Accounting & Taxation

VOLUME 10 NUMBER 1 2018

CONTENTS

Accounting & Taxation
Vol. 10, No. 1, 2018, pp. 1-21
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

IBFR
www.theIBFR.com

EMPIRICAL EVIDENCE ON THE RELATIONSHIP BETWEEN AUDIT PROBABILITY AND INTERNAL REVENUE SERVICE BUDGET LEVELS

Akinloye Akindayomi, The University of Texas Rio Grande Valley
Gideon T. Akinleye, Ekiti State University
Adeduro A. Ogunmakin, Ekit State University

ABSTRACT

Despite a large literature on tax avoidance strategies by individuals and the IRS ability to curb them, how the agency's audit/examination activities respond to tax expenditures within the individual taxation context is not well understood. We hypothesize that IRS audit probability of individual tax returns will positively respond to the magnitude of different tax expenditure drivers if the agency has a shot at curtailing them. We find that while the probability of IRS audit increases as the agency's budget on enforcement activities increases, tax expenditures do not appear to prompt IRS enforcement activities in many of the tax expenditures drivers.

JEL: H24, M40, M41

KEYWORDS: Tax Expenditures, Tax Avoidance, IRS Audit, Individual Income Taxation

INTRODUCTION

The prominence of tax expenditure in public and tax policy debates speaks to the controversies surrounding its desirability and measurement (see Burman et al., 2008). Equally controversial is its accounting and budgetary implications for the U.S. government. According to the Office of Management and Budget (2012), tax expenditures are defined as "revenue losses attributable to provisions of the Federal tax laws which allow a special exclusion, exemption, or deduction from gross income or which provide a special credit, a preferential rate of tax, or a deferral of tax liability". While some argue that tax expenditures are essentially a U.S. government off-budget financing through the tax code which must be quantified and reported for full disclosure, others believe that these expenditures cannot be accorded the same accounting and reporting treatments like other federal government expenditure lines such as education, defense, and health care among others. Tax expenditures are sizeable and believed to have consistently been a substantial percentage of the Gross Domestic Product (GDP) in the past four decades (estimated by the Tax Policy Center to be 7.3% of GDP in 2016). For example, the projections from the Office of Management and Budget put Tax Expenditures at $878 billion (over $700 billion in 2007) and $1.2 trillion for fiscal years 2008 and 2014 (October 1 through September 30), respectively. This suggests primarily that taxpayers' burden will be lowered by the respective figures at the expense of the U.S. treasury since the government arguably 'spends' the forgone revenue created by these type of 'latent' expenditures. In context, these figures translate to over 35% and 40% of the approved spending levels by Congress for the same respective periods.

Further, there is a lack of consensus on the definition of tax expenditures. As documented by Burton and Sadiq (2013), there is neither a universal definition of tax expenditure, nor a consensus among academics and practitioners on what should be its appropriate normative goal. Burton and Sadiq specifically writes,

"…we do not purport to provide a definitive answer to the question of what a tax expenditure is, but rather argue that there is no one answer." Notwithstanding the lack of its universal definition, we argue that the indisputable commonality in tax expenditure dynamics is that it is largely a product of tax avoidance strategies by individual taxpayers and corporations. It therefore remains an empirical question whether the Internal Revenue Service (IRS) has the ability to constrain those taxpayers' tax avoidance strategies thereby, limiting the amount of tax expenditures that taxpayers receive from this 'latent' government off-balance sheet spending. This off-balance sheet government spending is considered to be dominated by individual taxation relative to corporate taxation. For example, the tax expenditures for fiscal year 2014 are 87% individual and 13% corporate (Cole, 2014). Although individual income taxation is the larger 'player' in tax expenditures, the existing literature examining the latter within the context of the former is relatively limited.

Therefore, within the individual income tax context, and knowing fully that the IRS is a "strategic actor" in the tax compliance scheme (Dubin and Wilde, 1988), we specifically investigate whether the IRS audit/examination activities respond to the levels and direction of tax expenditure drivers at different income groups given the agency's budget activity on tax law enforcement between 1993 and 2011. These tax expenditure drivers are: (1) charitable contributions, (2) home mortgage interest deductions, (3) casualty or theft loss deductions, (4) medical and dental expenses deductions, (5) gambling loss deductions, (6) miscellaneous deductions other than gambling, (7) unreimbursed employee business expenses, (8) tax preparation fees, (9) miscellaneous deductions subject to 2% AGI limitation, and (10) total tax credits.

The findings of this study reveal that IRS enforcement activities regarding auditing/examination of individual tax returns largely ignores the magnitude of the dollar amounts and the directions of many of the tax expenditure drivers investigated in this study. In some cases, IRS enforcement activities are arguably counter-productive as there is a significant negative relationship between tax expenditure drivers (i.e. charitable contributions, miscellaneous deductions other than gambling, and miscellaneous deductions subject to 2% AGI limitation) and the probability of audit in a given year and across the various levels of tax income groups. With the exception of home mortgage interest deductions, which is significant and positive, other tax expenditure drivers (i.e. casualty or theft loss deductions, medical and dental expenses deductions, gambling loss deductions, unreimbursed employee business expenses, tax preparation fees, and total tax credits) are not shown to be significantly related to IRS audit/examination activities of individual tax returns, notwithstanding the consistent allocation of budgetary resources by the agency to auditing/examination of these tax expenditure drivers (as the IRS budget on enforcement is significantly positive in all of our empirical models).

Uniquely, this study contributes to the literature as it contextualizes tax expenditures study within the individual taxation environment as many studies tend to focus on corporate tax avoidance (see for example, Dyreng et al., 2010; Hoopes et al., 2012). To the best of our knowledge, this study is one of the first attempts to link tax expenditures with individual tax avoidance. Scholz and Pinney (1995) earlier acknowledge that the probability of being audited by the IRS affects the behavioral responses of taxpayers to tax compliance. This is vital in that, many will agree, there is no political will on the part of Washington to concretely address tax expenditures (both individual and corporate) in a substantial way. Therefore, if not much can legislatively be done to reform this huge 'latent' government spending by politicians, providing evidence on IRS scorecard regarding how these expenditures have been administered can potently signal to policy makers and the agency the need to target and improve its tax returns audit/examination activities efficiently for effective desired outcomes (i.e. constraining individual tax avoidance vis-à-vis tax expenditures). Specifically, the findings of this study show the association between individual tax expenditure driver and IRS audit/examination activities within the budget constraints faced by the agency.

The remainder of the paper is organized as follows. The next section reviews the prior literature and develops the hypotheses tested in this study. In section 3, we present the empirical design, with the results

and the discussions of the findings presented in section 4. Further, the findings from the additional sensitivity analysis and diagnostics performed are also presented in that section. The final section concludes the study.

PRIOR LITERATURE AND HYPOTHESES DEVELOPMENT

There is no shortage of debates (with relative individual merits) on virtually every area of the U.S. tax code. On the one hand, central to the debates is the complexity of the tax code. On the other hand, there is the issue surrounding the sufficiency of the revenue generated through it. Both issues revolve around the strategic relevance and operational importance of the Internal Revenue Service (IRS), especially as it relates to its enforcement activities. An emerging stream of research in accounting examines extensively the amplitude at which corporate tax avoidance is constrained by IRS monitoring activities. For example, studies examine and find that IRS monitoring and enforcement mechanisms impact corporate financial reporting quality (Hanlon et al. 2014); corporate tax avoidance (Hoopes et al. 2012; Akindayomi and Warsame, 2016); equity pricing of public firms (El Ghoul, 2011); debt pricing of private firms (Guedhami and Pittman, 2008). However, as mentioned earlier, tax expenditures relating to personal income taxation substantially exceeds those on corporate taxation and since tax expenditures are largely the outcome of tax taxpayers' avoidance activities, it is no doubt desirable to accord similar research efforts to them within the individual taxation context.

Scholz and Pinney (1995) note the importance of 'objective audit probabilities' by the IRS in ensuring taxpayers compliance. Earlier studies (e.g., Violette 1989) stress the importance of tax audits and penalties in the overall compliance scheme, especially within the voluntary compliance regime of the U.S. tax system. Klepper and Nagin (1989) find no evidence that higher tax rate leads to increased noncompliance but instead, that compliance responds to enforcement realties. Efebera et al. (2004) observe that prior tax compliance research focused more on high-income taxpayers and less on low-income taxpayers because federal tax proceeds come largely from the former income group. However, their research signifies that policy makers can reduce tax evasion/avoidance among low-income individual taxpayers through enhanced compliance strategy. In addition, Dubin and Wilde (1988) find that compliance is associated with audits, specifically in the low and middle-income group. This in part informs the need for the current study to include all income groups in the empirical analysis, more so that the majority of taxpayers who itemize tend to fall below the six-digit income group. For example, in the 2011 tax year, nearly 64% of itemizers made less than $100,000.

To further stress the importance and the potential potency of the IRS compliance activities, the most recent tax gap estimates report released by the IRS in 2012 (see Black et al. 2012) shows that the gross (net) tax gaps increased from $345 ($290) billion in the 2001 tax year to $450 ($385) billon in the 2006 tax year (see also Internal Revenue Service, 2012). The gross tax gap is defined as the taxpayer's true tax liability that is not paid on a timely manner. With IRS enforcement efforts and (sometimes) voluntary compliance of the affected taxpayers, the amount subsequently collected is deducted from the gross to arrive at the net tax gap which essentially is the taxpayer's true liability that is never collected from taxpayers or paid to the treasury. In addition to the overall increase in economic activity during this period, the 30% (33%) increase in the tax gaps can be attributed to a decline in the voluntary compliance rate from 83.7% (86.3%) to 83.1% (85.5%) during the same periods. The tax gap components are (1) nonfilling gap; (2) underreporting gap; and (3) underpayment gap. Underreporting gap accounts for over 83% of the tax gap in tax year 2006 which is a 32% increase from the 2001 tax year. The tax expenditure drivers examined in the current study fit into the underreporting component of the tax gap. To further put into perspective, the individual income tax category of the underreporting tax gap component in 2006 tax year is over 62% compared to 18% of corporation income tax. The individual tax category is a 20% jump from the 2001 tax year compared to just a little over 1% increase in the corporation income tax category. These statistics motivates in part, the current study efforts to examine tax expenditure drivers relating only to individual income taxation. One

speculation on the dominance of individual income taxation in the tax expenditures scheme could be that many of the expenditure drivers are tax items available only to individuals and not corporate taxpayers.

Charitable Contribution

Of particular interest is the charitable donations deduction by individual tax payers because it is one of the top tax expenditure maximizers. Ample of evidence abounds regarding the enabling impact of charitable giving on the receiving charitable organizations. There appears not to be much controversy on the public good that such giving serves. To further encourage more charitable giving, there have been proposals to extend charitable deduction to non-itemizers. It should be noted that this deduction was briefly available to that category of taxpayers between 1982 and 1986 (for more see Ackerman and Auten 2006). The real question has been the intellectual controversy on whether the forgone tax revenue (i.e. tax expenditure) from such a deduction serves right the treasury purpose. This unease becomes more dynamic if one considers the fact that charitable giving could be cash or non-cash. While the deduction of the former might somewhat be straightforward, the latter is not as simple as one can sometimes run into complicated measurement issues. Even though cash donations are more popular, noncash contributions are not insignificant. For example, the reported deductions of noncash charitable giving was $48 billion, which according to Ackerman and Auten (2011) translates to over $9 billion in tax expenditures and approximately 25% of all charitable deductions in the 2005 tax year. Halperin (2002) submits that the tax expenditure arising from donated appreciated properties is grossly understated because capital gains tax revenue that would have accrued to the treasury is not factored into the calculations of the tax expenditure numbers.

O'Neil et al (1996) claim that top-income earners are more likely to be tax motivated to make charitable giving relative to other individual taxpayer groups. However, Bakija and Heim (2011) caution against making such an assertion as the authors could not find "strong evidence of differences in persistent price elasticities across income levels". In fact, Ackerman and Auten (2011) note that, "noncash charitable deductions are claimed by taxpayers in all income classes" which makes up to one-fifth of "total deductions in most groups…" Therefore, the current study finds it compelling to examine all tax expenditure drivers for all income groups.

The tendency for over-reporting of charitable giving by taxpayers is real. Several studies including Ackerman and Auten (2011) document the mismatch between taxpayers' valuations of noncash charitable donations and the 'true' value of the donated items (see also Buchheit et al., 2005). Attempts by the IRS to shift monitoring to charities have not been particularly effective. We posit that this is in part because, from the charity perspective, any positive net amount from charitable giving is value-enhancing to it as the opportunity cost of the alternative (i.e. no donation) is zero. It must be noted that undoubtedly, there is an unease tension between policy reforms (see Baneman et al., 2014 for more on the policy proposal/prescriptions) on tax expenditure drivers and the potential disincentive effect on rational taxpayers who may avoid some of the associated activities that produce tax expenditures. This may become counterproductive if such avoided activities serve public good purpose (such as charitable donations). Kemp et al. (2011) clearly link charitable giving to poverty alleviation, submitting that, "charitable giving is an important way in which a rich society tries to alleviate poverty". Consequently, we will argue that it is possible for the tax code to support fiscally the art of charitable giving so that it continues to serve public purpose but reduce the abuse with measured IRS scrutiny and enforcement (both are not and should not be mutually exclusive!). It must be noted that tax motivations drive primarily, but not exclusively, many donors in their charitable giving (see Cermak et al., 1994).

Home Mortgage Interest Deduction

Another big and highly controversial tax expenditure driver in this consistent era of persistent budget deficits is the Home Mortgage Interest Deduction (MID). Hanson and Martin (2013) see MID as the "largest

government intervention in the housing markets" that Hilber and Turner (2014) assert create "one of the largest tax expenditures in the U.S.". In 2010 alone, approximately 37 million households claimed nearly $400 billion in MID through their tax returns, notwithstanding the $1.1 million limit on mortgage debt upon which interest deduction can be taken by a taxpayer. MID is considered a tax expenditure driver mainly because there is no imputed rent taxation in the U.S. Bourassa et al. (2013) identify three developed economies that tax imputed rent to include Switzerland, Poland and Netherlands. It is universally believed that the tax deductibility of mortgage interests in the U.S. impacts homeownership (Poterba and Sinai, 2008). However, this tax deduction costs the treasury in the form of lost tax revenue. Notwithstanding the findings of Follain and Melamed (1998) on the potential negative consequences of eliminating MID, many academic studies tend to converge on the idea that keeping MID in the tax code will have minimal or no effect on homeownership rate due to capitalization influence (Hanson, 2012, but see Hilber and Turner, 2014). Hilber and Turner (2014) specifically state that, "MID is an effective policy to promote homeownership and improve social welfare". However, it is considered a 'backdoor' means of making the tax code less progressive as wealthier Americans tend to have relatively larger amounts of mortgage debts (Glaeser and Shapiro, 2002), thereby skewing the distributional burden of the tax code in favor high-income tax payers. But the practical question is whether the government has the political will to limit or remove MID from the tax code. Therefore, working within the current regime, it is important to examine IRS efficiency regarding MID in terms of the agency's audit/examination activities when it comes to curbing the avoidance strategies by taxpayers.

Hendershott and Pryce (2006) argue that there will be an asymmetric treatment between mortgage debt and equity financing without mortgage interest deduction and that MID allows for "tax equality" between the two costs of mortgage and equity financing (see also Woodward and Weicher, 1989). The authors warn that MID does not necessarily make the debt financing cheaper than equity financing, but claim that the absence of MID creates a "debt tax penalty" that can incentivize taxpayers to "shift from debt toward equity financing". They claim that there will be a large decline in mortgage debt in the U.S. if MID is removed from the tax code, a conjecture that is more bullish (in favor of MID) than the earlier findings of Follain and Melamed (1998). Both studies concur with the evidence in prior and emerging studies that eliminating MID will not have a noticeable impact on homeownership rates in the U.S. at least in the short-term.

The current study sees the findings in Hendershott & Pryce and Follain & Melamed as impressive in that they focus on the direct technical fundamentals of MID and not merely on the qualitative importance of MID or the implicit moral arguments supporting its desirability. Such arguments in favor of homeownership orbit around active political participation evidenced by relatively higher voting rates, lower crime rates, enhanced civic engagement, and improved governance at the local level, among others (see Dietz and Haurin, 2003; Hilber and Mayer, 2009 for more). Further, if the findings are true, one can only imagine the toll a substantial decline in mortgage financing will have on the U.S. banking industry and the potential untoward multiplier effects on the economy. The key findings in Follain and Melamed have the following three consequential implications for eliminating MID: (i) the anticipated increase in tax revenue is overestimated; (ii) younger married households with considerable amount of mortgage debts will be "most likely" impacted and not only wealthy American homeowners; and (iii) the overall demand for mortgage debt financing will drop substantially. We consider these findings consequential in that aside from the politics and the dormancy of the political will, they may explain why policy makers and Congress have been very reluctant in drastically changing MID, but instead continually accommodate MID within the tax code since its inception in 1913 (see Stansel and Randazzo, 2011 for more on the history of MID in the U.S.). If this is true, it therefore accentuates the need for the IRS, through compliance mechanisms, to curtail the potentials for avoidance that taxpayers may engage in when it comes to MID.

Medical Expenses Deduction

Medical expenses deduction (MED) introduced in 1942 is primarily conceived and designed to provide some relief in the form of tax subsidy to Americans who incur medical bills, especially of catastrophic nature, provided the taxpayer possesses tax-specific income appropriate to absorb the allowed deduction. Some criticize MED for its failure on the ground that it is merely an affordable deduction, which Johnson (2013) referred to as "counterfeit charity". Lurie and Minicozzi (2010) note that this deduction (including qualified dental expenses) is mainly claimed persistently by taxpayers who are 65 years or older relative to younger Americans (see also Kopecky and Koreshkova, 2014). Citing the Congressional Research Service analysis of the Joint Committee on Taxation estimates of tax expenditure, Lowry (2014) notes that medical expenses deduction is categorized as one of the top four tax expenditure drivers. Kopecky and Koreshkova (2014) show that medical expenses do impact the aggregate savings stock of many Americans, which we argue may lead to tax avoidance activities by some taxpayers. In fact, Johnson (2013) lays out the scenarios that can increase the likelihood of aggressive tax avoidance strategies regarding MED by taxpayers. If healthcare cost reduction, which is one of the prominent expectations of the Patient Protection and Affordable Care Act (2010), is actualized, then the share of MED in the tax expenditure drivers group will likely diminish.

Gambling Loss Deduction

Gambling loss deduction is another component of tax expenditure driver in the U.S. tax code. Recognizing that the gambling industry is embedded in the American economy (Zorn, 1995), Warren (1980) suggests that the tax code rationale for deducting the losses stem from the belief that gambling activities can be likened to business activities capable of generating profit to the taxpayer, and that full tax deduction of the losses ignores the significant consumption that gamblers derive from the activity. Therefore, it is believed that limiting deductible gambling losses to gambling gains accounts for the personal consumption portion of the activity. Zorn (1995) characterized such a limitation as "purely theoretical" relying on the winnings-losses asymmetry that is pervasive in gambling dynamics. In context, we interpret this asymmetry to mean that gambling losses are generally higher than gambling winnings, and allowing the latter to be a benchmark for deducting the former could still produce substantial tax expenditures. Consequently, IRS enforcement mechanisms in this respect could be vital, especially if one agrees that gambling loss deduction is another choice area in taxpayers' avoidance strategies mix. In fact, Zorn worries that gambling loss limitations potentially open doors for tax manipulations by taxpayers.

Tax Credits

Tax credits claimed by Americans through the federal tax code continue to be substantial not only in the dollar amount, but also in proportion of individual taxpayers obtaining the credits. For example, of the nearly 145 million returns filed, approximately 65% claimed one credit or the other in the 2012 tax year. Further, Individual tax credits are also a substantial chunk of tax expenditures. We note that while virtually all the tax expenditure drivers earlier discussed are meant to minimize taxable income and the consequent tax liability, tax credits not only reduce tax liability dollar for dollar, they can literarily put money in qualifying taxpayers (with no tax liability) pockets if they are refundable credits. For example, in the 2010 tax year, approximately 27 million taxpayers claimed earned income credit, a substantial component of which was refundable.

Other Tax Expenditure Drivers

Casualty and theft losses deduction is an insurance-like personal deduction allowed in the U.S. tax code that indemnifies taxpayers' uninsured losses mainly using the ability to pay criterion argument (see Dodge, 2013 for more). Although this tax expenditure is relatively less prominent, we argue that its deductions can

only at best reduce tax proceeds coming to the treasury. Therefore, efforts aimed at curtailing this deduction may prove rewarding.

The deduction of the tax return preparation fees is another subsidy granted by the federal tax code assisting taxpayers to defray the costs arising from engaging the services of fee-based tax returns professionals. Jackson et al. (2005) find a strong positive relationship "between taxpayers' prepayment positions and tax return preparation fees". They test and find that tax refund/due positions faced by taxpayers determine the taxpayers' view of tax preparation fees either as a loss or a cost. The extent to which this view motivates taxpayers into tax avoidance strategies is unclear. We leave that to future research. Notwithstanding, we will submit that a rational taxpayer will want to explore opportunities to minimize cost or loss. Following this finding, we maintain that the part of the revenue loss from such a deduction is somewhat offset by the "interest-free" loans available to the government with positive prepayment positions. This may explain partly the reason the federal government continues to allow this subsidy, especially in view of the findings of Jackson et al. (2005) that nearly half of taxpayers have positive prepayment positions; and that taxpayers receiving tax refunds are willing to pay higher tax return preparation fees (Jackson and White, 2008). However, we like to caution that this seemingly mutual understanding between taxpayers and their tax professionals may not be the optimum outcome for the tax system in an all-party scenario, especially if the treasury is thrown into the all-party mix. The assertion by Jackson and White (2008) highlighting the inadequacy or ineffectiveness of legislative efforts to constrain tax refunds lends credence to the need for improved IRS effective audit activities and enforcement mechanisms in the overall tax environment.

The unreimbursed employee business expenses deduction is another popular item that has attracted IRS scrutiny in recent years. Its tax treatment pre Tax Reform Act of 1986 is different from the post reform regime, which we posit is in part, to discourage employer-employee connivance skewing the structuring of compensation packages towards tax-favored treatment. As noted by Dennis-Escoffier (2013), the IRS continues to engage taxpayers and their employers when it comes to wage re-characterization, as the character of wages and reimbursements often determines their tax treatment. The extent to which IRS enforcement activities are effective in this regard remains an empirical question.

Research Question and Hypothesis

At the center of IRS enforcement activities are the financial resources appropriated by Congress that are available to the agency specifically regarding enforcement and compliance. We note that there are sometimes volatile political realities around IRS budget dynamics with one certain fact that budgetary resources are not infinite. Therefore, effective prioritization of the agency's mutually exclusive activities (driven by finite budgetary resources) becomes paramount, especially as it relates to its primary role of bringing in tax revenue (i.e. constraining both tax evasion and avoidance). The above review of the extant literature and the accompanying discussions motivates the main research question of this study: Does IRS audit/examination respond to tax expenditures within individual income taxation context? To answer this research question, the following hypothesis stated in alternative form is tested:

H_a: *in years when tax expenditure drivers are high, the probability of IRS audit/examination is high.*

The above hypothesis tests the responsiveness of IRS audit/examination activities to the trend and magnitude of tax expenditure drivers arising from individual income taxation. Recall that the tax expenditure drivers examined in this study are: charitable contributions, home mortgage interest deduction, casualty or theft loss deduction, medical and dental expenses deduction, gambling loss deduction, miscellaneous deduction other than gambling, unreimbursed employee business expenses, tax preparation fees, miscellaneous deductions subject to 2% AGI limitation, and total tax credits.

EMPIRICAL SPECIFICATIONS

The current study collects usable data from the Statistics of Income (SOI) tax numbers of the Internal Revenue Service (IRS) Data Book for the years ranging from 1993 to 2011. These data include the dollar amount of deductions and credits taken by individual taxpayers on what we refer to as tax expenditure drivers, namely: (1) charitable contributions, (2) home mortgage interest deduction, (3) casualty or theft loss deduction, (4) medical and dental expenses deduction, (5) gambling loss deduction, (6) miscellaneous deduction other than gambling, (7) unreimbursed employee business expenses, (8) tax preparation fees, (9) miscellaneous deduction subject to 2% AGI limitation, and (10) total tax credits. From the same source, enforcement and examination coverage data across income groups are also collected, as well as the IRS budget as it relates specifically to costs incurred on enforcement activities. Other secondary data sources are the Bureau of Labor Statistics (for gross domestic product figures) and Office of Management and Budget (for federal government budget numbers).

In order to test the hypothesis stated earlier, the following empirical model is specified:

$$ProbAud_{it} = \alpha_0 + \alpha_1 TaxExpd_{it} + \alpha_2 IRSbdgt_t + \alpha_3 GDP_t + \alpha_4 President_t + \alpha_5 Senate_t + \alpha_6 House_t + \alpha_7 TaxExpd_{it-1} + \alpha_8 DumIncomeGrp_i + \alpha_9 IntTaxExpd_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

Where:

ProbAud = probability of audit which is the number of individual tax return audits in the IRS's fiscal year t for income group i divided by the number of individual tax returns received by IRS for the same income group i at the IRS fiscal year t.

TaxExpd = tax expenditures for individual income group i at time t for each of the tax expenditure drivers (namely: charitable contributions, home mortgage interest deduction, casualty or theft loss deduction, medical and dental expenses deduction, gambling loss deduction, miscellaneous deductions other than gambling, unreimbursed employee business expenses, tax preparation fees, miscellaneous deductions subject to 2% AGI limitation, and total tax credits).

IRSbdgt = IRS budget in its fiscal year t, normalized by overall federal non-defense outlay.

GDP = real gross domestic product at time t to control for the overall economic activity.

President = dummy variable that equals one (zero) when a democrat (republican) is the president

Senate = dummy variable that equals one (zero) when a democrat (republican) is the majority leader of the senate.

House = dummy variable that equals one (zero) when a democrat (republican) is the Speaker of the House of Representative.

DumIncomeGrp = dummy variable that equals one if the income group is $200,000 ($500,000) or more and zero otherwise.

IntTaxExpd = variable interacting TaxExpd with DumIncomeGrp

μ = unobserved individual income group specific (fixed) effect and ε is the error term.

The above model is applied to the aggregate as well as to the individual tax expenditure drivers. In other words, there will be eleven estimated models in the study. We do not examine the reverse of the above

empirical design because there is no *a priori* theory justifying the fact that individual taxpayers *ex ante* pay attention to the probability of being audited (as captured in the dependent measure). This is different from corporations where evidence abounds that managers and Tax Directors anticipate concretely the probability of IRS audit/examination and therefore place their tax avoidance strategies within that context (see for example Hoopes et al., 2012).

TaxExpd (tax expenditures, α_1) is the primary variable of interest in the model. The expected sign of the coefficient (α_1) for this variable relative to the dependent variable is positive. That is, in years when tax expenditure is high, the probability of audit should be high if IRS enforcement activities and priorities reflect the trend and magnitude of those tax expenditures. Relatedly, it is practical to expect a positive sign for α_2 as higher budgetary allocations for IRS enforcement activities should increase the ability of the agency to conduct audit examinations. A negative sign may indicate a counterintuitive interplay between resource availability and examination/enforcement activities (i.e. inefficiency in budgetary resource allocation). We use gross domestic product as a variable to control for macroeconomic conditions. Given the model set up, it is difficult *a priori* to predict the sign of its coefficient α_3. Knowing that the federal budget of the U.S. government is generally determined in the preceding fiscal year, we lag the IRSbdgt variable (t-1) in the regression. Also in equation 1 above, we use the IRS budget numbers without normalizing them (i.e. with no scale) so as to ensure that normalizing the IRSbdgt variable does not mask the substantial year-to-year changes in the agency's budget. The tenor of the inferences (results untabulated for parsimony) remains unchanged.

The political variables (i.e. party affiliations of the President, Senate and House) were thrown into the model to accommodate the theoretical insights in the literature regarding the effect of the power dynamics in Washington on the IRS's activities, as major IRS strategic structures including top leadership and budget allocations are Washington driven. As noted by Bagchi (2012), a similar ratio (i.e. normalized IRS enforcement budget by federal outlay) reflects tax enforcement priorities of political powers in Washington. DumIncomeGrp variable is created to examine whether the IRS enforcement activities follow the money by targeting 'higher' income taxpayers in its (IRS) individual income tax audit. Two different cutoffs selected are $200,000 and $500,000. Other cutoffs are examined and the results (untabulated) remain substantially the same. The interaction variable (IntTaxExpd) captures tax expenditures within the two delineated income groups, i.e. adjusted gross income of $200,000 and $500,000. A positive coefficient α_9 will mean that in that particular income group, an increase in tax expenditure driver is responded to by the IRS through increased examination/audit activities. The income group effect (i.e. μ) is important to address the econometric concern that certain characteristics or variations may exist between or among income groups that could correlate with the main variable of interest (TaxExpd), other explanatory variables and also the error term. In essence, the covariance between μ and the explanatory variables are not equal to zero. When this is true, the coefficient estimates from fixed effect regressions are considered more persuasive than those of the random effects regressions if such an econometric anomaly situation subsists (more tests are conducted and discussed in the additional analysis section to further explore varying scenarios).

RESULTS AND DISCUSSION

Table 1 contains descriptively the summary statistics of the relevant variables in the empirical model as it relates to the sample period 1993 – 2011. There are seven panels in Table 1 (Panel A – G) with the first panel (Panel A) reporting the statistics of the combined tax expenditure drivers. Panels B through G respectively report statistics of: charitable contributions, home mortgage interest deduction, medical and dental expenses deduction, unreimbursed employee business expenses, miscellaneous deductions subject to 2% AGI limitation, and total tax credits. For brevity, we do not tabulate the results of Gambling Loss Deductions, Miscellaneous Deductions other than Gambling, and Tax Preparation Fees. These expenditure drivers are a small component of the combined tax expenditures (results are available upon request).

Table 1: Descriptive/Summary Statistics - Sample Period (1993 – 2011)

Variables	Units	Mean	Standard Deviation	Minimum	Maximum
Panel A: Combined (N = 367)					
Tax Expenditure	In dollars (millions)	31,400	38,600	1,587.96	236,000
IRS Budget	In dollars (millions)	4,231.85	733.62	3,103.64	5,510.73
Federal Non-Defense Outlay	In dollars (billions)	1,892.87	553.06	1,118.30	2,897.51
Gross Domestic Product (GDP)	In dollars (billions)	11,700	1,439.41	8,870.70	13,300
President	1 = Democratic 0 = Republican	0.5204	0.5003	0	1
Senate	1 = Democratic 0 = Republican	0.4578	0.4989	0	1
House	1 = Democratic 0 = Republican	0.3351	0.4727	0	1
DumOver200	1 = AGI > $200,000 0 = AGI ≤ $200,000	0.2643	0.4416	0	1
DumOver500	1 = AGI > $500,000 0 = AGI ≤ $500,000	0.2153	0.4116	0	1
Panel B: Charitable Contributions (N = 367)					
Tax Expenditure	In dollars (millions)	6,700.46	7,957.22	54.90	42,800
IRS Budget	In dollars (millions)	4,231.85	733.62	3,103.64	5,510.73
Federal Non-Defense Outlay	In dollars (billions)	1,892.88	553.06	1,118.30	2,897.51
Gross Domestic Product (GDP)	In dollars (billions)	11,700	1,438.94	8,870.70	13,300
President	1 = Democratic 0 = Republican	0.5204	0.5003	0	1
Senate	1 = Democratic 0 = Republican	0.4578	0.4989	0	1
House	1 = Democratic 0 = Republican	0.3351	0.4727	0	1
DumOver200	1 = AGI > $200,000 0 = AGI ≤ $200,000	0.2643	0.4416	0	1
DumOver500	1 = AGI > $500,000 0 = AGI ≤ $500,000	0.2153	0.4116	0	1
Panel C: Home Mortgage Interest Deductions (N = 367)					
Tax Expenditure	In dollars (millions)	16,100	23,000	106.36	143,000
IRS Budget	In dollars (millions)	4,231.85	733.62	3,103.64	5,510.73
Federal Non-Defense Outlay	In dollars (billions)	1,892.88	553.06	1,118.30	2,897.51
Gross Domestic Product (GDP)	In dollars (billions)	11,700	1,438.94	8,870.70	13,300
President	1 = Democratic 0 = Republican	0.5204	0.5003	0	1
Senate	1 = Democratic 0 = Republican	0.4578	0.4989	0	1
House	1 = Democratic 0 = Republican	0.3351	0.4727	0	1
DumOver200	1 = AGI > $200,000 0 = AGI ≤ $200,000	0.2643	0.4416	0	1
DumOver500	1 = AGI > $500,000 0 = AGI ≤ $500,000	0.2153	0.4116	0	1
Panel D: Medical and Dental Expenses Deductions (N = 355)					
Tax Expenditure	In dollars (millions)	2,735.71	2,269.73	853	12,400
IRS Budget	In dollars (millions)	4,226.06	732.86	3,103.64	5,510.73
Federal Non-Defense Outlay	In dollars (billions)	1,884.91	553.78	1,118.30	2,897.51
Gross Domestic Product (GDP)	In dollars (billions)	11,600	1,449.51	8,870.70	13,300
President	1 = Democratic 0 = Republican	0.5300	0.4998	0	1
Senate	1 = Democratic 0 = Republican	0.4535	0.4985	0	1
House	1 = Democratic 0 = Republican	0.3352	0.4727	0	1
DumOver200	1 = AGI > $200,000 0 = AGI ≤ $200,000	0.2394	0.4273	0	1
DumOver500	1 = AGI > $500,000 0 = AGI ≤ $500,000	0.1887	0.3918	0	1

Panel E: Unreimbursed Employee Business Expenses (N = 367)					
Tax Expenditure	In dollars (millions)	2,901.42	3,831.23	9.305	21,900
IRS Budget	In dollars (millions)	4,231.85	733.62	3,103.64	5,510.73
Federal Non-Defense Outlay	In dollars (billions)	1,892.88	553.06	1,118.30	2,897.51
Gross Domestic Product (GDP)	In dollars (billions)	11,700	1,438.94	8,870.70	13,300
President	1 = Democratic 0 = Republican	0.5204	0.5003	0	1
Senate	1 = Democratic 0 = Republican	0.4578	0.4989	0	1
House	1 = Democratic 0 = Republican	0.3351	0.4727	0	1
DumOver200	1 = AGI > $200,000 0 = AGI ≤ $200,000	0.2643	0.4416	0	1
DumOver500	1 = AGI > $500,000 0 = AGI ≤ $500,000	0.2153	0.4116	0	1
Panel F: Miscellaneous Deductions Subject to 2% AGI Limitation (N = 176)					
Tax Expenditure	In dollars (millions)	1,411.15	1,489.04	57.80	6,651.86
IRS Budget	In dollars (millions)	4,845.71	466.77	4,140.48	5,510.73
Federal Non-Defense Outlay	In dollars (billions)	2,376.84	389.56	1,837.03	2,897.51
Gross Domestic Product (GDP)	In dollars (billions)	12,900	3,324.59	12,222.00	13,300
President	1 = Democratic 0 = Republican	0.3750	0.4855	0	1
Senate	1 = Democratic 0 = Republican	0.5000	0.5014	0	1
House	1 = Democratic 0 = Republican	0.4943	0.5014	0	1
DumOver200	1 = AGI > $200,000 0 = AGI ≤ $200,000	0.3182	0.4671	0	1
DumOver500	1 = AGI > $500,000 0 = AGI ≤ $500,000	0.2727	0.4466	0	1
Panel G: Total Tax Credits (N = 367)					
Tax Expenditure	In dollars (millions)	1,289.94	2,172.70	0	17,800
IRS Budget	In dollars (millions)	4,231.85	733.62	3,103.64	5,510.73
Federal Non-Defense Outlay	In dollars (billions)	1,892.88	553.06	1,118.30	2,897.51
Gross Domestic Product (GDP)	In dollars (billions)	11,700	1,438.94	8,870.70	13,300
President	1 = Democratic 0 = Republican	0.5204	0.5003	0	1
Senate	1 = Democratic 0 = Republican	0.4578	0.4989	0	1
House	1 = Democratic 0 = Republican	0.3351	0.4727	0	1
DumOver200	1 = AGI > $200,000 0 = AGI ≤ $200,000	0.2643	0.4416	0	1
DumOver500	1 = AGI > $500,000 0 = AGI ≤ $500,000	0.2153	0.4116	0	1

This table shows summary descriptive statistics across all the models examined in this study excluding Gambling Loss Deductions, Miscellaneous Deductions other than Gambling, and Tax Preparation Fees. Theses tax expenditure drivers are substantially a small component of the combined tax expenditures and are all virtually insignificant statistically in the empirical tests. President = dummy variable that equals one (zero) when a democrat (republican) is the president; Senate = dummy variable that equals one (zero) when a democrat (republican) is the majority leader of the senate; House = dummy variable that equals one (zero) when a democrat (republican) is the Speaker of the House of Representative: DumOver200 & DumOver500 are defined as dummy variable that equals one if the income group is $200,000 ($500,000) or more and zero otherwise.

The combined tax expenditures for the period 1993 – 2011 amount to an average of $31. 4 billion with a minimum (maximum) of $1.588 ($236) billion and a standard deviation of $38.6 billion. During the same period, home mortgage interest deductions (charitable contributions) on the average amount to $16.1 ($6.7) billon with a minimum of $106.36 ($54.90) million; a maximum of $143 ($42.8) billion and standard deviation of $23 ($7.96) billion (see Table 1 for similar information on each of the remaining four individual expenditure drivers). It is worthy to note that home mortgage interest deductions (charitable contributions) account for approximately 50% (20%) of the mean and approximately 60% (18%) of the maximum amounts. The Internal Revenue Service (IRS) budget devoted to examination and enforcement during the sample period averaged $4.232 billion. The budget peaked in 2011 and reached its lowest in 1998, thus having a minimum (maximum) amount of $3.104 ($5.511) billion and standard deviation of $733 million. The Gross Domestic Product (GDP) during the period 1993 – 2011 averaged $11.7 trillion with a maximum of $13.3 trillion, minimum of $8.871 trillion and standard deviation of $1.439 trillion. Similarly, the mean

(standard deviation) of the Total Federal Non-Defense Outlay is $1.893 ($0.553) trillion with a minimum outlay of $1.118 trillion and maximum outlay of $2.898 trillion.

On the political variables, the president from the Democratic Party was in the White House on average for over half (0.520) of the sample period. However, on average, neither the Democratic Party nor the Republican Party controls either the Senate or the House of Representative for up to half of the time. This suggests that neither Party definitively has political control through legislative process on the IRS policy initiatives and priority ramifications. Notwithstanding, it must be mentioned that the occupant of the White House and the Party often have relative influence (compared to Congress) on the strategic direction of the IRS through, for example, nomination and appointment of IRS Commissioners.

Table 2 provides the correlation coefficients of the variables tested in the empirical model. With respect to the main explanatory variable of interest (TaxExp), its relationship to the dependent variable (ProbAudit) is positive and statistically significant at the 5% confidence interval in two (charitable contributions, miscellaneous deductions subject to 2% AGI limitation) of the six individual tax expenditure drivers. Further, the correlation between these two variables is negative and statistically significant at the 5% threshold in three (home mortgage interest deduction, medical and dental expenses deduction, unreimbursed employee business expenses) out of the six tax expenditure drivers. This variation in significance and signs suggest a non-identical effect of the IRS audit/examination responses to different tax expenditure drivers. This insight is explored further below in the presentation and discussion of the results from the regression models.

Table 2: Correlation Coefficients

Panel A: Combined									
Variables	1	2	3	4	5	6	7	8	9
1 ProbAudit	1.00								
2 TaxExpd	-0.0882***	1.00							
3 BudgNonDef	-0.0988*	-0.1636***	1.00						
4 GDP	0.1709***	0.1966***	-0.8891***	1.00					
5 President	0.1490***	-0.1073**	0.3920***	-0.4897***	1.00				
6 Senate	0.1922**	-0.0091	0.0450	-0.0254	0.1890***	1.00			
7 House	0.2094***	0.0274	0.2047***	-0.0291	0.2153***	0.5560***	1.00		
8 DumOver200	0.4360***	-0.1473***	-0.1350***	0.1478***	-0.0916*	0.0193	-0.0123	1.00	
9 DumOver500	0.4583***	-0.2368***	-0.1446***	0.1564***	-0.1163**	0.0093	-0.0176	0.865***	1.00
Panel B: Charitable Contributions									
Variables	1	2	3	4	5	6	7	8	9
1 ProbAudit	1.00								
2 TaxExpd	0.1146**	1.00							
3 BudgNonDef	-0.0988*	-0.1518***	1.00						
4 GDP	0.1709***	0.1782***	-0.8891***	1.00					
5 President	0.1490***	-0.1692**	0.3920***	-0.4987***	1.00				
6 Senate	0.1922***	-0.0393	0.0450	-0.0254	0.1890***	1.00			
7 House	0.2094***	-0.0179	0.2047***	-0.0291	0.2153***	0.5560***	1.00		
8 DumOver200	0.4360***	0.1819***	-0.1350***	0.1478***	-0.0919*	0.0193	-0.0123	1.00	
9 DumOver500	0.4583***	0.0650	-0.1446***	0.1564***	-0.1163**	0.0093	-0.0176	0.865***	1.00
Panel C: home Mortgage Interest Deductions									
Variables	1	2	3	4	5	6	7	8	9
1 ProbAudit	1.000								
2 TaxExpd	-0.1553***	1.000							
3 BudgNonDef	-0.0988*	-0.1095**	1.00						
4 GDP	0.1709***	0.1309***	-0.8891***	1.00					
5 President	0.1490***	-0.0814	0.3920***	-0.4987***	1.00				
6 Senate	0.1922***	-0.0138	0.0450	-0.0254	0.1890***	1.00			
7 House	0.2094***	0.0252	0.2047***	-0.0291	0.2153***	0.5560***	1.00		
8 DumOver200	0.4360***	-0.2209***	-0.1350***	0.1478***	-0.0916*	0.0193	-0.0123	1.00	
9 DumOver500	0.4583***	-0.3127***	-0.1446***	0.1564***	-0.1163**	0.0093	-0.0176	0.865***	1.00

Panel D: Medical and Dental Expenses Deductions									
Variables	1	2	3	4	5	6	7	8	9
1 ProbAudit	1.00								
2 TaxExpd	-0.3201***	1.00							
3 BudgNonDef	-0.0721	-0.3099***	1.00						
4 GDP	0.1438***	0.3763***	-0.8906***	1.00					
5 President	0.1680***	-0.1506***	0.3963***	-0.5038***	1.00				
6 Senate	0.1953***	0.0589	0.0488	-0.0286	0.1922***	1.00			
7 House	0.2357***	0.0733	0.2075***	-0.0359	0.2203***	0.5640***	1.00		
8 DumOver200	0.4800***	-0.5992***	-0.1163**	0.1304**	-0.0781	0.0229	-0.0035	1.00	
9 DumOver500	0.4978***	-0.5649***	-0.1243**	0.1375***	-0.1027**	0.0129	-0.0077	0.853**	1.00
Panel E: Unreimbursed Employee Business Expenses									
Variables	1	2	3	4	5	6	7	8	9
1 ProbAudit	1.00								
2 TaxExpd	-0.1935***	1.00							
3 BudgNonDef	-0.0988*	-0.1486***	1.00						
4 GDP	0.1709***	0.1732***	-0.8891***	1.00					
5 President	0.1490***	-0.1024**	0.3920**	-0.4987***	1.00				
6 Senate	0.1922***	-0.0126	0.0450	-0.0254	0.1890***	1.00			
7 House	0.2094***	0.0028	0.2047***	-0.0291	0.2153***	0.5560***	1.00		
8 DumOver200	0.4360***	-0.3359***	-0.1350**	0.1478***	-0.0916*	0.0193	-0.0123	1.00	
9 DumOver500	0.4583***	-0.3671***	-0.1446***	0.1564***	-0.1163**	0.0093	-0.0176	0.865***	1.00
Panel F: Miscellaneous Deductions Subject to 2% AGI Limitation									
Variables	1	2	3	4	5	6	7	8	9
1 ProbAudit	1.00								
2 TaxExpd	0.2948***	1.00							
3 BudgNonDef	-0.2603***	-0.0831	1.00						
4 GDP	0.2164***	0.1534**	-0.3807***	1.00					
5 President	0.3060***	0.0675	-0.8492***	0.3833***	1.00				
6 Senate	0.2941***	0.1058	-0.8733***	0.5396***	0.7935**	1.00			
7 House	0.1851***	0.0905	-0.4976***	0.4846***	0.3131***	0.5450***	1.00		
8 DumOver200	0.4991***	0.4228***	-0.0122	0.0121	0.0203	0.0161	0.0016	1.00	
9 DumOver500	0.5403***	0.2609***	-0.0051	-0.0051	-0.086	-0.0068	-0.0007	0.876***	1.00
Panel G: Total Tax Credits									
Variables	1	2	3	4	5	6	7	8	9
1 ProbAudit	1.00								
2 TaxExpd	0.0716	1.00							
3 BudgNonDef	-0.0988*	-0.2891***	1.00						
4 GDP	0.1709***	0.3101**	-0.8891***	1.00					
5 President	0.1490***	-0.0650	0.3920***	-0.4987***	1.00				
6 Senate	0.1922***	0.0746	0.0450	-0.0254	0.1890***	1.00			
7 House	0.2094***	0.0915*	0.2047***	-0.0291	0.2153***	0.5560***	1.00		
8 DumOver200	0.4360***	-0.0047	-0.1350***	0.1478***	-0.0916*	0.0193	-0.0123	1.00	
9 DumOver500	0.4583***	-0.0106	-0.1446***	0.1564***	-0.1163**	0.0093	-0.0176	0.865***	1.00

*This table shows the correlation coefficients of the variables used in our analysis. ProbAud = probability of audit which is the number of individual tax return audits in the IRS's fiscal year t for income group i divided by the number of individual tax returns received by IRS for the same income group i at the IRS fiscal year t. TaxExpd = tax expenditure for individual income group i at time t for each of the tax expenditure drivers. GDP = real gross domestic product at time t. President = dummy variable that equals one (zero) when a democrat (republican) is the president. Senate = dummy variable that equals one (zero) when a democrat (republican) is the majority leader of the senate. House = dummy variable that equals one (zero) when a democrat (republican) is the Speaker of the House of Representative. DumIncomeGrp = dummy variable that equals one if the income group is $200,000 ($500,000) or more and zero otherwise. *, **, *** indicate significance at 10, 5 and 1 percent levels respectively.*

Regression Results

All regression results for the seven models are provided in Table 3. Panel A (B) of the table contains results for income group with $200,000 ($500,000) or more. For the respective tax expenditure drivers: Model 1 = Combined; Model 2 = charitable contributions; Model 3 = home mortgage interest deduction; Model 4 = medical and dental expenses deduction; Model 5 = unreimbursed employee business expenses; Model 6 = miscellaneous deductions subject to 2% AGI limitation; and Model 7 = total tax credits.

We first examine the combined model (Model 1) which is the aggregate of tax expenditures amounts across the ten tax expenditure drivers (refer to introduction for the list). TaxExpd was not significant in both income groups for Model 1. This may suggest that the probability of audit/examination of individual returns by IRS does not respond to the magnitude or direction of tax expenditures across all the tax expenditure drivers examined in this study. However, further analysis of the individual tax expenditure driver shows

the differentiated effect of each of the tax expenditures drivers' vis-à-vis their ability to drive IRS audit/examination exercises. For both income groups and across all the tax expenditures drivers, the coefficients of the IRSbdgt are positive and significant. This suggests that in years when the IRS budget on enforcement is high, the agency's audit activities are pronounced within the context of individual taxation. A Similar trend persists with respect to economic buoyancy as measured by the GDP coefficients.

Table 3: Fixed-Effect Regression with ProbAud as the Dependent Variable across all Models

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Panel A: Fixed-Effect Regressions of Income Group with $200,000 Adjusted Gross Income (AGI) or More							
TaxExpd	5.140	-2.220*	1.410**	3.620	5.290	-2.320**	-6.980
	(1.26)	(-1.96)	(2.49)	(0.18)	(1.50)	(-2.07)	(-0.48)
IRSbdgt	1.527***	1.581***	1.372**	1.587***	1.484***	10.052**	1.350***
	(2.71)	(2.80)	(2.44)	(4.16)	(2.63)	(2.38)	(2.61)
GDP	9.850***	9.130***	9.790***	1.080***	1.030***	4.830	6.250***
	(4.60)	(4.31)	(4.70)	(6.54)	(4.80)	(0.57)	(3.16)
President	2.375***	2.197***	2.400***	1.621***	2.288***	3.570***	1.811***
	(7.69)	(7.31)	(7.91)	(8.03)	(7.61)	(3.71)	(6.62)
Senate	0.5662*	0.5055*	0.6139**	0.4590**	0.4606	1.623	0.5233*
	(1.86)	(1.68)	(2.04)	(2.28)	(1.56)	(1.65)	(1.94)
House	0.3154	0.1329	0.3849	0.2524	0.4013	0.3729	-0.0609
	(0.91)	(0.38)	(1.11)	(1.09)	(1.15)	(0.66)	(-0.19)
LagTaxExpd	-6.250	1.850*	-1.590***	-4.370**	-6.790	1.510**	-2.720
	(-1.58)	(1.80)	(-2.91)	(-2.06)	(-1.97)*	(1.98)	(-0.19)
IntTaxExpd	2.880	1.050	-1.680	-4.300	-1.130	4.190***	3.290***
	(1.32)	(1.33)	(-0.41)	(-0.86)	(-0.22)	(3.28)	(9.73)
R-sq.	0.2069	0.2085	0.1756	0.3550	0.1870	0.3442	0.4563
N	367	367	367	355	367	176	367
Panel B: Fixed-Effect Regressions of Income Group with $500,000 Adjusted Gross Income (AGI) or More							
TaxExpd	4.440	-2.400**	1.380**	3.580	5.330	-2.090**	-7.870
	(1.11)	(-2.13)	(2.46)	(0.18)	(1.51)	(-2.08)	(-0.56)
IRSbdgt	1.434**	1.551***	1.377**	1.583***	1.504***	9.940**	1.158**
	(2.57)	(2.75)	(2.44)	(4.13)	(2.66)	(2.39)	(2.35)
GDP	8.990***	9.040***	9.740***	1.060***	1.000***	4.380	5.590***
	(4.21)	(4.28)	(4.65)	(6.27)	(4.67)	(0.52)	(2.96)
President	2.278***	2.158***	2.400***	1.627***	2.300***	3.415***	1.627***
	(7.42)	(7.16)	(7.91)	(8.05)	(7.66)	(3.59)	(6.20)
Senate	0.6455**	0.5363*	0.6155**	0.4635**	0.4767	1.665*	0.5420**
	(2.14)	(1.78)	(2.04)	(2.30)	(1.62)	(1.71)	(2.12)
House	0.2658	0.1249	0.3764	0.2375	0.4019	0.4278	-0.0050
	(0.77)	(0.35)	(1.09)	(1.02)	(1.15)	(0.77)	(-0.02)
LagTaxExpd	-5.390	2.020*	-1.570**	-4.310**	-6.730*	1.640**	-2.590
	(-1.38)	(1.95)	(-2.88)	(-2.03)	(-1.95)	(2.20)	(-0.19)
IntTaxExpd	1.290***	1.650*	2.960	-3.700	2.560	4.520***	4.220***
	(3.13)	(1.81)	(0.02)	(-0.11)	(0.87)	(3.88)	(11.81)
R-sq.	0.3463	0.2696	0.1803	0.3503	0.2081	0.4863	0.5217
N	367	367	367	355	367	176	367

*This table shows the regression coefficients equation 1. For respective tax expenditure drivers, Model 1 = Combined ; Model 2 = charitable contributions; Model 3 = home mortgage interest deductions; Model 4 = medical and dental expenses deductions; Model 5 = unreimbursed employee business expenses; Model 6 = miscellaneous deductions subject to 2% AGI limitation; and Model 7 = total tax credits. TaxExpd = tax expenditure for individual income group i at time t for each of the tax expenditure drivers; IRSbdgt = IRS budget in its fiscal year t, normalized by overall federal non-defense outlay: President = dummy variable that equals one (zero) when a democrat (republican) is the president; Senate = dummy variable that equals one (zero) when a democrat (republican) is the majority leader of the senate; House = dummy variable that equals one (zero) when a democrat (republican) is the Speaker of the House of Representative: LagTaxExpd = TaxExpd in the previous year: IntTaxExpd = variable interacting TaxExpd with DumIncomeGrp; where DumIncomeGrp is dummy variable that equals one if the income group is $200,000 ($500,000) or more and zero otherwise. *, **, *** indicate significance at 10, 5 and 1 percent levels respectively*

On the political variables, only the President is positive and significant in both income groups. The Senate is positive and significant at the >$500,000 income level but only positively significant at the 10% threshold for >$200,000 income level. The House is positive but not significant at both income levels. These results imply that IRS audit/examination activities are higher in years when a Democratic President is in the White House and when the Democratic Party controls the United States Senate. Interestingly, the House of

Representatives has no effect on IRS audit activities irrespective of the party (Democratic or Republican) in control of that lower chamber. This insight is remarkable in that statutorily, the House is generally the initiator of budgetary dynamics as it relates to taxation. However, it may be believed that the Senate is a more deliberative body with potentially bigger clout to shape statutory and policy responses of agencies such as the IRS. In 2012 for example, the majority of lobbying activities/money go to Senate Committees and politicians relative to the House according to the Center for Responsive Politics (2012, https://www.opensecrets.org/lobby/lobby_contribs.php?cycle=2012&type=C) statistics. This might explain the value placed on the Senate compared to the House by the lobbying community. We must acknowledge that while there might not be pronounced individual-level political lobbying activities on the IRS when it comes to individual taxation, it is a valid expectation that corporate lobbying activities could shape the overall audit/enforcement activities of the agency (i.e. complementarity effect). However, if there is a 'substitution effect', then the audit/enforcement landscape becomes more interesting. We leave that to future research.

On the six respective tax expenditure drivers, the findings are mixed. For both categories of income levels, only home mortgage interest deductions (Model 3) is positive and significant. Charitable contributions (Model 2) and miscellaneous deductions subject to 2% AGI limitation (Model 6) are all negative and significant at the conventional thresholds. Since charitable deductions are constrained by income level as well as type of donations and recipient charities (50%, 30% and 20%), one interpretation of our findings on charitable donations is that more IRS attention needs to be devoted to the income audits and not necessarily the magnitude of charitable deductions as the former might be driving the latter. This becomes important if one considers the fact that in 2011, the Joint Committee on Taxation notes that charitable deduction is a top 10 driver of the federal tax expenditures. Therefore, the IRS may need to re-examine its audit mechanisms across all income groups when it comes to charitable giving. In another analysis, we include all the tax expenditure drivers in a single regression model, our results (not reported here) remain unchanged.

Medical and dental expense deductions (Model 4); unreimbursed employee business expenses (Model 5); and total tax credits (Model 7) are not significant at the conventional 5% confidence threshold. While some inferences may be speculated on those models at the margin, we will caution that the lack of statistical significance suggests that no strong conclusions can be drawn therefrom.

The above results suggest that it is only in the case of home mortgage interest deductions that IRS audit/examination activities increase in years when the associated tax expenditures increase. In the case of charitable contributions and miscellaneous deductions subject to 2% AGI limitation, IRS audit/examination activities increase in years when those tax expenditures are trending downward even after controlling for prior year tax expenditures in the same model. One interpretation could mean that IRS is aggressive in its enforcement activities but plausibly misplacing its budgetary priorities on these two cost drivers mainly because of the conventional belief that individual taxpayers have the incentives to misreport on them. This becomes tenable with the findings that for both income levels, IRSbdgt is positive and significant across all models. A similar trend subsists with respect to GDP which is positive and highly significant across all the models (excepting model 6). We note that the opposite sign between these two tax expenditure drivers and the GDP is also worth mentioning. It shows that in years where the economy is showing slower strength, charitable deductions and the other driver are high. This may explain the rationale for the plausible aggressiveness of the IRS on those three tax expenditure drivers.

Further, in order to determine whether the IRS pays attention to varying income levels in its audit/examinations activities, we interact TaxExpd with the DumIncomeGrp for each of the seven models (see equation 1 above). Under the >$500,000 income category, four out of the seven models are positive and significant. These are the combined model (Model 1); charitable contributions (Model 2); miscellaneous deductions subject to 2% AGI limitation (Model 6); and total tax credits (Model 7). It implies

that the IRS probability of audit increases as the income level increases. A similar pattern exists within the >$200,000 income category. Hence the IRS follows the money!

Additional Analysis

The above regression analyses are based on fixed effect regressions. Using a random effect model, one will assume that all the income groups are the same in their tax expenditure drivers with respect to the probability of audit and other explanatory variables. In econometric terms, it is assumed that all the income groups have a common mean value for the intercept. As this is not likely to be the case practically, it is important to account for the potential unobservable effects that may be unique to each group (heterogeneity) but are time-invariant. The random effect model assumes that the unobserved heterogeneity in individual income groups is uncorrelated with the explanatory variables. Hence the justification for the use of the fixed effect regression, as doing otherwise can accentuate the omitted variable bias (for more see Cameron et al, 2011). Notwithstanding, we performed random effect analysis in order to rule out econometric bias in our analyses and results which involves correcting for serial correlation; otherwise the error terms will no longer be independent and identically distributed with a mean of zero (i.e. nonspherical error variance). To do this, we run each of the seven models with both fixed effect and random effect regression analyses so as to choose the appropriate analysis using the Hausman Test. It must be noted that generally, coefficient estimates from fixed effect regressions are considered more persuasive than those of the random effects regressions (Wooldridge, 2010).

The null in Hausman Test is that there is no difference between both models (H_0: $Cov(u_i,X_{it})=0$). Failure to reject the null means that the difference in coefficients is not systematic, thus implying that both the random effect and fixed effect models are consistent. However, the former is recommended because it has smaller variance. The results from the Hausman Test reveal (results suppressed for parsimony) that for the income group of $200,000 or more, the null for each of the seven models is rejected confirming that fixed effect regression analyses are appropriate. With respect to the $500,000 or more income group, only two (model 3, & 6) of the seven models suggest using the random effect regression analysis. However, since the magnitude and signs of the coefficients as well as the statistical significance are not substantively inconsistent with the reported fixed effect regression analyses, we can report that the overall tenor of the findings remains substantially similar.

Further, we employ different scalar for the IRS budget to ensure that the results are not sensitive to scalars used. Specifically, we use total federal outlay as opposed to total non-defense outlay to scale the IRS budget (we also run the regression without scaling the budget numbers). The results still hold. Also, nominal (and not the real) numbers for the gross domestic product are used. The results remain unchanged.

We also investigate the possibility that the IRS budget in one year may affect the probability of audit in the following year by introducing a lagged IRS budget variable in the models (thanks to the anonymous referee suggestion). Results not reported here for parsimony (but available upon request) remain qualitatively unchanged. On one hand, the construction of our ProbAud variable ties our model construction to fit current year IRS budget resources. On the other hand, due to resource constraints faced by the agency as well as the magnitude and complexities of its enforcement responsibilities, it may be somewhat farfetched to expect that it (IRS) will carry enforcement budget forward to pursue new potential audit cases arising from noncompliance, especially given that the agency is funded by the annual congressional budget procedure referred to as the appropriation process. Therefore, we choose to report results from models using current year IRS budget resources as this is considered more descriptive of the IRS budget dynamics and priorities. Overall, the findings of the study reveal that calculated adjustments to IRS enforcement activities can be extraordinarily important in constraining the growth of tax expenditures in the U.S., especially if one considers the assertion of Kleeper and Nagin (1989) that, "…taxpayers will respond to marginal adjustments in enforcement policy". Getting rid of all or some tax expenditures does not readily place the

savings in the treasury coffers, especially when put within the context of the opportunity cost or benefit forgone if a tax expenditure is outlawed. Therefore, a targeted approach to IRS enforcement activities in the individual taxation system can curb the avoidance (and probable evasion) that may abound in the tax expenditures regime. Specifically, within the individual income taxation context, the current study shows that IRS enforcement activities (through its audit/examinations) need, and can be improved, to minimize tax avoidance strategies of individual taxpayers as reflected in related tax expenditures.

CONCLUSION

This study examines the Internal Revenue Service (IRS) audit/examination activities of individual tax returns within the context of tax expenditures arising from individual taxation. We find that while the probability of IRS audit increases as the agency's budget on enforcement activities increases, tax expenditures do not appear to prompt IRS enforcement activities in some of the tax expenditure drivers. Specifically, it is only the home mortgage interest deduction as a tax expenditure driver that influences heightened IRS audit/examination. Other tax expenditure drivers namely: charitable contributions and miscellaneous deductions subject to 2% AGI limitation, arguably imply that IRS budgetary resource-allocation to enforcement activities, as a driver of the agency's audit probability, has a conflicting signal and an inconsistent effect as reflected in the magnitude and direction of those tax expenditure drivers. The magnitude or direction of the remaining tax expenditure drivers investigated in this study does not influence or impact IRS audit/examination activities. Additionally, individual taxpayers' income level generally influences IRS enforcement activities suggesting that the agency follows the money. We also document a strong relationship between the Party that occupies the White House or controls the U.S. Senate but not the House of Representative, and the probability of IRS audit activities. Our results are robust to the choice of regression analyses employed (fixed versus random effects) and difference measures or scales of some explanatory variables examined in the study.

Overall, our results are consistent with the view that individual taxpayers' avoidance activities, as manifested in tax expenditures, can be curbed with appropriately targeted IRS audit/examination responses. This is important if one considers the reality that there is no political will on the part of Washington to legislatively or by executive leadership constrain the growth of tax expenditures, in part, because different political constituencies are passionately connected to different tax expenditure drivers. Results from the current study contribute to the literature in understanding the response of IRS audit/examination activities to the magnitude and direction of individual tax expenditure drivers within the context of individual income taxation.

As indicated above, this study has stimulated some intellectual insights. Notwithstanding, its analyses and findings must be interpreted with certain caveats in mind. For example, this study focuses on deductions and credit and not so much on income induced tax expenditure drivers. Also it does not get into the realm of negative tax expenditures. We opine that these are fertile research grounds for future studies, with the findings of our study providing a starting leverage point. Further, there is always the likelihood of omitted variable bias in virtually all empirical designs. We attempt to address this concern econometrically by using the fixed effect regression analyses. However, this cannot be a sufficient remedy conceptually. In addition, our inability to find a positive relationship between IRS audit and tax expenditure drivers (such as charitable contribution) consistent with conventional expectations require further research, as such a worthy research effort could potentially ignite legislative or tax administration changes on the dynamics of charitable contributions. Further, there could be a potential endogeneity bias between our dependent measure (ProbAud) and our main independent variables of interests (TaxExpd and IRSbdgt). We attempt to attend to this by including lag variable of IRS budget, but our findings remain unchanged. In addition, we are not aware of a compelling theoretical justification for a reverse relationship between ProbAud and TaxExpd. We look to future research for further investigation.

REFERENCES

Ackerman, D. and G. Auten (2006) "Floors, Ceilings, and Opening the Door for a Non-itemizer Deduction, " *National Tax Journal,* Vol. 59(3), p. 509-530.

Ackerman, D. and G. Auten (2011) "Tax Expenditures for Noncash Charitable Contributions," *National Tax Journal*, Vol. 64 (2 part 2), p. 651-687.

Akindayomi, A. and H. Warsame (2016) "IRS Enforcement and Corporate Tax Avoidance: Additional Empirical Evidence," *Working Paper, The University of Texas Rio Grande Valley, Edinburg, TX.*

Bagchi, S. (2012) "Are Republican Administrations Light on Tax Enforcement?: A Look at the IRS, " *Working Paper, University of Michigan, Ann Arbor, MI*.

Bakija, J. and B. Heim (2011) "How Does Charitable Giving Respond to Incentives and Income? New Estimates from Panel Data, " *National Tax Journal* Vol. 64 (2 Part 2), p. 615-650.

Baneman, D., J. Rosenberg, E. Toder, and R. Williams (2014) "Curbing Tax Expenditures." *Pathways to Fiscal Reform in the United States*: 239.

Black, T., K. Bloomquist, E. Emblom, A. Johns, A. Plumley, and E. Stuk (2012) "Federal Tax Compliance Research: Tax Year 2006 Tax Gap Estimation (Washington DC: IRS Research, Analysis & Statistics)."

Bourassa S.C., D.R. Haurin, P.H. Hendershott and M Hoesli (2013) "Mortgage Interest Deductions and Homeownership: An International Survey," *Journal of Real Estate Literature,* Vol. 21(2), p. 181-203.

Buchheit, S., T. Lightner, J.J. Masselli and R.C. Ricketts (2005) "Noncash Charitable Giving: Evidence of Aggressive Taxpayer Reporting Following a Compliance Change," *Journal of the American Taxation Association*, Vol. 27(1), p. 1-17.

Burman, L.E., C. Geissler and E.J. Toder (2008) "How Big are Total Individual Income Tax Expenditures, and Who Benefits from Them?" *The American Economic Review,* Vol. 98 (2), p. 79-83.

Burton, M. and K. Sadiq (2013) "Tax Expenditure Management: A Critical Assessment, " *Cambridge University Press, New York, NY.*

Cameron, A.C., J.B. Gelbach and D.L. Miller (2011) "Robust Inference with Multiway Clustering," *Journal of Business & Economic Statistics*, Vol. 29 (2), p. 238-249.

Cermak, D.SP., K.M. File and R.A. Prince (1994) "A Benefit Segmentation of the Major Donor Market," *Journal of Business Research*, Vol. 29(2), p. 121-130.

Cole, A. (2014) "Corporate Versus Individual Tax Expenditures, " *In Tax Foundation,* Accessed September 1, 2014 at: http://taxfoundation.org/article/corporate-vs-individual-tax-expenditures.

Dennis-Escoffier, S. (2013) "IRS Issues Ruling on Wages Recharacterized as Nontaxable Reimbursements," *Journal of Corporate Accounting & Finance,* Vol. 24 (2), p. 87-90.

Dietz, R.D. and D.R. Haurin (2003) "The Social and Private Micro-Level Consequences of Homeownership," *Journal of urban Economics,* Vol. 54(3), p. 401-450.

Dodge, J.M. (2013) "Some Income Tax Simplification Proposals," *Florida State University Law Review,* Vol. 41(1), p. 71.

Dubin, J.A. and L.L. Wilde (1988) "An Empirical Analysis of Federal Income Tax Auditing and Compliance," *National Tax Journal,* Vol. 41(1), p. 61-74.

Dyreng, S.D., M. Hanlon, and E.L. Maydew (2010) "The Effects of Executives on Corporate Tax Avoidance," *The Accounting Review,* Vol. 85 (4), p. 1163-1189.

Efebera, H., D.C. Hayes, J.E. Hunton, and C.O'Neil (2004) "Tax Compliance Intentions of Low-Income Individual Taxpayers," *Advances in Accounting Behavioral Research,* Vol. 7, p. 1-25.

El Ghoul, S., O. Guedhami, and J. Pittman (2011) "The Role of IRS Monitoring in Equity Pricing in Public Firms," *Contemporary Accounting Research,* Vol. 28(2), p. 643-674.

Follain, J.R. and L.S. Melamed (1998) "The False Messiah of Tax Policy: What Elimination of the Home Mortgage Interest Deduction Promises and A Careful Look at What It Delivers." *Journal of Housing Research,* Vol. 9(2), p. 179-199.

Glaeser, E.L. and J.M. Shapiro (2002) "The Benefits of the Home Mortgage Interest Deduction," *NIBER Working Paper, No. 9284*. *National Bureau of Economic Research, Cambridge, MA.*

Guedhami, O. and J. Pittman (2008) "The Importance of IRS Monitoring to Debt Pricing in Private Firms," *Journal of Financial Economics,* Vol. 90(1), p. 38-58.

Halperin, D. (2002) "Charitable Contribution of Appreciated Property and the Realization of Built-in Gains," *Tax Law Review,* Vol.56, p. 1-34.

Hanlon, M., J.L. Hoopes and N. Shroff (2014) "The Effect of Tax Authority Monitoring and Enforcement on Financial Reporting Quality," *The Journal of the American Taxation Association,* Vol. 36(2), p. 137-170.

Hanson, A. (2012) "Size of home, Homeownership, and the Mortgage Interest Deduction," *Journal of Housing Economics,* Vol. 21(3), p. 195-210.

Hanson, A. and H. Martin (2013) "Housing Market Distortions and the Mortgage Interest Deduction," *Public Finance Review,* Vol. 42(5), p. 582-607.

Hendershott, P.H., and G. Pryce (2006) "The Sensitivity of Homeowner Leverage to the Deductibility of Home Mortgage Interest," *Journal of Urban Economics,* Vol. 60(1), p. 50-68.

Hilber, C.AL. and C. Mayer (2009) "Why do Households without Children Support Local Public Schools? Linking House Price Capitalization to School Spending," *Journal of Urban Economics,* Vol. 65(1), p. 74-90.

Hilber, C.AL. and T.M. Turner (2014) "The mortgage interest deduction and its impact on homeownership decisions," *Review of Economics and Statistics,* Vol. 96(4), p. 618-637.

Hoopes, J.L., D. Mescall, and J. A. Pittman (2012) "Do IRS Audits Deter Corporate Tax Avoidance?" *The Accounting Review,* Vol. 87(5), p. 1603-1639.

Internal Revenue Service. (2012) "IRS Releases New Tax Gap Estimates; Compliance Rates Remain Statistically Unchanged from Previous Study, " IR-2012-4, Accessed August 30, 2014 at: http://www.irs.gov/pub/irs-pdf/p2104.pdf.

Jackson, S.B., P.A. Shoemaker, J.A. Barrick, and F. Burton (2005) "Taxpayers' Prepayment Positions and Tax Return Preparation Fees," *Contemporary Accounting Research*, Vol. 22(2), p. 409-447.

Jackson, S.B. and R.A. White (2008) "The Effect of Tax Refunds on Taxpayers' Willingness to Pay Higher Tax Return Preparation Fees," *Research in Accounting Regulation,* Vol. 20, p. 63-88.

Johnson, C.H. (2013) "Ordinary Medical Expenses," *The Shelf Project, Tax Notes,* November 20, p. 773-780.

Kemp, S., J. Richardson, and C.DB. Burt (2011) "A Goat for Christmas: Exploring Third-Party Gifts," *Journal of Managerial Psychology,* Vol. 26(6), p. 453-464.

Kopecky, K.A. and T. Koreshkova (2014) "The Impact of Medical and Nursing Home Expenses on Savings," *American Economic Journal: Macroeconomics,* Vol. 6(3), p. 29-72.

Klepper, S. and D. Nagin (1989) "The Anatomy of Tax Evasion," *Journal of Law, Economics, & Organization*, Vol. 5(1), P. 1-24.

Lurie, I.Z. and A. Minicozzi (2010) "Understanding the Increasingly Popular Itemized Deduction for Medical Expenses," *Medical Care Research and Review,* Vol. 67(6), p. 707-721.

Lowry, S. (2014) "Itemized Tax Deductions for Individuals: Data Analysis," Congressional Research Service, Vol.8, p. 1-11, Accessed November 23, 2015 at: http://digitalcommons.ilr.cornell.edu/key_workplace/1229.

O'NEIL, C.J., R.S. Steinberg, and G. R. Thompson (1996) "Reassessing the Tax-favored Status of the Charitable Deduction for Gifts of Appreciated Assets," *National Tax Journal*, Vol. 49(2), p. 215-233.

Office of Management and Budget (2012). Analytical Perspectives. Washington, D.C.: Government Printing Office.

Poterba, J. and T. Sinai (2008) "Tax Expenditures for Owner-occupied Housing: Deductions for Property Taxes and Mortgage Interest and the Exclusion of Imputed Rental Income," *The American Economic Review*, Vol. 98(2), p. 84-89.

Scholz, J. T. and N. Pinney (1995) "Duty, Fear, and Tax Compliance: The Heuristic Basis of Citizenship Behavior," *American Journal of Political Science,* Vol. 39(2), p. 490-512.

Stansel, D. and A. Randazzo (2011) "Unmasking the Mortgage Interest Deduction: Who Benefits and by How Much?" *Reason Foundation,* July 1, p. 1-37.

Violette, G. R. (1989) "Effects of Communicating Sanctions on Taxpayer Compliance," *Journal of the American Tax Association,* Vol. 11(1), p. 92-104.

Warren, Alvin, 1980. "Would a Consumption Tax Be Fairer Than an Income Tax?" *Yale Law Journal* 89 (6), 1081-1124.

Woodward, S.E. and J.C. Weicher (1989) "Goring the Wrong OX: A Defense of the Mortgage Interest Deduction," *National Tax Journal*, Vol. 42(3), p. 301-313.

Wooldridge, J.M. (2010) "Econometric Analysis of Cross Section and Panel Data, " *MIT press, Cambridge, MA.*

Zorn, S.A (1995) "The Federal Income Tax Treatment of Gambling: Fairness or Obsolete Moralism?" *The Tax Lawyer,* p.1-54.

ACKNOWLEDGEMENT

The authors gratefully acknowledge comments and constructive critiques from colleagues at the various presentation forums where the study was presented. We are also grateful to the editor and the two anonymous reviewers for the helpful comments provided during the review process.

DATA AVAILABILITY

Data are available from public sources indicated in the text.

DISCLOSURES

The authors have no financial arrangements that might give rise to conflicts of interest with respect to the research reported in this paper.

BIOGRAPHY

Dr. Akinloye Akindayomi (who is the lead and corresponding author) is an Associate Professor of Accounting, at the Robert C. Vackar College of Business and Entrepreneurship, The University of Texas Rio Grande Valley (UTRGV). He can be contacted at: 1201 West University Drive, Edinburg, Texas 78539-2999, U.S.A. Phone: (956) 665 – 7842. Email: akinloye.akindayomi@utrgv.edu

Dr. Gideon. T. Akinleye is a Senior Lecturer at the Ekiti State University, Ado-Ekiti, Nigeria. He is also the Chair and Head of the Accounting Department.

Adeduro A. Ogunmakin is a lecturer at the Ekiti State University, Ado-Ekiti, Nigeria

Accounting & Taxation
Vol. 10, No. 1, 2018, pp. 23-38
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

IBFR
www.theIBFR.com

PREDICTIVE ABILITY OF DIRECTORS' AND OFFICERS' LIABILITY INSURANCE COVERAGE FOR CLASS ACTION LAWSUIT SETTLEMENTS

Irene Y. Kim, Catholic University of America

ABSTRACT

The primary conclusion from prior literature is that firm size, as a measure of firm resources and capacity to pay, is a key predictor of class action securities settlement amount, and the merits of the case are less important in settlement negotiations. The purpose of this study is to shed additional light on the settlement determination process: given defendant incentives to avoid paying out of pocket and plaintiff incentives to settle quickly with maximum settlement, does directors' and officers' (D&O) insurance coverage limit explain variation in settlement amounts? I find that D&O coverage limit has predictive ability for settlement size, even when controlling for firm size. I also find that the association depends on the level of coverage; high D&O coverage has stronger explanatory power for settlements than low coverage, presumably due to the marginal benefits of plaintiff attorney effort at high levels of coverage to yield the big payoff. In sum, this paper contributes to the existing literature on predicting class action securities lawsuit settlements, which even though D&O coverage levels are unobservable to investors, impacts decision-making important to shareholders.

JEL: K4, M4

KEYWORDS: Accounting, Securities Litigation

INTRODUCTION

The purpose of this paper is to shed light on the role Directors' and Officers' (hereafter D&O) insurance coverage plays in the class action settlement determination process and to provide evidence on the importance of firm size in predicting the settlement amounts. The main conclusion of prior literature is that settlement amounts increase with firm size (Francis, Philbrick, and Schipper, 1994, Dunbar, Juneja and Martin, 1995, Skinner, 1996). The purpose of this study is to examine whether D&O insurance total coverage limit is a predictor of settlement amounts, above and beyond firm size. The tension in this rationale is that premiums will rise following a large claim to fund a class action lawsuit settlement; however, this cost is incurred by the firm (and therefore, the shareholders with an ownership interest at settlement payout), rather than a personal cost to the defendant executives. In prior literature (Francis, Philbrick, and Schipper, 1994, Dunbar, Juneja and Martin, 1995, Skinner, 1996), the firm's capacity to pay has been *indirectly* measured using firm total assets. In contrast, the policy coverage limit is independent of the merits of the plaintiffs' case and is a *direct* measure of the funds available to pay. Claims are more easily funded by insurance companies that are contractually required to fund coverage as opposed to individual defendants (Baker and Griffith, 2009). Naturally, the firm has incentives to settle without using its own money and its D&O insurance coverage. Therefore, this study contributes to the existing research on whether the merits of the individual case matter in determining class action securities settlements (Alexander, 1991, Francis et al., 1994, Skinner, 1996, Palmrose and Scholz, 2004, Donelson, Hopkins, and Yust, 2015). The goals of this paper are twofold.

First, I examine whether firm size is correlated with the amount of D&O coverage a firm carries and if so, whether firm size or D&O coverage limit has stronger explanatory power for class action lawsuit settlement size. Anecdotally, we know that plaintiff and defendant attorneys have incentives to settle class action lawsuits at or within coverage limits to avoid the use of firm resources to fund settlements and to avoid lengthy settlement negotiations (Alexander, 1991). To accomplish this goal, I compare the R-squared of a regression of settlement amount on D&O limit, to a regression of settlement amount on firm size, both controlling for the merits of the case. I find that coverage limit is statistically significant in explaining settlement amount, even when controlling for firm size. This result suggests that the D&O coverage limit contains information for settlements beyond firm size. Moreover, in a univariate regression, firm size (as a proxy for capacity to pay within the firm) does a better job of explaining settlement amounts than D&O coverage alone (as a proxy for capacity to pay using other peoples' money). This result is consistent with the idea that firm size is a useful summary measure to capture other (possibly unmeasurable or unobservable) variables in predicting settlement amounts. Consistent with the idea in Berk (1995) that firm size encompasses many unobservable factors; in this case, firm size proxies for many unobservable predictors of settlement size, potentially correlated with litigation risk and capacity to pay.

The second goal of my paper is to explore whether the predictive ability of D&O insurance for settlement size depends on the level of D&O coverage. I expect that there is a nonlinear impact of coverage limit and firm size on settlements. That is, for high levels of D&O coverage, I predict that the plaintiff attorneys undergo effort to use as much of the limit as possible. In contrast, at low levels of D&O coverage, the plaintiff attorney incentive system realizes the marginal benefit of their effort is low, and thus trade off a high settlement for a quick settlement. I test this prediction using piecewise linear regressions, and I find that the slope coefficient for high D&O firms is significantly larger than the slope coefficient for low D&O firms in the prediction of settlement size. To further explore whether the merits of the case matter for settlement determination in cases arising from errors and irregularities, i.e. earnings restatement, I also test whether the percentage change in earnings as a result of the restatement is a determinant for settlement amounts. The severity of the error or irregularity is predictive of settlement negotiations (a steeper drop in earnings has valuation implications for stockholders, and affects their expectation of future earnings). I find that a reduction in earnings is statistically significant in explaining settlement value, and the amount of earnings that were restated is a merit of the lawsuit that factors into settlement determination.

The contribution of this study is to provide large sample evidence on D&O insurance coverage limits for application to class action settlements. Furthermore, I confirm the intuitive anecdotal and theoretical evidence which suggests that plaintiffs' attorneys and defendants have interests to settle at or within coverage limits. Baker and Griffith (2009) use anecdotal evidence to conclude that "although securities settlements are influenced by some factors that are arguably merit related, such as the 'sex appeal' of a claim's liability elements, they are also influenced by many that are not, including, most obviously, the amount and structure of D&O insurance" (page 755). This paper's conclusions are that firm size is preeminent even when considering coverage limits because of the all-encompassing nature of firm size, i.e. largely because firm size captures many correlated factors of settlement determination, and coverage limit does play a role in explaining settlements, even when controlling for firm size. Intuitively, though, settlement amount and D&O coverage limits have a direct relationship, while firm size (representing a proxy for unobservable litigation risk variables and firm resources) and settlement amount have an indirect relationship. Plaintiffs' attorneys discover the defendant coverage limit after class certification, and have incentives to use the coverage limit as a target for the settlement amount to settle quickly and move onto their next case. Furthermore, the relationship between D&O and settlements is nonlinear: the association is even stronger at higher levels of D&O coverage, implying that plaintiff attorneys have higher incentives to get that large settlement and use the available coverage when the limit is substantial without wasting available coverage. Defendant attorneys also have strong reasons to settle within D&O coverage limits. Insurers pay the limit used less a deductible, and as long as executives do not incur personal liability, defendant attorneys are willing to use it. Interestingly, D&O insurers often agree to settle using the policy

limit, because defendants select defense counsel, rather than using insurer attorneys. This is in contrast to other types of insurance (Black, Cheffins, and Klausner, 2006).

The remainder of this paper proceeds as follows. In the next section, I provide institutional detail on D&O insurance and literature review, followed by a section on data description. The results follow, and I end with concluding comments.

LITERATURE REVIEW

Institutional Background on Directors' and Officers' Liability Insurance

D&O insurance covers managers, directors, and in some cases entire firms. The risk aversion of the firm's officers and directors results in the purchase of D&O insurance coverage as part of an executive compensation policy. D&O insurance serves several purposes for the firm, its shareholders, managers, and directors, such as: (1) reduces the agency problem between investors and management by introducing convexity to a manager's risk averse function (Bhagat, Brickley, and Coles, 1987), and (2) represents a substitute monitoring device for other governance mechanisms that are too costly for the firm (Holderness, 1990, O'Sullivan, 1997). As a recruitment tool, a covered officer is part of the D&O purchase decision because she is exposed to possible financial and reputational loss in the event of a filing, regardless of merit. According to the Tillinghast-Towers Perrin *Directors and Officers Liability Survey*, D&O coverage is virtually universal among survey participants, at 97%; however, it is difficult to know whether this coverage percentage extends to the broader population of firms. According to Tillinghast-Towers Perrin, the mean D&O coverage limit is $20.1 million. D&O coverage curbs managerial risk aversion, and covers employment discrimination, securities lawsuits, and other employment-related suits (Kim, 2015). Class action securities litigation reduces agency costs, because it is an ex post monitoring deterrent available to investors (Jennings, Kedia, and Rajgopal, 2011).

D&O insurance can offset the benefits of the litigation threat, which therefore suppresses the reduction of agency costs by buffering the manager from being responsible for his actions. The effect of these two forces inhibits the ex post settling up of securities litigation. The amount of D&O coverage carried is determined partially by the price a firm will pay for insurance because of price protection by insurers (in the form of the deductible, coverage, and premium) (Core, 2000, Cao and Narayanamoorthy, 2014). D&O insurance firms must evaluate the risks associated with insuring the firm, its industry, and the individual managers; monitoring costs come when a manager makes a misrepresentation and the insurers determine whether information used to establish the contract was incorrect. These contracting and monitoring costs are built into the premium charged, the deductible charged, and the coverage limit made available to the insured. The anecdotal evidence suggests that the insurers will not undersell the covered; rather, it will price protect to compensate them for the borne risk. Therefore, the amount of coverage purchased is purely a function of how much the firm (its executives) wants to purchase given the premium. However, Baker and Griffith (2009) find that, based on anecdotal evidence, once the policy is in place, "D&O insurers do almost nothing to monitor the risky activities of their corporate insureds and that, as a result, D&O insurance is a pure risk-spreading form of insurance, raising the attendant moral hazard concerns" (page 762). Similar to other types of insurance, this lends to the idea that defendants can use their D&O limit when necessary to cover securities claims.

The insurer's risk level is increasing in litigation settlements and coverage offered per firm, which is why multiple carriers generally insure a firm together, thereby spreading the risk among insurance companies. D&O insurance premiums have increased dramatically in the past several years due to the dramatic increase in securities litigation (Woodruff-Sawyer & Co). If it is brought to light that the information used to establish the D&O contract was misleading, the D&O contract may be revoked. For example, if a firm restates earnings and is found guilty of misleading investors in a securities trial, the information used to

prepare the contract is deemed incorrect, and contract rescission occurs. However, there is generally no admission of wrongdoing in a settled case, making it difficult for the insurer to rescind the contract. If an insurance provider refuses to pay the settlement amount, then the insurer can be held responsible for trial verdict amounts above coverage limits (Black et al., 2006). Thus, the plaintiff (attorneys), defendant (attorneys), and D&O insurers all have strong incentives to settle so that D&O resources can be used to fund the settlement (Romano, 1991, Black et al., 2006).

Extant empirical literature on *U.S.* D&O insurance is sparse, presumably because data generally are not available for U.S. firms. Baker and Griffith (2009) document that the D&O relationships are theoretically testable, but do not have access to reliable D&O information. Chalmers, Dann, and Harford (2002) use D&O insurance and post-offering returns to identify opportunism in U.S. IPO firms, by identifying a negative correlation between D&O coverage and post IPO returns. Furthermore, Cao and Narayanamoorthy (2004) perform a similar premiums determinant analysis to Core, except with U.S. data. This study draws comparison to Donelson et al. (2015). However, there are several reasons why I find the Donelson et al. (2015) results interesting as they relate to the D&O-settlement issue. To begin with, the Donelson et al. results and its implications are highly dependent on the lawsuit damages measure used. They purport that damages and other merits of the case have strong predictive power for settlements, whereas D&O coverage limits do not. The damages proxy does not contain a measure of share turnover (volume) during the manipulation period. In a rule 10b-5 case, a drop in market value during the class period is significant only if trades occurred. We know from prior literature that settlements are extremely highly correlated with firm size; the Pearson correlation coefficient reported in Donelson et al. (2015) between firm size (log assets) and damages (log) is extremely high at 0.81. The high correlation could certainly result in some multicollinearity issues and unstable coefficients. In contrast, this study uses a damages measure which encompasses impact – market drop with trading volume to capture both dimensions of investor loss. The Pearson correlation between damages and assets is only 0.4 in this paper, i.e. damages and assets contain different pieces of information.

Secondly, the Donelson et al. (2015) paper seems to suggest that D&O coverage limit and case merits are mutually exclusive in explaining settlement size. "Evidence that settlements are largely determined by insurance limit would be consistent with plaintiffs lacking confidence in their cases and their ability to win a jury trial" (Donelson et al. 2015). As we know from Alexander (1991), plaintiff attorneys have a menu of cases and a litigation settlement wrapped up expeditiously is ideal for both sides alike. Plaintiff attorneys have several reasons for targeting a settlement, namely D&O coverage often cannot be used in a losing adjudicated trial, reputation effects can worsen with a jury trial, and the marginal benefit of going to trial is low for settlement maximization purposes. If merits matter more for settlement negotiations, we would see many settlement amounts above the maximum D&O coverage; however, 96% of settlements are within the available policy coverage (Cox, Thomas, Bai, 2008). Therefore, it appears that there are more unanswered questions regarding the D&O settlement story. Additionally, the observation count used in Donelson et al. (2015) is 94, and regressions by quartile use only 23 observations. It is difficult to draw inferences from 23 or 94 observations; the paper tries to assess generalizability by comparing D&O sample descriptive statistics and regression coefficients with the D&O sample to the non D&O sample, but the prime variable of interest is missing. For these reasons, the contribution of this study is to continue to delve into the relation between settlement determination, D&O limits and case merits, an issue that has not fully been resolved.

The Settlements Merits Issue

Accounting and legal literature has debated whether the settlement amount corresponds to (i) firm resources, or (ii) the strength of the plaintiff's legal case, otherwise known as the merits of the case. Beginning with Alexander (1991), research shows that settlement amounts often are not related to the merits of the case, but rather, firm size and loss in market value explain much of the variation in resolutions

(Francis et al., 1994, Dunbar and Hinton, 1995, DuCharme, Malatesta, and Sefcik, 2004). The linear correlation between damages filed and litigation outcomes is statistically insignificant (Francis et al., 1994, Dunbar and Hinton, 1995). An exception to this is Donelson et al. (2015), who find that the correlations between damages and settlements are highly significant at 71%, p-value <0.05 based on a two-tailed test. The presence of insured co-defendants and time to reach settlement are positively associated with settlements (Dunbar and Hinton, 1995). Thus, the primary conclusion from prior literature is that size (representing a proxy for resources) is the leading predictor of settlement amount. Dunbar et al. (1995) concludes that available assets are a better predictor of settlements than merits, while much of the variation in settlements remains unexplained. Furthermore to the merits issue, claims featuring easily identifiable indicia of wrongdoing or fraud–such as earnings restatements, insider selling, and concomitant regulatory investigations–settle higher than claims without such features (Baker and Griffith, 2009). Donelson et al. (2015) stretch the merits issue to represent a determinant of financial reporting fraud by stating that meritorious cases are a measure for accounting fraud. The sample in Donelson et al. is simply a sample of rule 10b-5 cases; therefore, the measure of fraud using merits is misleading due to the prevalence of non-accounting related cases and non accounting-related merits, e.g. insider trading.

Akin to the firm resources argument of firm size as a predictor of settlement amount, I investigate how D&O coverage affects litigation settlements (a joint decision by parties internal and external to the firm). The policy coverage limit is a direct measure of the firm's ability to pay (i.e. firm resources) and does not reflect the merits of the plaintiffs' case. "Size of insurance coverage does usually shape the final size of a settlement" (Savett, 1997). Defendants naturally have incentives to settle without using their own money, which lends to a natural link between settlements and D&O coverage. "[C]orporations possess a vested interest, only in settling cases *within policy limits*, which are often quite large. This has caused settlement amounts to skyrocket and removed incentives to control defense costs as well" (Keogh, 2002, emphasis added). Even if D&O coverage does not provide for all of the settlement amount, firms can cover the remainder without having to resort to the use of executives' money (Klausner, Hegland, and Goforth, 2011). D&O insurance coverage cannot be used to fund a negative adjudication, because policies routinely exempt losses from trials finding dishonest or misleading behavior. However, in the case of a settlement, the insurer generally cannot refuse to pay because there is no admission of guilt (Romano, 1991). Hence, in addition to the purchase of insurance, the corporate executives' risk aversion creates incentives to settle a lawsuit quickly, funding the settlement with D&O insurance coverage (Alexander, 1991, Romano, 1991). Defendants do not want the lawsuit to get to trial, with additional adverse reputation and monetary consequences. Premiums may rise following insurance funding of settlement, but any rise in premiums is essentially paid by investor ownership at the time of the cost increase (Romano, 1991).

On the opposing side, the class is represented by the plaintiff counsel, who is the major player in settlement negotiations with the defendant. As discussed in Alexander (1991), the high monitoring costs with pennies to the dollar expected recovery prohibit active monitoring by the class members of the plaintiff attorney. "Class actions are characterized by high agency costs: that is, a significant possibility that litigation decisions will be made in accordance with the lawyer's economic interests rather than those of the class" (Alexander, 1991). Plaintiffs' attorneys interests need not coincide with the shareholders' interests (Romano, 1991). Plaintiffs' counsel agree to settle within policy limits without pushing for a trial, because they have a menu of class actions to pursue, thus potentially trading off a slightly higher settlement amount for the opportunity cost of pursuing other class actions. "Plaintiffs' counsel will often settle with officer and director defendants who are usually the most culpable defendants within policy limits because there is little incentive to refuse a bird in the hand and go outside policy limits" (Savett, 1997).

Hence, following lawsuit certification by the court, both plaintiffs' attorneys and defendants have incentives to settle quickly and use the D&O coverage, which leads to Hypothesis 1. Settlement amounts are increasing in firm resources in the form of D&O coverage, *ceteris paribus*.Furthermore, I also expect that the prediction of D&O insurance and firm assets (size) for settlement amounts is nonlinear. For small firms

and low values of D&O insurance, it is logical that plaintiff attorneys trade off a lower settlement for a quicker one, which would imply a weaker association between settlement size, coverage limit, and firm size. However, the coefficient for limit on settlement amount should be larger (and different) for higher values of limit, because plaintiff attorneys want to settle as close to coverage limits as possible to garner the big payoff. The differential coefficients of limit on settlement amount lead to Hypothesis 2. There is a nonlinear relationship between D&O coverage limit and settlement amount, ceteris paribus.

Accounting Restatements

Restatements may result from: (i) accounting irregularities, including aggressive accounting practices, (ii) intentional and (iii) unintentional misuses of facts applied to financial statements, (iv) oversight or misrepresentation of accounting rules, or (v) fraud (General Accounting Office, 2003). There are several consequences of earnings restatements; for example, the market penalizes the firm for an earnings restatement, due to the valuation implications of altering the earnings into perpetuity (Palmrose, Richardson, and Scholz, 2004, Richardson, Tuna, and Wu, 2002). Furthermore, the market perceives that earnings restatements have earnings management implications. Palmrose et al. (2004) find a market reaction of –9.2% to quarterly and annual restatement announcements, while Richardson et al. (2002) find a market response of –11% to the announcement of an earnings restatement. Additional market penalty occurs when there is no quantification of the amount of the restatement, a large change in originally-filed income, insider trading by executives, or when the restatements affects multiple financial statement accounts (Palmrose et al., 2004, Badertscher, Hribar, and Jenkins, 2011). Hence, the market appears to penalize firms for restating earnings due to the valuation implications of altering past earnings.

Aside from stock valuation penalties from earnings restatements, Srinivasan (2005) and Carver (2014) confirm that penalties for earnings restatements come in the form of turnover. Srinivasan (2005) finds that board turnover is 51% for firms that restate earnings downwards, compared to 29% for positive restatement firms and 17% for technical restatement firms. These results provide evidence that directors are held accountable for financial reporting failures, such as earnings restatements. Another consequence of an earnings restatement is recourse in the form of securities litigation (Palmrose and Scholz, 2004). In a test of auditor litigation, they find that only 38% of restatement firms are sued, and they identify whether the litigation rate increases when a firm restates core earnings (normal, recurring earnings from operating activities) and has pervasive misstatements (the number of financial statement items affected by the restatement). Restatements involving core earnings items yield a higher litigation rate (51%) than non-core items (18%), and as expected, restatements related to revenue recognition items are the most predominant and have the highest litigation rate. Given prior evidence suggesting that a restatement of earnings has valuation implications, I examine whether firms face an additional consequence from an earnings restatement. In class action lawsuit cases arising from restatements, I expect that the amount of earnings that changed as a result of the restatement is a determinant of settlement amounts, i.e. that the severity of the error has implications for settlement negotiations. The amount of earnings that are restated predicts settlement amounts, ceteris paribus.

Data

D&O data is gathered from a highly proprietary industry source. The D&O sample starts with an observation count of 8,662. The relevant D&O limits and deductibles used for the settlement analysis are those prevailing during the class period, because the funding of settlements is based on the coverage in place during the class period. I use three sources for my settlement data. The first source is the *Securities Class Action Alert* paper service, which spans from 1990-2002. The second source is *Securities Class Action Clearinghouse*, which is sponsored by Stanford Law School and documents cases filed after the Private Securities Litigation Act of 1995. The third source is Woodruff-Sawyer & Co. The total number of settlements from these sources is 1,172, spanning from 1990-2002. Once merged with the D&O

observations, there are 151 remaining settlements. Tables 1-3 provide descriptive statistics for the D&O sample. Table 1 shows that a company's average annual premium is $470 million, while premiums as a percentage of coverage is 3.2%. D&O contracts often stretch more than one year; the average number of policy years is 1.2. Insurers often spread the risk of a firm over multiple insurers. For example, an insurer can cover the layer up to $10 million of liability, and another insurance company can cover the layer from $10 to $20 million of coverage for a firm. Table 1 shows that the average number of layers is 2.9.

Table 1: D&O Sample Premium and Coverage Descriptive Statistics

N=627	Mean	Median
Premiums ($ millions)	$469.6	$335.0
Premium/ Coverage	3.2%	2.8%
Number of Policy Years	1.2	1.0
Number of Layers	2.9	3.0

Premium data are available for 627 observations. Means and medians of premiums, premium per dollar of coverage limit, number of policy years covered in the policy, and number of insurers providing coverage to a firm (number of layers) are provided.

The purpose of Tables 2 and 3 is to identify whether there is a tradeoff between premiums and deductibles charged by the insurer. Table 2 is a correlation table of coverage year, deductibles per dollar of coverage, premiums per dollar of coverage, and the coverage limit. The correlation coefficient between coverage year and scaled premiums (about 50%) is much higher than the correlation between coverage year and scaled deductible (14%). This suggests that insurers have resorted to price protecting through premiums in more recent years than using deductibles.

Table 2: D&O Sample Tradeoff Analysis of Coverage Limit, Deductible, and Premium Correlation Coefficients

	CovYear	Deduc%	Prem%	Limit
		0.138***	0.497***	0.198***
CovYear		[0.003]	[<0.0001]	[<0.0001]
		455	454	455
	0.032		0.181***	–0.530***
Deduc%	[0.500]		[0.0001]	[<0.0001]
	455		454	455
	0.455***	–0.007		0.261***
Prem%	[<0.0001]	[0.880]		[<0.0001]
	454	454		454
Limit	0.111**	–0.018	0.108**	
	[0.017]	[0.695]	[0.022]	
	455	455	454	

, **, * indicate significance at the 10, 5, and 1 percent levels respectively. Limited premium and deductible data are available for the original D&O sample of 8,662. Pearson correlation coefficients are below the diagonal and Spearman correlation coefficients are above the diagonal. CovYear is the coverage year. Deduc% is the firm's total deductible scaled by the coverage limit. Prem% is the firm's total premium scaled by the coverage limit. Limit is the firm's total coverage limit in $millions.*

The Spearman correlation between premium and deductible per dollar of coverage is 18% (Pearson is not statistically significant). Insurers do not appear to tradeoff the premiums for deductibles; instead, they price protect using both mechanisms. As expected, the coverage limit and deductible per dollar of coverage are negatively correlated (Spearman correlation of –53%). Furthermore, the higher the coverage purchased, the higher the cost per dollar of coverage (Spearman correlation of 26%). Table 3 lists the descriptive statistics by coverage limit quartile. Consistent with the correlation coefficients, the median of the premiums per dollar of coverage increases as the coverage quartile increases, whereas deductibles per dollar of coverage limit gets smaller as the coverage limit quartile changes. Even though deductibles decrease and premiums increase as the coverage increases, there does not appear to be a tradeoff between the two. The correlation coefficient is positive at 18%.

Table 3: D&O Sample Tradeoff Analysis of Coverage Limit, Deductible, and Premium Descriptive Statistics by Coverage Limit Quartiles

		Deduc%	Prem%
Quartile 1	*Mean*	5.48%	2.55%
	Median	3.66%	2.30%
Quartile 2	*Mean*	3.14%	3.31%
	Median	2.50%	2.74%
Quartile 3	*Mean*	9.58%	3.30%
	Median	2.00%	3.04%
Quartile 4	*Mean*	2.07%	3.40%
	Median	1.25%	3.12%

Limited premium and deductible data are available for the original D&O sample of 8,662. CovYear is the coverage year. Deduc% is the firm's total deductible scaled by the coverage limit. Prem% is the firm's total premium scaled by the coverage limit. Limit is the firm's total coverage limit in $millions.

Descriptive statistics for the settlement sample are in Table 4. Settlement amounts are naturally very skewed. There is considerable variation in deductibles per dollar of coverage. Insurers not only price protect by charging higher premiums to riskier insureds (Core, 2000), but also charge higher deductibles to riskier clients. The sample firm with the largest limit ($350 million) during its class period has a relatively small deductible, at only $10 million. In contrast, the firm with the largest deductible ($50 million) has a limit of only $150 million. This suggests that insurers charge higher deductibles per dollar of limit to perceived riskier firms.

Table 4: Settlement Sample Descriptive Statistics

Variable	Units	Obs	Mean	Minimum	Median	Maximum
SETTLEMENT VARIABLES						
Sett	Millions	151	17.09	0.00	7.75	490.00
Shr	Millions	14	6.36	0.12	1.47	53.5
Ins Pmt	Millions	27	20.51	1.25	7.25	196.00
Co Pmt	Millions	28	13.01	0.00	0.00	294.00
Atty Fees	%	148	29.6%	3.69%	30.0%	40.00%
Atty Expenses	Millions	88	0.53	1.60%	0.32	5.85%
Damages	Millions	145	577.24	1.00	69.37	12,914.66
D&O VARIABLES ASSOCIATED WITH SETTLEMENT SAMPLE						
Limit	Millions	160	35.56	0.18	20.00	350.00
Deductible	Millions	161	2.36	0.03	0.28	50.00
DATES ASSOCIATED WITH SETTLEMENT SAMPLE						
Beg Class Per		169	1995	3/1988	8/1996	4/2002
End Class Per		169	1996	5/1990	7/1997	12/2002
Filing Date		90	1996	6/1990	7/1996	12/2001
Settle Date		166	1998	12/1991	1/2001	4/2003
FIRM CHARACTERISTICS OF SETTLEMENT SAMPLE						
Size	Millions	111	8,579	2.20	548	259,260
RESTATEMENT VARIABLE						
Rest Ni	%	169	–0.014	–0.53	0.00	0.062

Descriptive statistics are for firms that settled a class action lawsuit case, and also have available D&O coverage limits. Sett is measured as the total cash settlement award, excluding consideration of attorney fees and expenses ($millions). Ins Pmt is the portion of cash settlement covered by D&O insurer(s), if data is available. Co Pmt is the amount of cash settlement paid by the firm directly, if data is available. Atty Fees is the percentage of cash settlement awarded to the plaintiff attorney for fees. Atty Exps is expenses awarded to plaintiff, which is distributed out of cash settlement ($millions). Limit is the average coverage limit prevailing during the class period. The coverage limit at settlement is not the relevant limit, since the limit prevailing when the fraud occurred is used to pay the settlement. Deductible is the firm's deductible under the D&O relevant policies. Settle Date is the month and year of the settlement announcement. Filing Date is the month and year of the class action filing date. Beg Class Per is the class period beginning date. End Class Per is the class period ending date. Size is the average of beginning class period total assets and ending class period assets. Rest NI is the percentage of restated earnings, i.e. [(Restated NI– Originally Filed NI)/Originally Filed Total Assets]. If no restatement, REST NI is set to 0. Damages is an estimate of damages computed in equation [4].

Estimated damages are also very skewed. The average amount of net income that decreased as a result of the restatement is about 1.4% of total assets. Plaintiff attorney fees seem to be rather standard, at about 30% of settlement amounts. Plaintiff attorney fees and expenses come out of the settlement fund, and must

be approved by the district court. Consistent with extant literature, alleged accounting problems are the leading cause of settled cases (Table 5).

Table 5: Frequencies of Settlement Sample Count Variables

FirmDef	**Yes**	**127**
	No	3
Cause	Accounting	71
	Failure to Warn	58
	False Forecast	33
	Acquisition	21
	Offering	19
	Business	8
District Ct (Top 6)	CA	66
	NY	16
	IL	8
	OH	5
	PA	6
	TX	7

Frequencies are for firms that settled a class action lawsuit case and also have available D&O coverage limits. FirmDef =1 if the firm was named as defendant in the class action filing, and 0 otherwise. Cause is the list of causes for the suit, as detailed in the filing press release. District Ct is the district court where the class action suit was originally-filed.

Pearson and Spearman correlation coefficients are shown in Table 6. As expected, the correlation between *LnSize* and *LnLimit* is quite high, at about 0.66. Settlement amounts, firm size, coverage limits, and estimated damages are all highly correlated, with correlation coefficients of 40–50%.

Table 6: Settlement Sample Correlation Coefficients

	LnSett	**LnSize**	**LnLimit**	**LnDamages**	**Rest NI**
LnSett		0.459***	0.477***	0.486***	–0.065
		[<0.001]	[<0.001]	[<0.001]	[0.414]
		151	160	139	162
LnSize	0.494***		0.704***	0.451***	0.103
	[<0.001]		[<0.001]	[<0.001]	[0.199]
	151		155	136	158
LnLimit	0.438***	0.661***		0.447***	0.109
	[<0.001]	[<0.001]		[<0.001]	[0.161]
	160	155		142	166
LnDamages	0.402***	0.395***	0.405***		0.016
	[<0.001]	[<0.001]	[<0.001]		[0.848]
	139	136	142		145
Rest NI	–0.120	0.139*	0.095	0.062	
	[0.129]	[0.081]	[0.223]	[0.462]	
	162	158	166	145	

, **, * indicate significance at the 10, 5, and 1 percent levels respectively. Pearson and Spearman correlation coefficients for firms that settled a class action lawsuit case, and also have available D&O coverage limits. Pearson correlation coefficients are below the diagonal. LnSett is the natural log of the total cash settlement award, excluding consideration of attorney fees and expenses ($millions). LnSize is the natural log of the average of beginning class period total assets and ending class period assets in $millions. LnLimit is the natural log of the coverage limit prevailing during the class period in $millions. The coverage limit prevailing at settlement is not the relevant limit, since the limit prevailing when the fraud occurred is used to pay the settlement. LnDamages is the natural log of an estimate of damages constructed using equation [4]. Rest NI is [(Restated NI– Originally Filed NI)/Originally Filed Total Assets]. If no restatement, Rest NI is set to 0.*

RESULTS

Federal Regulation

The Private Securities Litigation Reform Act of 1995 (PSLRA) was passed to encourage a reduction of abusive litigation and coercive settlements (Foster, Martin, Juneja, and Dunbar, 1999). The PSLRA is a federal law, so it does not affect cases filed in the states. Pre-PSLRA, there was a preference given to the

first attorney to file; however, the PSLRA reduces this first mover advantage. Another key change is the strengthening of the scienter requirement. The desired effects of these two key changes is to reduce the number of filings by increasing the chance of an early dismissal and raising the standard for liability, and to curb a quick filing without cause (Foster et al., 1999). The desired effects and actual consequences of the Act are quite divergent (Foster et al., 1999). The number of cases filed drastically increased post-PSLRA, along with a significant increase in the number of cases dismissed. These changes would have presumably increased the average settlement amount, because the reduced number of cases getting through the dismissal stage and reaching settlement is of higher merit, all else equal. However, since the desired effects were not achieved, I do not distinguish between settlements in the pre- and post- PSLRA regimes in my research design.

Settlement Prediction

The insurer(s) paid 100% of the settlement in 33 of the 56 cases in my sample where the settlement allocation between D&O underwriter(s) and the firm is known. In many cases, the firm's contribution is to dilute earnings per share by contributing common shares to the settlement fund (non cash portion of the settlement). The regressions to test Hypotheses 1 and 2 take the following form:

$$LnSett = \beta_0 + \beta_1(LnSize) + \beta_2(LnLimit) + \varepsilon \quad (1)$$

$$LnSett = \beta_0 + \beta_1(LnLimit) + \beta_2(LnDamages) + \varepsilon \quad (2)$$

$$LnSett = \beta_0 + \beta_1(LnLimit) + \beta_2(LnDamages) + \beta_3(Rest\ NI) + \varepsilon \quad (3)$$

where

LnSett is the natural log of the cash portion of the class action lawsuit settlement amount;

LnLimit is the natural log of the firm's coverage limit for the class period;

LnDamages is the natural log of estimated damages; and

Rest NI is [(Restated NI– Originally Filed NI)/Originally Filed Total Assets]. If no restatement, Rest NI is set to 0.

The value of stock awarded during negotiations, at settlement, and at payout may all be different. These different stock values could drastically skew the settlement amount, and the relation between D&O insurance and the settlement value. I am studying the relation between D&O insurance coverage limits and the cash part of the settlement amount. The firm issues the class common shares at settlement payout, whereas the D&O insurers do not pay any part of the common stock awarded. Since I am only studying the relation between D&O coverage and settlement amounts, it makes sense to only include the cash value, or insurable, portion of the settlement in the analysis. Hence, I estimate the settlement amount using the cash value only, because valuing the stock portion is an ambiguous process (especially with dilution considerations). The estimated damages measure is a proportional trading model, adapted from Jones and Weingram (1996). Estimated damages are calculated using equation [4] below.

$$Estimated\ Damages = -MVE_t * MRET_{i,t} * (1 - (1 - Turnover)^x \quad (4)$$

The end of the class period is usually marked by some disclosure that leads to the class action filing. The MVE_t measure represents the market capitalization before the stock price response to the disclosure. $MRET_{i,t}$ is the cumulative market-adjusted stock return over the class period. The last measure is a volume

measure, and is an estimate of the number of shares that were bought and sold during the class period (deflated by the total number of shares outstanding). x is the number of days in the class period. Estimated damages are constrained to be nonnegative; hence, if $MRET_{i,t}$ is greater than or equal to zero, I set damages equal to one million dollars.

Table 7 provides regression results for Hypothesis 1 and 3. I begin by confirming that the result identified in prior literature holds with my sample. Firm size is statistically significant in explaining settlement amount, significant at the 1% level (model *a*). Firm size appears to do a better job in explaining settlement amounts than coverage limit (R^2 of 24% and 19%, respectively). The coefficient in the regression with *LnLimit* is 0.47 as shown in model *b* (significant at the 1% level). After controlling for size, coverage limit is still significant in explaining settlement amounts (model *c*), which is a significant finding especially given the correlation between size and limit. Since the correlation coefficient between coverage limit and size is 0.66, multicollinearity may be a concern in the regression with both explanatory variables. Some diagnostics of multicollinearity include: (i) coefficients may have low significance levels even though they are jointly significant and the R^2 for the regression is quite high; (ii) coefficients have the wrong sign or magnitude; (iii) the condition index is over thirty; and (iv) the variance inflation factor is above ten (Greene, 2000, Gujarati, 1995). The coefficients for *LnSize* and *LnLimit* are statistically significant, and the R^2 of 22% is not much higher than the univariate regressions (17% and 19%, respectively). The coefficients have the expected sign. A confidence index between ten and thirty suggests moderate to severe collinearity (Gujarati, 1995). The confidence index is 10.57, which suggests moderate collinearity. According to Gujarati (1995), a variance inflation factor of over ten suggests a problem. The variance inflation factor is two for both variables. There is no clear cut test for collinearity. However, the various symptoms of multicollinearity do not suggest an extreme problem in this case.

Prior research has concluded that size is the leading determinant of settlement amounts, but coverage limit is also a significant determinant. *LnLimit* has a coefficient of 0.17 when controlling for size, and is significant at the 5% level. These findings reject the null of Hypothesis 1. Model *d* shows that coverage limit is also statistically significant (coefficient of 0.32, p-value of 0.02%) when controlling for estimated damages (coefficient of 0.14, p-value of 0.05%), suggesting that coverage limit also contains information beyond estimated damages. This result is in contrast to the findings in Donelson et al. (2015), who find that damages are the strongest predictor of settlement amounts, and there is no relationship between D&O coverage limit and estimated damages. Regression model *e* uses *LnLimit*, *LnSize*, *LnDamages*, and *Rest NI* as the explanatory variables to explain settlement amount. *Rest NI* is statistically significant and negative (coefficient of –5.03 with a p-value of 0.7%). This is a significant result unidentified in prior literature; a decrease in originally-reported net income has valuation implications, and translates into a higher settlement amount, all else equal. Prior literature has concluded that the lawsuit's merits do not necessary have implications for settlement amounts, but restated net income results in a larger settlement amount. This finding sufficiently rejects the null of Hypothesis 3. Interestingly, in lawsuits arising from restatements, merits in the form of the correction of net earnings determines settlement amounts, while the resources variable of D&O coverage limit is not a statistically significant explanatory variable.

Table 7: H1 and H3 Regression Results Determinants of Class Action Lawsuit Settlement Amount

$$LnSett = \beta_0 + \beta_1(LnSize) + \beta_2(LnLimit) + \beta_3(LnDamages) + \beta_4(Rest\ NI) + \beta_5(Auditor) + \beta_6(FirmDef) + \beta_7(Under) + \beta_8(Offer) + \beta_9(Class\ Per) + \varepsilon$$

	Expected Sign	*A*	*B*	*C*	*D*	*E*	*F*
Intercept		0.440* [0.072]	0.632** [0.011]	0.219 [0.397]	0.491* [0.051]	−0.073 [0.783]	−0.526 [0.498]
LnSize	+	0.261*** [<0.0001]		0.216*** [<0.0001]		0.257*** [<0.0001]	0.254*** [<0.0001]
LnLimit	+		0.466*** [<0.0001]	0.170** [0.046]	0.318*** [0.0002]	0.015 [0.889]	0.057 [0.302]
LnDamages	+				0.138*** [0.0005]	0.099*** [0.009]	
Rest NI	−					−5.029*** [0.007]	
Auditor	+/0						0.549 [0.244]
FirmDef	+/0						0.496 [0.494]
Under	+/0						0.936 [0.237]
Offer	+/0						0.733* [0.057]
Class Per	+/0						0.001*** [0.010]
ADJ R^2		23.91%	18.67%	27.25%	23.94%	34.98%	34.68%
NO. OF OBS.		151	160	149	137	128	99

, **, * indicate significance at the 10, 5, and 1 percent levels respectively. P-values are reported below the coefficients. The sample used in these regressions is only firms that have settled a class action lawsuit case during the sample period. These regressions are of settlement amount on firm size, coverage limit, and other variables that characterize the lawsuit. The dataset is a cross-sectional sample for the period 1991 – 2003. The dependent variable is LnSett, which is the natural log of the total cash settlement award, excluding consideration of attorney fees and expenses ($millions). LnSize is the natural log of the average of beginning class period total assets and ending class period assets in $millions. LnLimit is the natural log of the coverage limit prevailing during the class period in $millions. The coverage limit prevailing at settlement is not the relevant limit, since the limit prevailing when the fraud occurred is used to pay the settlement. Auditor takes a value of 1 if the firm's auditor is named as a defendant in the filing. Firm Def takes a value of 1 if the firm is named as a defendant in the filing. Under takes a value of 1 if the offering underwriter is named in the filing. Offer takes a value of 1 if the filing is associated with a stock offering. Class Per is the length of the class period in days. LnDamages is the natural log of an estimate of damages constructed using equation [4]. Rest NI is [(Restated NI– Originally Filed NI)/Originally Filed Total Assets]. If no restatement, Rest Ni is set to 0.*

As a robustness check, I add in other variables which prior literature has classified as merit variables, since they are predicted to add to the plaintiffs' claim. The number of observations with non missing variables in regression model *f* is only ninety-nine. Hence, the coverage limit variable is not statistically significant with such a small observation count. Furthermore, consistent with prior literature, these variables, for the most part, are not significant in explaining settlement amount. Cases resulting from stock offerings are associated with higher settlement amounts, all else equal. Class periods spanning years yield larger settlements as compared to class periods that arise from one-day price drops.

Piecewise Linear Regressions

Hypothesis 2 predicts that the slope coefficient for varying levels of D&O insurance on settlement varies based on the level of coverage. This is due to the larger marginal benefits to the plaintiff attorneys' efforts at higher levels of D&O insurance coverage. The regression specification to test Hypothesis 2 takes the form of equation [5] below. I also test the slope coefficient at varying levels of firm size (equation 6 below).

$$LnSett = \beta_1(LnSize) + \beta_2(Low\ Limit) + \beta_3(Mid\ Limit) + \beta_4(High\ Limit) + \varepsilon \quad (5)$$

$$LnSett = \beta_1(LnLimit) + \beta_2(Low\ Size) + \beta_3(Mid\ Size) + \beta_4(High\ Size) + \varepsilon \quad (6)$$

Low Limit, *Mid Limit*, and *High Limit* take a value of 1 if the observation is in the low, mid, and high tercile of D&O coverage limit, respectively; *Low Size, Mid Size,* and *High Size* take a value of 1 if the observation is in the low, mid, and high tercile of firm size, respectively; and other variables are as defined earlier.

Results for equations [5] and [6] are shown in Table 8. The D&O Coverage Limit Portfolio regressions show that the coefficient on the limit variables are different for the three portfolios of coverage, and monotonically increase from smallest to largest limit portfolio, even when controlling for firm size. The coefficient on *Low Limit* is 1.18, 1.90 for the *Mid Limit* group, and by far, the strongest for the *High Limit* group, with a coefficient of 2.8 (all statistically significant at the 1% level). These findings indicate that D&O coverage limit plays a more crucial role at larger D&O coverage values; plaintiff attorneys presumably put forth more effort when they know there is potential for a large payoff, i.e. high total coverage limit. D&O coverage limit plays a less important role in predicting settlements at lower D&O limit levels.

Table 8: H2 Regression Results Piecewise Linear Ordinary Lease Squares Regressions of Settlement Amount on Firm Size and D&O Coverage Limit

	D&O Coverage Limit Portfolios		**Firm Size Portfolios**	
LnSize		0.202***		
		[0.000]		
LnLimit				0.408***
				[<0.0001]
Low Size			1.723***	0.692**
			[<0.0001]	[0.026]
Mid Size			1.916***	0.763***
			[<0.0001]	[0.005]
High Size			2.759***	1.124**
			[<0.0001]	[0.011]
Low Limit	1.179***	0.390		
	[<0.0001]	[0.182]		
Mid Limit	1.897***	0.786**		
	[<0.0001]	[0.011]		
High Limit	2.810***	1.051**		
	[<0.0001]	[0.024]		
ADJ R^2	78.13%	79.63%	74.63%	78.32%
NO. OF OBS.	160	149	151	149

, **, * indicate significance at the 10, 5, and 1 percent levels respectively. P-values are reported below the coefficients. The sample used in these regressions is only firms that have settled a class action lawsuit case. The dataset is a cross-sectional sample for the period 1991 – 2003. The dependent variable is LnSett, which is the natural log of the total cash settlement award, excluding consideration of attorney fees and expenses ($millions). LnSize is the natural log of the average of beginning class period total assets and ending class period assets ($millions). LnLimit is the natural log of the coverage limit prevailing during the class period ($millions). The coverage limit prevailing at settlement is not the relevant limit, since the limit prevailing when the fraud occurred is used to pay the settlement. Low Size, Mid Size, and High Size take a value of 1 if the observation is in the low, mid, and high tercile of firm size, respectively; and Low Limit, Mid Limit, and High Limit take a value of 1 if the observation is in the low, mid, and high tercile of D&O coverage limit, respectively.*

Results for the firm size portfolio regressions are similar. Firm size, as a proxy for firm resources, plays a more important role in predicting settlement when the firm is large, even when controlling for D&O coverage limit. The coefficient is 1.72, 1.92, and 2.76 on *Low Size, Mid Size,* and *High Size*, respectively. These results indicate that there is a nonlinear relationship between firm size and coverage limit in the prediction of lawsuit settlement amount. This is not surprising given that firm size is a proxy for many indirect measures of firm resources.

CONCLUDING COMMENTS

This paper broadens our understanding of how Directors' and Officers' liability insurance affects class action lawsuit settlements. I provide empirical evidence to show that D&O coverage affects the settlement decision. This study uses scarce U.S. D&O coverage limit data prevailing during the lawsuit manipulation period as a key determinant of settlement amount. I find evidence suggesting that D&O is a key determinant of settlement, and the relationship is nonlinear. Firm size remains a strong predictor of settlement amounts, even when controlling for coverage limits. A direct relationship between settlement amounts and coverage limits is intuitive; plaintiff's attorneys discover coverage limits and both sides have incentives to settle within the limit. Firm size has an indirect relationship with settlement amounts, and encompasses many factors associated with settlements. I also find there is a stronger association between coverage limit and settlement size at higher levels of coverage limit; a similar higher association exists for cases with mid D&O insurance limits than low levels of coverage limit. This suggests that there is a nonlinear relationship between coverage limit and settlement. If settlement amount can proxy for the plaintiff attorney's effort, these findings imply that plaintiff attorneys realize the marginal benefits of additional effort are higher when the firm has high coverage.

The limitations of this paper are twofold: (1) the small sample size given data restrictions (149 cases in the limited regression sample and 99 in the full regression sample), and (2) the age of the data. However, despite the high correlation (over 60%) between firm size and coverage limit, D&O coverage limit contains information in explaining settlement amounts beyond size. My study has implications for how undisclosed D&O insurance has an unexpected impact on decisions made jointly by internal and external parties to the firm. Future research could explore other effects D&O has on managerial decision-making.

REFERENCES

Alexander, J. (1991) "Do the Merits Matter? A Study of Settlements in Securities Class Actions," *Stanford Law Review*, vol. 43(3), February, p. 497-598

Badertscher, B., S. Hribar, and N. Jenkins (2011) "Informed Trading and the Market Reaction to Accounting Restatements," *The Accounting Review*, vol. 86(5), May, p. 1519-1547

Baker, T. and S. Griffith (2009) "How the Merits Matter: Directors' and Officers' Insurance and Securities Settlements," *University of Pennsylvania Law Review*, vol. 157(3), February, p. 755-832

Berk, J. (1995) "A Critique of Size-Related Anomalies," *The Review of Financial Studies*, vol. 8(2), April, p. 275-286

Bhagat, S., J. Brickley, and J. Coles (1987) "Managerial Indemnification and Liability Insurance: The Effect on Shareholder Wealth," *The Journal of Risk and Insurance*, vol. 54(4), December, p. 721-736

Black, B., B. Cheffins, and M. Klausner (2006) "Outside Director Liability," *Stanford Law Review*, vol. 58(4), February, p. 1055-1110

Cao, Z. and G. Narayanamoorthy (2014) "Accounting and Litigation Risk: Evidence from Directors' and Officers' Insurance Pricing," *Review of Accounting Studies*, vol. 19(1), March, p. 1-42

Cao, Z. and G. Narayanamoorthy (2004) "The Determinants of Directors' and Officers' Liability Insurance Premium," Working Paper

Carver, B. (2014) "The Retention of Directors on the Audit Committee Following An Accounting Restatement," *Journal of Accounting and Public Policy*, vol. 33(1), January-February, p. 51-68

Chalmers, J., L. Dann, and J. Harford (2002) "Managerial Opportunism? Evidence from Directors' and Officers' Insurance Purchases," *The Journal of Finance*, vol. 57(2), April, p. 609-636

Core, J. (2000) "The Directors' and Officers' Insurance Premium: An Outside Assessment of the Quality of Corporate Governance," *Journal of Law Economics & Organization*, vol. 16(2), October, p. 449-477

Cox, J., R. Thomas, and L. Bai (2008) "There are Plaintiffs…There are Plaintiffs: an Empirical Analysis of Securities Class Action Settlements," *Vanderbilt Law Review*, vol. 61(2), March, p. 355-386

Donelson, D., J. Hopkins, and C. Yust (2015) "The Role of Directors' and Officers' Insurance in Securities Fraud Class Action Settlements," *The Journal of Law & Economics*, vol. 58(4), November, p. 747-778

DuCharme, L., P. Malatesta, and S. Sefcik (2004) "Earnings Management, Stock issues, and Shareholder Lawsuits," *Journal of Financial Economics*, vol. 71(1), January, p. 27-49

Dunbar, F. and P. Hinton (1995) "The Securities Litigation Environment: Will Reform Make a Difference?," National Economic Research Associates, Inc.

Dunbar, F., V. Juneja, and D. Martin (1995) "Shareholder Litigation: Deterrent Value, Merit and Litigants' Options," National Economic Research Associates, Inc.

Foster, T., D. Martin, V. Juneja, and F. Dunbar (1999) "Trends in Securities Litigation and the Impact of PSLRA," National Economic Research Associates, Inc.

Francis, J., D. Philbrick, and K. Schipper (1994) "Determinants and Outcomes in Class Action Securities Litigation," Working Paper

General Accounting Office (2003) "Financial Statement Restatements: Trends, Market Impacts, Regulatory Responses, and Remaining Challenges," Washington, D.C.

Greene, W. (2000) *Econometric Analysis.* New Jersey: Prentice Hall

Gujarati, D. (1995) *Basic Econometrics.* New Jersey: Prentice Hall

Holderness, C. (1990) "Liability Insurers as Corporate Monitors," *International Review of Law and Economics*, vol. 10(2), September, p. 115-129

Jennings, J., S. Kedia, and S. Rajgopal (2011) "The Deterrent Effect of SEC Enforcement and Class Action Litigation," Working Paper

Jones, C. and S. Weingram (1996) "The Effect of Insider Trading, Seasoned Equity Offerings, Corporate Announcements, Accounting Restatements, and SEC Enforcement Actions on 10b-5 Litigation Risk," Working Paper

Keogh, D. (2002). *D&O Entity Coverage Had Its Downsides.* Retrieved May 25, 2017, from http://www.propertycasualty360.com/2002/11/12/do-entity-cover-had-its-downsides?ref=navbar-next

Kim, I. (2015) "Directors' and Officers' Insurance and Opportunism in Accounting Choice," *Accounting & Taxation*, vol. 7(1), January, p. 51-66

Klausner, M., J. Hegland, and M. Goforth (2011) "How Protective is D&O Insurance in Securities Class Actions?−An Update," Stanford Law and Economics Oliln Working Paper No. 446

O'Sullivan, N. (1997) "Insuring the Agents: the Role of Directors' and Officers' Insurance in Corporate Governance," *The Journal of Risk and Insurance*, vol. 64(3), September, p. 545-556

Palmrose, Z. and S. Scholz (2004) "The Circumstances and Legal Consequences of Non-GAAP Reporting: Evidence from Restatements," *Contemporary Accounting Research*, vol. 21(1), March, p. 139-180

Palmrose, Z., V. Richardson, and S. Scholz (2004) "Determinants of market reactions to restatement announcements," *Journal of Accounting & Economics*, vol. 37(1), February, p. 59-89

Richardson, S., I. Tuna, and M. Wu (2002) "Predicting earnings management: the case of earnings restatements," Working Paper

Romano, R. (1991) "The Shareholder Suit: Litigation Without Foundation," *The Journal of Law, Economics, & Organization*, vol. 7(1), Spring, p. 55-87

Savett, S. (1997) "The merits matter most and observations on a changing landscape under the Private Securities Litigation Reform Act of 1995," *Arizona Law Review*, vol. 39(1), p. 1-7

Skinner, D. (1996) "Why is Stockholder Litigation Ties to Accounting and Disclosure Problems?" Working Paper

Srinivasan, S. (2005) "Consequences of Financial Reporting Failure for Outside Directors: Evidence From Accounting Restatements and Audit Committee Members," *Journal of Accounting Research*, vol. 43(2), March, p. 291-334

Tillinghast-Towers Perrin (2001) "Directors and Officers Liability Survey: U.S. and Canadian Results," Chicago, IL.

BIOGRAPHY

Dr. Kim is an associate professor of accounting at Catholic University of America in Washington DC. Her research appears in the *Journal of Accounting & Economics, The Accounting Review, Journal of Accounting, Auditing, and Finance, and Accounting & Taxation.* Her contact information is: kimiy@cua.edu; (202) 319-6556.

Accounting & Taxation
Vol. 10, No. 1, 2018, pp. 39-49
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

IBFR
www.theIBFR.com

EARNINGS MANIPULATION BENCHMARK FOR NON-FINANCIAL LISTED COMPANIES IN VIETNAMESE STOCK MARKET

Nguyen Huu Anh, National Economics University, Hanoi, Vietnam
Nguyen Ha Linh, National Economics University, Hanoi, Vietnam
Sung Wook Yoon, California State University, Northridge, USA

ABSTRACT

The paper examines earnings management detection using the Beneish M-score benchmark model on a sample of 468 non-financial Vietnamese companies listed on the Hochiminh Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX) during 2013-2014. The results show that 40 % of non-financial Vietnamese-listed companies were involved in earnings management, and the sampled observations do fit the Beneish M-score model. This study suggests that the M-score model is a useful technique to use to detect the earnings manipulation behaviors of companies in Vietnam. The M-score model is also a reliable tool for investors to make when making decisions and verifying the reliability of accounting information found in financial reports.

JEL: M41, G32

KEYWORDS: Earnings Management, Detecting, M-Score Model, Non-Financial Vietnamese Listed Companies

INTRODUCTION

Earnings management (EM) has gained the attention of academics, regulators, and practitioners worldwide. Researchers examine EM from different points of view. For example, Healey & Whalen (1999) indicate that earnings management happens when managers use judgment when preparing financial reporting and structure the transactions to change the financial reports to either mislead stakeholders about the underlying economic performance of their company or to influence contractual outcomes that depend on reported accounting numbers. Schipper (1989) defines earnings management as intervention in the external financial reporting process that is motivated by self-interest. Other authors, including Park and Park (2004), have distinguished earning manipulation within GAAP and manipulated earnings outside GAAP, which means that EM is not simply fraud in all the cases.

The world has witnessed many serious financial scandals such as Enron (2001), Worldcom (2002), and Tyco (2002) etc. They have badly affected users' reliance on and faith in the financial information published in markets. Before making investment decisions, information users need to read financial statements carefully and any suspect signals. The major such concerns are how to detect earnings management, how to select a reliable tool or a benchmark for accurate and early evaluation.

As the process of developing tools for detecting EM has progressed, the Beneish M-score model has been applied on different listed companies to detect the existence of income manipulation and particularly in the U.S, Italy, and India (Beneish, 1999; Paolone & Magazzino, 2014; Kaur, Sharma & Khanna, 2014).

Indeed, there are interrelations between the Balance Sheet, the Income Statement and the Statement of Cash Flows so that fraud can always show up by examining certain numbers. Based on a ratio analysis, M-score was built, and many researchers now believe that M-score is a suitable tool to detect accounting fraud and/or to support auditors (Beneish et al., 2013; Warshavsky, 2012). The Beneish model and related empirical studies on it have proven its reliability in calculating the probability of the existence accounting fraud in a company (Paolone & Magazzino, 2014).

In Vietnam, still a very young stock market, changes in disclosed profits before and after auditing, such as for Thép Việt Ý, Vinaconex...as well as the existence of financial scandals, such as for Bông Bạch Tuyết, Dược Viễn Đông, have raised concerns about the quality of the financial information being gathered and overall earnings management. However, not many researchers have focused on EM in general and in using the M-score benchmark in particular. Nguyen & Nguyen (2014) used the M-score with a sample of only 30 companies in 2012 to predict materiality errors. Nguyen & Nguyen (2016) tested M-score only on HoSE in 2014. Due to the limitations in these previous researches, this study enlarges the sample size to address the entire Vietnamese stock market, both the HoSE and HNX stock markets, in 2014. A second goal of this study is applying the Beneish M-score model and examining whether this model can produce a reliable template for Vietnamese-listed companies that some differences in their financial structures as well as their accounting rules. Based on those objectives, three research questions asked here are 'Research Question 1: Is there any acceptable limit/threshold to use for precise earnings management?', 'Research Question 2: Is it possible to identify manipulated financial statements?', and 'Research Question 3: What are the consequences of manipulated statements that are created outside of accepted accounting rules/standards?'

The remainder of this paper proceeds as follows. Section 2 discusses the prior research related to earnings management and the M-score model. Section 3 lays out the research methodology, the M-score model, and the date of the research process. Section 4 presents the statistical results for eleven different industries and discusses the results. Finally, research conclusions, comments, and future directions are offered in Section 5.

LITERATURE REVIEW

Earnings is a key indicator of the ongoing performance of a company. The positive image of a company depends on the indexes disclosed in financial statements, so its managers will have the key incentives to manage earnings. Earnings management has two main types, namely, real earnings management and accrual management. Roychowdhury (2006) mentions real earnings management achieved by cutting back on advertising fees, research and development expenditures, handling essential equipment maintenance, accelerating sales, and delaying maintenance…However, managers prefer to manage earnings via accruals (shifting the recognition of transactions between precise periods…) because these have no direct cash flow consequences; thus, it is difficult to observe and detect them directly.

A number of models have been developed to investigate the existence of earning management, and they range from the simple to the complex. They can be aggregated accruals, such as with the Jones model (Jones, 1991), the Modified Jones model (Dechow et al., 1995), the earnings distribution model (Burgstahler & Dichev, 1997; Chen et al., 2010), the specific - accrual Models (McNichols & Wilson, 1998) or using certain benchmarks, such as the M-score Model (Beneish, 1999; Beneish, Lee & Nichols, 2013).

In this research, the popularity of the M-score model is discussed while reviewing the previous literature. Table 1 presents some of the important M-score - related studies and their findings, as they relate to the effectiveness of M-score in the accounting field. Beneish (1999) realized the importance of financial ratios in forensic accounting and is considered the pioneer who created the between-ratio benchmark for investigating EM. In a study of 74 company samples for 10 years (1982-1992), Beneish (1999) designed a mathematical model that can discriminate manipulation reports from non-manipulation ones. When his M-

score model was first applied, it could detect about half of the companies who were involved in earnings manipulation. Since then, the model and its power have been proven and used by researchers worldwide.

Table 1: Summary of Important Prior Researches

Authors	Country	Objects	Conclusion	Sample
M-Score for a Number of Companies				
Beneish (1999)	US	Design a model that can discover manipulation of earnings or earnings management.	The model concludes half of the companies involved earnings manipulation prior to public discovery.	1982-1992, 74 firms
Paolone & Magazzino (2014)	Italy	Study the risk of manipulating earnings among several major industrial sectors	A half of the analyzed companies have a low probability of manipulating income	1.809 firm - year observation between 2005-2012
Kaur, Sharma & Khama (2014)	India	Using both M-score and Modified Jones (1995) to understand EM in different sectors of the economy	Number of EM detections is higher by using the Beneish M-score	332 companies with data from 2011 - 2013
Nwoye el al. (2013)	Nigeria	Answer the question whether M-score could strengthen Auditors' likelihood in detecting manipulations	The model could improve the effectiveness of Auditors in detecting fraud	First five most capitalized manufacturing companies in Nigeria for the years (2002-2006: confirmatory test purposes) and (2006-2010).
Franceschetti & Koschtial (2013).	Italy	M-score could be used to investigate earnings manipulations between bankrupt and non-bankrupt small and medium-sized enterprises.	The bankrupt group reported 1.6 times more red flags than the non-bankrupt one.	30 bankrupt and 30 non-bankrupt Small and medium-sized enterprises (2009-2011).
M-Score for High Profile Cases				
Mahama (2015)	Enron (US)	Altman's Z-score & Beneish M-score were used to determine how early investors, regulators and other stakeholders could detect the financial distress of the company	Both models showed that Enron was engaged in earnings manipulation since 1997.	Reports of Enron filed with the US SEC from 1996 to 2000
Omar et al. (2014)	Malaysia	Discuss a case of Malaysian company and analyze how the fraud was committed and detected.	The company manipulated its financial statements	MMHB case, 2005 to 2007
M-Score and Other Models, Extended M-Score				
Dechow el al. (2011)	US	Both financial and non- financial variables are considered while building Z-score model (based on M-score model)	The Z-Score provide another measurement to discretionary accruals for detecting "low -quality" earnings firms.	2,190 SEC Accounting and Auditing Enforcement Releases (AAERs) issued between 1982 and 2005
Marinakis (2011)	UK	Additional variables: audit fee to total asset index…, effective tax rate, directors remuneration to sales were considered while using M-score model in detecting EM	The improvement of the model could enhance the ability in detecting potential manipulators, with smaller error rates than the 8-variable Beneish (1999) Model	185 companies between 1994-2006 from Company Reporting (p.210)
Aris et al. (2013)	Malaysia	Analyzing the usage, process and application of Benford's Law and Beneish Model in detecting accounting fraud	Both models appear to have its own benefit in detecting and preventing fraud	Comparison between M-score model and Benford's Law

This table refers to related researches that used M-score as a tool for detecting earnings management.

In some studies, the M-score model has been extended. Marinakis (2011) and Dechow et al. (2011) inserted additions that included financial and non-financial variables, and others continued to apply the original M-score for EM detection (Kaur, Sharma & Khanna, 2014; Paolone & Magazzino, 2014; Franceschetti & Koschtial, 2013). The M-score could be applied to either a sample of thousands of companies or to a specific high profile case like Enron in the U.S. (Mahama, 2015) or MMHB in Malaysia (Omar el al., 2014). Kaur, Sharma & Khanna (2014), Mahama (2015) used the M-score benchmark in a comparison they made with Modified Jones (1995) and Atman's Z-score.

Table 1 presents the results and the evidence of M-score's reliability in the global context. In India, Kaur, Sharma & Khanna (2014) tested a sample of 332 companies from 2011-2013 and showed that the M-score is better than Modified Jones (Dechow et al., 1995) in detecting income manipulation. Paolone & Magazzino (2014) studied a sample of 1,809 firm-year observations in Italy from 2005 to 2012 and concluded that half of the tested companies had a low probability of earnings manipulation. In another study from the U.S. in the Enron case, Mahama (2015) filed the data during 1996-2000 and found that the warning sign of a serious earnings manipulation could have been detected sooner in early 1997 by using the M-score. In another high-profile case of MMHB in Malaysia using data from 2005–2007, Omar et al. (2014) concluded that the M-score could be used for predicting the signs of financial turmoil earlier. Based on the original M-score, some researchers developed a more powerful tool with additional variables that included both financial variables and non- financial variables (Dechow et al., 2011; Marinakis, 2011).

The Beneish M-score Model is selected as a detection tool for this study due to its simplicity, reliability, and popularity in the EM field. There exists certain interrelationships between the Balance Sheet, Income Statement and Statement of Cash Flows that allow fraud to always pop out when certain numbers do not make sense (Joseph, 2001). Based on ratio analysis, many researchers and/or information users thus believe that M-score is a suitable tool for investigating accounting fraud or supporting auditors (Aris et al., 2013; Nwoye et al., 2013).

DATA AND METHODOLOGY

The M-score model is a mathematical model developed by Beneish. Using 8 variables related to financial ratios, Beneish (1999) developed a powerful tool for distinguishing earnings manipulators and non-earnings manipulators. The model has been widely used by many financial statement academic researchers, articles directed at auditors, certified fraud examiners, and investment professionals (Beneish et al. 2013). The M-score model and its 8 indicators are listed and explained below:

Days' Sales in Receivables Index (DSRI): The Days' sales in receivables index (DSRI) measures the ratio of receivables to sales in year t, compared to the previous year. If the ratio is greater than 1, the percentage of receivables to sales has increased in year t, compared to year t-1. An abnormally large increase in a day's sales in receivables can be the result of revenue inflation. Index expectation is that a large increase in the DSRI is associated with a higher likelihood that revenues/profits are overstated. (Beneish 1999)

Gross Margin Index: The gross margin index (GMI) measures the ratio of the gross margin in year t-1 to the gross margin in year t. If the GMI is greater than 1, that means the gross margin has deteriorated and it is a negative sign about a company's prospects and indicates that managers tend to manipulate revenue. Index expectation is that there is a positive relationship between the GMI and earnings management. (Beneish 1999)

Asset Quality Index: The asset quality index (AQI) measures the ratio of asset quality in year t compared to year t-1. If the AQI is greater than 1, there may be a tendency to avoid expenses by capitalizing and deferring their cost to preserve profitability. Index expectation is there is a positive relationship between the AQI and EM. (Beneish 1999)

Sales Growth Index: The sales growth index (SGI) measures the changes in sales, compared to the sales of the previous year. A SGI of greater than 1 represents an a positive growth in sales. Growth can pressure managers to achieve earnings targets for their job securities, and thus managers may have stronger incentives to manipulate earnings. (Beneish 1999).

Depreciation Index: The depreciation index (DEPI) measures the ratio of the depreciation rate in year t-1 to the depreciation rate in year t. If the DEPI is greater than 1, it represents a declining depreciation rate, and a slower depreciation rate can increase earnings. There is a possibility that a company has adjusted the useful life of PPE upwards or has used a new method for income increase. (Beneish 1999)

Sales, General and Administrative Expenses Index: The sales, general, and administrative expenses index (SGAI) measures the ratio of the SGA expenses to sales in year t compared to the SGA expenses to sales in year t-1. If the SGAI is greater than 1, it represents a disproportionate increase in sales compared to SGA, and it can be an indicator of earnings manipulation. Index expectation is that there is a positive relationship between the SGAI and earnings management. (Beneish 1999)

Leverage Index: The leverage index (LVGI) measures the leverage in year t to the leverage in year t-1. If the LVGI is greater than 1, it represents an increase in leverage and shows the incentives in the debt covenant, which leads to manipulating earnings. Index expectation is that there is a positive relationship between the LVGI and earnings management. (Beneish 1999)

Total Accruals to Total Assets: Total accruals to total assets (TATA) measures the ratio of total accruals to total assets. This method measures the extent to which managers alter earnings by making discretionary accounting choices. Total accruals are computed as the change in working capital (except cash) less depreciation for year t, less changes in income taxes payable and the current portion of long-term debt. Index expectation is that higher positive accrual is positively associated with the likelihood of earnings management. (Beneish 1999)

The actual Beneish M-score model is presented below:

$$M = -4.84 + 0.920 \cdot DSRI + 0.528 \cdot GMI + 0.404 \cdot AQI + 0.892 \cdot SGI + 0.115 \cdot DEPI$$
$$-0.172 \cdot SGAI + 4.679 \cdot TATA - 0.327 \cdot LVGI \quad (1)$$

The Beneish regression model has eight indicators. The M-score will be retrieved based on the above equation, and it shows the manipulation score. If the M-score is greater than the (-2.22) benchmark, then the company should be flagged as an earnings manipulator (Beneish 1999). Table 2 presents a detailed descriptions of all the variables used in the M-score.

Table 2: Variable Descriptions

Variables	Formulas	Descriptions
DSRI	$\left[\frac{Receivables_t}{Sales_t}\right] \Big/ \left[\frac{Receivables_{t-1}}{Sales_{t-1}}\right]$	If there is an abnormal large increase in day's sales in receivables, it can be a result of revenue inflation
GMI	$Gross\ Margin_{t-1} / Gross\ Margin_t$ *Gross margin = (Sales - Cost of goods sold) / Sales*	If GMI > 1, the deterioration of gross margin shows a negative sign about a company's prospect and managers tend to manipulate its revenue.
AQI	$\left[1 - \frac{PPE_t + CA_t}{Total\ Assets_t}\right] \Big/ \left[1 - \frac{PPE_{t-1} + CA_{t-1}}{Total\ Assets_{t-1}}\right]$ PPE: Plant, Property and Equipment/ CA: Current asset	If AQI >1, it may represent the tendency of avoiding expenses by capitalizing and deferring costs to preserve profitability
SGI	$\left[\frac{Sales_t}{Sales_{t-1}}\right]$	If the SGI > 1, it represents a positive growth. Growth can put pressure on managers in maintaining a company's positions, achieving earnings targets…
DEPI	$\left[\frac{Depreciation\ Rate_{t-1}}{Depreciation\ Rate_t}\right]$ *Depreciation rate = Depreciation / (Depreciation + PPE)*	If the DEPI > 1, it represents a declining depreciation rate, slower depreciation rate can increase earnings. There is a possibility of income – increasing manipulation
SGAI	$\left[\frac{SGA_t}{Sales_t}\right] \Big/ \left[\frac{SGA_{t-1}}{Sales_{t-1}}\right]$ SGA: Sales, general, and administrative expense	If the SGAI > 1, it represents a disproportionate increase of sale compared to SGA and it can be an indicator of earnings manipulation
TATA	$\frac{\Delta \text{ Current Asset} - \Delta \text{ Cash} - (\Delta \text{ Current Liabilities} - \Delta \text{ Current maturities of LTD} - \Delta \text{ Income Tax payable}) - \text{Depreciation \& Amortization}_t}{\text{Total Assets}_t}$	The TATA measures the ratio of total accruals to total assets. It measures the extent to which managers alter earnings by making discretionary accounting choices. The total accruals are computed as change in working capital (except cash) less depreciation for year t, less changes in income tax payable and current portion of long –terrn debt.
LVGI	$\left[\frac{Leverage_t}{Leverage_{t-1}}\right]$ Leverage = Debts / Assets	If the LVGI > 1, it represents an increase in leverage and it shows the incentives in debt covenant which lead to manipulate earnings.

sing Beneish (1999), the formulas for 8 indexes in the M-score model are presented in this table. The index description also refers to Nguyen and Nguyen (2016).

RESULTS OF M-SCORE MODEL TESTING

In this study, the financial statements for the year 2013-2014 were collected from the Vietnamese stock markets (both HNX and HoSE) for a sample of 639 companies. Since several data in 171 of these companies were not available, the test could only be implemented for 468 companies.

By setting up certain complicated calculations in Excel, the huge amount of data could be inserted for the required outputs. The findings show that when using a benchmark of -2.22, 40% of the listed companies

demonstrated a high probability of earnings manipulation while 60% did not. The details of these M-score differences are presented in Table 3.

Table 3: Descriptive Statistics for Eight Variables in M-score Model

INDUSTRY	M-score > -2.22	%		DSRI	GMI	AQI	SGI	DEPI	SGAI	TATA	LVGI	M-score
Agriculture (3 firms)	0	0%	Mean	1.012	- 6.201	0.965	0.854	1.037	1.523	- 0.065	0.974	- 6.799
			Median	1.181	0.850	0.968	1.009	0.952	1.263	- 0.054	1.015	- 2.662
Publisher (17 firms)	0	0%	Mean	0.830	1.023	0.974	1.041	1.232	1.068	- 1.472	1.009	- 2.988
			Median	0.808	1.051	0.990	1.032	0.984	0.992	- 0.759	1.018	- 3.005
Mining (83 firms)	30	36%	Mean	1.860	1.019	0.956	1.412	1.900	1.103	0.979	1.107	- 1.680
			Median	0.922	1.014	0.996	1.102	0.927	0.993	- 0.027	0.977	- 2.568
Manufacture (79 firms)	36	46%	Mean	1.317	0.927	1.048	1.168	3.860	1.101	- 0.017	1.009	- 1.888
			Median	1.004	0.998	1.001	1.069	0.943	1.038	0.017	0.959	- 2.332
Commerce (47 firms)	23	49%	Mean	1.312	1.005	1.002	1.144	1.151	1.218	0.073	0.952	- 1.766
			Median	0.941	0.953	1.004	1.043	0.934	1.005	0.078	0.972	- 2.223
Construction (78 firms)	29	37%	Mean	1.152	0.955	0.972	1.252	14.280	1.078	- 0.040	0.995	- 1.178
			Median	0.901	1.023	0.998	1.088	0.937	1.042	- 0.072	0.999	- 2.668
Real estate (47 firms)	26	55%	Mean	3.194	0.495	1.117	2.452	1.413	1.182	- 0.046	0.966	0.412
			Median	0.750	0.935	1.030	1.463	0.956	0.870	0.016	0.967	- 1.955
Foods & Beverage (36 firms)	14	39%	Mean	1.693	0.968	1.041	1.126	1.260	1.046	- 0.084	1.020	- 1.852
			Median	0982	0.962	1.004	1.077	0.911	1.053	- 0.027	0.996	- 2.527
Services (32 firms)	12	38%	Mean	1.663	1.291	1.214	2.401	4.412	1.004	- 0.454	1.037	- 0.516
			Median	1.035	1.051	0.998	1.183	1.052	0.931	- 0.106	1.005	- 2.496
Transport (24 firms)	8	33%	Mean	2.218	0.829	1.025	1.056	2.078	1.026	- 0.872	0.980	- 1.753
			Median	1.0056	0.986	1.002	1.054	0.961	1.005	- 0.077	0.937	- 2.625
Telecommunication (22 firms)	9	41%	Mean	0.944	1.037	1.058	1.225	6.931	1.095	- 0.266	1.065	- 1.510
			Median	0.869	0.979	1.002	1.112	0.970	0.999	- 0.006	1.025	- 2.504
Total (468 firms)	**187**	**40%**	Mean	1.620	0.898	1.029	1.423	4.508	1.104	0.018	1.018	- 1.440
			Median	0.937	0.991	1.000	1.094	0.945	0.998	- 0.031	0.985	- 2.528

The table shows the descriptive statistics for the eight variables in M-score model based on industry classifications.

Agriculture sector: In the sample, only 3 companies had all M-scores less than – 2.22; therefore, the study could conclude that there was no sign of earnings manipulation.

Publisher sector: In the sample, 17 companies had all M-scores less than – 2.22, these results indicate that the Publisher sector was the same as the Agriculture sector where there was no sign of earnings manipulation

Mining sector: 36 % of the companies had a M-score greater than -2.22, and 64% had a lower than -2.22 score. That means that 36 % of the companies had high probability of EM while the remaining 64 % did not.

Manufacture sector: Compared to the M-score threshold, 36 out of these 79 companies (46% of sample) had a M-score greater than – 2.22. Thus, these 46 % of companies had a high probability of earnings manipulation and the remaining 54% did not.

Commerce sector: Based on the M-score results, one group of 23 companies (49%) proved to be involved in earnings management. Another group or 51 % of the 24 companies had no such signs.

Constructions sector: Of the 78 companies, 29 companies (37%) showed the warning sign of earnings manipulation, while the other 63 % had no such evidence.

Real estate sector: Of 47 companies, 26 companies (55%) had a M-score more than – 2.22, showing evidence of high probability of earnings manipulation, while the remaining 45% did not. This sector had the highest percentage of companies involved in earnings management.

Foods - Beverage sector: Of the 36 companies in this sample, 14 companies, accounted for 39%, indicated signs of earning manipulation, as their M-scores were greater than the benchmark. The remaining 61 % did not.

Service sector: Here 12 out of 32 companies were committed to adjusting earnings as the M-score calculations showed that 38% of these companies' M-scores were higher than the threshold. The rest or 62% is not.

Transport sector: In this sample of 24, 16 companies or a 67 % had a M-score less than –2.22, which proved that 67 % of these companies had a low probability and 33 % had a high probability of earnings manipulation.

Telecommunication sector: Of 22 companies, 9 accounted for 41% with an M-score greater than – 2.22. The study concluded that 41 % of these companies had a high probability of earnings manipulation while the remaining 59 % did not.

Besides calculating the M-score for each sector, Table 3 also provides more details about the 8 factors used in the M-score model: DSRI, GMI, AQI, SGI, DEPI, SGAI, TATA, LVGI. For each factor, Mean and Median are shown. Among all the sectors, Real Estate has the highest value index for DSRI at 3.194. The service sector has GMI mean = 1.291 and an AQI mean = 1.214, the highest GMI, and an AQI mean value. SGI = 2.452 is the top mean value of the Real Estate sector compared to other types of businesses. The DEPI is one factor that indicates a big difference whereas the DEPI mean of the Construction sector = 14.280. The Agriculture sector had the highest value with SGAI = 1.523. The mining sector has TATA mean of 0.979 and LVGI at 1.107, the highest value.

Almost all of the values for the 8 variables are distributed around 1, thus when collating with the description in Table 2, we can explain and evaluate in detail the situation of each company. If DSRI, GMI, AQI, SGI, DEPI, SGAI, LVGI values are greater than the benchmark 1, there may be some abnormal changes, and it could be a sign of earnings manipulation. TATA only has a general benchmark of zero, so high level of accruals compared to assets may also be an indicator of earnings manipulation.

CONCLUSION

In this study, the Beneish M-score model proved to be an useful support tool for detecting EM in the Vietnamese stock market. It could discriminate between the high and low probability of EM in the listed companies. Based on the retrieved M-score, the findings in Table 3 show that the Real Estate sector has the highest probability of earnings management practice with a percentage of 55 % compared to the lowest

percentage at 0% in the Agriculture and Publisher sectors. Manufacture, Commerce and Telecommunication constituted the group that is greater than 40 % but less than 50% in terms of high probability of earnings manipulators. The remaining sectors of Mining, Construction, Foods & Beverage, Services and Transport have more than 30% but less than 40% for high probability of producing managed earnings.

These findings show that all sectors (except Agriculture and Publishers) are engaged in earnings management, and the findings raise questions regarding the effectiveness of corporate governance and the protection of investors. However, the analyzed results are consistent with many other researches in the developed countries as well as those in some of the developing ones in terms of the percentages of detected manipulators at around 50% (Beneish, 1999; Mahama, 2015; Nguyen & Nguyen, 2014; Omar et al., 2014; Paolone, F. & Magazzino, 2014). These results also prove that the M-score model can be considered to be fit for use in sample observations in Vietnam because the findings of this study are consistent with auditing disclosure reports in 2014. Therefore, using M-score is be a good mean for detecting EM not only in the developed countries but it also in developing countries like Vietnam.

These results also broaden our understanding of earning management in Vietnam. The M-score model has proven its strong power in detecting EM in the country, and thus, it is a reliable tool for investors to use when making decisions and verifying the reliability of the accounting information in financial reports. It also can help banks and other financial institutions to protect themselves from frauds or uncollectible lending cases. However, there are still certain limitations, and those should be examined in future research. These limitations include enlarging the sample size, providing more details and explanations, or undertaking a cross-country analysis instead of only a nationwide one.

REFERENCES

Aris, N.A., Othman, R., Arif, S.M.M., Malek, M.A.A and Omar, N. (2013), Fraud Detection: Benford's Law vs Beneish Model. *IEEE Symposium on Humanities, Science and Engineering Research*, 726-731.

Beneish, M. D. (1999), The Detection of Earnings Manipulation. Financial Analyst Journal, 55(5), 24-36.

Beneish, M.D., Lee, M.C. C. and Nichols, D.C. (2013), Earnings Manipulation and Expected Returns. Financial Analyst Journal, 69(2), 57-82.

Burgstahler, D. and Dichev, I. (1997), Earnings Management to Avoid Earnings Decreases and Losses. *Journal of Accounting & Economics*, 24, 99–126.

Chen, S., Lin, B., Wang, Y. and Wu, L. (2010), The Frequency and Magnitude of Earnings Management: Time-series and Multi-threshold Comparisons. *International review of economics and finance*, Working Paper, University of Rhode Island.

Dechow, P.M, Ge, W., Larson, C.R. and Sloan, R. (2011), Predicting Material Accounting Misstatements. *Contemporary Accounting Research*, 28 (1), 17–82.

Dechow, P.M., Sloan, R. and Sweeney, A. (1995), Detecting Earnings Management. *The Accounting Review*, 70(2), 193-225.

Degeorge, F., Patel, J. and Zeckhauser R. (1999), Earnings Management to Exceed Thresholds. *Journal of Business*, Working paper, Boston University.

Franceschetti B.M. & Koschtial C. (2013), Do Bankrupt Companies Manipulate Earnings More Than the Non-bankrupt Ones?. *Journal of Finance and Accountancy*, 12, 1-22.

Healy, P.M., & Wahlen, J.M. (1999), A Review of the Earnings Management Literature and Its Implications for Standard Setting. *Accounting Horizons,*13, 365–383.

Jones J. (1991). Earnings Management During Import Relief Investigations*, Journal of Accounting Research*, Vol. 29, 193-228.

Joseph, T.W. (2001). The Numbers Raise a Red Flag. Texas: ACFE.

Kaur, R., Sharma, K. & Khanna, A. (2014), Detecting Earnings Management in India: a Sector - Wise Study. *European Journal of Business and Management*. 6 (11), 11-18.

Mahama, M. (2015), Detecting Corporate Fraud and Financial Distress Using the Atman and Beneish Models. *International Journal of Economics, Commerce and Management,* 3(1), 1-18.

Marinakis, P. (2011), An Investigation of Earnings Management and Earnings Manipulation in the UK, Doctoral dissertation, Nottingham University, UK.

McNichols, M., and Wilson G.P. (1988)), Evidence of Earnings Management from the Provision for Bad Debts. *Journal of Accounting Research* 26 (3): 1-31.

Nguyễn Công Phương & Nguyễn Trần Nguyên Trân (2014). Beneish Model in Predicting Materiality Errors in Financial Statements. *Economics and Development Journal*, No. 206, 54-60.

Nguyễn Hữu Ánh and Nguyễn Hà Linh (2016), Using the M-score Model in Detecting Earnings Management: Evidence form Non-Financial Vietnamese Listed Companies. *VNU Journal of Science: Economics and Business, 32(2),* 14 - 23.

Nwoye, U.J., Okoye, E. I & Oraka, A. O (2013), Beneish Model as An Effective Complement to the Application of SAS No. 99 in the conduct of audit in Nigeria. *Management and Administrative Sciences Review*, 2(6), 640-655.

Omar, N., Koya, R.K., Sanusi, Z. M. & Shafie, N. A. (2014), Financial Statement Fraud: a Case Examination Using Beneish Model and Ratio Analysis. *International Journal of Trade, Economics and Finance*, 5(2), 184-186.

Paolone, F. & Magazzino, C. (2014), Earnings Manipulation Among the Main Industrial Sectors: Evidence from Italy. *Economia Aziendale*, 5, 253-261.

Park, M. S., and T. Park. (2004), Insider Sales and Earnings Management. *Journal of Accounting and Public Policy,* 23 (5), 381-411.

Roychowdhury, S. (2006), Earnings Management Through Real Activities Manipulation. *Journal of Accounting and Economics,* 42 (3), 335-370.

Schipper, K.(1989), Commentary on Earnings Management. *Accounting Horizons*, 3, 91–102.

Warshavsky, M. (2012). Analyzing Earnings Quality as a Financial Forensic Tool. *Financial Valuation and Litigation Expert Journal*, 39, 16-20.

ACKNOWLEDGEMENT

We would like to acknowledge the support of State Security Commission, Hanoi, Vietnam who gave us access to the financial data source of listed companies in Vietnamese stock market. We are also grateful to our colleagues who encouraged us to pursue this topic and spent time consulting us some data-solving techniques. We would like to thank the journal editors, two anonymous reviewers for their insightful comments. Any errors are our own.

BIOGRAPHY

Assoc. Prof. Nguyen Huu Anh, Senior lecturer, Head of School of Accounting & Auditing, National Economics University, Vietnam, Research interest: accounting, auditing, management, Tel: + 84-906163535, Email: anhnh@neu.edu.vn

Nguyen Ha Linh, Lecturer, School of Accounting & Auditing, National Economics University, Vietnam Research interest: accounting, auditing, e-commerce, Tel: + 84-945088886, Email: linhnh@neu.edu.vn

Sung Wook Yoon, Department of Accounting and Information Systems, Address: David Nazarian College of Business and Economics, California State University, Northridge, USA, 18111 Nordhoff St., Northridge, CA 91330-8372. Tel:1-818-677-2428, E-mail: sungwook.yoon@csun.edu

Accounting & Taxation
Vol. 10, No. 1, 2018, pp. 51-60
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

IBFR
www.theIBFR.com

BIG OIL IN A SMALL TOWN: THE EFFECTS OF A LARGE ECONOMIC EVENT ON SMALL BUSINESS SALES

Amy Bieber, Montana State University Billings Graduate
Salem Boumediene, Montana State University Billings
Scott Butterfield, Montana State University Billings

ABSTRACT

The purpose of this research is to determine whether a relationship exists between the sales of small businesses when a large economic event occurs in the area. The sales examined were those of a small auto parts store located within in the Bakken Shale Formation during the rise and fall of the Bakken Oil Boom. In order to observe a relationship, data from the business's sales was gathered along with historical oil prices and oil production in the region. Through the use of two-tailed statistical testing comparing sales to oil price and again to oil production, the differences between two means with dependent samples were observed. Both tests found that the oil production and price were indeed driving factors that affected the sales of the small business causing the sales trends to follow the same patterns as those found in the oil production and price amounts. These same tests can be applied to other businesses in the region to determine whether or not oil had a large effect on their sales figures as well.

JEL: M41, C12, C3, Q31

KEYWORDS: Sales Revenue, Oil Price, Oil Production, Bakken Oil Boom, Statistical Testing, Regression Analysis

INTRODUCTION

Years ago, stretching along the eastern Montana-western North Dakota border lay a huge source of untapped potential now known as the Bakken Shale Formation. The first successful well began producing in 1953, however, the shale formation posed a problem for the common practice of vertical drilling. Because of the way the layer of sandstone and dolomite, the layer from which oil is extracted, was sandwiched between two layers of shale rock, vertical drilling proved to be an extremely difficult way to extract the oil. It was not until 2008 that oil production began to really flourish because of the combination of hydraulic fracturing (fracking) and horizontal drilling processes ("First North Dakota oil well," n.d.). Thus, began the Bakken Oil Boom.

Oil production immediately took off. The area which had been producing, on average, about 33,000 barrels a day at the end of 2007 was pushing upwards of 100,000 barrels a day by the close of 2008 ("ND monthly Bakken oil production statistics," n.d.). Of course, this boom created huge opportunities for oil companies as well as the average American worker. With all the new oil production came a high need for employees and people from all over the country flocked to the region for their share of good fortune. However, all good things must come to an end. The end of 2014 saw the peak of the boom and it has been slowly decreasing ever since. Where once the oil price maxed out at over one hundred dollars a barrel, in 2016 the price has yet to reach even fifty dollars a barrel, and has even dropped to as low as thirty-three dollars a barrel ("Crude oil historical prices," n.d.).

Obviously, the rise and fall of the Bakken oil industry had major effects on the price of oil, but what about those businesses in the area not directly associated with the boom? According to some articles, they were negatively impacted when employees quit their jobs to strike it rich working out in the oil fields, but with the large influx of people coming into the area, were sales affected? After analyzing the data of a small auto parts store located in a small town within the Bakken (for confidentiality purposes, we will call this town xyz), a noticeable trend could be seen in monthly sales. From 2009 to 2016 a distinct increase, peak, and decrease in sales was present, creating a "hill" effect. The obvious question was, what is the explanation for this? And the possible answer could be the Bakken Oil Boom.

The purpose of this study was to examine possible factors that impacted this sales trend. The oil was such a huge part of the economy, it basically defined the region. Was it able to infiltrate small-town business revenues as well? If this is one of the driving factors for a small auto parts store, the oil economy may serve as an explanation for other businesses who might have seen a similar trend in their sales. With this information, these businesses could then plan accordingly and forecast what sales might look like in the future.

In this paper, we first present the literature review, then the data and methodology, the results and finally the conclusion.

LITERATURE REVIEW

Crude oil production has become more and more important as an indicator to measure the economic activity worldwide. Galayini (2011) and Jimenez-Rodríguez & Sanchez (2004) investigated the relationship between oil price and economic growth on a macro-level. While the research of Jimenez-Rodríguez & Sanchez (2004) showed that there is a direct relationship between oil price and economic growth, Galayini (2011) in her research couldn't confirm this finding.

In another research, Idemudia (2009) analyzed Nigeria's Niger Delta case on the relationship between oil extraction and poverty reduction of local communities. He found that oil and gas companies' initiative to develop local communities have the potential to reduce the local poverty and thus develop the economy. However, the empirical study found that those companies' initiatives have limited impact on the local economies.

Cavalcanti et al. (2016) studied the impact of oil extraction on Growth in Brazil. In their research, the author found a positive impact of oil field discoveries and later production on urbanization as well as an increase in GDP for services, companies size and GDP for services output per worker. However, this study applies only to Brazil and has limited application in the US.

Loe and Kelman (2016), in their research on the Artic (Hammerfest, Norway) petroleum's community impacts, realized a single-case study. They interviewed twelve males and six females from the local community (Hammerfest, Norway). The interview focused on four themes. From the discussions with the interviewees, they found that they were differences in the way that the population perceives the effect of oil and gas industry and the responsibilities of oil and gas companies. Moreover, the authors found that the population is in alignment with Friedman (1970) original vision that considers companies contributions (in this case oil and gas) to create and maintain jobs and general welfare is adequate as their responsibilities to society.

Later development of Friedman's original view of corporate social reasonability suggests that companies are expected to contribute actively to society's well-being, and protection of the environment (for example Aguinis (2012), Brammer (2012), and Piercy (2011)) are not reflected in the views of the local population.

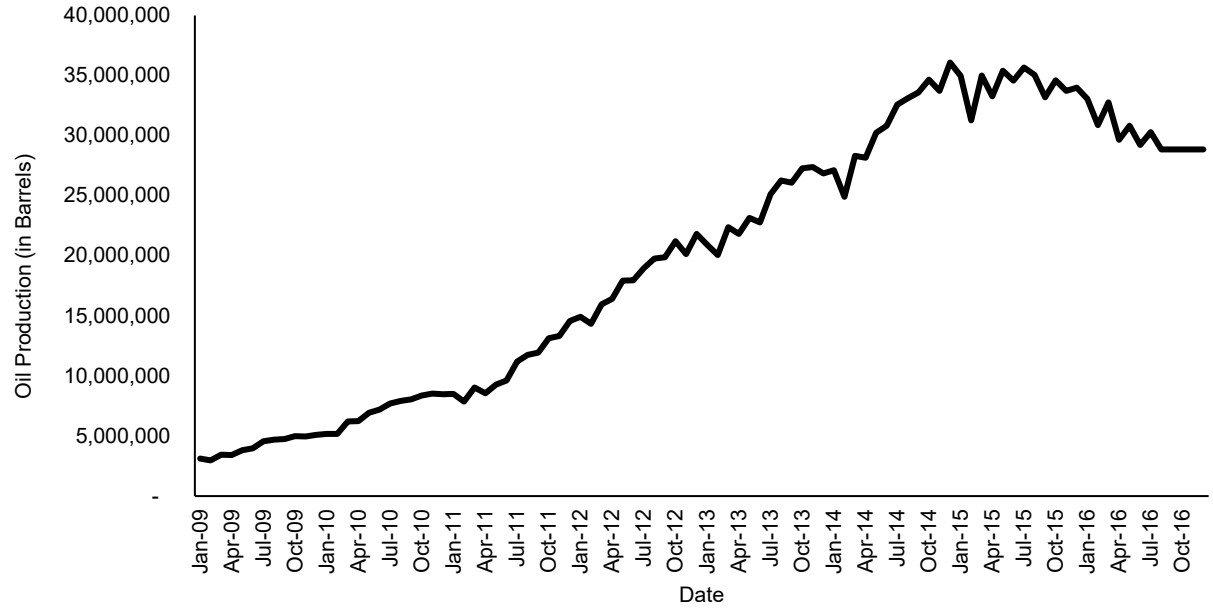
The results help in the filling of missing parts of the gap that was described by Sovacool (2014). In those parts, researchers speculate what energy policy is important compared to what policymakers and communities think while also comparing it to the reality. Business people, authorities, and others were interviewed in Hammerfest. Their perspective, needs, and interests are different from non-locals. Their advice and recommendations on how the petroleum sector should work are also different. Although their opinions are different from the experts, it does not mean that they are indifferent about the risks of development of Arctic petroleum. Their priorities are different. Taking in consideration different views is important in understanding the full picture of the Arctic petroleum debate.

Various articles give an estimated timeline of the rise and fall of the Bakken Oil Boom. Articles from the American Oil & Gas Historical Society (n.d.), the New York Times (Davey, 2008), and Reuters (Scheyder, 2016) all agree the boom really took off between 2007 and 2008. This all had to do with combining the practices of horizontal drilling and hydraulic fracking. The previous standard of vertical drilling was not nearly as effective as this new practice and the 3 to 4.3 billion barrels of oil estimated to be available in the Bakken Formation by a U.S. Geological Survey was now able to be extracted.

Oil production was on the rise and the boom kept growing. That is, until oil prices peaked in 2014 and suddenly began dropping. According to an article from the Federal Reserve Bank of Minneapolis, the price of oil rose to about $105 in June of 2014, then dropped drastically. By December of 2014, the oil price was down to about $53 a barrel (Crude oil historical prices). Production has also steadily been slowing down since 2014. Monthly Bakken oil production was at its summit in December 2014 at approximately 36 million barrels. Most recently reported, production is down to about 30 million barrels in July of 2016.

North Dakota's Department of Mineral Resources provides historical amounts of monthly oil production as seen in Figure 1. A noticeable hill can be seen showing the rise, crest, and fall of oil production, a similar pattern to that of the auto parts store's monthly sales.

Figure 1: Monthly Oil Production in the Bakken



This figure shows the progression of Bakken oil production over time.

Because of this boom in oil activity, an influx of people flocked to the area looking to make a fortune, and because production was so high, the number of oil jobs that opened up were looking to be filled. The Federal Reserve Bank of Minneapolis states there were about 110,000 jobs in the Bakken region at the end of 2014, the peak of the boom (Grunewald, 2016).

Census data of xyz alone portrays an upward trend in the population rising from about 4,700 people in 2007 to about 6,500 in 2014 ("xyz demographics", n.d.). A Forbes article states multiple other cities have experienced economic booms and busts over the years such as Pittsburgh with its steel production. Because of the drastic change in an exchangeable good, like oil, population grows and other industries are affected as well, such as retail stores (Millsap, 2016).

Furthermore, according to research done by professors at the University of Georgia and Oklahoma State University, the extraction of oil is directly linked to the increase or decrease of employment and income. The local economy will see "spillover effects" that the oil industry creates and local businesses will be able to see a positive, strong correlation between high sales and economic boom, as well as a strong, positive correlation between lowering sales and economic bust (Munasib & Rickman, 2014).

A similar event occurred in the same region during the 1980s: an oil boom and bust. Businesses all over the Bakken were hit with an increased demand for goods and services when oil came to town. Wages across all sectors increased as did employment opportunities, and region population according to an article from the Economic Journal (Jacobsen & Parker, 2014). Then, once the boom was over, businesses saw their profits declining back to what they once were as if the boom had never occurred.

Taking all of this into consideration, the next step was to answer the question: is there a relationship between the sales of an auto parts store and oil production and price?

This paper proceeds as follows. Section 2 presents a brief overview of literature. Section 3 presents database and methodology. Section 4 presents results. Section 5 concludes.

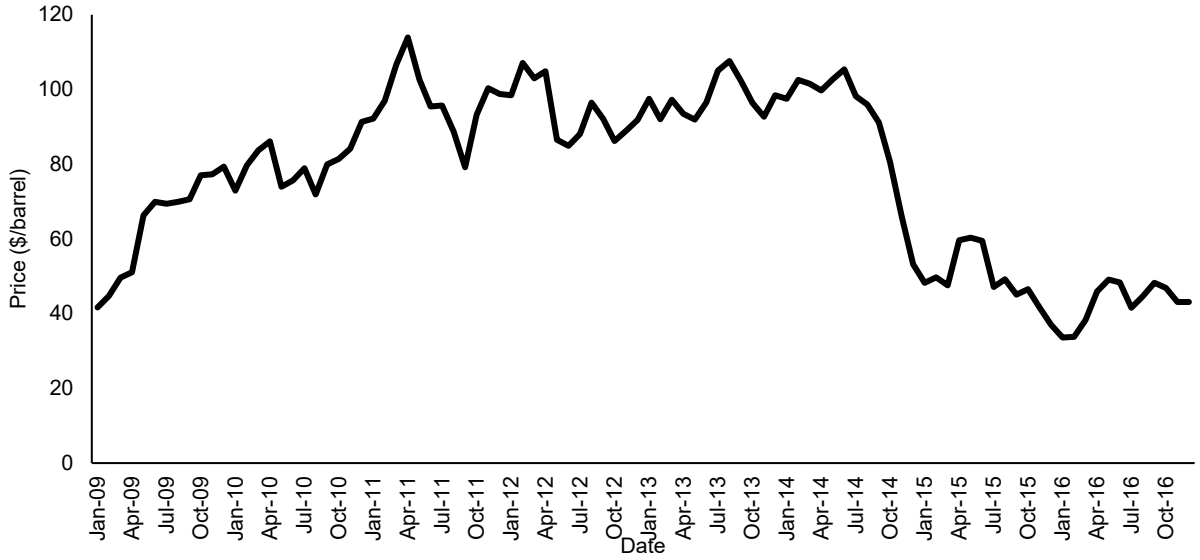
DATA AND METHODOLOGY

For the business in question, some sales information simply was not possible to obtain. Although it has been established that the oil boom took off sometime between 2007 and 2008, the data from those two years was not readily available and unable to be included in the analysis. Furthermore, the study only includes information seen at an auto parts store in xyz. Sales revenues from businesses of other industries or other towns within the Bakken region were not able to be examined. In fact, we couldn't have access to other businesses data.

This analysis relies on the use of a sample of an auto parts business's monthly sales dating back to January of 2009 to July 2016. Furthermore, the amounts of monthly oil production from the Bakken and the fluctuating oil price for the same period were able to be obtained as well. With this information, statistical testing was utilized based on the large sample sizes. Hypothesis testing was conducted with dependent samples to compare the difference between two means of two populations: sales with the Bakken oil production and then sales with oil price.

The first step of this research analysis was to gather relevant data. Since it is to be proven that oil production and oil price drive the sales of a small business, those numbers have been obtained and graphed. As already seen, the oil production can be found in Figure 1, and the oil price and the business's sales can be seen in Figures 2 and 3 respectively.

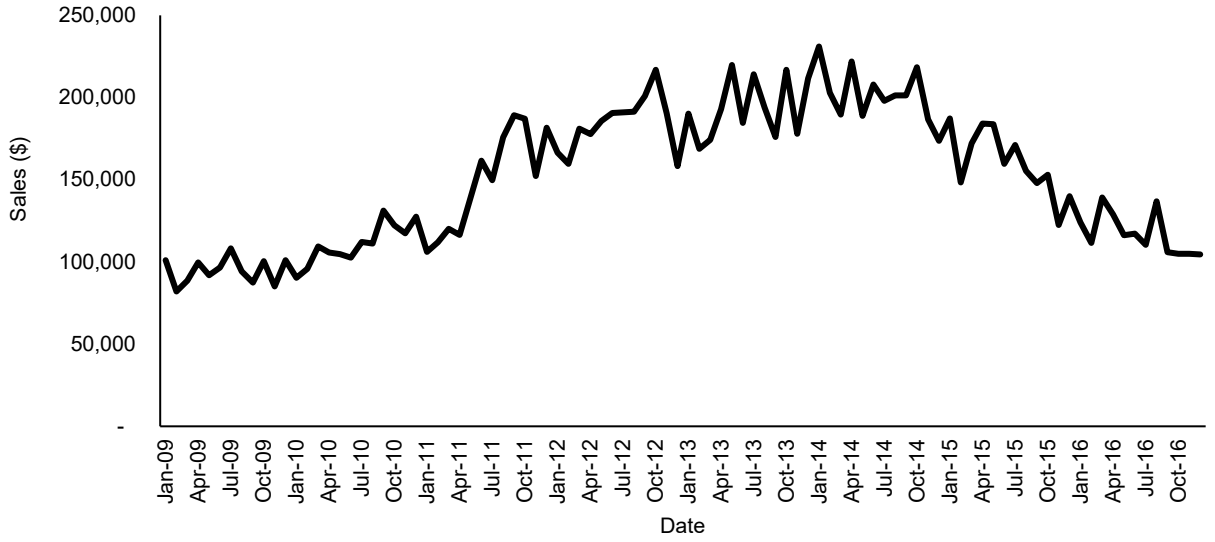
Figure 2: Monthly Oil Price in the Bakken



This figure shows the over-time progression of oil prices.

As it can be seen in all three graphs, there is a definite rise, peak or plateau, and subsequent decline all occurring throughout the same time period. Oil price, production, and businesses sales were all on the rise until 2014 hit. Around that time the three populations see a decrease. From here, correlation coefficients were calculated between sales with production and sales with oil price. The term found between sales and production came out to be an extremely strong, positive correlation of 0.6108 and the correlation between sales and oil price was not as high, yet still came out to be a strong number of 0.4522. Although correlation does not necessarily imply causation, this serves as a basis for thinking the oil boom had such a large impact on not only its own economic sector, but others like the auto parts company's as well.

Figure 3: Monthly Sales Revenue



This figure shows the over-time progression of sales revenue.

The empirical validation of the relationship between sales, oil price, and oil production requires the measurement of the relationship between Y value or monthly sales of xyz and the two variables (X_1 and X_2) intended to reflect the oil price and the oil production:

$$Y = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \varepsilon \quad (1)$$

Where:

Y: represents the monthly sales of xyz;
X_1: represents the oil price;
X_2: represents the oil production;
ε: represents the error term.

Our model can be written as follows:

$$sales = \alpha_0 + \alpha_1 oprice + oprod \quad (2)$$

The coefficient of correlation (R^2) is used to assess the intensity of the relationship between the sales and the oil price and production.

RESULTS

The next step was to actually look for causation through the use of statistical testing. First, because the sample sizes are so large, through the Central Limit Theorem, it is assumed the populations follow a normal distribution. Additionally, the amount of alpha was set at 0.05 for both tests. The null hypothesis states the auto parts company's sales are not dependent on oil price or oil production and the alternative states that those sales are dependent on oil price and production. This is determined to be a two-tailed test. Regarding all three variables, it has also been determined that the tests conducted must compare the differences between two means with dependent samples. Dependent samples are those in which observations from one sample, in this case oil production with sales and oil price with sales, can be matched, or paired up with, specific observations from the other sample. For this study, each amount of monthly oil price and oil price correspond with the monthly sales of the business.

For our analysis, we define sales as the monthly sales for xyz, oprice as the average monthly oil price per barrel and oprod as the monthly oil production in the Bakken region. Table 1 present the descriptive statistics for our variables (mean, standard deviation and number of cases) and the correlation between the variables.

Table 1: Descriptive Statistics for Variables of the Study

	Sales	**oprice (Oil Price)**	**oprod (Oil Production)**
Mean	151,474	77.021	19.991 (millions)
Standard Deviation	81,844	22.704	11.138 (millions)
Observations	96	96	96
Correlation			
sales	1		
oprice	0.4889	1	
oprod	0.5408	-0.2902	1

This table shows the mean, standard deviation, number of cases of the variables used in the study. It also shows the correlation between the variables.

Table 2 shows the paired two sample t-test for means for sales and oprice variables and the sales and oprod variables. The results for the paired two sample t-test for means for sales and oprice shows that the t-stat is equal to 35.4593 and the P(T<=t) is equal to 0, which leads us to reject the null hypothesis and conclude that company sales are dependent on oil price. In the same way, the results for the paired two sample t-test for means for sales and oprod shows that the t-stat is equal to -17.4878 and the P(T<=t) is equal to 0, which leads us to reject the null hypothesis and conclude that company sales are dependent on oil production in the Bakken region.

Table 2: Paired Two Samples T-Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1: sales - oprice	151,397	41,833	4,270	142,921	159,874	35.459	99	0.000***
Pair 2: sales - oprod	-19,839,686	11,115,677	1,134,489	-22,091,931	-17,587,440	-17.488	99	0.000***

*This table shows results of paired two-sample t-tests where ***, **, * indicate significance at the 1, 5 and 10 percent levels respectively.*

The results presented in Table 3 show that the variables included in the model, explain the monthly sales at 74.25% (adjusted R^2). This is a good value for a regression performed on a number of observations of 96 (96 months over 8 years).

Table 3: Regression Results of Sales to Oil Price and Oil Production

Model 1	Unstandardized Coefficients B	Standardized Coefficients Std. Error	Beta	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
						Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
(Constant)	-4,619	9,968		-0.463	0.644	-24,413	15,174					
Production (barrels)	0.003	0.000	0.745	13.701	0.000***	0.002	0.003	0.541	0.818	0.713	0.916	1.092
Oil Price	1,300	100.27	0.705	12.963	0.000***	1,101	1,499	0.489	0.802	0.675	0.916	1.092

This table shows regression results for the estimated equation $sales = \alpha_0 + \alpha_1 oprice + oprod.$ ****, **, * indicate significance at the 1,5 and 10 percent levels respectively.*

The percentage of the adjusted R^2 (74.25%) is significantly different from zero, which proves the existence of a relationship between sales, oil price, and oil production. Moreover, all the empirical studies in this direction proved the existence of a correlation between these variables (sales with oil price and sales with oil production). The coefficients of the independent variables are positive and significant at 1% which reinforce our previous conclusion that company sales are dependent on oil price and company sales are dependent on oil production in the Bakken region.

CONCLUSION

The purpose of this study was to examine possible factors that impacted this sales trend. The oil was such a huge part of the economy, it basically defined the region. Was it able to infiltrate small-town business revenues as well? If this is one of the driving factors for a small auto parts store, the oil economy may serve as an explanation for other businesses who might have seen a similar trend in their sales. With this information, these businesses could then plan accordingly and forecast what sales might look like in the future.

This study proved large economic changes can, and do, have an effect on business not directly related to the economic change. In both tests, the null, stating the oil boom was not a direct cause of the upside-down

U trend observed in the auto parts company's sales data, was able to be rejected. Observing similar trends from three sets of data as well as engaging in statistical testing and regression analysis were able to solidify the notion that oil in the Bakken did not just create opportunities in the oil and energy economic sectors. The "spillover" effect took place and businesses can use this information to explain any strange trends they may find in their own sales. Depending on the region and time period, the sales may not be dependent on oil in particular, but knowing that an economic change may be the cause is a good place to start.

Our analysis shows that, in our case, company sales are dependent on oil price and company sales are dependent on oil production in the Bakken region. Businesses within the eastern Montana-western North Dakota area may be able to follow the same procedures to analyze their own data and find similar results. Can a large economic development in one industry act as a driving force for the amount of revenue collected by small businesses across multiple industries? And, if so, those businesses can then prepare themselves for the next boom or bust.

Like any research our study has limitations. The first limitation is that the findings are based one case and not a panel data. The second limitation is related to the data period. We couldn't obtain the sales revenue before 2009. We think that if we had access to earlier sales data, such as 2005, our finding could be different. Finally, the third limitation is that we looked only at the sales generated by the oil boom in the Bakken region and we ignored all the environmental impact that may have created.

This study can be a start for future research. In fact, using the information found through observation and testing, some businesses may be able to use advanced statistical analysis to forecast future trends and plan accordingly for a boom, bust, or even just normal economic growth. Furthermore, other studied may focus not only on the direct monetary impact (sales, income, etc.) but also on the environmental and ecological impact

REFERENCES

Aguinis, H., Glavas A. (2012) "What we know and don't know about corporate social responsibility: a review and research agenda," Journal of Management, Vol. 38(4), p. 932-968

Brammer, S., Jackson, G., Matten, D. (2012) "Corporate social responsibility and institutional theory: new perspectives on private governance," Socio Economic Review Vol. 10(1), p. 3-28

Cavalcanti, T., Da Mata, D. & Toscani, F. (2016) "Winning the Oil Lottery: The Impact of Natural Resource Extraction on Growth," IMF Working paper series, No. WP/16/61, March 2016

Davey, M. (2008) "Oil in North Dakota brings job boom and burdens," Retrieved August 8, 2017 from http://www.nytimes.com/2008/01/01/us/01dakota.html?action=click&contentCollection=U.S.&module=RelatedCoverage®ion=EndOfArticle&pgtype=article&_r=1

Friedman, M. (1970) "The Social Responsibility of Business Is to Increase Its Profit," New York Times Magazine, September 13, 1970

Ghalayini, G. (2011) "The Interaction between Oil Price and Economic Growth," Middle Eastern Finance and Economics, Issue 13 (2011), p. 127-141

Grunewald, R. (2016) "From red-hot to lukewarm in the Bakken," Federal Reserve Bank of Minneapolis. Retrieved August 9, 2017 from https://www.minneapolisfed.org/publications/fedgazette/from-red-hot-to-lukewarm-in-the-bakken

Idemudia, U. (2009) "Oil Extraction and Poverty Reduction in the Niger Delta: A Critical Examination of Partnership Initiatives," *Journal of Business Ethics* (2009), p. 91-116

Jacobsen, G., & Parker D. (2014) "The economic aftermath of resource booms: Evidence from boomtowns in the American west," *The Economic Journal*, Vol. 126(593, June), p. 781-1291

Jimenez-Rodriguez, R. & Sanchez, M. (2004) "Oil Price Shocks and Real GDP Growth – Empirical Evidence for Some OECD Countries," ECB Working paper series, No. 362, May 2004

Loe, J.S.P., Kelma, I. (2016) "Arctic petroleum's community impacts: Local perceptions from Hammerfest, Norway," *Energy Research & Social Science*, 16(2016), p. 25-34

Millsap, A. (2016) "What the boom and bust of Williston, North Dakota teaches us about the future of cities," Retrieved August 9, 2017 from http://www.forbes.com/sites/adammillsap/2016/06/07/williston-nd-and-the-rise-and-fall-of-american-cities/#3c09c8236c81

Munasib, A., & Rickman, D. S. (2014) "Regional economic impacts of the shale gas and tight oil boom: A synthetic control analysis," *Regional Science and Urban Economics*, Vol. 50(January), p. 1-17

Piercy, N.F., Lane, N. (2011) "Corporate social responsibility initiatives and strategic marketing imperatives," *Social Business*, Vol. 1(4), p. 325-345

Sovacool, B.K. (2014) "What are we doing here? Analyzing fifteen years of energy scholarship and proposing a social science research agenda," *Energy Research & Social Sciences*, 1(2014), p. 1-29

Scheyder, E. (2016) "In North Dakota's oil patch, a humbling comedown," Retrieved August 9, 2017 from http://www.reuters.com/investigates/special-report/usa-northdakota-bust/

"Crude oil historical prices," (n.d.) Retrieved August 8, 2017 from http://www.investing.com/commodities/crude-oil-historical-data

"First North Dakota Oil Well," (n.d.) Retrieved August 8, 2017 from http://aoghs.org/petroleum-pioneers/north-dakota-williston-basin/

North Dakota monthly Bakken Oil Production Statistics. (n.d.) Retrieved August 8, 2017 from https://www.dmr.nd.gov/oilgas/stats/historicalbakkenoilstats.pdf

ACKNOWLEDGEMENTS

The authors would like to thank the company xyz for providing the information used in this study. We also wish to express our appreciation to two anonymous reviewers for their insightful comments and structural suggestion to strengthen the paper.

NOTE

The authors list is ordered by last name.

BIOGRAPHY

Ms. Amy Bieber, graduate, Montana State University Billings, College of Business, 1500 University Drive. Email: abieber13@hotmail.com

Scott Butterfield has a Ph.D. from Georgia State University. He is Associate Professor of Accounting at Montana State University Billings, College of Business 1500 University Drive. Email: scott.butterfield1@msubillings.edu

S. Boumediene has a PhD in Business Administration (Accounting) from the University of El Manar, Tunisia. Before joining Montana State University-Billings, Dr. Boumediene taught both financial and managerial accounting at both the undergraduate and graduate levels at the top business schools in Tunisia. Dr. Boumediene has been publishing his research work in academic journals, such as the Journal of Applied Business Research and the International Journal of Business and Finance Research, among others. Dr. Boumediene published a book on statistical characteristics and quality of accounting information in 2013. E-mail: salem.boumediene@msubillings.edu (Corresponding author)

Accounting & Taxation
Vol. 10, No. 1, 2018, pp. 61-76
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

IBFR
www.theIBFR.com

HUMAN CAPITAL ACCOUNTING TOOL USAGE: EVIDENCE FROM A SURVEY OF KENYAN FIRMS

Sammy Lio, Chandaria School of Business, United States International University-Africa

ABSTRACT

I study the effect of applicability and assessability of accounting for Human Capital tools on the Human Capital accounting practice in the Kenyan medium and large organizations. The study employed the explanatory-mixed method cross-sectional survey on Chief Finance Officers (CFOs) in the Kenyan medium and large organizations. The need to establish the causal relationships between the explanatory and response variables promoted the research design. Mixed method was selected due to its suitability as it allows the collection of both qualitative and quantitative data, as well as data integration into meaningful findings. The study found that accounting for Human Capital tools' applicability, and assessability would enable the Human Capital accounting practice in the Kenyan medium and large organizations for improved decisions which enhance firm value. However, it is difficult to delineate Human Capital; the total stock of skills of an entire workforce in an organization from Human Resources and People, which possess dynamic social and relational non-financial or accounting measures. This paper contributes to the body of knowledge by establishing a link between accounting for Human Capital practice and Human Capital tool usage which is a new phenomenon in Kenyan.

JEL: M41

KEYWORDS: Accounting, Human Capital, Medium and Large Organizations, Applicability, Accessibility for Efficacy

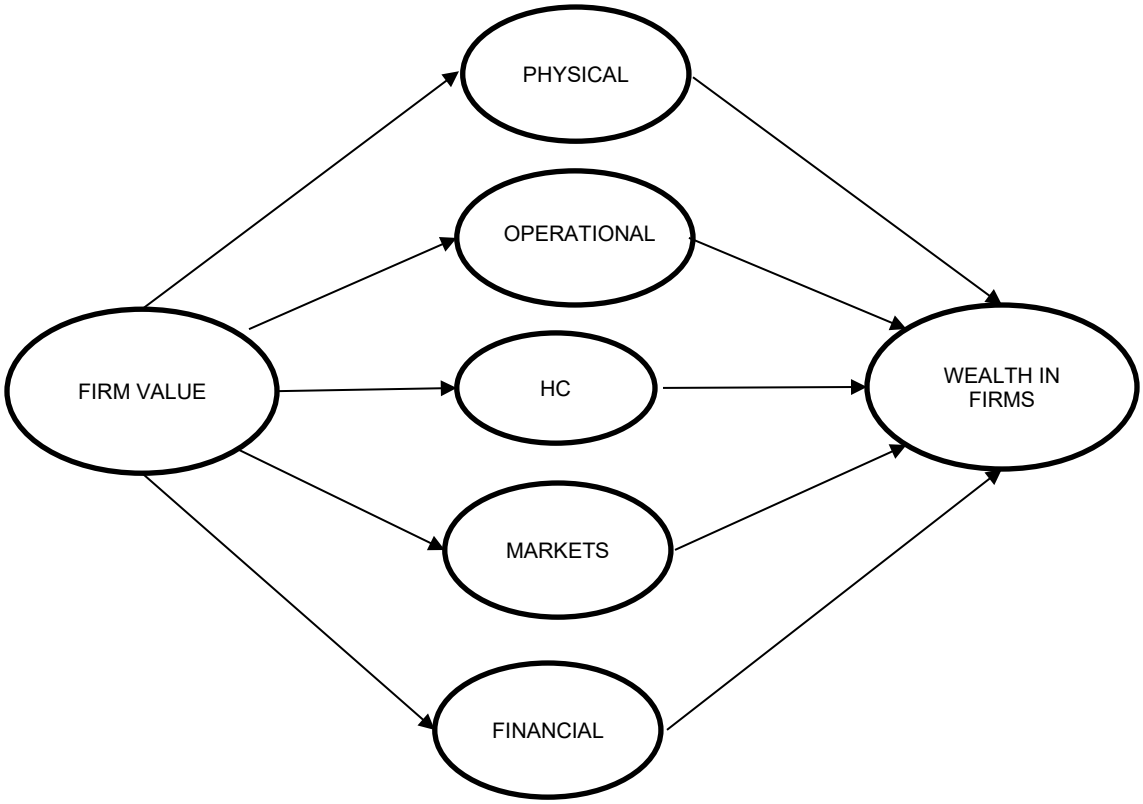
INTRODUCTION

Jones (2013) has defined an organization as a tool people use to achieve their unique goals. One huge goal is wealth creation. To achieve this goal, organizations thrive in assets as means of wealth production. To carry on business, a corporation needs almost endless variety of real assets (Brealey, Myers and Allen, 2011). Mello (2011) has identified financial, physical, market, operational, and Human Capital (HC) as the five key assets in organizations. However organizations extol HC as the foremost factor of competitive advantage (Chouhan & Naghshbandi, 2015; Chang, 2014; Kaur, Raman, & Singhania, 2014; Butt, 2013; Enofe, Mgbame, Otuye, & Ovie, 2013; Akintoye, 2012; Fischetti, 2011; Mello, 2011; Zhang, 2006; Theeke, 2005; Flamholtz, Bullen, & Hua, 2002; Batra, 1996; Likert, 1967), as nothing can ensue without its mediation. The most ubiquitous statement in most large publicly listed corporations' annual reports is that 'people are our most valuable assets' (Steen, Welch & McCormack, 2011; Cascio, 1998; Baker, 1974). This authenticity is historical as depicted in existing literature, and dates back to the 1960s of the last century when organizations relied on physical assets such as raw materials and machines; to the present time when HC is supreme (Gamerschlag, 2013; Flamholtz, Bullen & Hua, 2002) in the knowledge economy. This reality is conceptualized in this study in Figure 1. As illustrated, HC is centrally positioned as it is the intervening factor in aligning others core assets for optimal productivity in organizations.

All indispensable tangible and intangible assets of firms are accounted for as material investments in their financial reports for improved decisions which enhance firm value (Chouhan &Naghshbandi, 2015;

Andrade & Sotomayor, 2013; Bullen & Eyler, 2010). Accordingly; organizations which engage in HC accounting (ACC) practice report superior financial performance. Becker, Huselid and Ulrich (2001) investigated HC ACC and management quality indices in various organizations and confirmed that the top 10% of those studied earned 391% Return On Investment (ROI) as a result of ACC and managing their HC. Gates (2002) established that sound and strategic management of HC ACC can explain up to 47% increase in firm market value. The American Bankers Association conducted a study among America's leading banks on the relationship between a bank's investments in HC and its overall business performance and concluded that the institutions with the greatest focus on HC ACC enjoy the greatest financial returns (Pickett, 2005). Pfau and Kay (2002) established that firms with the best HC ACC practices provide returns to shareholders three times greater than their counterparts with weak HC ACC practices in a study of 750 huge publicly traded companies.

Figure 1: Alignment of Firm Assets Which Create Value: Source: Researcher 2017



This figure shows firms and the assets they use, including physical, operational, HC, markets, and financial for wealth creation. As shown in the middle of the figure, HC is centrally positioned because it is the utmost factor of competitive advantage in firms as the other assets cannot function without its intervention.

Consequently, several ACC for HC tools, such as the Acquisition Cost (AC) which takes into account recruitment, selection, contracting, and placing; Learning Cost (LC) which includes training, orientation, promotion, and improvement; Actual Human Capital Return (AHCR) in an organization; Intangibles Monitor (IM) which uses measures such as growth, renewal, efficiency, and stability; Adjusted Present Value technique (APVT) which estimates the Present Value (PV) of future wages, future earnings, and value addition by workers; among others have been unveiled (Massingham, Nguyen & Massingham, 2011; Andriessen, 2004; Flamholtz, Narasimhan, & Bullen, 2004; Sveiby, 1997) to promote ACC for HC practice in organizations. However, the tools are unadopted by key constituents in organizations (Butt, 2013; Kirfi & Abdullahi, 2012; Mello, 2011; Theeke, 2005; Flamholtz, Narasimhan, & Bullen, 2004) because they lacks generally accepted HC ACC frameworks. As a result, Kenyan Medium and Large

Organizations (MLOs) have not used the tools in ACC for their HC as the superlative wealth productive investments. One way to solve this puzzle is to enquire on the applicability and assessability of the tools in the Kenyan MLOs because of their all-embracing financial reporting. The objective of the study is therefore to investigate HC ACC tool usage in the Kenyan MLOs. Much of HC ACC practice studies have been contacted in various international settings such as UK, Scandinavia, Australia, Canada, Austria, USA, and Malaysia, among others, (Bontis, Keow, & Richardson, 2000) but none in Kenya. The study findings will come in handy to help overcome the challenges currently overloading the existing accounting for HC tools. The remainder of the document will underscore literature review, data and methodology, results, concluding remarks, references, and acknowledgements.

LITERATURE REVIEW

In this study, applicability means using an accounting tool to calculate Total Human Capital Cost (THCC) in the Kenyan MLOs successfully for comparison with AHCR and Human Capital Earnings Potential (HCEP) in the assessment of HC as the utmost factor of competitive advantage in organizations. It addresses the key concerns of whether firms: would support the notion of HC as the foremost factor of their competitive advantage; would have requisite data to compute AC and LC; would forecast their anticipated HCEP; and whether they would have skilled managers to execute the HC ACC practice. Several firms have applied various ACC for HC tools with positive bottom-line results (Mello, 2011; Hansson, 1997; O'Regan, O'Donnell, Kennedy, & Cleary, 2001; Garcia-Ayuso, Moreno-Campos, & Sierra, 2000) as shown in Table 1.

Table 1: Application of Existing Accounting for HC Tools in Organizations with Positive Financial Results.

1 Firm	2 ACC For HC Tool Applied	3 How the Firm Has Applied the Tool	4 Why the Tool is Not Adopted	5 This Research Propositions
RG Barry Corporation (USA)-1970	AC (Brummet, 1970), as cited in Flamholtz (1999)	Presented Statement of Financial Position (SFP) based on seven functional accounts.	According to Flamholtz (1999): first, cost data was not readily available hence data used was costly to retrieve and unreliable; second, presenting many (7) accounts had the potential of introducing errors in the HC values; and finally, there was lack of empirical evidence on the system as a HC management and strategic decision tool. In addition, only AC and replacement cost parts of the model were used. Finally, the tool was not cost effective (Kaur, Raman, & Singhania, 2014)	Acquisition or Historic costs are fundamental costs used to identify and recognize assets in the Financial Statements (FS) of firms initially (per IAS 16). However replacement costs are inappropriate for HC ACC in this study because when HC exit, a loss ought to be recognized and Acquisition costs incurred on new HC. A model is proposed in this study based on empirical evidence from Kenyan MLOs which aggregates AC, Learning Costs (LC), 3 Months' Salary and HCEP to calculate THCC, using Stochastic Rewards Valuation Model (SRVM) (Flamholtz, 1999), as a surrogate measure in **Figure 4**. SRVM is a probabilistic positioning of HC in various positions throughout their life in an organization and was not applied by RG Barry Corporation. Furthermore, the definition of replacement cost in Flamholtz (1999) is similar to AC.
Touche Ross & Co. (CPA Entity)-1970	AC (Brummet, 1970) and Opportunity Cost (Hekimian & Jones, 1967); as cited in Flamholtz (1999)	Presented a Human Resource Investments Report	Flamholtz (1999) observed that the system designed by the firm was inadequate in aiding the assessment of validity, reliability, and utility of HC ACC information.	Current operational assets such as advanced technology are instrumental in aiding firms of the current era to collect, analyse, and report data in sophisticated systems which are in turn assessed for efficacy.

'Metro Bank' USA PLC-1999	AC (Flamholtz, 1999)	Presented divisional summary of cost per hire	The accounts presented portrayed disparity in costs incurred by different divisions; and the notion that high costs signified an adverse variance did not hold, as these could imply material investments in LC such as quality training (Flamholtz, 1999).	As in RG Barry Corporation above. However in the 'Metro' case, AC was restricted to recruitment and selection costs only (Flamholtz, 1999).Contemporary research (Barcons-Vilardell et al, 1999) has identified AC to constitute recruitment, Selection, Contracting, and Placing HC in organizations.
The USA Navy-1999	AC (Brummet, 1970; Flamholtz,1999)	Presented statements of Acquisition and Development costs for Individuals	See R G Barry above.	As in R G Barry above.
Dow Chemical Co (USA)-2003	Tailor made tool, which aggregates AC , LC and AHCR (Mello, 2011)	Presented statements of Break-Even Points (B-E-P) which compare the AHCR, expected HCEP and Net Present Value (NPV) of projects executed by each employee in a single business unit.	This was an on-going effort by the entity, and the tool was expected to be rolled out to other business units.	The tool computes the B-E-P metric, rather than the THCC in organizations, which is the focus in Kenyan MLOs. THCC is essential for comparison with AHCR in the assessment of HC as the utmost factor of competitive advantage in organizations.
18 British Football clubs - 1997	Most clubs applied the AC cost approach (Morrow, 1997)	Presented SFP	The practice is ongoing.	Morrow (1997) supported the practice and recommended the historical cost approach (Similar to AC). However, clubs can efficiently account for their players by determining the THCC favoured by MLOs in Kenya, for comparison with AHCR.
Swedish National Tele-Communications Co-1996	Tailor made tool (Telia, 1996) as cited in Kaur et al (2014)	Presented Human Resource (HR) Income Statement and HR SFP	The ACC for HC efforts were ongoing. However, according to Sveiby (1997), several reasons made the process difficult, namely: Financial analysts were unfamiliar with HC data and hence the company did not get good response; there was the fear that the indicators could give too much away; there exists no rigorous theoretical model on ACC for HC; there is lack of benchmark experience; and finally, lack of empirical evidence that the metrics were sufficient in HC ACC practice. Furthermore, HC ACC is a HR rather than ACC function and includes non-financial measures.	Managers are increasingly becoming aware of ACC for HC practice and its positive impact on the quality of management decisions Kouhy et al, 2009) which enhance firm value. Kenyan CFOs in MLOs validate ACC for HC tools which may be applied as the basis of a sound theoretical model in ACC for HC practice. Furthermore, reporting mechanisms, including social media platforms have transformed the way ACC for HC information is transmitted (Dumay & Guthrie (2017). In addition, ACC for HC is a strategic integration (Kouhy et al, 2009) and as such, cannot be condemned as an HR preserve.
Swedish Civil Aviation Administration-1998	IM (Sveiby, 1997) as cited in Kaur et al (2014)	Presented HR income statement and HR SFP	See Swedish National Tele-Com above.	See Swedish National Tele-Com above.
WM data-Swedish Computer software consulting Co-1995	IM (Sveiby,1997)	Presented statements of ACC for HC ratios such as Number of employees, Turnover, Net Profit, Market value, Return On Capital Employed (ROCE), and Return On Equity (ROE).	This was an on-going effort by the firm. However, the model employed by this entity is multi-faceted as it includes non-financial measures of HR such as the social dynamics (Flamholtz, Narasimhan & Bullen, 2004), and therefore made it infeasible for the firm to effectively undertake HC ACC practice, which calculates THCC.	Cascio and Boudreau (2011) have concluded that it is impossible to measure everything about talent or HR program effects. Accordingly, firms can distinguish between HC financial measures and non-financial HR programs.

Skandia Group-Swedish Insurance Co-1994	IM –Sveiby (1997)	Presented statements of HC ACC ratios such as Number of employees, Turnover, Net Profit, Market value, Return On Capital Employed (ROCE), and return On Equity(ROE).	As in WM data above	As in WM data above
Bharat Heavy electrical (India)-2003	APVT As modified by Lev & Schwartz (1971)	Presented SFP	The tool: ignored the probability of HC turnover for reasons other than retirement or death; ignored HC learning and growth as it assumes people will remain in the same position; assumed individual measures could be aggregated to THCC, although this is infeasible because of synergism (Flamholtz, 1999)	Salary is an input, rather than an output in HC, and hence should be offset against AHCR. Furthermore, firms wish to focus on THCC, which is cost effective to measure for accurate and effective decisions, rather than Individual capital which is not cost-effective to measure (Jensen, 2001; Johanson & Mabon, 1998).
Cement Corporation of India-2006	APVT as modified by Lev & Schwartz Model (1971)	Presented SFP	See Bharat Heavy electrical above	As Above
Oil & Natural Gas Corporation India-2006	APVT as modified by Lev & Schwartz Model (1971)	Presented SFP	See Bharat Heavy electrical above	As Above
Engineers India Ltd-2006	APVT as modified by Levi & Schwartz Model (1971)	Presented SFP	See Bharat Heavy electrical above	As Above. It is noted that the companies in India were in the public sector, and their private sector counterparts were not studied.

This table shows organizations which have applied ACC for HC tools. Column one shows the name of the firm and the year it applied the tool. Column two and three show the author and ACC for HC tool applied; and how the firm applied the tool respectively. Column four shows why the tool has not been adopted by Kenyan MLOs for use in HC ACC practice. The last column shows the authors propositions based on research findings. Source: Researcher 2017.

Assessability for efficacy answers such questions such as: did the tool compute accurate THCC meaningful for managers' decisions based on the available historical records? How much time is it taking the staff to arrive at the THCC value? At what cost? Is it going to help the firm to grow its bottom-line and shareholder value? Does the firm have a budget to implement the tool? Has its implementation received managers and shareholders support? Who will be responsible for implementing it and championing the change? Is the firm willing to release this information to all the stakeholders? Jackson (2010) has introduced additional key concerns on assessability: what subcultures are within the firm and how will they resist the new changes? What cultural traits are puny or will obstruct the changes? What will be the toughest changes and how will they be managed? For example how would HC ACC conform to an entity's social order between the management leaders, employees and other stakeholders (Grojer, 1997)? Jensen (2001) investigated 350 firms and established that time and resources are material barriers to the assessment and implementation of HC ACC practice in organizations. In a study on Swedish firms, Sveiby (1997) found that few managers were willing to allocate budgets to assess how HC ACC practice can be applied to their firm strategies. In their empirical work, Johanson and Mabon (1998) cited the challenge of the costs of assessment and implementation of HC ACC practice as being greater than the benefits. In their study, Hedlin and Adolphson (2000) determined that the assessment and implementation of ACC for HC practice in organizations is characterised by uncertain benefits and lack of transferable value. After successfully computing the estimated THCC, managers at R.G. Barry Corporation dropped the tool after its assessment because it was not cost effective (Kaur et al, 2014).

DATA AND METHODOLOGY

The study employs the critical realism philosophical view, centred on the explanatory-mixed methods research design, and is anchored on the cross-sectional sampling scheme. Combining qualitative, quantitative, action, and critical research (Mertens, 2007) has been brought to a level of legitimacy as a result of numerous outstanding documented works (Creswell, 2009). The key assumption of the study is that: The applicability and assessability for efficacy of any accounting tool is inextricably linked to its practice. The target respondents were 165 CFOs in two strata as follows: The 100 Kenyan best medium firms in the year 2016 (as ranked by renowned KPMG on the basis of financial performance) and the 65 Kenyan large organizations listed at the NSE in 2016. The firms were selected for this study on HC ACC practice because of their all-embracing financial reporting. Primary data was collected from a sample of 116 CFOs through the survey strategy and a response rate of 51% achieved. The criteria for medium firms in Kenya include: turnover in Kenyan shillings between 5-800 million ($50,000-$8,000,000) and employees between 50 and 99. These were part of the nominal portion of the data collection instrument. The data were collected using both hard copies (34) as well as web-based questionnaires (25) and A *t*-test was employed to analyse any disparities and it was found that there was no significant difference in the average scores of the variables between the two survey methods with a ($p>0.05$). The questionnaire was pre-tested on a pilot set of respondent from the technical staff of the Institute of Certified Public Accountants of Kenya (ICPAK) for comprehension, logic and relevance. All the aspects of the questionnaire were pre-tested including question content, question difficulty, layout wording, sequence, and form and instructions. The feedback obtained was used to revise the questionnaire before administering it to the study respondents. The study variables were measured using both the ordinal scale and Likert-type scale (*1= Very strongly disagree; 2= strongly Disagree; 3= Disagree 4= Not sure; 5= Agree; 6= strongly agree; 7= Very Strongly Agree*). The relationship between applicability, assessability and ACC for HC practice in the Kenyan MLOs was modelled using the simple linear regression models. The models were as follows:

$$Y_i = \beta_0 + \beta_1 X_{1} + \varepsilon \quad (1)$$

$$Y_i = \beta_0 + \beta_2 X_{2} + \varepsilon \quad (2)$$

Where:

- Y_i = Dependent variable (HC Accounting Practice)
- β_0 = Constant or intercept which is the value of dependent variable when all the independent variables are zero.
- β_{1-2} = Regression coefficient for each independent variable.
- X_1 = Applicability of existing accounting for HC tools
- X_2 = Assessability for efficacy of existing accounting for HC tool
- ε = Error term.

The results are presented in Tables 2 and 4 respectively. Two hypotheses were assessed:

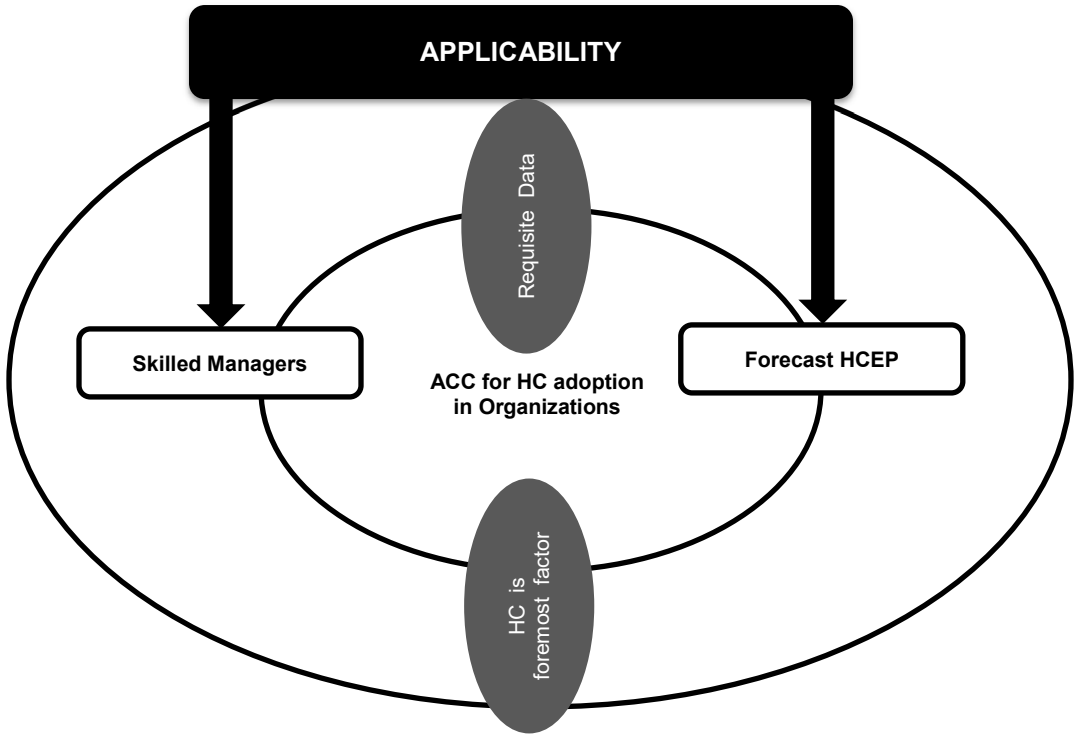
H_1 applicability of ACC for HC tools has a significant relationship with ACC for HC practice in Kenyan MLOs.

H_2 Assessability for efficacy of ACC for HC tools has a significant relationship with ACC for HC practice in Kenyan MLOs.

Hypotheses one and two were conceptualized in Figure 2 and Figure 3 respectively based on the theoretical review. Furthermore, the two hypotheses are not mutually exclusive since after a successful

application of a tool in HC ACC practice in the Kenyan MLOs, the tool should be assessed for use in the long-term.

Figure 2: Applicability of ACC for HC Tools Effect on ACC for HC Practice in Kenyan MLOs



This figure shows how the applicability hypothesis was conceptualized. Existing literature proposes that, in order for firms to apply an ACC for HC tool, it must have requisite data, skilled managers, be able to forecast HCEP, and treat HC as the foremost factor of competitive advantage. Kenyan CFOs in MLOs were asked these questions to test the applicability hypothesis and results presented in Tables 2 and 3. Source: Researcher 2017

The depiction of the applicability hypothesis, namely, the availability of requisite data for HC ACC (AP1), ability to forecast HCEP (AP2), skilled managers in organizations (AP3), as well as the verity that HC is the foremost asset in organizations (AP4); if supported would aid ACC for HC practice in the Kenyan MLOs as shown in Figure 2. CFOs were asked to state whether the existing ACC for HC tools were applied in real organizations before they were unveiled (AP5).

In Figure 3, organizations' willingness to set aside budgets (ACSB1), willingness to share THCC information with stakeholders (ACSB2), readiness to deal with tough changes arising from ACC for HC practice (ACSB3), and the quest for accuracy (ACSB4) , should promote the assessability of ACC for HC tools for efficacy, and promote ACC for HC practice in the Kenyan MLOs. CFOs were asked to state whether the existing ACC for HC tools were assessed for efficacy before they were unveiled (ACSB5).

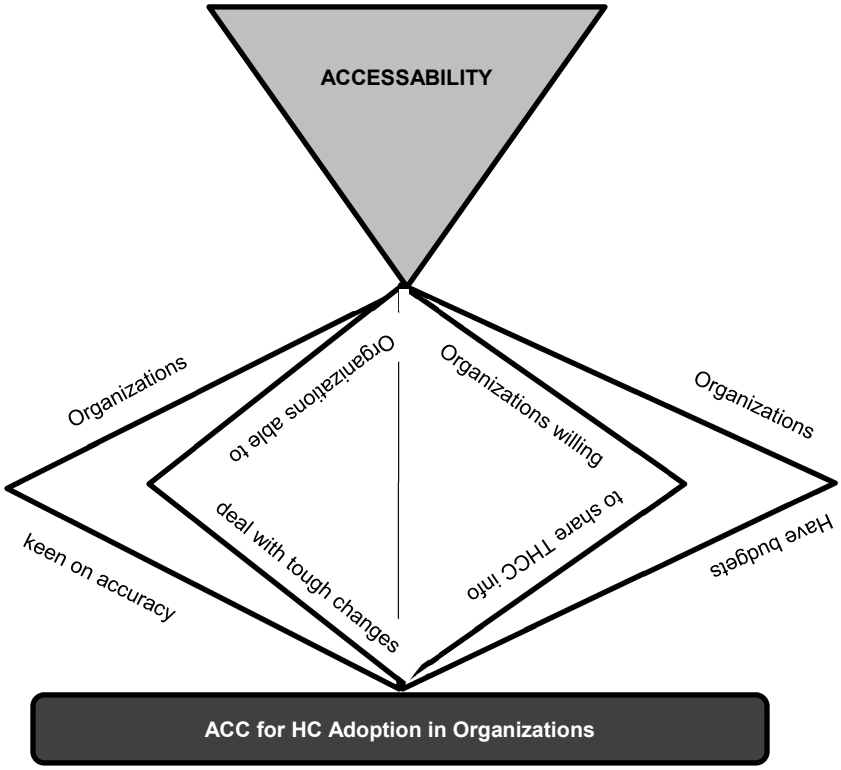
EMPIRICAL RESULTS

The Applicability Hypothesis

Table 2 shows simple regression analysis for the applicability hypothesis based on the first equation. The first and second Columns show the model and the un-standardized coefficients with the constant ($\beta_{0)}$ (13.151), applicability hypothesis ($\beta_{1)}$ (0.352) and the standard errors associated with the results. The third column shows the coefficient of the model without a constant. The forth column shows the t-test statistic

at 95% level of confidence. The fifth, sixth and last columns show the significance of the model and its explanatory power, as well as the variation (R^2) on the HC ACC practice in the Kenyan MLOs.

Figure 3: Assessability of ACC for HC Tools Effect on ACC for HC Practice in Kenyan MLOS



This figure shows how the assessability hypothesis was conceptualized. Existing literature proposes that, in order for firms to assess an ACC for HC tool, it must have a budget, be willing to share THCC information, be able to deal with tough changes caused by HC ACC, and be keen on accuracy. Kenyan CFOs in MLOs were asked these questions to test the assessability hypothesis and results presented in Tables 4 and 5. Source: Researcher 2017

Table 2: Regression Model with ACC for HC Practice and ACC for HC Tools' Applicability

Model	Un-standardized Coefficients		Standardized Coefficients	t	Sig.	R^2	F-Value (p-value)
	B	Std. Error	Beta				
(Constant)	13.151	1.982		6.635	0.000	0.207	14.853
Applicability	0.352	0.091	0.471	3.854	0.000		(<0.001)

This table shows simple regression analysis for the applicability hypothesis based on the first equation. The first and second Columns show the model and the un-standardized coefficients with the constant ($\beta_{0)\ (13.151)}$ applicability hypothesis ($\beta_{1)}$ (0.352) and the standard errors. The third column shows the coefficient of the model without a constant. The forth column shows the t-test statistic at 95% level of confidence. The fifth, sixth and last columns show the significance of the model and its explanatory power, as well as the variation (R^2) on the HC ACC practice in the Kenyan MLOs.

The analysis in Table 2 reveals that ACC for HC tools' applicability had a significant positive linear relationship with ACC for HC practice, with an r=0.471. Based on the regression analysis, ACC for HC tools' applicability would explain 20.7% of the variation in the ACC for HC practice in Kenyan MLOs, and would significantly predict it as indicated by an F-value of 14.853 and p-value of 0.001. According to the research findings, a unit change in ACC for HC tools' applicability would increase ACC for HC practice in Kenyan MLOs by 0.352 units. This implies that Kenyan MLOs need requisite data, skilled managers, ability to forecast HCEP, and to position HC has the overriding factor of competitive advantage to successfully implement the HC ACC practice for improved decisions which enhance firm

value. Thus the hypothesis was supported. When asked whether the tools were applied in real organizations before they were unveiled, the respondents were unsure.

Correlation analysis was carried out on each of the statements in Figure 2 measuring the applicability hypothesis and their effect on HC ACC practice in the Kenyan MLOs. The results are presented in Table 3. The table shows the statistical significance as well as the Pearson's correlation between each of the statements measuring the applicability hypothesis and HC ACC Practice in the Kenyan MLOs. As can be seen from the table, each of the statement has a positive correlation and is statistically significant in predicted HC ACC practice in Kenyan MLOs. * And ** means the Pearson correlation value is significant at 5% level of significance. N' represents the number of respondents used in each case.

Kenyan CFOs in medium firms supported applicability to enable ACC for HC practice more than CFOs in large organizations. CFOs of the male gender considered ACC for HC tool's applicability more fundamental in predicting the ACC practice than those of the female gender. Members of ICPAK were more inclined to applicability than CFOs of other professional bodies. Service sector CFOs felt that applicability would explain ACC for HC practice in the Kenyan MLOs to a greater degree than CFOs in other sectors. CFOs with less than one year experience in their current positions thought that applicability would predict ACC for HC practice more, than CFOs with more experience, although those with more than five years experience also supported this view. CFOs with costing expertise were more agreeable that applicability would elucidate ACC for HC practice, compared to those with expertise in other accounting disciplines; a view taken by those who had not worked in HC ACC related assignments relative to those who had. This implies that a Kenyan male CFO who is a member of ICPAK, and has worked for less than one year in a medium firm in the service sector, and has previous HC ACC experience, promoted applicability as predicting the HC ACC practice in the Kenyan MLOs.

Table 3 Correlation Coefficient between ACC for HC Practice and the Statements Measuring ACC for HC Tools' Applicability

		ACC for HC Practice	Ap1	Ap2	Ap3	Ap4	Ap5
ACC for HC Practice	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	56					
Ap1	Pearson Correlation	0.342**	1				
	Sig. (2-tailed)	0.010					
	N	56	59				
Ap2	Pearson Correlation	0.542**	0.652**	1			
	Sig. (2-tailed)	0.000	0.000				
	N	55	58	58			
Ap3	Pearson Correlation	0.297*	0.557**	0.546**	1		
	Sig. (2-tailed)	0.028	0.000	0.000			
	N	55	57	56	57		
Ap4	Pearson Correlation	0.497**	0.643**	0.515**	0.690**	1	
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		
	N	55	57	56	57	57	
Ap5	Pearson Correlation	0.290*	0.087	0.206	0.368**	0.226	1
	Sig. (2-tailed)	0.032	0.518	0.128	0.005	0.091	
	N	55	57	56	57	57	57

*This table shows the statistical significance and the Pearson's correlation between each of the statements measuring the applicability hypothesis and HC ACC Practice in the Kenyan MLOs. As can be seen from the table, each of the statement has a positive correlation and is statistically significant in predicted HC ACC practice in the Kenyan MLOs. * And ** means the Pearson's correlation value is significant at 5% level of significance. N' represents the number of respondents used in each case.*

The Assessability Hypothesis

Table 4 shows simple regression analysis for the assessability hypothesis based on the second equation. The first and second Columns show the model and the un-standardized coefficients with the constant (β_0)

(13.421), the assessability hypothesis ($\beta_{1)}$ (0.341), and their standard errors. The third column shows the coefficient of the model without a constant or the beta coefficient of 0.429. The forth column shows the t-test statistic at 95% level of confidence. The fifth, sixth and last columns show the significance of the model and its explanatory power, as well as the variation (R^2) on the HC ACC practice in the Kenyan MLOs. According to the findings in Table 4, there is a significant positive correlation between ACC for HC tools' assessability for efficacy and ACC for HC practice in the Kenyan MLOs with r=0.429.

Table 4: Regression Model with ACC for HC Practice and ACC for HC Tools' Assessability

Model	**Un-standardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**R^2**	**F-value (p-value)**
	B	Std. Error	Beta				
(Constant)	13.421	2.004		6.697	0.000	0.168	11.941
assessability	0.341	0.099	0.429	3.456	0.001		(0.001)

This table shows simple regression analysis for the assessability hypothesis based on the second equation. The first and second Columns show the model and the un-standardized coefficients with the constant ($\beta_{0)}$ (13.421), assessability hypothesis ($\beta_{1)}$ (0.341) and the standard errors. The third column shows the coefficient of the model without a constant. The forth column shows the t-test statistic at 95% level of confidence. The fifth, sixth and last columns show the significance of the model and its explanatory power, as well as the variation (R^2) on the HC ACC practice in the Kenyan MLOs.

Regression analysis reveals that ACC for HC tools' assessability would explain 16.8% of the variation in the ACC for HC practice in the Kenyan MLOs, with the independent variable found to significantly predict the dependent variable with an F-value of 11.941 and p-value of 0.001. This implies that Kenyan MLOs need to set aside budgets, be willing to share THCC information with stakeholders, be prepared to deal with the tough changes occasioned by HC ACC practice, and be keen on accuracy to successfully implement HC ACC practice. These findings are supported by former research work, such as Narayand (2014), Jackson (2010), Pineda (2010), Flamholtz, Narasimhan and Bullen (2004), and Batra (1996) who supported assessability of ACC for HC tools before implementation as a determinant of ACC for HC practice in organizations. Therefore the hypothesis was supported. The respondents were unsure as to whether the tools were assessed for efficacy before they were unveiled. Correlation analysis was carried out on each of the statements in Figure 3 measuring the assessability hypothesis and their effect on HC ACC practice in the Kenyan MLOs. The results are presented in Table 5. The table shows the statistical significance and the Pearson's correlation between each of the statements measuring the assessability hypothesis and HC ACC Practice in the Kenyan MLOs. As can be seen from the table, each of the statement has a positive correlation and is statistically significant in predicted HC ACC practice in the Kenyan MLOs. * And ** means the Pearson's correlation value is significant at 5% level of significance. 'N' represents the number of respondents used in each case.

CFOs in medium organizations supported assessability as influencing ACC for HC practice in the Kenyan MLOs to a greater extent, when compared to their counterparts in large organizations. Female CFOs were more agreeable with assessability as a predictor of the ACC for HC practice than CFOs of the male gender. CFOs who were members of ICPAK supported assessability as influencing the practice to a greater degree compared to their counterparts in other professional bodies. CFOs in the manufacturing sector promoted assessability as predicting HC ACC practice more than CFOs in other sectors. CFOs who had held their positions for less than one year concurred with assessability as a determinant of ACC for HC practice at a greater scale when compared to those holding the position for a longer period. CFOs with HC ACC experience preferred assessability as a determinant of the ACC for HC practice to a larger extent than those without; and so were CFOs with expertise in other accounting disciplines when compared to their costing colleagues. This implies that a female CFO who is a member of ICPAK, and has worked for less than one year in a medium firm in the manufacturing sector, and has previous HC ACC experience promoted assessability as corroborating the HC ACC practice in the Kenyan MLOs.

Table 5: Correlation Coefficient Between ACC for HC Practice and the Sub-Hypotheses Measuring ACC for HC Tools' Assessability

		ACC for HC Practice	ACSB1	ACSB2	ACSB3	ACSB4	ACSB5
ACC for HC Practice	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	56					
ACSB1	Pearson Correlation	0.351**	1				
	Sig. (2-tailed)	0.008					
	N	56	59				
ACSB2	Pearson Correlation	0.320*	0.697**	1			
	Sig. (2-tailed)	0.016	0.000				
	N	56	59	59			
ACSB3	Pearson Correlation	0.305*	0.790**	0.620**	1		
	Sig. (2-tailed)	0.022	0.000	0.000			
	N	56	59	59	59		
ACSB4	Pearson Correlation	0.401**	0.572**	0.492**	0.586**	1	
	Sig. (2-tailed)	0.002	0.000	0.000	0.000		
	N	55	58	58	58	58	
ACSB5	Pearson Correlation	0.370**	0.253	0.134	0.264*	0.467**	1
	Sig. (2-tailed)	0.005	0.053	0.312	0.043	0.000	
	N	56	59	59	59	58	59

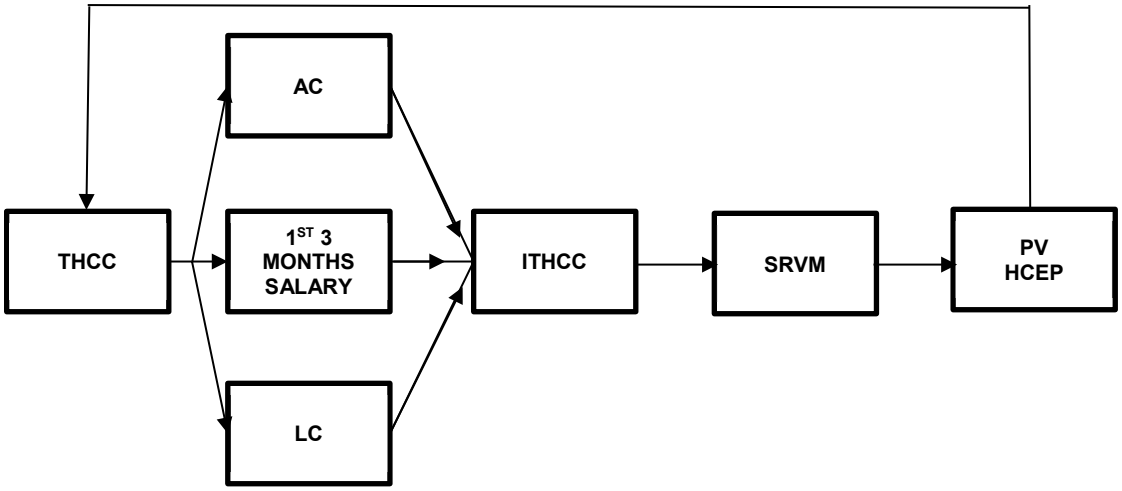
*This table shows the statistical significance and the Pearson's correlation between each of the statements measuring the assessability hypothesis and HC ACC Practice in the Kenyan MLOs. As can be seen from the table, each of the statement has a positive correlation and is statistically significant in predicted HC ACC practice in the Kenyan MLOs. * And ** means the Pearson's correlation value is significant at 5% level of significance. 'N' represents the number of respondents used in each case.*

Unique ACC For HC Tool in Kenya

The support of the two hypotheses based on empirical evidence from the Kenyan MLOs has led to the development of an integrated ACC for HC tool for use in HC ACC practice in Kenya as shown in Figure 4. The figure shows an integrated tool which would be applied in the Kenyan MLOs in HC ACC Practice. The MLOs would start by including AC, plus LC, plus the first three months salary before HC can be fully engaged, to calculate Initial Total Human Capital Cost (ITHCC) in their financial statements. Thereafter, the ITHCC would be modified using the SRVM (Flamholtz, 1999) which estimates HC value based on their mobility to various positions within the firm during their contract life, to arrive at HCEP. The PV of HCEP would equal to THCC in the financial statements of Kenyan MLOs. This would enable the firms to match the THCC, with AHCR and HCEP and execute better HC decisions which improve firm market value.

In the proposed formula, AC plus, LC plus, Three months' salary before HC is fully placed in functional teams: will total ITHCC to be recorded in organizations. After the three months period when HC is fully and productively engaged; the ITHCC figure would be revalued to its PV based on performance in terms of future economic benefits anticipated from HC by the firm or the HCEP. This would be done using the SRVM (Flamholtz, 1999) as a surrogate measure due to its stochastic positioning of HC in various positions within the organization during their contractual life. Thereafter, salaries would be treated as expenses to be matched with AHCR in conformity with the matching postulate. AC and LC are adopted from Barcons-Vilardell et al (1999). THCC would be amortized normally, in the normal working period of HC to retirement. Upon liquidation before retirement, a loss would be recorded in tandem with normal accounting practice. If THCC is revalued as an increase, the amortization period would be adjusted to the new economic productive life of HC. The revaluation will aid managers undertake a cost-benefit analysis on their HC, especially linking it to performance. For example, a firm may find that it is either over compensating or under compensating its HC. Accordingly, mangers in organizations will manage their HC better, by paying benefits which are commensurate with performance, and anticipated HCEP and AHCR.

Figure 4: Integrated ACC For HC Tool (IAHCM)



This figure shows an integrated Tool which would be applied in the Kenyan MLOs in HC ACC Practice. The MLOs would start by including AC, plus LC, plus the first three months' salary before HC can be fully engaged to calculate Initial Total Human Capital Cost (ITHCC) in their financial statements. Thereafter, the ITHCC would be modified using the Stochastic Rewards Valuation Model (SRVM) (Flamholtz, 1999) which estimates HC value based on their mobility to various positions within the firm during their contract life to arrive at HCEP. The Present Value (PV) of HCEP would equal to THCC in the financial statements of Kenyan MLOs. This would enable the firms to match the THCC, with AHCR and HCEP and execute better HC decisions which improve firm market value. Source: Researcher 2017

CONCLUDING COMMENTS

The main goal of this study was to investigate HC ACC tool usage as a predictor of HC ACC practice in the Kenyan MLOs for improved decisions which enhance firm value. The study took the explanatory research design, and sought to explain the applicability and assessability of ACC for HC tools as predictors of HC ACC practice in the in Kenyan MLOs. A research design is an outline that forms the basis for conducting a well-directed study, amidst relational variables. Explanatory researchers ask one fundamental question: 'why is it going on', and the study sought to establish why HC ACC is not practiced in Kenya. A survey was contacted on a sample of 116 CFOs, and simple regression and Pearson's correlation analysis used to test the hypotheses.

The two hypotheses of applicability and assessability of ACC for HC tools were supported. This implies that HC ACC practice for improved decisions which enhance firm value can be successfully undertaken by the Kenyan MLOs. Based on the empirical evidence obtained, a unique ACC for HC tool for use by the Kenyan MLOs has been developed to enable the firms calculate THCC in their financial statements and execute the consequent decisions which augment firm market value. CFOs in Kenyan Medium firms were more supportive of the HC ACC practice than their large organizations counterparts. Female CFOs were more supportive of assessability, while their male counterparts supported applicability. This was an interesting finding as it may exemplify gender characteristics. For example based on this finding, CFOs of the female gender were more interested in the long-term success of the HC ACC practice, while their male colleagues were more interested on its immediate use.

A major limitation of the study is that it focused on ACC for HC, which is the total stock of skills of an entire workforce in an organization. However it is difficult to disengage HC from people and Human Resource (HR) which possess dynamic relational and social dynamics which may not be quantifiable in monetary terms. HC ACC experienced a major drawback in the 1970s due to a widespread erroneous belief suggesting that the discipline would treat people as financial objects (Grojer & Johnson, 1998). Furthermore, Kenya has tens of thousands of CFOs but the study targeted only 165 as its population, and employed cross-sectional rather than longitudinal data collection scheme. Therefore any changes on the

respondents' characteristics after the data collection were ignored. In addition, correlation analysis lacks in that, it does not consider all the essential variables inherent in measuring relationship models and hence the need to manage the omitted variables' bias (Greene, 2012).

Future research is recommended in Kenya and the region targeting a larger population of CFOs and HR managers, and enquiring on ACC for HC, HR, and people as agents of innovation and performance.

REFERENCES

Akintoye, I.R. (2012). The Relevance of Human Resource Accounting to Effective Financial Reporting. *Internationl Journal of Business Management & Economic Research*, 3(4), 566-572.

Andrade, P., & Sotomayor, A.M. (2013). Measurement Models of Human Capital Accounting: A Case Study. *Journal of Economics, Accounting and Finance*, 2(4), 86-92.

Andriessen, D. (2004). *Making Sense of Intellectual Capital.* Elsevier Butterworth-Heinemann, Burlington, MA.

Baker, G.M.N. (1974). The Feasibility and Utility of Human Resource Accounting, *California Management Review*, 16(4), 17-23.

Barcons-Vilardell, C., Moya-Gutierrez, S., Somoza-Lopez, A., Vallverdu-Calafell, J., & Griful-Miquela, C. (1999). Human Resource Accounting. *IAER*, 5(3), 386-394.

Batra, G.S. (1996). Human Resource Auditing as a tool of Human Resource Valuation: Interface and Emerging Practices. *Managerial Auditing Journal*, 11(8), 23-30.

Becker, B.E., Huselid, M.A., & Ulrich, D. (2001). *The HR Score-Card: Linking People, Strategy and Performance*. Harvard Business School, Boston.

Bontis, N., Keow, W.C., & Richardson, S. (2000). Intellectual capital and Business performance in Malaysian Industries. *Journal of Intellectual capital*, 1(1), 85-100.

Brealy, R.A., Myers, S.C., & Allen, F. (2011). *Principles of Corporate Finance* (10th ed.). McGraw-Hill.

Brummet, R.L.(1970). Accounting for Human Resources. *Journal of Accountancy*, 62-66.

Bullen, M.L., & Eyler, K. (2010). Human Resource Accounting and International Developments: Implications for Measurement of Human Capital. *Journal of International Business and Cultural Studies,* 1-16.

Butt, S.A. (2013). How to Bring Human Resource Asset into Balance Sheet. *Pensee Multidisciplinary Journal,* 75 (2), 1-12.

Cascio, W.F. (1998). The Future World of Work: Implications for Human Resources Costing and Accounting. *Journal of Human Resource Costing ad Accounting*, 3(2), 9-19.

Casio, W.F., & Boudreau, J. (2011). *Investing in People (2nd ed.): Financial Impact of Human Resource Initiatives.* Pearson Education Inc, New Jersey.

Chang, P.S. (2014). *Board of Trustees*: http://english.tku.edu.tw/aboutTKU_trustee.asp, accessed, May 2, 2014.

Chouhan, V., & Naghshbandi, N. (2015). Measuring Employees Value: A Critical Study on Human Resources Accounting in India. *International journal of Management, accounting and Economics,* 2(4), 277-292.

Creswell, J.W. (2009). Mapping the Field of Mixed Methods Research. *Journal of Mixed Methods Research*, 3, 95-108.

Dumay, J., & Guthrie, J. (2017). Involuntary Disclosure of Intellectual Capital: Is it Relevant? *Journal of Intellectual Capital,* 18(1), 29-44.

Enofe, A.O. , Mgbame, C., Otuya, S., & Ovie, C. (2013). Human Resource Accounting Disclosures in Nigeria Quoted Firms. *Research Journal of Finance and Accounting,* 4(13), 7-12.

Fischetti, M. (2011). *Computers versus Brains*: Scientific American. http://www.scientificamerican.com/article/computers-vs-brains/, accessed 7 May 2014.

Flamholtz, E.G. (1999). *Human Resource Accounting: Advances, Concepts, Methods and Applications*, Boston MA: Kluwer academic publishers.

Flamholtz, E.G., Bullen, M.L., & Hua, W. (2002). Human Resource Accounting: A Historical Perspective and Future Implications. *Management Decision*, 40 (10), 947-954.

Flamholtz, E.G., Narasimhan, R.K., & Bullen, M.L. (2004). Human Resource Accounting Today: Contributions, Controversies and Conclusions. *Journal of Human Resource Costing and Accounting*, 8(2), 23-37.

Gamerschlag, R. (2013). Value Relevance of Human Capital Information. *Journal of Intellectual Capital*, 4(2), 325-345.

Garcia-Ayuso, .M, Moreno-Campos, I., & Sierra-Molina, G. (2000). Fundamental Analysis and Human Capital: Empirical Evidence on the Relationship Between the Quality of Human Resources and Fundamental Accounting Variables. *Journal of Human Resource Costing and Accounting*, 5(1), 45-57.

Gates, S.(2002). *Value at Work: The and Opportunities of Human Capital Measurement and Reporting.* New York, The Conference Board.
Greene, H. (2012). *Econometric Analysis* (7th ed.). Upper Saddle River, N.J. Prentice Hall.

Grojer, J.E. (1997). Employee Artifacts on Balance Sheet: A Model Illustration and Implications. *Journal of Human Resource Costing & Accounting*, 2(1), 27-53.

Grojer, J.E., & Johanson, U. (1998). Current Development in Human Resource Costing and Accounting: Reality, Present Researchers Absent? *Accounting, Auditing, & Accountability Journal,* 11(4), 495-506.

Hansson, B. (1997). Personal Investments and Abnormal Return: Knowledge-based Firms and Human Resource Accounting. *Journal of Human Resource Costing and Accounting*, 2(2), 9-29.

Hedlin, P., & Adolphson, J. (2000). Strategies for Change in Financial Reports. *Journal of Human Resource Costing and Accounting,* 5(1), 27-35.

Hekimian, J.S., & Jones, C.H. (1967). Put People to your Balance Sheet. *Harvard Business Review*, 45(1), 105-113.

Jackson, L.A. (2010). Enterprise Resource Planning Systems: Revolutionizing Lodging Human Resources Management. *Worldwide Hospitality and Tourism Themes*, 2(1), 20-29.

Jensen, H. (2001). Policy and Company Perspectives for IC Reporting. *Journal of Human Resource Costing and Accounting*, 6(1), 11-28.

Johanson, U. & Mabon, H. (1998). The Personnel Economics Institute After Ten Years: What has Been Achieved and Where We Are Going. *Journal of Human Resource Costing and Accounting*, 3(2), 65-76.

Jones, G. R. (2013). *Organizational theory, design and chang*e(7th ed.). Pearson Education, Inc., publishing as Prentice Hall.

Kaur, S., Raman, A.V., & Singhania. (2014). Human Resource Accounting Disclosure Practices in Indian companies. *Vision,* 18(3), 217-235.

Kirfi, M.M. & Abdullahi, A. (2012). Human Capital Accounting: Assessing Possibilities for Domestication of Practice in Nigeria. *Research Journal of Finance and Accounting*, 7-11.

Kouhy, R.,Vedd, R., Yoshikawa, T., & Innes, J. (2009). Human Resource Policies, Management Accounting and Organizational Performance: Journal of Human Resource Costing & Accounting, 13(3), 245-263.

Lev, B. & Schwartz, A. (1971). On the Use of the Economic Concepts of Human Capital in Financial Statements. *Accounting Review*, 103-112.

Likert, R. (1967). *The Human Organization-Its Management and Value*.(p.153). McGraw-Hill, New York.

Massingham, P., Nguyen, T.N., & Massingham, R. (2011). Using 360 Degree Peer Review to Validate Self-Reporting in Human Capital Measurement. *Journal of Intellectual Capital,* 12(1), 43-74.

Mello, J.A. (2011). *Strategic Human Resource Management* (3rd ed.). South-West Cengage Learning. Mason, OH.

Mertens, D. (2007). Transformative Paradigm: Mixed Methods and Social Justice. *Journal of Mixed Methods Research*, 1, 212-225.

Morrow, S. (1997). Accounting for Football Players: Financial and Accounting Implications of

Royal Club Liegois and Orhers V Bosman' for Football in the United Kingdom. *Journal of Human Resource Costing and Accounting*, 2(1), 55-71.

Narayand, A.K. (2014). Accounting and Accountability Challenges. *Pacific Accounting Review*, 26(1/2), 94-111.

O'Reagan, P., O'Donnell, D., Kennedy, T., Bontis, N., & Cleary, P. (2001). Perceptions of Intellectual Capital : Irish Evidence. *Journal of Human Resource Costing and Accounting,* 6(2), 29-38.

Pfau, B., & Kay, I. (2002). *In Human Capital Edge: 21 People Management Practices Four Company Must Implement (or Avoid) to Maximize Shareholder Value*. McGraw-Hill, NY.

Pickett, L. (2005). Optimising Human Capital: Measuring what really Matters. *Industrial and Commercial Training*, 37(6), 299-303.

Pineda, P. (2010). Evaluation of Training in Organizations: A Proposal for an Integrated Model. *Journal of European Industrial Training*, 34(7), 673-693.

Steen, A., Welch, D., & McCormack, D. (2011). Conflicting Conceptualization of Human Resource Accounting. *Journal of Human resource Costing & Accounting*, 15(4), 299-312.

Sveiby, K.E. (1997). *The New Organizational Wealth*: *Managing and Measuring Knowledge-Based Assets*. Berrett-Korhler. San Francisco, CA.

Telia, A.B. (1996). The Statement of Human Resources. *Journal of Human Resource Costing and Accounting,* 1(1), 99-116.

Theeke, H.A. (2005). A Human Resource Accounting Transmission: Shifting from Failure to Future. *Journal of Human Resource Costing & accounting*, 9(1), 40-59.

Zhang, Q. (2006). Human Capital, Weak identification, and Asset Pricing. *Journal of Money, Credit, and Banking,* 18(4), 873-899.

ACKNOWLEDGEMENT

I would like to thank the journal editor, Terrance Jalbert for the guidance, and the two anonymous referees for their insightful comments. Any errors found in this document are my own.

BIOGRAPHY

Dr. Sammy Lio is a lecturer of accounting and finance at the Chandaria School of Business, United States International University-Africa. He is a Certified Public Accountant of Kenya (CPA-K), a Fellow Chartered Certified Accountants (FCCA), and a Fellow Institute of Financial Consultants (FIFC). He can be contacted at: Chandaria School of Business, Thika Super highway, USIU road, Nairobi, Kenya, P.O BOX 14634-00800. Phone: +254-729179157. Email: slio@usiu.ac.ke.

Accounting & Taxation
Vol. 10, No. 1, 2018, pp. 77-86
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

IBFR
www.theIBFR.com

THE ROLE OF COMPANY SPECIFIC INFORMATION IN VALUATION MODELS USED IN THE UAE

Hafiz Imtiaz Ahmad, New York Institute of Technology
Khaled Aljifri, United Arab Emirates University

ABSTRACT

The role of company specific information in valuation is important. In this paper, we explore company specific information as considered by the UAE's financial analysts. A questionnaire and interviews were used to answer the research questions of this study. Thirty-five investment analysts, in cooperation with the CFA Society, Emirates, participated in the questionnaire. The sample covered most of the analysts who have professional qualifications such as CFA and CAIA (coupled with an academic degree such as the MBA) and an average of more than eight years of experience in the relevant sectors. Descriptive and comparative analysis was employed in this study. The results reveal that, , in analyzing a listed stock,the financial analysts and fund managers in the UAE give more weight to the assessment of management and performance sustainability and less to historical performance and reviews of research and development.

JEL: M41, M49

KEYWORDS: Financial Analysts; Valuation Models; Company Specific Information; UAE

INTRODUCTION

Analyzing a company strategy and its financial statements as a whole is an important element of financial analyst's job. It helps analysts to question the economics of the firm at a qualitative level in order to ground the accounting and financial analysis in business reality. This also enables analysts to assess the sustainability of the firm's current performance and to forecast future performance. The firm's value is its ability to earn a return higher than its cost of capital. What are the factors that enable a firm to accomplish this objective? How do financial analysts perceive these factors? Normally, capital markets are responsible for the cost of a firm's capital, while the firm's profit potential is determined by its own strategic choices made to enhance competitive advantages, management, earnings, balance sheet, return on capital, future earnings growth, etc. (Palepu et al, 2004; Penman, 2007). The purpose of this article is to highlight the company specific information that the analysts in UAE consider when analyzing a listed stock. The company specific factors that are important to financial analysts have been studied in the literature (Barker, 1999a; Block, 1990). The survey employed in this paper was structured on the basis of certain previous studies (Arnold and Moizer, 1984; Pike et al. 1993; Barker, 1999a, 1999b; Block, 1999).

The study replicates, with modifications, the study of Barker, (1999a) and provides additional insights. Its research methods focus on surveys (a questionnaire and semi-structured interviews). To generate a broader understanding of financial statement analysis than that given by company specific information alone, the questionnaire includes a section related to accounting ratios (Breton and Taffler; 1995). Foster (1986) states that investment analysts depend heavily on accounting ratios in their valuations. The current study, unlike all previous ones, draws its results from an emerging economy in the Middle East which has been ranked as one of the most developed in the world and is in the top three countries for attracting infrastructure investment. Another distinctive point of this study is the time frame involved. Similar studies in the literature have taken 5- 6 years to complete, whereas for this research the survey was launched in 2014 and

interviews were completed in 2015. Omran (2003) studies equity valuation in the context of the UAE, focusing on the determinants of three valuation multiples (namely, price earnings; price book value; the price sales). However, to the best of the authors' knowledge, no study in this region has addressed analysts' choices of company specific information for the valuation models. This indicates the originality of our work. The major findings of this study are remarkably consistent with those of Barker, (1999a). This study contributes to the literature as follows: (1) it provides evidence of the company specific information used by analysts in an emerging economy (that of the UAE, which has become one of the most attractive countries in the world for investment). The results suggest that the financial analysts in the UAE, in analyzing a listed stock, give more weight to the assessment of management and of performance sustainability and less to historical performance and reviews of research and development. The study addresses the following three questions: (1) "What types of company-specific information do analysts in the UAE use?", (2) "What accounting variables do these analysts employ?", and (3) "Why do analysts use this information?" The study of this particular developing country presents an interesting case study for understanding its analysts' choice of company specific information used in valuation models. Although this study has specific relevance to the UAE business environment, it is believed that many other developing countries, especially those countries in the Middle East that face similar problems and needs, could benefit from the findings below. The remainder of the paper is structured as follows. Section 2 provides a literature review, followed by a description of the research methodology in section 3. Section 4 reports and discusses the results. Section 5 presents a summary and conclusions.

LITERATURE REVIEW

The reliability of the analysts' forecasts is a function of the accuracy of the information on which the model is built. There is a great deal of literature that discusses financial analysts' work. In a recent paper, Imam, and Spence (2016) find that the primary value of sell-side analysts' work lies in the rich contextual information that they provide to buy-side analysts. In order to successfully provide this information, analysts have to instill a large amount of technical capital in their habitus. Similarly, Christopher (2015) concludes that, "there is just support for a positive relation between firm-level corporate governance and forecast accuracy in civil law countries, and only support for a negative relation between firm-level corporate governance and forecast dispersion in common law countries." However, all firms with strong corporate governance in both types of country have a greater following among analysts. Ahmad & Helfenstein (2015) study the impact of internal audit and enterprise risk management (ERM) on valuation and conclude that valuing companies without considering the influence of the internal audit and ERM functions, analysts may be ignoring an important source of risk that materially affects value. Green et al (2014) find that changes in analysts' recommendation have a greater price impact when the broker has a conference-hosting relationship with the firm. Conference-hosting brokers also issue more accurate earnings forecasts than non-hosts. They suggest that access to management remains an important source of analysts' informational advantage following the passage of Regulations on Fair Disclosure.

Company-specific information does play a critical role in letting an analyst to reach his/her conclusions about value. The most important information for both analysts and fund managers is the information which is sourced directly from the companies (Arnold and Moizer, 1984; Vergoossen, 1993; Barker, 1998; Holland, 1998; Barker, 1999); it is helpful to understand the characteristics of company sourced information that is useful. The kinds of company specific information that we cover in the present study are derived from Barker (1999a) and cover the categories of both accounting and non-accounting information; the aim being to understand the role of accounting information in the context of the broader information set that is available to analysts and fund managers (Yap, 1997). We find only one study discussing the equity valuation in the context of the UAE, that of Omran (2003), who tested the determinants of three valuation multiples for 46 UAE companies listed in local share directories. The three valuation multiples are price sales (PS), price book value (PBV) and price-earnings (PE). He used a regression analysis of panel data for the years 1996–2001 and found that PS, PBV, and PE are significantly linked to the net profit margin, return on

equity, and the payout ratio. As far as we are aware, ours is the first study that documents company specific information considered by analysts in the UAE. The above literature indicates that understanding analysts' choices of the company specific information that financial analysts use to reach their conclusion of value in a country such as the UAE is crucial for practitioners and academics. As mentioned in the introduction, this study will complement previous studies by examining the analysts' choice of company specific information in the valuation models in a country whose economic development has been rapid and which is considered one of the world's major business centers.

DATA AND METHODOLOGY

This section reports the empirical methods used to address the research questions of this study, describes the questionnaire design, presents a detailed description of the sample, and discusses the sample selection. Analysts in the UAE were asked to complete a questionnaire which was electronically and randomly distributed to them with the help of the CFA Society, Emirates. The questionnaire was distributed and collected between October 2014 and March 2015. The response rate of this questionnaire (around 42%) appears reasonable compared with those of similar studies (see for example Block, 1999). In addition, Nulty (2008) states that, "In general, online surveys are much less likely to achieve response rates as high as surveys administered on paper—despite the use of various practices to lift them." A total of 35 analysts of different nationalities participated in the questionnaire: Emirati, Egyptian, Moroccan, Lebanese, Libyan, American, British, French, Indian, and Pakistani. Of the total, eight (23%) were sell-side analysts, and 27 (77%) were buy-side analysts. Twenty-three percent of the analysts had less than five years of work experience, thirty-four percent had 5-10 years of work experience, and the remainder (43%) had more than ten years of work experience; the average was more than eight years. The sample covered most of the analysts who have professional qualifications, such as CFA and CAIA (coupled with an academic degree such as the MBA). Table 1 summarizes the details of the sample who completed the questionnaire and reveals that 86% of the analysts came from the Financial Sector followed by the Real Estate sector (8%), the Media sector (1%), and other sectors (1%). Table 2 yields descriptions of the sample used in the semi-structured interviews and shows that most of the analysts (97%) were buy-side and 3% were sell-side analysts. These are the two types of financial analyst: buy-side analysts work in fund management firms. They use information provided by sell-side analysts and other sources for portfolio investment decisions. They also write reports for their employers which are confidential. According to recent studies, buy-side analysts have more influence on the trading decisions of fund managers than sell-side analysts do (Crawford et al, 2011; Frey and Herbst, 2010; Cheng et al, 2006). Buy-side analysts are also known as 'in-house' analysts and fund managers as 'portfolio managers' who are responsible for pensions, insurance, and unit funds among other things. Sell-side analysts work in the equity research departments of investment banks. They generate and publish earnings forecasts, recommendations (to buy, hold or sell) and price targets. They write research reports that are used by fund managers and buy-side analysts.

As presented in Table 1, our sample of survey participants consisted of 27 buy-side analysts and 8 sell-side analysts (total 35); those who participated in the semi-structured interviews comprised 13 buy-side analysts and 1 sell-side analyst (total14) (see Table 2). The questions in the present study, which could be answered on a 5-point Likert scale, fell into six sections: demographic questions; questions on valuation models, accounting variables, accounting ratios , company specifc information; and an open question, asking which valuation models were used by analysts in the UAE and how well they functioned. This study covers only the sections related to company specific information and accounting variables used by the analysts to support their valuation. The other sections have recently been covered in a recent study by Aljifri and Ahmad (2017). In addition, semi-structured interviews were employed to get more insight into the participants' answers and improve the level of consistency and reliability in the results (Harris et al., 2010).

Table 1: Descriptions of the Sample Used in the Questionnaire

Participants	**Sectors**				**Total Participants in the Questionnaire**
	Financial	**Real Estate**	**Media**	**Others**	
Buy-Side Analysts	23 (85%)	3 (11%)	1 (4%)	-	27 (77%)
Sell-Side Analysts	7 (87.5%)	-	-	1 (12.5%)	8 (23%)
Total	30 (86%)	3 (8%)	1 (3%)	1 (3%)	35 (100%)

This table presents the sample size with more details on the sectors and the participants. It reveals that the sample was predominantly buy-side analysts and the financial sector.

Table 2: Descriptions of the Sample Used in the Interviews

Participants	**Sectors**				**Total Participants in the Interviews**
	Financial	**Real Estate**	**Media**	**Others**	
Buy-Side Analysts	13 (93%)	-	-	-	13 (93%)
Sell-Side Analysts	1 (7%)	-	-	-	1 (7%)
Total	14 (100%)	-	-	-	14 (100%)

This table shows the sample size of participants used for the interviews. It reveals that the sample was also predominantly buy-side analysts and the financial sector.

RESULTS

What Types of Company-Specific Information Do the Analysts in the UAE Use?

To better understand the above research question, it is important to know that the accuracy of each valuation model depends on the reliability of the information on which the model is built. Each valuation case is unique. Certain types of information become more or less important depending upon the growth phase of the company, the industry it belongs to and the overall economic outlook. To be more precise, the most important information for the analysts is that which is directly sourced from the companies (Anrold and Moizer, 1984; Vergossen, 1993; Barker,1998; Holland,1998; Barker, 1999). Table 3 presents a list of the 9 different types of information that is useful to the analysts. This list is derived from the literature (Barker, 1999). Broadly speaking, this list can be divided into two main categories of information i.e., accounting information and non-accounting information. The objective here is to understand the role of accounting information in the context of non-accounting information that is available to the analysts (Yap,1997). The accounting information in Table 3 is: 'classification of financial statements', 'segmental information (business unit and geographic), 'your own assessment of the quality of financial statements', and 'analysis of historical performance'. The accounting information presented in the list above plays a critical role in the valuation, even though it is historical in nature. But areas of information such as 'performance sustainability', 'industry competition' and 'corporate strategy' can make sense only in the presence of accounting information. It is also more important than the review of investment projects and research and development. Actually, the value relevance of information relies on the certainty of its forecasts. For example, the analysts' assessment of factors such as industry competition and corporate strategy is value relevant but the certainty of this forecast diminishes with the extension in the forecast horizon. Accounting information is reliable, but its value relevance depends upon how it can be envisioned in the future. At the same time, the investment projects and research and development are value relevant but their projected

payoff is not certain, making them a less useful information source in Table 3. In a nutshell, we can say that the analysts' analytical process is rooted in accounting information and it takes into account financial statements and other sources of information depending upon their reliability in the foreseeable future.

According to residual income valuation (RIV) model of Ohlson (1995), non-accounting information in the present affects future abnormal earnings or residual income auto-regressively. The firm's market value equals its book value adjusted for current profitability (as measured by abnormal earnings) and future profitability (i.e., goodwill as measured by other information). In this context, the most important category of information in Table 3, as ranked by UAE analysts, is their own assessment of management. Why do analysts rank this category higher than the other categories? The reason is that this assessment is a proxy for the capacity of a business to outperform in periods beyond the foreseeable future. Good managers will influence future performance and the quality of management can be assessed now, but future performance itself is unobservable. The kinds of information presented in Table 3 clearly imply that the analysts in the UAE consider their own assessment of the management to be the most important, with a mean of 4.03 and standard deviation of 1.22. This ranking of the assessment of management as the most important information is consistent with Barker (1999), who found that the UK financial analysts consider this the most important, too. In the UAE the financial analysts ranked the assessment of performance sustainability as the second most important information (mean =4.03 and standard deviation= 1.22). Barker (1999) notes that the UK financial analysts ranked it at no.3. The table below reveals that the respondents to our survey, keeping in view the unique economic, legal environment and industrial set-up of the UAE, agreed that the review of corporate strategy (mean=3.80 and standard deviation= 1.18), their own assessment of quality of financial statements (mean = 3.66 and standard deviation= 1.41), clarification/classification of financial statements (mean=3.54 and standard deviation=1.48), review of investments projects (mean=3.54 and standard deviation=1.12), segmental information (mean=3.51 and standard deviation=1.31), analysis of historical performance (mean=3.49 and standard deviation=1.22) and review of research and development (mean=3.11 and standard deviation of 1.18) were less important items of company specific information. Our results are consistent with Barker (1999) in the UK context, especially for the first two categories and the last category. The rest of the categories are also quite close to those of Barker (1999) but not exactly the same.

Table 3: Characteristics of Company Specific Information Useful to the Analysts in UAE

	N	Mean	Median	Std. Deviation
Assessment of Management	35	4.03	4	1.22
Assessment of Performance Sustainability	35	4.03	4	1.22
Review of Corporate Strategy	35	3.80	4	1.18
Assessment of Quality Financial Statements	35	3.66	4	1.41
Clarification/Classification of Financial Statements	35	3.54	4	1.48
Review of Investment Projects	35	3.54	4	1.12
Segment Information	35	3.51	4	1.31
Analysis of Historical Performance	35	3.49	4	1.22
Review of Research and Development	35	3.11	3	1.18

This table provides a summary of the characteristics of company specific information found to be useful the analysts in UAE. A high proportion of participants considered Assessment of Management and Assessment of Performance Sustainability to be the most important.

The findings for the analysts in the UAE may be directly compared to those of fund managers, which are reported in Table 4. Here, the buy-side analysts ranked the performance sustainability (with the mean=4 and standard deviation= 1.3) as the highest that is followed by the assessment of the management (mean=3.9

and standard deviation =1.3). The review of the corporate strategy (mean =3.7 and standard deviation=1.3) is ranked at number three. Analysts in the UAE consider 'your own assessment of the management' (mean=3.6 and standard deviation =1.5), analysis of historical performance (mean= 3.6 and standard deviation=1.3), review of investment projects (mean= 3.6 and standard deviation=1.2), clarification/classification of financial statements (mean=3.5 and standard deviation=1.6), segmental information (mean =3.6 and standard deviation= 1.5) and review of research and development (mean= 3.1 and standard deviation=1.2) as progressively less important. Our findings for the buy-side analysts' preference of company specific information are also quite consistent with that of Barker (1999a), particularly, the review of research and development, clarification/classification of financial statements, and review of corporate strategy. The rest of the categories are also very close to what Barker (1999a) has found in the UK, but not exactly the same.

The information categories such as performance sustainability, corporate strategy, and industry competition are value relevant but also carry some kinds of uncertainty attached to their payoffs. This information is incremental to financial information. In Table 4, the second broad category of information is based on financial statements such as 'your own assessment of the quality of financial statements', analysis of historical performance, clarification/classification of financial statements. Table 4 suggests that despite its reliability this information is lower ranked by the analysts. As discussed previously, this evidence may be interpreted in the framework of the residual income valuation (RIV) model (Peasnell, 1982; Ohlson, 1995).

Table 4: Characteristics of Company Specific Information Useful to Buy-Side Analysts in UAE

	N	Mean	Median	Std. Deviation
Assessment of Performance Sustainability	27	4	4	1.3
Assessment of Management	27	3.9	4	1.3
Review of Corporate Strategy	27	3.7	4	1.3
Assessment of Quality Financial Statements	27	3.6	4	1.5
Analysis of Historical Performance	27	3.6	4	1.3
Review of Investment Projects	27	3.6	4	1.2
Clarification/Classification of Financial Statements	27	3.5	4	1.6
Segment Information	27	3.4	4	1.5
Review of Research and Development	27	3.1	3	1.2

This table provides a summary of the characteristics of company specific information found to be useful the buy-side analysts in UAE. A high proportion of participants considered Assessment of Performance Sustainability and Assessment of Management to be the most important.

Why do Analysts Use This Information?

We explored this question in the research interviews that we conducted after the survey and dicovered that the analysts in the UAE are of the view that to value a business one should have a business sense (an overall understanding of the business) and an ability to go beyond numbers apart from a basic understanding of financial statements. Below are some revealing extracts from the analysts' interviews:

> *I think to be a good analyst, one not only needs to know company fundamentals, valuation tools but also possess a business sense - how to run and own a business e.g., a restaurant like Mc Donalds, or a property company. Knowing this makes one a good analyst. (Financial Analysts)*

> *For an analyst, no matter which industry he is covering, he should have the ability to make economic sense of how the numbers are generated in terms of revenue, costs, and growth. He should have the ability to value a business at any given time. (Financial Analysts)*

The analysts should take into account the whole idea (context); how the numbers arrive; events that took place during the year. And if I am comparing this company with another company in another industry you need to know what the industry dynamics are. (Financial Analysts)

On the industry level, the analyst must be aware of the importance of macro-economic environment, demand and supply, barriers to entry, etc.(Financial Analysts)

I think you cannot value a company without actually sitting with the management. It is about how management wants to grow the business, what they are doing, what they did in the last three years, and what actually they can achieve. So sitting with management gives you a really different point of view. (Financial Analysts)

Sector analysis needs to be really strong. Compared to developed markets, in an emerging market sector research is not well covered. In the MENA region, there are many sectors which are not properly covered, e.g., the aviation industry. Today it is very difficult for us to find proper research on aviation. (Financial Analysts)

To conclude this section, we can say that the usefulness of a given piece of company information is dependent upon its value relevance. If a piece of information does not reduce the uncertainty attached to the riskiness of future cash flows, then analysts and fund managers in the UAE do not consider it useful. We can also say that the characteristics of company specific information considered by UAE financial analysts are most of the time quite similar to what analysts in a developed market such as the UK would consider. Any deviation in ranking that is found is quite small.

What Accounting Variables Do These Analysts Employ?

Table 5 presents the ranking of the analysts regarding the importance of accounting variables. The table shows that analysts perceive free cash flow (4.31), operating cash flow (3.91), and operating earnings (3.63) to be the most important variables to consider in their valuation. It also shows that the book value of equity (3.06), revenues (3.43), and net income (3.46) are the least important variables. This indicates that analysts in the UAE give more priority to cash-based valuation models than accrual-based valuation models. Another insight from this result is that the financial system in the UAE provides a wide range of information from which analysts can select more complicated valuation models.

Table 5: Accounting Variables Used by the Analysts

	N	Minimum	Maximum	Mean	Std. Deviation
Free Cash Flow	35	0.00	5.00	4.31	1.39
Operating Cash Flow	35	0.00	5.00	3.91	1.44
Operating Earnings	35	0.00	5.00	3.63	1.37
Net Income	35	0.00	5.00	3.46	1.27
Revenues	35	0.00	5.00	3.43	1.24
Book Value of Equity	35	0.00	5.00	3.06	1.47
Others	35	0.00	1.00	0.03	0.17

This table shows that the free cash flow and operating cash flow are the most important variables that analysts in UAE consider in their valuation. On the other hand, the participants ranked revenues and book value of equity as the least important variables.

These findings were explored in the semi-structured interviews with the analysts. Below are their arguments for the choice of these accounting variables:

Cash flow based estimates give a better picture of the company so cash flow and cash flow yields are better indicators than accrual-based estimates because of earnings management, receivables,

working capital requirements, etc. So cash flow would not be distorted by these things. (Financial Analysts)

Actually, to me, cash flow is more important. It is important to value a business, not only by using the immediate cash flow but also by using the projected cash flow. For earnings manipulations, the job of the analyst is to adjust for that.

(Financial Analysts): When we value the company using DCF model, we use cash instead of net profit which is very prone to accounting manipulations (IFRS & US GAAP). FCF is more relevant as business is worth of the money it is bringing in.

(Financial Analysts): In this region, I have found that liabilities are not always correctly stated or they may not be categorized correctly. Assets such as land and other things are overvalued and this can influence the valuation. So we have problems with EBITA because of accounting treatments. (Financial Analysts)

To conclude this section, we can say that the analysts in the UAE prefer cash flow based accounting variables for valuation purposes and rely less on book value of equity and revenues. In other words, we can say that the analysts in the UAE consider the ability to use resources (generation of cash flow/ assessment of management) more important than actual resources.

CONCLUDING COMMENTS

This paper provides insights into the two most important aspects of a listed company valuation: the characteristics of company specific information considered by the analysts and their preference in terms of accounting variables. In this study, we approached the research objectives by using the survey research methods of questionnaire and interviews. The surveys cover the sectors of Finance, Real Estate, the Media and others. Overall, this paper suggests that both analysts and fund managers in the UAE use accounting information with reference to its reliability and value-relevance, and they heavily discount information that is value relevant but whose pay-offs are uncertain (e.g., research and development). Management quality and performance sustainability are ranked highly by both analysts and fund managers in the UAE. This is because management has the ability to influence future performance, and this ability can be noted and also evaluated. But how the actual assessment of the management is made is still a question mark to us and thus a clear area of future research. A limitation of this study is that it did not include the content analysis of the equity research reports because of the difficulty of collecting these reports and because of the preponderance of buy-side analysts in our survey and interviews. Another limitation is that the sample concentrates on a few industries, most of them in the financial sector. The study did not include enough sell-side analysts, especially in the semi-structured interviews. Further research should include, in addition to the survey, the content analysis of equity research reports. In other words, it should include questionnaires, interviews, and content analysis. This study could be extended by increasing the sample size, considering other countries and including more analysts from other sectors.

REFERENCES

Ahmad, H.I. and Helfenstein, S.V. (2015) "Internal Audit, ERM and Valuation," *The Value Examiner*, 1094-3137.

Aljifri, K., and Ahmad, H.I. (2017) "Choosing Valuation Models in UAE," Information and Communication Technologies in Organizations and Society Past, Present and Future Issues-Lecture notes in Information System and Organization, 978-3-319-28907-6 (Forthcoming)

Arnold, J. A., and Moizer, P. (1984) "A Survey of the Methods used by UK Investment Analysts to Appraise Investments in Ordinary Shares," *Accounting and Business Research*, 14, 195–207.

Barker, R. G. (1999a), "The Role of Dividends in Valuation Models used by Analysts and Fund Managers," *European Accounting Review*, 8(2), 195–21.

Barker, R. G. (1998) "The Market for Information – Evidence from . Finance Directors, Analysts and Fund Managers," Accounting and Business Research, 29 (Winter):3–20.

Barker, R. G. (1999b) "Survey and Market-Based Evidence of Industry-Dependence in Analysts' Preferences Between the Dividend Yield and Price–Earnings Ratio Valuation Models," *Journal of Business Finance & Accounting*, 26(3-4), 393–418.

Block, S. B. (1999), "A Study of Financial Analysts: Practice and Theory," *Financial Analysts Journal*, July/August, 86–95.

Breton, G. and Taffler, R. J. (1995) "Creative Accounting and Investment Analyst Response," *Accounting and Business Research*, 25 (Spring), 81–92.

Cheng, Y., Liu, M., and Qian, J. (2006) "Buy-Side Analysts, Sell-Side Analysts, and Investment Decisions of Money Managers." *The Journal of Financial and Quantitative Analysis*, 41(1), 51-83.

Christopher .K. (2015) "The Relationship between Firm Level Corporate Governance and the Performance of Financial Analysts," *International Journal of Business and Social Science,* 6(2).

Foster, G. (1986) "Financial Statements Analysis," Second Edition, Englewood Cliffs, NJ: Prentice-Hall International.

Frey, S. and Herbst, P. (2014) "The Influence of Buy-Side Analysts on Mutual Fund Trading," *Journal of Banking & Finance*.

Green T. C, Russell J., Markov S., and Subasi M. (2014) "Access to Management and the Informativeness of Analyst Research," *Journal of Financial Economics*, 114(2), 239-255.

Groysberg, B., Healy, P. and Chapman, C.J. (2008) "Buy-Side vs. Sell-Side Analysts' Earnings Forecasts," *Financial Analysts Journal*, 64(4).

Harris, L.R., & Brown, G.T.L. (2010) "Mixing Interview and Questionnaire Methods: Practical Problems in Aligning Data," *Practical Assessment, Research & Evaluation*, 15(1), 1-19.

Holland, J. (1998) "Private Disclosure and Financial Reporting," *Accounting and Business Research*, 28(4): 255–69.

Hirst, D.E. & Hopkins, P.E. (2000) "Earnings: Measurement, Disclosure and the Impact on Equity Valuation", Charlottesville, Virginia: Chartered Financial Analysts.

Imam, S., and Spence, C. (2016) "Context, not Predictions: A Field Study of Financial Analysts," *Accounting, Auditing & Accountability Journal*, 29(2), 226-247.

Nulty, D. (2008) "The adequacy of response rates to online and paper surveys: What Can be Done? *Assessment & Evaluation in Higher Education*, 33(3), 301–314.

Ohlson, J. A. (1995) "Earnings, Book Values and Dividends in Security Valuation," *Contemporary Accounting Research*, 11, 661–687.

Omran, M. F. (2003) "Equity Valuation Using Multiples in the Emerging Market of the United Arab Emirates," *Review of Middle East Economics and Finance*, 1(3), 267–283.

Palepu, K., Healy, P. & Bernard, V. (2004) "Business Analysis and Valuation using Financial Statements," Cincinnati: South-Western College Publishing.

Peasnell, K.V. (1982) "Some Formal Connections Between Economic Values and Yields and Accounting Numbers", *Journal of Business Finance and Accounting,* 9, 361—381. 22.

Penman, S. H. (2007) "Financial Statement Analysis and Security Valuation," New York: McGraw-Hill.

Pike, R., Meerjanssen, J. and Chadwick, L. (1993) "The Appraisal of Ordinary Shares by Investment Analysts in the United Kingdom and Germany," *Accounting and Business Research*, 23, 489–499.

Vergoossen, R. G. A. (1993) "The Use and Perceived Importance of Annual Reports by Investment Analysts in the Netherlands", *European Accounting Review*, 2: 219–44.

Yap, C. (1997) "Users' Perceptions of the Need for Cash Flow Statements – Australian Evidence," *European Accounting Review*, 6(4): 653–72.

BIOGRAPHY

Hafiz Imtiaz Ahmad (Ph.D; CVA; MAFF) is serving as an Assistant Professor and Director of Professional Enrichment at the School of Management, New York Institute of Technology, Abu Dhabi Campus. Dr. Ahmad graduated from University of Lille, Lille, France, with a specialization in Finance. His domain of research includes equity valuation specifically residual income and abnormal earnings. He can be reached at hahmad02@nyit.edu.

Khaled Aljifri is a Professor of Accounting at United Arab Emirates University. He has published in Business, finance and accounting journals such as the European Accounting Review, International Business Review, Advances in Accounting, Accounting Educator's Journal, and Managerial Auditing Journal. He can be contacted at k.aljifri@uaeu.ac.ae .

Accounting & Taxation
Vol. 10, No. 1, 2018, pp. 87-96
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

IBFR
www.theIBFR.com

MODELLING UTILITY FINANCIAL VIABILITY USING LOGISTIC REGRESSION: EVIDENCE FROM FLORIDA

Daniel Acheampong, Florida Gulf Coast University
Tanya Benford, Florida Gulf Coast University
Ara Volkan, Florida Gulf Coast University

ABSTRACT

Ratemaking is the mechanism that various state commissions use to establish utility rates for investor-owned utilities. Using logistic regression, this study explains the need for a flexible model to determine the financial viability of such utilities. The study uses 47 Florida investor-owned water and wastewater utilities to assess financial viability from 2002 to 2013. The financial viability results obtained using the National Regulatory Research Institute (NRRI) model are compared to the results of a more rigorous logistics regression model developed in this study. First, the results show that the financial ratios currently used by the NRRI to determine the viability of utilities do not need to be all-inclusive. Second, using data from 2002 to 2013, the logistic regression model categorized the viability of these utilities into groupings different from those of the NRRI model. Third, the study shows that ratemaking is not a uniform process across all states and supports discontinuing usage of the NRRI standard viability model in favor of the logistic regression model that incorporates the same financial ratios used by the NRRI.

JEL: C02, C18, C30, G33, L32, L95

KEYWORDS: Water Utilities, Financial Viability, Logistic Regression, Financial Ratios

INTRODUCTION

There are more than 50,000 water utilities operating in the US, with 82% serving less than 3,300 customers. Developers and existing dilapidated infrastructures do not currently meet the needs of water and wastewater management utilities. Practical steps are required to assess the financial viability of existing utilities and the need for replacement and upgrade of their facilities. The ability to fund the replacement of assets will depend on the financial resources these utilities command (Wardrop, 2000). There are no known industry standards to measure the financial viability of water and wastewater utilities. Current models used in utility regulation focus on: (1) managing and reducing the risks associated with market failures, (2) the ability to perform certain social and political objectives, such as addressing public safety and health concerns and, (3) ensuring the continuity of operations. Given the huge number of utilities operating in the US, there is a need for developing scientific models that bring reliability and accuracy to assessing the financial viability of utilities. The National Regulatory Research Institute (NRRI) financial viability model is the only scientific model currently available to assess financial viability (NRRI, 2009). The purpose of this study is to develop a logistic regression (LR) model to assess the financial viability of water and wastewater utilities. The study employs both the LR and the NRRI models to determine which utilities are financially viable (nonviable) and demonstrates that the LR model uses fewer variables and produces more robust and reliable results.

The NRRI model does not work well with all regulatory environments since different states have different ratemaking approaches. As an alternative, this study develops a two-step process to determine the financial viability of water and wastewater utilities. First, the financial ratios that are best suited for analyzing the

financial condition of a particular regulatory environment are determined. Next, a statistical LR model that increases the reliability and accuracy of the financial viability forecast is developed using these financial ratios. Comparing the results of the LR model to the predictions of the NRRI model shows how the former improves the reliability and the accuracy of the forecasts in an efficient (less cost and time) and effective (higher rigor) manner. The next section reviews studies that analyze water utility financial viability; these studies use a variety of ratios to forecast viability. The third section presents a discussion of data sources, methodology and the process of developing the LR model and the fourth section provides a comparison of the LR model and NRRI model results. The fifth and final section includes the summary and concluding comments.

LITERATURE REVIEW

Models used to predict general business distress are not suitable for predicting small water utility financial viability. For example, Beecher, Dreese, and Landers (1992) argue the Altman's Z-score model is not appropriate for use in predicting financial distress in small water utilities because most are private, and one cannot determine the market value of their equity capital. Consistent with this argument, Wirick, Barrows, and Goldberg (1997) note that multivariate models have failed in the evaluation of water and wastewater utilities and suggested regulators consider the use of three ratios that measure the utility's ability to repay debt (debt to assets ratio, capitalization ratio, and the burden coverage ration). They argue that other financial ratios or multivariate models are not appropriate since they analyze general business performance not specifically water industry performance. For example, the Altman Z-score model, which predicts bankruptcy within 2 years, uses multiple income streams and financial ratios based on statement of financial position items (i.e., working capital to total asset ratio, retained earnings to total assets, income before income taxes to total assets, market value of equity to total liabilities, and sales to total assets) to measure the financial health of a business. Most water and wastewater systems do not have multiple income streams, and the application of the Altman Z-score model may not be appropriate for the determination of financial distress in water and wastewater systems. Wirick, Borrows, and Goldberg (1997) attempted to use discounted cash flow (DCF) models to determine the viability of water and wastewater utilities; using this method, utilities with a positive net present value are viable. However, DCF models do not capture either revenue or expense accruals, and DCF models treat the entire utility as a capital investment project. Treating existing utilities as new investments are problematic as assessing the appraised values of the assets to be used as the initial investments poses challenges.

In contrast, Beecher, Higbee, Anthony, and Richard (1996) support the use of the Platt and Platt (1991) model and claim that while this model uses viability ratios, it employs industry specific ratios and compares them to the individual firm ratios. Thus, similar to Altman's Z-score model, the Platt and Platt model minimizes data instability over time and integrates the industry-specific ratios to compare a firm's score to the industry score. Platt and Platt (2006) explain that their model is a LR analysis model that predicts outcomes based on a set of variables that may be determined from a larger number of related variables. LR may be binomial or multinomial. The flexibility of this model allows one to incorporate industry standards and individual firm specifics. Platt and Platt described the model as:

$$\mathrm{Pi} = \frac{1}{[1 + \exp.(\mathrm{B0} + \mathrm{B1Xi1} + \mathrm{B2Xi2} + \ldots\ldots\ldots\ldots \mathrm{BnXin})]} \quad (1)$$

Pi is the probability of financial failure of the ith firm, Xij is the jth industry-relative ratio of the ith firm, and Bij is the coefficient of the Xij term. The model flexibilities allow one to highlight specific variables and compare them to their industry-specific counterparts. However, Beecher, Higbee, Anthony, and Ricard (1996) warn that, when industry data is not available, it is difficult to establish the estimated coefficient Bij for each Xij in the model. The NRRI (2009) outlined seven ratios that may be considered together to determine the financial viability of water and wastewater utilities. The NRRI report (2009) recommended

the use of efficiency ratios, solvency ratios, and profitability ratios in assessing the financial viability of water utility systems. The lack of industry standards makes it difficult using multivariate ratio models to analyze the financial viability of these utilities. In addition, the NRRI did not have any known benchmark to measure viability or non-viability. This study suggests a flexible approach that employs the LR model and a 0.5 probability benchmark that is a default cutoff in predicting financial failure versus non-failure. The proposed approach will also be flexible for use by different state regulatory bodies.

All models use financial ratios to predict the viability of the test firms. Wirick, Barrows, and Goldberg (1997) and Beecher, Mann, and Sanford (1993) recommended the use of liquidity ratios or solvency ratios, efficiency ratios, and profitability ratios in viability models. While the NRRI model uses two separate ratios to measure profitability, Beecher, Mann, and Stanford (1993) use three ratios. First, return on sales and profit margin measure the profit earned per dollar of sales revenue and measure operational efficiency. The ratio, which indicates a firm's ability to withstand adverse conditions, such as falling rates, rising operational costs, and declining sales, is determined by dividing the net profit by net sales and. Next, return on assets ratio, which equals net profit divided by net assets, explains how a firm uses its assets to generate economic value and describes how efficiently a firm uses its assets to generate income. Finally, the return on net worth ratio (net profit divided by net worth), measures how management uses net assets to generate profit and an adequate return on owners' investment. However, this ratio may not apply to water utilities because the rate-setting process assures an expected rate of return on invested capital and investors do not own most of these utilities. Beecher, Mann, and Stanford (1993) use the quick ratio, current ratio, current liability to net worth, current liability to inventory, total liabilities to net worth, and fixed assets to net worth as solvency ratios. The quick ratio indicates how well the utility will meet its current obligations as they come due. The current ratio is the total current assets divided by total current liabilities.

This is an assessment of how the firm can use its current assets to meet its short-term obligations. The total assets ratio is also worth mentioning. This ratio measures the utility's ability to use its total assets to meet its total liabilities that measures the long-term financial risk of a utility to meet interest payments and repayments of debt on a timely basis. Wirick, Barrows, and Goldberg (1997) explain the need for efficiency ratios. They claim efficiency ratios depict how well the utility is managing and controlling its assets to generate revenues. Beecher, Mann, and Stanford (1993) recommended five efficiency ratios for small water systems: Collection period, net sales to inventory, assets to sales, sales to net working capital, and accounts payable to sales ratios. The receivable collection period, which is the average net account receivable, divided by daily sales, measures how efficiently the utility is collecting customer debts. Most small utilities depend on collections to fund their operations; hence, this efficiency ratio should be included in the analyses.

DATA AND METHODOLOGY

This study quantitatively identifies distressed or nonviable utilities using a LR model and compares the results to those predicted by the NRRI utility viability model, using the same financial ratios employed by the NRRI. The study selected 61 utilities regulated by Florida Public Service Commission (FPSC). Out of the 61 utilities selected, 47 had 10 years of annual financial statements (2004 to 2013) while 14 did not. Wirick, Barrows, and Goldberg (1997) assert that there is no specific model design to test for financial distress or viability for water utilities. Methods such as the Z-score model, as well as the Platt and Platt model, are used but are not consistent with conditions or circumstances surrounding water utilities. The NRRI model uses the profitability, liquidity, leverage, debt to equity, profit trend, growth and efficiency, and the efficiency ratios to determine the viability of a water utility. The NRRI model combines the results and categorizes them into three groups. Distressed or nonviable utilities have ratios totaling 3.0 or less. Weak to marginal utilities score between 3.1 and 3.9; if the total score is 4.0 or more then the utility is healthy and viable. The NRRI model represents a positive step towards building a model for a water utility (National Association of Regulatory Utility Commissioners, 1996). However, the model is not reliable;

because of its structure, anyone ratio can unduly influence the results. This study uses a LR model to test the ability of the NRRI model to separate the utilities into viable and non-viable categories based on the probabilities of the financial ratios used by the NRRI model. Using the Platt and Platt (1973) approach, the study LR model is as follows:

$$\mathrm{Pi} = \frac{1}{[1 + \exp.(\mathrm{B0} + \mathrm{B1LQi1} + \mathrm{B2LRi2} + \mathrm{B3DEi3} + \mathrm{B4PTi\$} + \mathrm{B5GEi5} + \mathrm{B6EFi6} + \mathrm{B7PRi7})]} \quad (2)$$

Where Pi is the probability of financial failure of the ith firm, B0-7 are the coefficients specified by the model, and the independent variables are the liquidity, leverage, debt to equity, profit trend, growth and efficiency, efficiency, and profitability ratios as the independent variables (ratio definitions are in the Appendix). The data are from the annual reports of the 47 qualified utilities referenced above. Table 1 reports the sample demographics.

Table 1: Sample Demographics of the 47 Sample Water Utilities

Data Item (in 1,000 dollars)	Total Assets	Common Stock Equity	Current Liab.	Long Term Liab.	Operating Revenues	Operating Expenses	Net Income	Retained Earnings
Mean	1,220.31	(18.89)	104.62	1,268.68	117.70	88.39	(30.85)	(134.10)
High	43,300.00	2,041.65	8,423.05	42,500.00	769.61	348.57	1,405.80	1,584.88
Low	(329.12)	(5,798.26)	(32.92)	-	5.35	0.86	(3,474.25)	(6,615.74)

Model Implementation and Discussion of Results

Table 2 below indicates the predictions of the NRRI model for the 47 qualified utilities. Out of 47, 32 utilities are classified as good to excellent, two are weak to marginal, and 13 are in the distressed category.

Table 2: Results from the NRRI Viability Model

NRRI Model Test	
Summary	**Utilities**
Good to Excellent	32
Weak to Marginal	2
Distressed	13
Total	47

Step 1 of the LR Model

The use of logistic regression (LR) is appropriate when the dependent variable is categorical (Hair, Black, Babin and Anderson 2010); in this study, LR is used to identify independent variables that predict small water utility financial viability. The first step of the viability test is a test for multicollinearity, which occurs when two or more of the ratios (independent variables) are explained by other ratios used in the test. When the variance inflation factor (VIF) is greater than 10 multicollinearity exists, and the variable causing this outcome must be eliminated from the LR model (Mertler and Vannatta 2013). To ascertain the extent of the problem, a collinearity diagnostic test was performed using a stepwise multiple regression on all 470 observations for each independent variable (47 firms over 10 years). Table 3 represents the results from the stepwise multiple regression.

Table 3: Eliminating Multicollinearity from NRRI Financial Ratios Using Stepwise Multiple Regression

Model		Beta In	T	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Liq_Quick	0.069	1.638	0.102	0.070	0.999	1.001	0.999
	Lev_Debit_Eqt	0.098	2.337	0.020 **	0.099	1.000	1.000	1.000
	Prof_Trend	-0.086	-2.056	0.040 **	-0.087	1.000	5.137	1.000
	Grow_Eff	-0.051	-1.205	0.229	-0.051	0.981	1.019	0.981
	Eff_Prof	0.061	1.455	0.146	.062	1.000	1.000	1.000
	Prof_NI_AOR	0.041	0.961	0.337	0.041	1.000	1.000	1.000
	DEBT_EQT	0.045	1.075	0.283	0.046	1.000	1.000	1.000
2	Liq_Quick	0.156	3.253	0.001 ***	0.138	0.754	1.327	0.754
	Prof_Trend	0.011	0.109	0.913	0.005	0.188	10.317	0.188
	Grow_Eff	-0.057	-1.341	0.180	-0.057	0.978	1.022	0.978
	Eff_Prof	0.056	1.321	0.187	0.056	0.996	1.004	0.996
	Prof_NI_AOR	0.039	0.933	0.351	0.040	1.000	1.000	1.000
	DEBT_EQT	0.045	1.072	0.284	0.046	1.000	1.000	1.000
3	Prof_Trend	0.010	0.107	0.915	0.005	0.188	10.317	0.177
	Grow_Eff	-0.040	-0.953	0.341	-0.041	0.963	1.039	0.742
	Eff_Prof	0.084	1.979	0.048 **	0.084	0.961	1.040	0.727
	Prof_NI_AOR	0.041	0.993	0.321	0.042	1.000	1.000	0.754
	DEBT_EQT	0.046	1.109	0.268	0.047	1.000	1.000	0.754
4	Prof_Trend	0.005	0.054	0.957	0.002	0.188	10.321	0.177
	Grow_Eff	-0.074	-1.662	0.097 *	-0.071	0.868	1.152	0.724
	Prof_NI_AOR	0.051	1.226	0.221	0.052	0.987	1.013	0.726
	DEBT_EQT	0.045	1.085	0.278	0.046	1.000	1.000	0.727

** p-value < 0.1 level of significance; ** p-value < 0.05 level of significance; *** p-value < 0.001 level of significance*

Of the seven LR ratios, the profit trend ratio exhibited a high VIF factor; all the other factors were below three. The profit trend ratio unstandardized (B) coefficient equals -5.26 and standardized Exp. (B) coefficient equals 0.0000463, with a z score of -0.11. This is an indication that the profit trend ratio has an inverse relationship in determining the viability or non-viability of a utility. Thus, coupled with high levels of VIF, the profit trend ratio is an outlier among the seven ratios identified by NRRI. After the profit trend ratio was removed from the LR analysis, the other six ratios were analyzed to separate the utilities between the viable and non-viable categories to determine the effectiveness of the predictors.

Step 2 of the LR Model

Table 4 presents the results from the LR using the six ratios with positive (B). The model R^2 is 0.704 indicating a high level of confidence in model predictions. The results from independent variables were tested both at the 0.01 (99%) and 0.05 (95%) probability levels. After removing the profit trend ratio, only the leverage ratio was significant. The rest of the independent variables were not significant, indicating that with the exception of the leverage ratio, the rest of the variables do not independently affect the viability classification.

Table 4: Results from the Six Selected Financial Ratios (All NRRI Ratios Except the Profitability Trend)

Step 1	B	S.E.	Wald	*df*	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Liquidity Ratio	0.024	0.015	2.675	1	0.102	1.025	0.995	1.055
Leverage Ratio	1.639	0.734	4.982	1	0.026 (**)	5.148	1.221	21.706
Debit to Equity Ratio	0.001	0.001	0.955	1	0.328	1.001	0.999	1.002
Growth& Efficiency	1.253	1.104	1.290	1	0.256	3.502	0.403	30.455
Efficiency & Profitability	2.706	3.297	0.674	1	0.412	14.969	0.023	9579.811
Profitability	0.113	0.646	0.031	1	0.861	1.120	0.315	3.974
Constant	-3.070	2.879	1.137	1	0.286	0.046		

(**) 95% or higher probability (liquidity ratio is close to 90% probability but does not make the cut).

Kremelberg (2011) asserts that the most valuable outcome of the logistic regression model is the determination of the significant variables in the equation table. Table 4 shows the test results for both the standardized Exp. (B) and the unstandardized (B) coefficients of the independent variables used in the regression. According to George and Mallery (2010), if an independent variable is significant at the 0.05 or 0.01 probability level, then that independent variable can predict the outcome without the help of the other predictors. The leverage ratio was significant (Sig. = 0.026 or 97.4% probability) at the 0.05 probability level. This means that higher levels of equity as a percentage of total assets will have a direct influence on the viability classification of a utility. In addition, Kremelberg explains that when the beta value (B) is greater than one, the predictor has a positive relationship with the outcome. The results indicate that three of the six financial ratios (leverage, growth and efficiency, efficiency and profitability) used in the analyses have a positive relationship with the classification of the outcomes.

Dutta, Bandopadhyay, and Sengupta (2012) describe the Wald statistic as the ratio of the unstandardized coefficient to the standard error (S.E.). Hence, the Wald statistic signifies the importance of each estimated (B). Higher values in combination with the degree of freedom (*df*) indicate the level of significance of each predictor in the model. All the selected financial ratios had a Wald statistic higher than 0.05, except for the profitability ratio. The profitability ratio had a 0.031 Wald statistic, which indicates that the determination of the viability and non-viability was less influenced by the profitability ratio as compared to the other ratios. Dutta, Bandopadhyay, and Sengupta (2012) recommend the dropping of an independent variable with less than 0.05 probability level. Because both (B) and Exp (B) have a positive relationship with the outcome, the profitability ratio was retained for the viable (non-viable) classification.

Kremelberg (2011) asserts that logistic models prefer the use of the odd coefficients in explaining the predictors' relationship to the outcome. The study adopted Kremelberg's preference in explaining the impact of changes in the financial ratios on the results of the reclassifications. The Exp (B) levels for the selected financial ratios are all greater than 1.0, indicating a direct or positive relationship between the financial ratios and the viability or the non-viability of the selected utilities. Table 5 indicates the results of the logistic regression using all the seven suggested NRRI financial ratios, with on-off decision criteria.

Table 6 results reflect the logistic regression model classification using the six selected ratios. The logistic regression tested the model by using the Hosmer and Lemeshow chi-square test (Steinberg, 2008) to determine the appropriateness of the data. The Hosmer and Lemeshow test indicate a 0.880 significant level with a chi-square value of 3.051. This is an indication that a meaningful logistic regression model with a high accuracy forecast between the predictors and the observed values exists. The logistic regression model reclassified the utilities based on the six selected financial ratios (liquidity ratio, leverage ratio, debt to equity ratio, growth and efficiency ratio, efficiency and profitability ratio, and profitability ratio). Six

utilities classified as non-viable were reclassified as viable, while five viable utilities were reclassified as non-viable.

Table 5: The Logistic Regression Model Predictions Using all Seven NRRI Ratios

Logistic Regression Model		Percentage of Predictability
Non-viable	20	0%
Viable	27	100%
Total/ Overall percentage of predictability	47	

Table 6: Logistic Regression Model Reclassifications Using Six Ratios (Profitability Trend Dropped)

	Non-viable	Viable	Percentage of Predictability
Non-viable	14	6	73.7%
Viable	5	22	81.5%
Total/ overall percentage of Predictability	19	28	78.3%

Note: The cut value is 0.500

The reclassification table indicates the separation of utilities into both viable and non-viable as compared to the all-inclusive ratios from Table 4. The NRRI model based the classification on three arbitrary categories that did not follow any known benchmarks. The logistic regression model used a default cut value of 0.5 to split the probability into two categories. Utilities with a probability of less than 0.5 were classified non-viable, and utilities with probabilities of 0.5 or greater were classified viable. George and Mallery (2010) explain that the 0.5 cut value is the standard, or the benchmark built into logistics regression to separate outcomes into yes or no and in this case to viable or non-viable. Removal of the profit trend ratio reclassified six utilities previously categorized as viable by the all-inclusive NRRI model into the non-viable category, and another five utilities were reclassified as non-viable.

The test of the model against a constant model was statistically significant, indicating that the predictors categorized the utilities into viability and non-viability with a chi-square = 26.271, $p < .000$ with df =2. Nagelkerke's R^2 of .586 showed a reasonably strong relationship between prediction and grouping (Steinberg, 2008). The prediction overall success was 78.3% (81.5% for viable and 73.7% for non-viable). Thus, the logistic regression model predicts viability and non-viability with fewer variables, higher accuracy, and greater rigor. The statistical tests show that the logistic regression approach, developed in this study, contributes greater efficiency and effectiveness to the analyses. Table 7 summarizes the overall results of the NRRI and logistic regression model predictions.

Table 7: Comparison between the Summary Predictions of the NRRI Model and Logistic Regression

	NRRI Model	Logistic Regression Model	Difference
Viable	34	28	6
Non-viable	13	19	6
Total	47	47	

CONCLUDING COMMENTS

The NRRI model classified 13 utilities as non-viable and 34 utilities as viable. The NRRI model did not remove any outliers from the ratios. The logistic regression removed the profit trend ratio and identified three ratios that significantly influenced the classification of the utilities. The leverage ratio, the efficiency and profitability ratio, and the profitability ratio had a direct influence on the determination of utility viability using all the seven NRRI ratios. The other four ratios (i.e. the liquidity ratio, profit trend ratio, debt to equity ratio, and growth and efficiency ratio) did not have a direct influence and exhibited multicollinearity with the other ratios. Thus, three significant ratios and an outlier (the profit trend ratio) influenced NRRI model outcomes. Employing logistic regression analysis eliminated the discrepancies. The logistic regression model reclassified six of the utilities previously categorized by the NRRI model as non-viable into the viable category and reclassified another five utilities from the viable category into the non-viable category. The NRRI model used simple summary statistics with no known benchmarks to determine the viability and non-viability of water utilities.

This study shows that simply adding the results of analyses may allow a single financial ratio to influence the results. The NRRI model does not test the financial ratios to determine their statistical relationship to the results. The logistic regression model developed in this study uses a two-step approach to eliminate weaknesses in model prediction and to improve the rigor and accuracy of the results. First, the ratios proposed for use in the LR model are tested at the aggregate level to determine which should be included in the model. Those showing multicollinearity are eliminated. The final model includes financial ratios (independent variables) that have positive unstandardized (B) and standardized Exp (B) coefficients. This suggested LR model can be used by different states because it offers the flexibility. The model has its own benchmarks to classify the utilities into viable and non-viable categories based on a widely accepted probability cut value of 0.5. We propose that further studies establishing water and wastewater industry ratios be completed. After an industry ratio standard is established, future studies develop a multivariate model incorporating the steps described in the study.

Appendix: Description of the Financial Ratios Used in this Study

SPSS_CODE	Description of Ratios	Formula
Liq_Quick	Liquidity (LQ)	$\frac{Cash\ +short-term\ investments\ +\ net\ account\ receivables}{Current\ Liabilities}$
Lev_CS_TA	Leverage Ratio (LR)	$\frac{Common\ Stock\ Equity}{Total\ Assets}$
Lev_Debit_Eqt	Debt to Equity (DE)	$\frac{long-term\ Debt}{Common\ Stock\ Equity}$
Prof_Trend	Profit Trend (PT)	$\frac{Retained\ Earnings}{Common\ Stock\ Equity}$
Grow_Eff	Growth and Efficiency (GE)	$\frac{Annual\ Operating\ Revenues}{Total\ Assets}$
Eff_Prof	Efficiency and Profitability (EF)	$\frac{Annual\ Operating\ Revenues}{Annual\ Operating\ Expenses}$
Prof_NI_AOR	Profitability Ratio (PR)	$\frac{Net\ Income}{Annual\ Operating\ Revenues}$

REFERENCES

Altman, E. (September 1968). Financial ratios, discriminate analysis, and the prediction of corporate bankruptcy. *Journal of Finance*, 23, 589-609.

Beecher, J. A., Dreese, G. R., & Landers, J. R. (1992). *Viability policies and assessment methods for small water utilities.* Columbus, OH: National Regulatory Research Institute Report 91-17, 1-290.

Beecher, J. A., Higbee, J., Anthony, M., & Richard, D. (1996). *The regionalization of water utilities: Perspectives, literature review, and annotated bibliography.* Columbus, OH: National Regulatory Research Institute Report 96-21, 1-158.

Beecher, J. A., Mann, P. C., & Stanford, J. D. (1993). *Meeting water utility revenue requirements: Financing and ratemaking alternatives.* Columbus, OH: National Regulatory Research Institute Report 93-13, 1-217.

Dutta, A., Bandopadhyay, G., & Sengupta, S. (2012). Prediction of stock performance in the Indian stock market using logistic regression. *International Journal of Business and Information, 7*(1), 105-129.

George, D., & Mallery, P. (2010). *SPSS for windows step by step: A simple study guide and reference.* Boston MA: Allyn & Bacon.

Hair, J. F. (2010). Black, WC, Babin, BJ, & Anderson, RE (2010). Multivariate data analysis, 7.

Hosmer, D., & Lemeshow, S. (1989). Applied logistic regression. New York, NY: Wiley Interscience.

Kremelberg, D. (2011). *Practical statistics: A quick and easy guide to IBM SPSS statistics, SATA and other statistical software.* Thousand Oaks, CA: Sage Publishing.

Mertler, A. C., & Vannatta, R. A. (2013). *Advanced and multivariate statistical methods: Practical application and interpretation.* Glendale, CA: Pyrczak Publishing.

National Association of Regulatory Utility Commissioners. (1996). *Uniform systems of accounts for class C water utilities.* Washington, DC: NARUC.

Platt, H., & Platt, M. (2006). Understanding differences between financial distress and bankruptcy. *Review of Applied Economics*, 2(2), 141-157.

Platt, H., & Platt, M. (May 1973). Development of a class of stable predictive variables: The case of bankruptcy prediction. *Journal of Finance*, 28, 389-396.

Steinberg, W. J. (2008). *Statistics alive*. Thousand Oaks, CA: Sage Publishing.

Wardrop, A. (2000). Investor-owned utilities in financial distress: Re-organization options and the public interest. *University of Queensland Law Journal, 21*(1), 42-66.

Wirick, D. W., Borrows, D. J., & Goldberg, S. (1997). *Evaluating water utility financial capacity with ratio analysis and discounted cash flows*. Columbus, OH: National Regulatory Research Institute Report 97-18, 1-60.

BIOGRAPHIES

Daniel Acheampong joined the FGCU faculty in June 2011, as Accounting Instructor. He received his doctorate in accounting from the Argosy University in 1913. Dr. Acheampong is a current DBA student at University of South Florida Muma Business of College and a current reviewing partner with Daga Accounting Solutions. Prior to joining FGCU, he served as a utility auditor for the state of Florida (PSC) and founded Daga Accounting Solutions. His research work is published in the Journal of Finance and Accountancy. email: Dacheampong@fgcu.edu

Tanya Benford, Department Chair of Accounting and Associate Professor at Florida Gulf Coast University, received a Ph.D. in Accounting with Information Systems as a supporting area of interest from the University of South Florida (2000). Tanya teaches Accounting Information Systems, has published numerous refereed journal articles and has successfully competed for both internal and external research grant funding. Her research interests include business process controls and corporate governance as well as the impact of information technology on judgment and decision-making in accounting. Prior to entering academia, she was Director of Finance for the Atlanta Symphony Orchestra. She also has held senior management positions in both the airline and insurance industries and began her career as a staff accountant at Coopers & Lybrand (PwC) in Miami, Fl. Email: tbenford@fgcu.edu

Ara G. Volkan joined the FGCU faculty in August 2004 as Eminent Scholar and Moorings Park Chair of Managerial Accounting. He served as the Chair of the Accounting Department and the Associate Dean and Interim Dean of the Lutgert College of Business during 2006-2014. He received his doctorate in accounting from the University of Alabama in 1979. Dr. Volkan is a member of the FICPA and AAA. He serves as reviewer for several journals. He published numerous articles in academic and professional accounting journals and in other publication outlets. Email: avolkan@fgcu.edu

REVIEWERS

The IBFR would like to thank the following members of the academic community and industry for their much appreciated contribution as reviewers.

Hisham Abdelbaki, University of Mansoura - Egypt
Isaac Oluwajoba Abereijo, Obafemi Awolowo University
Naser Abughazaleh, Gulf University For Science And Technology
Nsiah Acheampong, University of Phoenix
Vera Adamchik, University of Houston-Victoria
Iyabo Adeoye, National Horticultural Research Instittute, Ibadan, Nigeria.
Michael Adusei, Kwame Nkrumah University of Science And Technology
Mohd Ajlouni, Yarmouk University
Sylvester Akinbuli, University of Lagos
Anthony Akinlo, Obafemi Awolowo University
Yousuf Al-Busaidi, Sultan Qaboos University
Khaled Aljaaidi, Universiti Utara Malaysia
Hussein Al-tamimi, University of Sharjah
Paulo Alves, CMVM, ISCAL and Lusofona University
Ghazi Al-weshah, Albalqa Applied University
Glyn Atwal, Groupe Ecole Supérieure de Commerce de Rennes
Samar Baqer, Kuwait University College of Business Administration
Susan C. Baxter, Bethune-Cookman College
Nagib Bayoud, Tripoli University
Ahmet Bayraktar, Rutgers University
Kyle Brink, Western Michigan University
Giovanni Bronzetti, University of Calabria
Karel Bruna, University of Economics-Prague
Priyashni Chand, University of the South Pacific
Wan-Ju Chen, Diwan College of Management
Yahn-shir Chen, National Yunlin University of Science and Techology, Taiwan
Bea Chiang, The College of New Jersey
Te-kuang Chou, Southern Taiwan University
Shih Yung Chou, University of the Incarnate Word
Caryn Coatney, University of Southern Queensland
Iyanna College of Business Administration,
Michael Conyette, Okanagan College
Huang Department of Accounting, Economics & Finance,
Rajni Devi, The University of the South Pacific
Leonel Di Camillo, Universidad Austral
Steven Dunn, University of Wisconsin Oshkosh
Mahmoud Elgamal, Kuwait University
Ernesto Escobedo, Business Offices of Dr. Escobedo
Zaifeng Fan, University of Wisconsin whitewater
Perrine Ferauge University of Mons
Olga Ferraro, University of Calabria
William Francisco, Austin Peay State University
Peter Geczy, AIST
Lucia Gibilaro, University of Bergamo
Hongtao Guo, Salem State University
Danyelle Guyatt, University of Bath
Zulkifli Hasan, Islamic University College of Malaysia
Shahriar Hasan, Thompson Rivers University
Peng He, Investment Technology Group
Niall Hegarty, St. Johns University
Paulin Houanye, University of International Business and Education, School of Law
Daniel Hsiao, University of Minnesota Duluth
Xiaochu Hu, School of Public Policy, George Mason University
Jui-ying Hung, Chatoyang University of Technology
Fazeena Hussain, University of the South Pacific
Shilpa Iyanna, Abu Dhabi University
Sakshi Jain, University of Delhi
Raja Saquib Yusaf Janjua, CIIT
Yu Junye, Louisiana State University
Tejendra N. Kalia, Worcester State College
Gary Keller, Eastern Oregon University
Ann Galligan Kelley, Providence College
Ann Kelley, Providence college
Ifraz Khan, University of the South Pacific
Halil Kiymaz, Rollins College
Susan Kowalewski, DYouville College
Bamini Kpd Balakrishnan, Universiti Malaysia Sabah
Bohumil Král, University of Economics-Prague
Jan Kruger, Unisa School for Business Leadership
Christopher B. Kummer, Webster University-Vienna
Mei-mei Kuo, JinWen University of Science & Technology
Mary Layfield Ledbetter, Nova Southeastern University
John Ledgerwood, Embry-Riddle Aeronautical University
Yen-hsien Lee, Chung Yuan Christian University
Shulin Lin, Hsiuping University of Science and Technology
Yingchou Lin, Missouri Univ. of Science and Technology
Melissa Lotter, Tshwane University of Technology
Xin (Robert) Luo, Virginia State University
Andy Lynch, Southern New Hampshire University
Abeer Mahrous, Cairo university
Gladys Marquez-Navarro, Saint Louis University
Cheryl G. Max, IBM
Romilda Mazzotta, University of Calabria
Mary Beth Mccabe, National University
Avi Messica, Holon Institute of Technology
Scott Miller, Pepperdine University

REVIEWERS

The IBFR would like to thank the following members of the academic community and industry for their much appreciated contribution as reviewers.

Haydeé Aguilar, Universidad Autónoma De Aguascalientes

Bustamante Valenzuela Ana Cecilia, Universidad Autonoma De Baja California

María Antonieta Andrade Vallejo, Instituto Politécnico Nacional

Olga Lucía Anzola Morales, Universidad Externado De Colombia

Antonio Arbelo Alvarez, Universidad De La Laguna

Hector Luis Avila Baray, Instituto Tecnologico De Cd. Cuauhtemoc

Graciela Ayala Jiménez, Universidad Autónoma De Querétaro

Albanelis Campos Coa, Universidad De Oriente

Carlos Alberto Cano Plata, Universidad De Bogotá Jorge Tadeo Lozano

Alberto Cardenas, Instituto Tecnologico De Cd. Juarez

Edyamira Cardozo, Universidad Nacional Experimental De Guayana

Sheila Nora Katia Carrillo Incháustegui, Universidad Peruana Cayetano Heredia

Emma Casas Medina, Centro De Estudios Superiores Del Estado De Sonora

Benjamin Castillo Osorio, Universidad Pontificia Bolibvariana UPB-Seccional Montería

María Antonia Cervilla De Olivieri, Universidad Simón Bolívar

Cipriano Domigo Coronado García, Universidad Autónoma De Baja California

Semei Leopoldo Coronado Ramírez, Universidad De Guadalajara

Esther Eduviges Corral Quintero, Universidad Autónoma De Baja California

Dorie Cruz Ramirez, Universidad Autonoma Del Estado De Hidalgo /Esc. Superior De Cd. Sahagún

Tomás J. Cuevas-Contreras, Universidad Autónoma De Ciudad Juárez

Edna Isabel De La Garza Martinez, Universidad Autónoma De Coahuila

Hilario De Latorre Perez, Universidad Autonoma De Baja California

Javier De León Ledesma, Universidad De Las Palmas De Gran Canaria - Campus Universitario De Tafira

Hilario Díaz Guzmán, Universidad Popular Autónoma Del Estado De Puebla

Cesar Amador Díaz Pelayo, Universidad De Guadalajara, Centro Universitario Costa Sur

Avilés Elizabeth, Cicese

Ernesto Geovani Figueroa González, Universidad Juárez Del Estado De Durango

Ernesto Geovani Figueroa González, Universidad Juárez Del Estado De Durango

Carlos Fong Reynoso, Universidad De Guadalajara

Ana Karen Fraire, Universidad De Gualdalajara

Teresa García López, Instituto De Investigaciones Y Estudios Superiores De Las Ciencias Administrativas

Helbert Eli Gazca Santos, Instituto Tecnológico De Mérida

Denisse Gómez Bañuelos, Cesues

María Brenda González Herrera, Universidad Juárez Del Estado De Durango

Ana Ma. Guillén Jiménez, Universidad Autónoma De Baja California

Araceli Gutierrez, Universidad Autonoma De Aguascalientes

Andreina Hernandez, Universidad Central De Venezuela

Arturo Hernández, Universidad Tecnológica Centroamericana

Alejandro Hernández Trasobares, Universidad De Zaragoza

Alma Delia Inda, Universidad Autonoma Del Estado De Baja California

Carmen Leticia Jiménez González, Université De Montréal Montréal Qc Canadá.

Gaspar Alonso Jiménez Rentería, Instituto Tecnológico De Chihuahua

Lourdes Jordán Sales, Universidad De Las Palmas De Gran Canaria

Santiago León Ch., Universidad Marítima Del Caribe

Graciela López Méndez, Universidad De Guadalajara-Jalisco

Virginia Guadalupe López Torres, Universidad Autónoma De Baja California

Angel Machorro Rodríguez, Instituto Tecnológico De Orizaba

Cruz Elda Macias Teran, Universidad Autonoma De Baja California

Aracely Madrid, ITESM, Campus Chihuahua

Deneb Magaña Medina, Universidad Juárez Autónoma De Tabasco

Carlos Manosalvas, Universidad Estatal Amazónica

Gladys Yaneth Mariño Becerra, Universidad Pedagogica Y Tecnológica De Colombia

Omaira Cecilia Martínez Moreno, Universidad Autónoma De Baja California-México

Jesus Carlos Martinez Ruiz, Universidad Autonoma De Chihuahua

Alaitz Mendizabal, Universidad Del País Vasco

Alaitz Mendizabal Zubeldia, Universidad Del País Vasco/ Euskal Herriko Unibertsitatea

Fidel Antonio Mendoza Shaw, Universidad Estatal De Sonora

Juan Nicolás Montoya Monsalve, Universidad Nacional De Colombia-Manizales

Jennifer Mul Encalada, Universidad Autónoma De Yucatán

Gloria Muñoz Del Real, Universidad Autonoma De Baja California

Alberto Elías Muñoz Santiago, Fundación Universidad Del Norte

Bertha Guadalupe Ojeda García, Universidad Estatal De Sonora

Erika Olivas, Universidad Estatal De Sonora

Erick Orozco, Universidad Simon Bolivar

Rosa Martha Ortega Martínez, Universidad Juárez Del Estado De Durango

José Manuel Osorio Atondo, Centro De Estudios Superiores Del Estado De Sonora

Luz Stella Pemberthy Gallo, Universidad Del Cauca

Andres Pereyra Chan, Instituto Tecnologico De Merida

Andres Pereyra Chan, Instituto Tecnologico De Merida

Adrialy Perez, Universidad Estatal De Sonora

Hector Priego Huertas, Universidad De Colima

Juan Carlos Robledo Fernández, Universidad EAFIT-Medellin/Universidad Tecnologica De Bolivar-Cartagena

Natalia G. Romero Vivar, Universidad Estatal De Sonora

Humberto Rosso, Universidad Mayor De San Andres

José Gabriel Ruiz Andrade, Universidad Autónoma De Baja California-México

Antonio Salas, Universidad Autonoma De Chihuahua

Claudia Nora Salcido, Universidad Juarez Del Estado De Durango

Juan Manuel San Martín Reyna, Universidad Autónoma De Tamaulipas-México

Francisco Sanches Tomé, Instituto Politécnico da Guarda

Edelmira Sánchez, Universidad Autónoma de Ciudad Juárez

Deycy Janeth Sánchez Preciado, Universidad del Cauca

María Cristina Sánchez Romero, Instituto Tecnológico de Orizaba

María Dolores Sánchez-fernández, Universidade da Coruña

Luis Eduardo Sandoval Garrido, Universidad Militar de Nueva Granada

Pol Santandreu i Gràcia, Universitat de Barcelona, Santandreu Consultors

Victor Gustavo Sarasqueta, Universidad Argentina de la Empresa UADE

Jaime Andrés Sarmiento Espinel, Universidad Militar de Nueva Granada

Jesus Otoniel Sosa Rodriguez, Universidad De Colima

Edith Georgina Surdez Pérez, Universidad Juárez Autónoma De Tabasco

Jesús María Martín Terán Gastélum, Centro De Estudios Superiores Del Estado De Sonora

Jesus María Martín Terán Terán Gastélum, Centro De Estudios Superiores Del Estado De Sonora

Jesús María Martín Terán Gastélum, Centro De Estudios Superiores Del Estado De Sonora

Maria De La Paz Toldos Romero, Tecnologico De Monterrey, Campus Guadalajara

Abraham Vásquez Cruz, Universidad Veracruzana

Angel Wilhelm Vazquez, Universidad Autonoma Del Estado De Morelos

Lorena Vélez García, Universidad Autónoma De Baja California

Alejandro Villafañez Zamudio, Instituto Tecnologico de Matamoros

Hector Rosendo Villanueva Zamora, Universidad Mesoamericana

Oskar Villarreal Larrinaga, Universidad del País Vasco/Euskal Herriko Universitatea

Delimiro Alberto Visbal Cadavid, Universidad del Magdalena

Rosalva Diamantina Vásquez Mireles, Universidad Autónoma de Coahuila

Oscar Bernardo Reyes Real, Universidad de Colima

Ma. Cruz Lozano Ramírez, Universidad Autónoma de Baja California

Oscar Javier Montiel Mendez, Universidad Autónoma De Ciudad Juárez

Daniel Paredes Zempual, Universidad Estatal de Sonora

Miguel Ángel Latorre Guillem, Universidad Católica de Valencia "San Vicente Mártir"

HOW TO PUBLISH

Submission Instructions

The Journal welcomes submissions for publication consideration. Complete directions for manuscript submission are available at the Journal website www.theIBFR.com/journal.htm. Papers may be submitted for initial review in any format. However, authors should take special care to address spelling and grammar issues prior to submission. Authors of accepted papers are required to precisely format their document according to the journal guidelines.

There is no charge for standard paper reviews. The normal review time for submissions is 90-120 days. However, authors desiring a quicker review may elect to pay an expedited review fee, which guarantees an inditial review within two weeks. Authors of accepted papers are required to pay a publication fee based on the manuscript length and number of authors. Please see our website for current publication and expedited review rates.

Authors submitting a manuscript for publication consideration must guarantee that the document contains the original work of the authors, has not been published elsewhere, and is not under publication consideration elsewhere. In addition, submission of a manuscript implies that the author is prepared to pay the publication fee should the manuscript be accepted.

Subscriptions

Individual and library subscriptions to the Journal are available. Please contact us by mail or by email to: admin@theibfr.com for updated information.

Contact Information

Mercedes Jalbert, Managing Editor
The IBFR
P.O. Box 4908
Hilo, HI 96720
editor@theIBFR.com

Website

www.theIBFR.org or www.theIBFR.com

PUBLICATION OPPORTUNITIES

Review of Business & Finance Studies

Review of Business & Finance Studies (ISSN: 2150-3338 print and 2156-8081 online) publishes high-quality studies in all areas of business, finance and related fields. Empirical, and theoretical papers as well as case studies are welcome. Cases can be based on real-world or hypothetical situations.

All papers submitted to the Journal are blind reviewed. Visit www.theibfr.com/journal.htm for distribution, listing and ranking information.

Business Education and Acreditation (BEA)

Business Education & Accreditation publishes high-quality articles in all areas of business education, curriculum, educational methods, educational administration, advances in educational technology and accreditation. Theoretical, empirical and applied manuscripts are welcome for publication consideration.

All papers submitted to the Journal are blind reviewed. Visit www.theibfr.com/journal.htm for distribution, listing and ranking information.

Accounting and Taxation (AT)

Accounting and Taxation (AT) publishes high-quality articles in all areas of accounting, auditing, taxation and related areas. Theoretical, empirical and applied manuscripts are welcome for publication consideration.

All papers submitted to the Journal are blind reviewed. Visit www.theibfr.com/journal.htm for distribution, listing and ranking information.

Revista Global de Negocios

Revista Global de Negocis (RGN), a Spanish language Journal, publishes high-quality articles in all areas of business. Theoretical, empirical and applied manuscripts are welcome for publication consideration.

All papers submitted to the Journal are blind reviewed. Visit www.theibfr.com/journal.htm for distribution, listing and ranking information.