over the 2005 to 2017 years where year 2005 is equal to 0 and 2017 is equal to 11.

That is:
$$ALLOW_{it}/WO_{it+1} = YR$$
$$BDE_{it} - WO_{it+1} = YR$$

A positive sign on the YR coefficients would provide support for the notion that firms have increasingly overstated their allowance accounts.

Traditionally, the allowance for doubtful accounts has been viewed as unconditional conservatism (Ruch and 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.

In gathering the data, this study obtained total accounts receivable, total allowance for uncollectible accounts, total assets and other firm-level data from 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 and Liu (2010) research) through 2017.

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. 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. These 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 and 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 and Liu, 2010). Again, this was not possible. Substantially all companies reported net write-offs or recoveries.

Table 2 – Summary Statistics for 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%

Results

H1 states that the allowance for doubtful accounts is overstated by companies, and *H2* states that the level of overstatement is increasing. These are tested by *CON_1 and CON_2.*

As noted above, $CON\_1 = ALLOW_{it}/WO_{it+1}$. Therefore, a zero value in WO_{it+1} results in an irrational number that cannot be analyzed. However, zero write-offs in companies that are recording bad debt expense could be a significant factor in measuring whether the allowance for doubtful accounts is overstated. Therefore, the researcher added .001 to all write-offs to eliminate zero write-offs. This did not modify any write-offs that were originally negative (net recoveries) or existing write-offs. However, it created values for the years where companies had zero write-offs. Both BDE and WO were winsorized at the 1st and 99th percentile levels utilizing Stata. The resulting data modifications had significant outliers due to extremely low write-offs creating extremely high means per year in *CON_1*. The overall mean for the 12 years was 1,263.10 and standard deviation of 377.34. The minimum value was 691.09 for 2006, and the maximum value was 1,817.32 for 2011. To put this in perspective, replacing zero write-

offs results in an average of 1,263 years of write-offs reserved by the allowance for doubtful accounts. Given the wide variation of the means, the medians are believed to be a better test.

While the means result in extremely high values for CON_1 the medians during the study period result in more reasonable values. The medians range from a low of 2.714 in 2008 to a high of 4.606 in 2011. As Table 3 indicates, the trend is increasing for the entire study period.

Table 3 – CON_1 Medians Replacing Zeros with .01
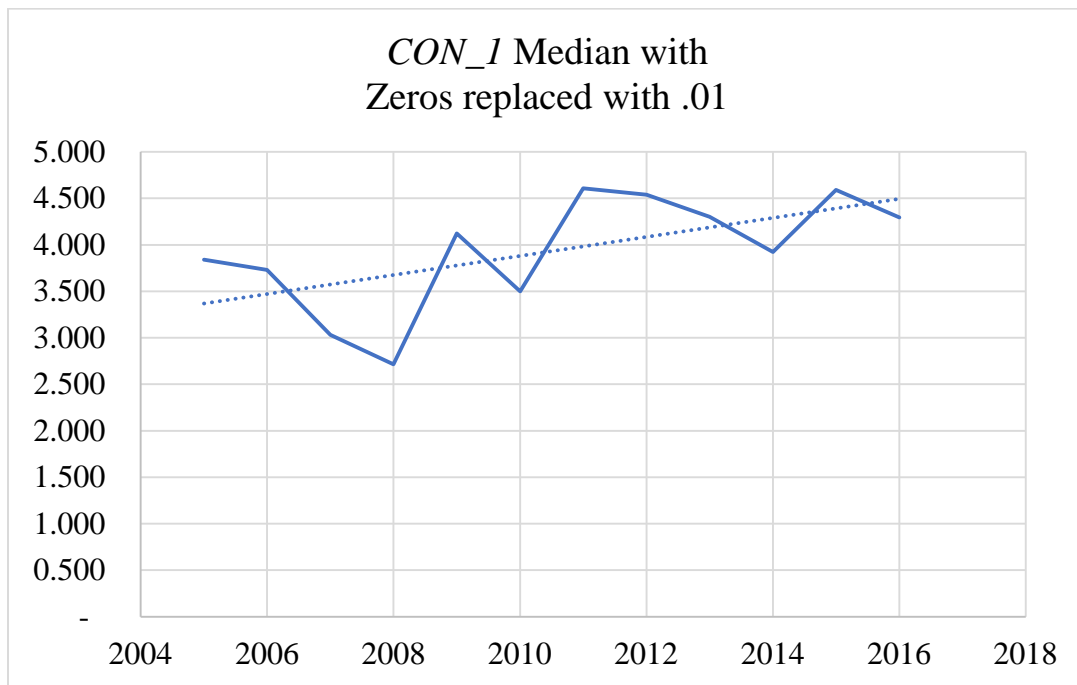
Jackson and Liu (2010) found on average companies had 3.031 years' worth of write-offs (*CON_1*) in 2004. They haphazardly utilized 5.5 years for missing write-offs. Based on their findings and the significant outliers causing very unusual calculations for *CON_1* means, missing *CON_1* values due to zero write-offs were re-keyed as 3.031. Also, negative *CON_1* values due to net recoveries were re-keyed as 3.031 as well. This treatment ignores the impact of a few companies with zero write-offs in specific years and, in some instances, companies with zero write-offs during the entire research period. Therefore, the actual results would be higher *CON_1* amounts if an estimate of *CON_1* for these companies could be obtained. The median for resulted in 3.031 for each period, so this methodology was rejected. The researcher believes utilizing the medians where zeros are replaced with .01 provides the best information for reaching conclusions.

A reasonable value for *CON_1* would be one, as this would assume that 100% of next year's write-offs are "reserved" by this year's allowance for doubtful account. However, even a value of one could be an overstatement in the allowance for doubtful accounts.

Most firms have an accounts receivable turnover ratio of significantly higher than one which means 100 percent of the dollar value of accounts receivables are collected more often than once a year. Table 4 presents summaries of the sample companies' accounts receivable turnover rations for the study period.

Table 4 – Accounts Receivable Turnover Ratios

|	Accounts Receivable Turnover Ratio	
	Mean	Median
2005	N/A	N/A
2006	8.32	6.77
2007	7.42	6.54
2008	7.69	6.95
2009	7.58	6.40
2010	7.31	6.42
2011	9.16	6.71
2012	8.60	6.37
2013	7.76	6.25
2014	7.88	6.35
2015	7.75	5.99
2016	6.38	5.94

In every year the sample companies' average accounts receivable turnover ratio is significantly higher than one which leads to the conclusion that a reasonable value for *CON_1* should be less than one. Never-the-less, the researcher will consider a *CON_1* value of one as reasonable even though it is conservative or marginally overstated. As noted earlier, Jackson and Liu (2010) observed a mean of 3.031 across all industries in 2004. This means for the year prior to this study, on average companies recorded an allowance of over three times the next year's write-offs.

As Table 3 shows, the median of *CON_1* with zeros replaced with .01. The medians ranged 1.892 with a low of 2.714 in 2008 to a high of 4.606 in 2011. The overall mean of the medians during the study period was 3.810.

CON_1 values greater than one for the entire 795 firm years was 742 or 92.9 percent of all observations with the overall mean for values greater than one of 7.585.

CON_2 is also a measure of overstatement of the allowance for doubtful accounts. As noted above, $CON\_2 = BDE_{it} - WO_{it+1}$. The expectation is that *CON_2* will zero or even less than zero is reasonable because the current year's bad debt expense should approximate the next year's write-offs. During the study period, *CON_2* ranged from a low of .1905 in 2006 to a high of 9.995 in 2009. The overall mean was 3.899 with a ninety-five percent confidence level of 1.984 for the period and a standard deviation of 2.95. Again, the trend for the study period is for *CON_2* to increase.

Table 5 – CON_2 Means
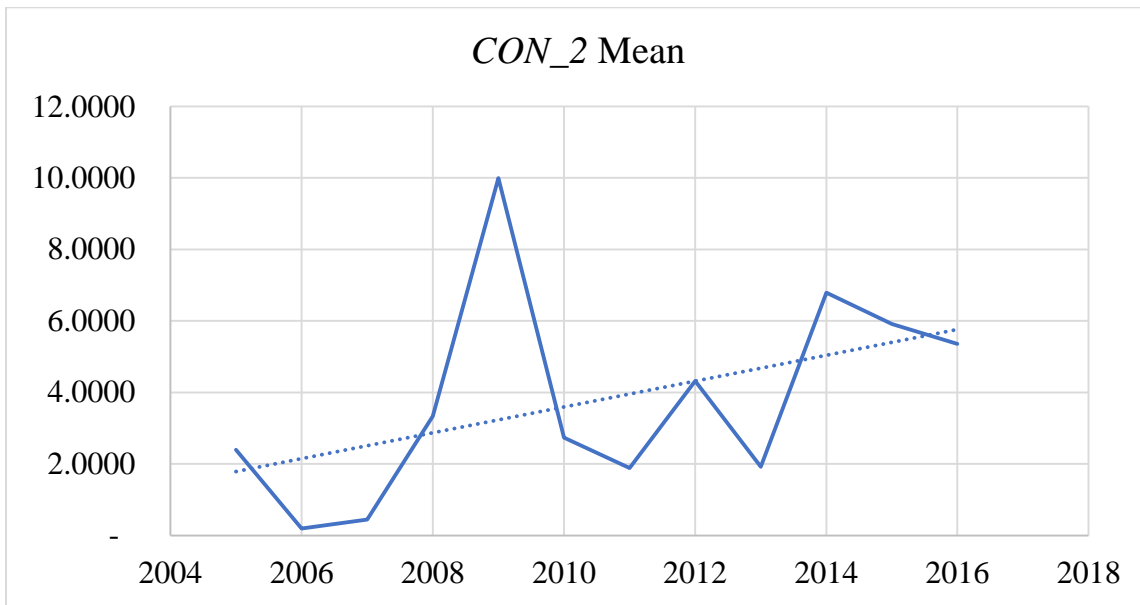
CON_2 Mean

The median for *CON_2* behaves in a similar manner with a minimum of (.132) and a maximum of 1.0. The overall trend of the medians for the companies in the study period is for *CON_2* to increase.

Table 6 – CON_2 Medians

CON_2 MEDIANS
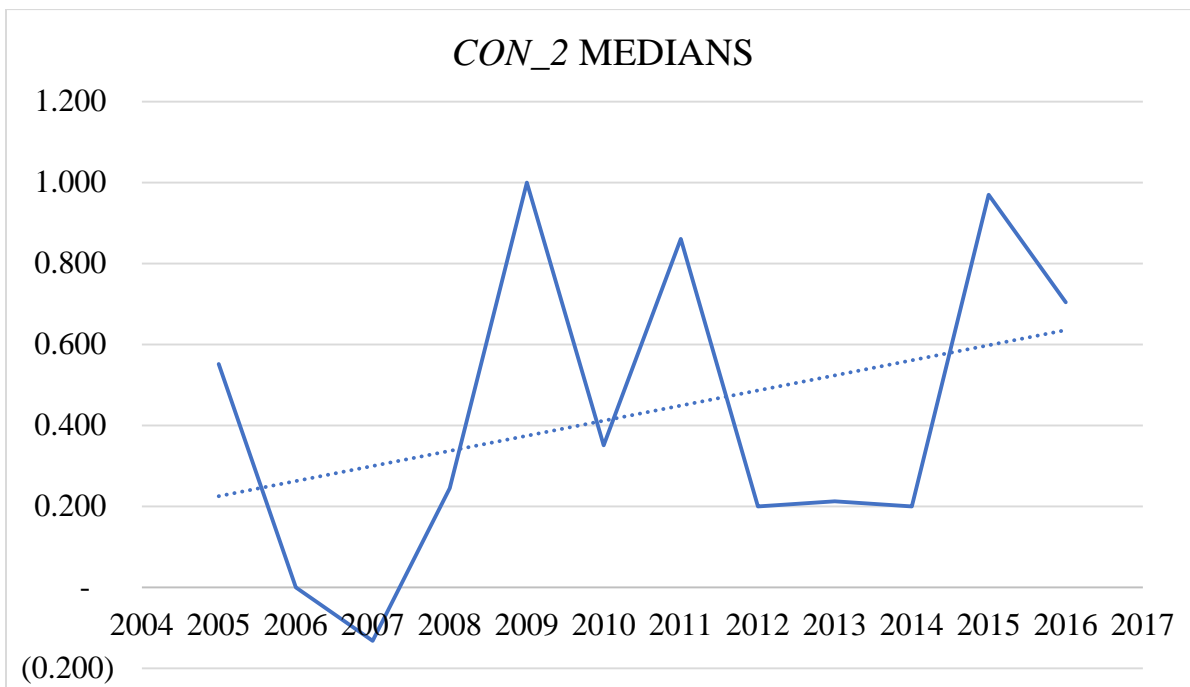
Similar to *CON_1,* where most firms exceed 1.0, the majority of firms have a *CON_2* exceeding zero. However, the percentages do not match exactly and are generally lower. Overall, 58.23 percent of the firms had *CON_2* greater than zero during the

study period.   Table 7 summarizes *CON_1* and *CON_2* where their respective thresholds are exceeded.

Table 7 – Percentage of Companies Exceeding CON_1 and CON_2 Thresholds

Year	CON_1 ≥ 1	CON_2 ≥ 0
2005	96.77%	62.90%
2006	90.48%	49.21%
2007	92.31%	44.61%
2008	93.55%	51.61%
2009	93.85%	73.85%
2010	92.19%	56.25%
2011	88.14%	54.24%
2012	95.38%	56.92%
2013	95.16%	56.45%
2014	95.24%	57.14%
2015	91.53%	69.49%
2016	90.57%	66.04%
Mean	92.93%	58.23%
Min	88.14%	44.61%
Max	96.77%	73.85%

H1 and *H2* are further tested by empirically, temporally examining the yearly medians for *CON_1* and *CON_2* over the years of this study (*YR*). Numbers are assigned for each year that increase sequentially over the 2005 to 2017 where year 2005 is equal to 0 and 2017 is equal to 11 as follows:

$$ALLOW_{it}/WO_{it+1} = YR$$
$$BDE_{it} - WO_{it+1} = YR$$

A positive sign on the YR coefficients would provide support for the notion that firms have increasingly overstated their allowance accounts.

Table 8 – YR independent variable of interest Median *CON*_1 and *CON*_2

Median *Con_1*	Coefficient	Standard Error	t - value	p-value	95% Confidence Interval	
YR	0.0111061	0.001716	6.47	0.000	0.007738	0.014475
Cons	2.890669	0.0148743	194.34	0.000	2.861472	2.919867
Median *Con_2*						
YR	0.104492	0.0058813	17.08	0.000	0.088904	0.111994
Cons	-0.264876	0.0509789	-5.20	0.000	-0.364945	-0.164806

Results show support the prior graphical depictions of *CON_1* and *CON_2* annual medians. For both equations, the coefficients on the *YR* independent variables of interest are positive and significant at the $p < .001$ levels.

Conclusions

Hypotheses 1

The first hypothesis is the allowance for doubtful accounts is overstated by chemical and allied products manufacturers. This hypothesis was first tested using the calculation of the allowance for doubtful accounts divided by the next year's write-offs of accounts receivable, or *CON_1*. As previously discussed, a value of one would be reasonable and still conservative. However, realistically, a value less than one would still be reasonable because during the study period from 2005 through 2016, the median accounts receivable turnover ratio ranged between 5.9 and 7.0 for the industry. This means that companies will collect their entire balance of accounts receivables approximately six time each year, so a *CON_1* of one is still probably an overstatement of the allowance for doubtful accounts. The median for *CON_1* over the entire study period was 3.92. The mean, due to several companies having zero write-offs, was a huge at 1,263 when zero write-offs were replaced with .01. As Panel 1 shows, the median of *CON_1* ranged from a low of 2.714 in 2008 to a high of 4.606 in 2011. The overall mean of the medians during the study period was 3.810. Approximately 93 percent of the sample companies had a *CON_1* greater than one during the study period.

The first hypothesis also was tested with the calculation of simply bad debt expense less next year's write off, or *CON_2*. A value of zero or even less would be reasonable. The results show the mean for *CON_2* during the study period ranged from 0.190 to 9.99 with an overall mean of 3.90. Approximately 58 percent of the sample companies had a *CON_2* of greater than zero during the study period.

Based on the results of analyzing *CON_1* and *CON_2*, the null hypothesis is rejected. The researchers conclude that the allowance for doubtful accounts is overstated by chemical and allied products manufacturers during the study period of 2005 through 2016.

Hypothesis 2

The second hypothesis is chemical and allied products manufacturers have increasingly overstated their allowance for doubtful accounts since 2004. This too was tested using *CON_1* and *CON_2* as described above. The researcher, utilizing Excel's graphing features, inserted a trend line into each of the line graphs of the means and medians of *CON_1* and *CON_2*. As illustrated in the graphs of *CON_1* and *CON_2,* shown on Panels one, two and three, each have a positive trend line in both the means and the medians. This assertion was further tested by empirically temporally examining the yearly medians for *CON_1* and *CON_2* over the years of this study (*YR*). Results of those regressions support the graphical depictions of *CON_1* and *CON_2*.

Based on these results, the null hypothesis is rejected, and the conclusion is chemical and allied products manufacturers have increasingly overstated their allowance for doubtful accounts since 2004.

Opportunities for Future Research

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.

Income tax valuation accounts could have more than one year before the ultimate realization of losses in deferred tax assets. Therefore, the methodology for testing would require expansion to multiple years depending on the nature of the underlying tax assets. However, the information for deferred tax assets and their ultimate realization is disclosed in the footnotes to the financial statements.

While there is strong inference that the allowance for doubtful accounts represents conditional rather than unconditional conservatism, this study does not directly test the classification. Therefore, addition research designed to specifically test the classification of bad debt expense could be performed.

Additional research is also available for the reasoning why companies have overstated their allowance for doubtful accounts. Do companies utilize their cookie jar reserves in the allowance for doubtful accounts to manipulate earnings?

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