Accounting & Taxation

VOLUME 12 NUMBER 1 2020

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Accounting & Taxation

Accounting & Taxation, ISSN:1944-592X (print) and ISSN 2157-0175 (online), publishes high-quality articles in all areas of accounting, auditing, taxation and related fields. Theoretical, empirical and applied manuscripts are welcome for publication consideration. The Journal is published once per year by the Institute for Business and Finance Research, LLC. All papers submitted to the Journal are blind reviewed. The Journal is distributed in print and through EBSCO*Host,* SSRN and RePEc.

This Journal is the result of the collective work of many individuals. The Editors thank the members of the Editorial Board, ad-hoc reviewers and individuals that have submitted their research to the Journal for publication consideration.

ISSN : 1944-592X (print) and ISSN: 2157-0175 (online)

Accounting & Taxation
Vol. 12, No. 1, 2020, pp. 1-10
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

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MICRO ANALYSIS OF AUDIT REVENUE IN NEW ZEALAND

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ABSTRACT

Data analysis enhances the quality of audit. Data analysis also enable auditors to gain better insights, draw better conclusions and ultimately improve the audit process. Audit profession of the late uses more data analysis to improve their audit planning, monitoring and control. Our analysis aims to use such a technique to analyze and visualize financial and audit data of listed companies from New Zealand stock exchange. Our analysis finds that New Zealand audit market has a unique market segmentation favoring the big four firms and the audit market is highly competitive with low auditor turnover. Our analysis find evidence that big four firms charge premium for their services in New Zealand. Compliance costs increase the audit and non-audit services fee and we find evidence in our analysis that the adoption of International Financial Reporting Standards (IFRS) increases both the audit and non-audit services fee in the year 2007 and 2008. Other interesting findings suggest that city of the auditor office is important and industry specialization of the audit firm determine their revenue share in some the industries.

JEL: M42, M48, M49

KEYWORDS: New Zealand, Audit Fees, SOX, IFRS

INTRODUCTION

Massive volumes of data are now available both internally and externally and the power of new data analytics bound to change the audit environment. Audit profession has long recognized the impact of data analysis on enhancing the quality and relevance of the audit but use of this technique has been hindered due to a lack of efficient technology solutions, issues with data capture and privacy concerns. However, recent technology advancements in big data and analytics provide ample scope to rethink the way in which an audit is executed. Big data and analytics are enabling auditors to better identify financial reporting, fraud and operational business risks and tailor their approach to deliver a more relevant audit (Roshan 2015). Our aim is to micro analyze the big data and investigate the audit market and its peculiarities in New Zealand. We mainly focus on the micro analysis of audit and non-audit services fee in New Zealand and the aim is to find patterns that are not reported at large. New Zealand is geographically and economically small country and has a saturated audit market with very low litigation. There is a low incidence of auditor turnover in New Zealand (3 percent over a nine-year period), and there is some evidence of competitive pressures to retain existing clients and regain lost clients (Sharma et al. 2011). Hay and Knechel (2010) conclude that competitive fee cutting as a client solicitation and retention strategy is not uncommon in New Zealand. Most of the earlier literature (e.g., Hay et al. 2006) explore the factors that affect audit pricing with hypotheses.

Our analysis does not hypothesize any specific effect of factors in audit pricing but attempts to show some of the facts which most of the earlier studies found but did not report in detail. Analyzing a sample of 1078 firm-years over a period of 2004 to 2016, we find that the New Zealand audit market like other countries like U.S. is dominated by the big four firms and even among the big four firms there is segmentation. Ever

since the introduction of governance codes mimicking SOX in the year 2004 and International Financial Reporting Standards (IFRS) in the year 2007, the audit and non-audit revenue shows mixed growth. The city of Auckland, being the commercial hub, houses most of the audit offices. Media industry on an average pays top dollars to the audit firms while the food industry pays the least. We discuss the literature review in the next section, followed by sample selection and methodology, results and discussion and the final section concludes the analysis.

LITERATURE REVIEW

Earlier audit literature starting from Simunic (1980) investigated the determinants of audit fee to price setting arrangement in a market setting. DeAngelo (1981) and Watts and Zimmerman (1983) used agency theory to explain the audit fee determination. Francis et al. (2005) observed that audit firms are aware of high litigation risk and they put in more hours of work in order to maintain audit quality. Rama and Read (2006) opine that regulatory changes (e.g., SOX, adoption of IFRS) on compulsory auditor rotation and auditor tenure may increase auditor's workload and audit risk and it is difficult to find audit partners with the desired skills to replace the lead partners. In such a case, the audit firm must increase the fee to compensate for more risk exposure. The introduction of corporate governance codes has further increased the workload of the auditors. Auditors now evaluate their audit risk by looking at various factors like board independence, audit committee independence, audit committee expertise, duality etc (e.g. Carcello et al. 2002; Abbott et al. 2003; Vafeas and Waegelein 2007; Sharma et al. 2011).

Audit literature cites a host of factors that impact audit pricing and most of the researchers have verified the authenticity of such claims. Hay et al. 2006 listed the most commonly used variables in most of the studies and opined that some of the variables like total assets (indicating size of the firm) show consistent results but several of them show no clear pattern in certain periods or countries. Studies (e.g. Simunic 1980) conducted in the U.S., used more control variables. The size of the firm, complexity of the audit and the risk associated with the audit mainly determine the audit price. Copley et al. (1995) show that Big8 firms charge higher fees. Hamilton et al. (2008) observe that BIG4 concentration is low in the small client market and high in the large client market in both 2000 and 2003 in Australian audit market.

The audit firms are likely to charge more audit fees when the firm is large, the audit is complex, and audit risk is higher (e.g., Kannan et al. 2014; Hay et al. 2006). The industry of the firm is another important factor in the determination of audit fees. Certain industries (e.g., mining, banking) need special audit work because of their nature. Taylor (2000) observes that these industries have different accounting policies regarding among other things, recognition of revenue and expense, and valuation of assets. Identifying significant audit areas, and inspection and observations of records need distinct skills. The audits of firms in such an industry call for specialized knowledge of the industry and the firms that possess the knowledge earn more revenue than others in that industry. Sharma et al. (2011) opine that client importance could compromise the performance of the audit in a small economy like New Zealand. They also observe that audit firms in New Zealand have engaged in fee-cutting behavior to regain lost clients, and non-audit fee revenues on a per client basis at the city office level comprise a more significant portion of the office revenues compared to larger economies such as the U.S. Corporate governance, chief executive officer's compensation do affect audit pricing (e.g., Kannan et al. 2014, Ananthanarayanan et al. 2017). Our aim is to bridge this gap and investigate the audit market patterns in New Zealand. The results of the U.S. studies cannot be generalized to N.Z. or many other countries primarily because of differences in the size and nature of the economy. N.Z. institutional, accounting, and auditing environments are different from the U.S. in many ways, including lower corporate and auditor litigation risk, smaller size and volume of capital markets (equity and debt), smaller size of firms, and less developed and voluntary nature of governance regulations (Sharma et al. 2011; Davis and Hay, 2012).

DATA AND METHODOLOGY

Our sample is selected from the population of firms listed on the New Zealand Stock Exchange (NZX) from fiscal years 2004 to 2016. The financial data for all companies are obtained from the Global Vantage Database. Data for audit fees are taken from the annual reports filed with the NZX. The initial sample yields 2,412 firm-years. We exclude 612 firm-years due to data unavailability for minimum nine years. To avoid the effect of foreign audit and corporate regulations, we exclude 657 firm-years that are dual listed on the NZX. We then exclude 65 firm-years due to less than five observations per industry as we need sufficient industry samples to measure audit fees. Thus, our overall sample consists of a balanced panel of 1078 firm-years (2004-2016). Table 1 summarizes our sample selection procedure. Table 1B summarizes the share of major audit firms in the New Zealand audit market. It is evident that PWC has the greatest number of audits and together with KPMG they have 65% share of the market. Ananthanarayanan et al. (2017) observed that the audit service suppliers of New Zealand listed companies are split into three groups, PWC and KPMG, Deloitte and Ernst & Young, and the non-big four and our analysis confirms their findings. The dominance of PWC is due to the fact that it is the first big four firm to start operating under its own name in New Zealand (*circa* 1930).We specify and estimate our OLS regression fee models based on prior audit fee research (e.g., Kannan et al. 2014; Hay and Knechel, 2010) to test the effect of *AUDFEE* on the big four firms and industry. We use limited control variables because our main focus is to study the effect of audit firms and industry on audit fees

$$AUDFEE = \beta_0 + \beta_1 BIGFOUR + \beta_2 INDS + \beta_3 Controls + \varepsilon \quad (1)$$

Where:

Audfee	=	Defined as the Natural Log of Audit Fees
BIGFOUR	=	1 if the client's external auditor is a Big 4 auditor, 0 otherwise
INDS	=	industry of the client firms

Control Variables

SIZE	=	natural logarithm of firm's total assets
GEOSEG	=	number of firm's geographic segments
BUSSEG	=	number of firm's business segments
ARINV	=	sum of accounts receivable and inventory scaled by total assets
MB	=	firm's market price per share to book value per share ratio
LEVERAGE	=	total long-term debt scaled by total assets
MERGER	=	1 if the firm had a merger or an acquisition during the year, 0 otherwise
NAS	=	natural logarithm of total non-audit fees paid by the firm to the auditor
YEAR	=	Year fixed effects indicator variable

Table 1: Sample Construction

Firms Listed on the New Zealand Stock Exchange From 2004 To 2016	**2,412**
Less: Dual-listed firms	(657)
Less: Firms with incomplete data (less than 9 years data)	(612)
Less: Firms with less than five observations in the industry	(65)
Final Sample (firm-years)	**1078**

This table shows data selection of firms listed in the New Zealand stock exchange from 2004 to 2016.

Table 1B: Distribution of Audit Firm share of the Audit Market

Names	Firms Audited	Percentage
PWC	414	38.40%
KPMG	286	26.53%
Deloitte	148	13.73%
Ernst & Young	85	7.88%
Grant	27	2.50%
BDO	21	1.95%
Others	97	9.00%
Total	1078	100%

This table shows audit market share audit firms in New Zealand from 2004 to 2016. Others include all other ten audit firms whose share is insignificant in the audit market.

RESULTS AND DISCUSSION

We discuss the results of our three-main analysis namely audit fees, audit fees by auditors, and audit fees by industries. It is quite possible to add further micro analysis based on the earlier audit literature (Hay et al. 2006).

Audit Fees

Table 2 show mean audit fees (actual and relative) in New Zealand between 2004 and 2016. We evaluate the level of audit fees per auditee and scaled by total assets (proxy for size of the firm) to understand the trend of audit fees in the post-SOX era. The audit fee shows a steady increase over the years 2004 to 2011 and declines marginally from 2012. One of the reasons is that the number of listed companies with more than nine-year data is on the decline due to takeovers, mergers and delisting from the NZX after 2012. Non-audit service fees show a declining trend in the years 2004 to 2007 but increases in 2008 (Figure 1a and 1b). Earlier studies (Griffin et al. 2008; Kannan et al. 2014) have documented such an increase in the audit fee, decrease in the non-audit service fee, and attribute this to the implementation of SOX, and in New Zealand, Griffin et al. (2008) document an increase in audit fees and opine that the adoption of NZ IFRS, rather than overseas governance reforms, is the main cause of the increase. The non-audit service fees increase in 2008-2009 could also be due to implementation of IFRS.

There are no severe restrictions on non-audit services to be provided by audit firms in New Zealand, but the growth of non-audit fees is relatively low as compared to audit fees growth. It is quite possible that New Zealand firms, being relatively small, do not require rigorous audits and extensive non-audit services. The decrease in non-audit service fees could be due to the adoption of corporate governance principles and practices in New Zealand, which mimic SOX but our analysis excludes governance variables. Comparatively the growth of audit fees in the later years could be attributed to the introduction of corporate governance principles. Firms now demand an increased audit effort from audit firms to minimise the risk of poor financial reporting and its after effects. Studies conducted in the U.S. (e.g., Vafeas and Waegelien 2007) on audit fees strongly support such views. Another important development is the establishment of the Financial Markets Authority (FMA), an agency with a critical role in regulating capital markets and financial services in New Zealand since 2011. Prior to that multiple agencies were responsible to monitor different aspects of financial reporting, accounting and auditing standards.

Table 2: Average Audit and NAS Fees (in NZ Dollars)

Years	AUDFEE	NAS	AUDFEETA	NASTA
2004	209,735	128,940	0.0030	0.0009
2005	246,716	121,408	0.0026	0.0005
2006	301,238	101,721	0.0022	0.0007
2007	322,323	89,616	0.0024	0.0006
2008	343,432	120,312	0.0029	0.0005
2009	385,873	71,449	0.0023	0.0016
2010	386,150	62,087	0.0025	0.0012
2011	391,553	56,637	0.0025	0.0011
2012	376,795	68,717	0.0026	0.0010
2013	387,122	99,762	0.0020	0.0003
2014	347,757	91,523	0.0017	0.0004
2015	348,717	88,686	0.0018	0.0003
2016	361,161	90,970	0.0016	0.0003

This Table Shows Audit Fees (AUDFEE), Non-Audit Services Fee (NAS), AUDFEETA (Audit Fees Scaled by Total Assets of a Firm), And NASTA (Non-Audit Services Fee Scaled By Total Asset) In New Zealand 2004 To 2016.

Table 2 show that average audit fees steadily increase from 2004 to 2011, and non-audit service fees decline in the years 2005 to 2007 but increase in 2008-2009 falling again in 2010. Table 2, and Figure 1b shows that, as a proportion of total assets, audit fees increase slowly between 2005 and 2008 but declines in 2009 and fluctuate thereafter. Non-audit service fees, as a proportion of total assets, decline in 2005, but raise to the maximum in 2009 and decreases in the following years. Increase in audit fees could be due to the implementation of the IFRS, which became compulsory from 2007 onwards in New Zealand. There is no visible evidence of SOX having an effect in New Zealand. However, it is possible that there is a ripple effect of SOX, since its implementation from 2004.

Audit Fees by Auditors

Table 3: Audit and NAS Fees

Panel A: Average AUDIT and NAS Fees Earned by Audit Firms Nation-Wise (in NZ Dollars)				
Names of Audit firms	**AUDFEE**	**NAS**	**AUDFEETA**	**NASTA**
BDO	68,282	8,227	0.0045	0.0001
Deloitte	232,461	89,437	0.0022	0.0013
Ernst & Young	389,317	116,475	0.003	0.0002
Grant	186,815	30,259	0.003	0.0008
KPMG	423,324	120,658	0.0018	0.0005
PWC	401,989	94,690	0.0018	0.0006
Panel B: Audit and NAS Fees of BIGFOUR and Non-BIGFOUR Firms (in New Zealand Dollars)				
Auditor Name	**AUDFEE**	**NAS**	**AUDFEETA**	**NASTA**
BIGFOUR	379,576	103,547	0.002	0.0006
BDO & GRANT	133,596	20,367	0.0036	0.0005

Panel A shows the audit fees (AUDFEE), non-audit services fee (NAS), AUDFEETA (audit fees scaled by total assets of a firm), and NASTA (non-audit services fee scaled by total asset) earned by the major firms over the years 2004 to 2016. Panel B shows the audit fees (*AUDFEE*), non-audit services fee (*NAS*), AUDFEETA (audit fees scaled by total assets of a firm), and NASTA (non-audit services fee scaled by total asset) earned by the big four and non-big four firms over the years 2004 to 2016.

Auditor dominance is another issue that has been pointed out in the literature (Hay et al.2006). To test this contention this analysis observes and records the current state of audit fees in the New Zealand audit market by individual audit firms. Our analysis accounts only for the major non- BIGFOUR firms BDO and Grant Thornton (hereinafter Grant). As per Table 3, Panel A, on an average, KPMG charges more audit and non-audit service fees than the other BIG4 and non-BIG4 audit firms. Of the BIGFOUR firms, Ernst & Young

on average charges lower audit and non-audit service fees. On average, the BIGFOUR audit firms charge more audit fees and non-audit service fees than the non-BIG4 audit firms. Table 3, Panel A also shows as a proportion of total assets, Binder Dijker Otte (BDO) charges higher audit fees than all other firms. PricewaterhouseCoopers (PWC) and Klynveld Peat Marwick Goerdeler (KPMG) charges the least amount of average audit fees scaled by total assets. Deloitte charges more non-audit service fees per dollar of total assets than all other audit firms. Table 3, Panel B shows that the BIGFOUR firms earn more fee revenue than non- big four firms because they audit 87% of the audit firms. Our analysis accounts only for the major non- big four firms BDO and GRANT (Grant Thornton) as other firms cover insignificant portion of the total audit market in New Zealand. On the other hand, non-big four firms charge a higher relative audit fee than the big four.

Audit Fee by Industry and Office Location

Table 4: Industry-Wise Audit and NAS Fees (in New Zealand Dollars)

Name of Industry and (%) Share	AUDFEE	NAS	AUDFEETA	NASTA
Agriculture & Fishing (10%)	229,391	77,497	0.0020	0.0004
Food (5%)	97,774	31,885	0.0049	0.0004
Intermediate & Durables (20%)	404,280	92,274	0.0018	0.0003
Property (10%)	534,253	137,839	0.0004	0.0001
Ports (9%)	357,133	148,353	0.0006	0.0002
Leisure & Tourism (6%)	485,737	290,018	0.0021	0.0018
Consumer (21%)	178,544	40,697	0.0022	0.0007
Media & Communications (6%)	766,688	57,684	0.0034	0.0009
Health services (6%)	426,033	79,623	0.0037	0.0008
Bio Technology (7%)	83,634	48,392	0.0062	0.0035

This table shows the audit fees (AUDFEE), non-audit services fee (NAS), AUDFEETA (audit fees scaled by total assets of a firm), and NASTA (non-audit services fee scaled by total asset) in each industry over the years 2004 to 2016.

Industries having different needs and different levels of audit risk lead to different levels of audit fees. Table 4 shows that on average, the media industry pays higher average audit fees than any of the other industries, the leisure industry pays higher amounts of non-audit service fees than other industries, and the food industry pays the least amount of audit and non-audit service fees. The biotechnology industry pays more audit and non-audit service fees per dollar of total assets whereas property industries pay the least audit and non-audit service fees per dollar of total assets.

Table 5 City-wise Audit and NAS fees (in New Zealand dollars)

Name and (% share) of City Audit Office	AUDFEE	NAS	AUDFEETA	NASTA
Auckland (64%)	442,784	118,075	0.0023	0.0007
Christchurch (9%)	128,732	27,287	0.0026	0.0001
Dunedin (6%)	108,632	24,278	0.0025	0.0016
Hamilton (1%)	118,692	64,385	0.0005	0.0004
Lyttleton (1%)	69,222	52,556	0.0003	0.0003
Tauranga (5%)	166,058	99,854	0.0007	0.0004
Wellington (14%)	180,871	39,385	0.0029	0.0005

This table shows the audit fees (AUDFEE), non-audit services fee (NAS), AUDFEETA (audit fees scaled by total assets of a firm), and NASTA (non-audit services fee scaled by total asset) by audit firm's audit offices in various cities of New Zealand over the years 2004 to 2016.

Table 5 shows that on average audit offices in Auckland earn higher revenue in audit and non-audit services fee as Auckland accounts for 64% of the total audit market. Wellington and Christchurch accounts for 14%, and 9% of the audit market respectively. Wellington offices earn higher audit and non-audit services fee per dollar of total assets. Our finding is similar to the observations made by Sharma et al. 2011. In

untabulated analysis, we observe that PWC audit firm earns a higher average audit fees and non-audit fees in agriculture, leisure & tourism, consumer, media, health services, and bio technology industries whereas KPMG earns higher average audit and non-audit services fee in property, and intermediate industries. Deloitte earns higher average audit and non-audit services fee in ports and food industries.

Regression Results

In Table 6, the coefficients on *BIGFOUR* is positive and significant ($p<0.01$) suggesting that *BIGFOUR* firms earn a higher audit fees than the non-big four firms. This result is consistent with earlier findings of audit studies (e.g. Simunic 1980; Hay et al. 2006). On the other hand, the coefficients on each industry has its own positive or negative effects on audit fees. The coefficients on *FOOD, PROPERTY, PORTS and TRANSPORT,* and *HEALTH SERVICES* are positive ($p<0.05$, $p<0.01$) and significant indicating that these industries pay higher audit fees to the audit firms due to higher risk and litigation factors. The coefficients on *INTERMEDIATE AND DURABLES* is negative but significant ($p<0.10$) suggesting that they pay less audit fee than others due to comparatively lower risks than other industries. The coefficients on all other industries are not significant indicating lack of association with audit fees. The results are consistent with earlier studies (Hay et al. 2006, Sharma et al. 2011) conducted in New Zealand. All our other control variables results are consistent with the results of earlier studies (Sharma et al. 2011; Davis and Hay, 2012)

In untabulated results (due to brevity), we also run another regression based on *AUDFEENY* (audit fees of next year) and find the results similar to results reported in Table 6. We also run year wise regressions on our regression model 1 (results not tabulated) and find that years 2005, 2008, 2009 and 2012 are positive and significant with audit fee suggesting that IFRS adoption could be the reason for the years 2005 (earlier adoption by some companies) and in 2008 and 2009. An interesting point here is that after 2012 the number of companies listed in NZX with complete data has reduced considerably due to mergers and takeover. We also run tests on reduced sample size (845 firm-years) and find that our results are consistent with the main sample

Table 6: Regressions of Audit Fees on Industry and Big Four Firms (Dependent Variable = *AUDFEE)*

Variable (Predicted Sign)	Coefficients	t Value
Intercept	1.928	8.622***
Bigfour (+)	0.112	2.814***
Agriculture and fishing	-0.064	-1.463
Food	0.0950	2.505**
Intermediate and durables	-0.087	-1.648*
Property	0.149	3.344***
Ports and transport	0.138	3.172***
Leisure and tourism	-0.040	-1.046
Consumer	-0.056	-1.042
Media and communications	0.048	1.235
Health services	0.127	3.073***
Bio technology	-0.064	-1.463
Year	YES	YES
Controls	YES	YES
F value	124.875***	
Adjusted R-square	0.712	
N	1078	

*This table shows the regression results of audit fees on industry and Big four firms in New Zealand from 2004 to 2016. *, **, *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively. Directional tests are one-tailed, otherwise two-tailed. Due to brevity we have not shown the individual controls results and year effects.*

CONCLUSION

The aim of our paper is to use data analysis of listed companies of New Zealand stock exchange from the year 2004 to 2016 to find patterns in the audit fee market. Our overall sample consists of a balanced panel

of 1078 firm-years (2004-2016). We test the association of audit fees with big-four firms and various industries using a regression model. Our audit market analysis clearly shows the existence of audit market segmentation in New Zealand and the larger share of big four firms. Auditor turnover is very low in New Zealand and audit firms audit and non-audit revenue shows a mixed growth. It is to be noted that regulatory compliance pushes the audit cost which is evident in the year 2007 -2009. Our regression results indicate that big four firms earn higher audit fees than non-big four firms. Some of the industries pay higher audit fees due to higher risks while less risky industries pay lower audit fees. Adoption of IFRS in the year 2007 to 2009 increased the audit and non-audit services fee as regulatory changes increase the compliance requirements of firms. Audit market in every country exhibit certain patterns which may be relevant in other countries and in some periods. Our findings confirmed certain findings of earlier researchers.

Our analysis has certain limitations. First, we analyze limited areas like general audit fees, audit fees of firms, city office revenues, and industry-wise revenues. Second, the sample size may look very small compared to research and analysis in the U.S., and the findings of the report are applicable only to NZX listed firms during the period 2004 to 2016 and no other firms of New Zealand in general. Third, our sample estimation requires minimum of nine-year listing in NZX. Due to mergers and takeovers, the number of listed firms in NZX is reduced after year 2012 and there may be some distortion in the data but our sensitivity tests considering all the 65 unique firms that has all the thirteen-year financial records show consistent results like our main sample. Fourth, our regression did not consider governance variables as our main focus is to analyze mostly audit firm and industry effects on audit fees. Micro analysis of other factors that impact audit fee like accounts receivable and inventory, business and geographical segments, merger and acquisition, executive compensation and corporate governance measures could be explored in future analysis. Future studies should also include corporate governance and other variables in their regression analysis to determine their effect on audit fees.

DATA AVAILABILITY

All Data Are Publicly Available from Sources Identified in the Text.

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ACKNOWLEDGMENTS

We sincerely thank Professor Asheq Rehman of AUT University, Auckland and Associate Professor Stephen Courtenay (formerly from Massey University, Auckland) for their guidance, support, and invaluable feedback at the thesis stage.

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Accounting & Taxation
Vol. 12, No. 1, 2020, pp. 11-22
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

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FOREIGN EXPOSURE LEVEL AND THE IMPACT OF THE 2017 TAX CUTS AND JOBS ACT ON VALUATION OF US MULTINATIONAL COMPANIES

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ABSTRACT

U.S. multinational corporations conduct a significant amount of their business and book a significant portion of their sales and profits in foreign countries. Prior to the passage of the Tax Cuts and Jobs Act, which was signed into law by President Trump on December 22, 2017, income generated by US multinational corporations was not subject to US taxation until repatriated to the US. The Tax Cuts and Jobs Act reduced US corporate tax rates, changed the corporate taxation of US multinational corporations to a territorial system, and created an immediate tax liability for US multinationals' "deemed repatriation" of their past foreign earnings. This study examines the impact of these complex changes to the US corporate tax system on the short-term valuation of US multinational firms. Our results indicate the Tax Cuts and Jobs Act had a net negative impact on US multinational corporations' valuation in the short-term, with higher levels of foreign exposure leading to lower returns. Our results are robust to alternate measures of foreign exposure and abnormal returns.

JEL: G14, G38, H25

KEYWORDS: Valuation, Multinational Corporations, Tax Cut and Jobs Act

INTRODUCTION

In today's global economy, many U.S based corporations conduct a significant amount of business in other countries, and book a significant portion of their sales and profits in those countries. Traditionally, income generated by US companies in foreign countries was not taxed by US authorities until these funds were repatriated to the US. This policy created a significant incentive for these multinational corporations (MNCs) to retain income earned internationally in their foreign operations and subsidiaries. According to some estimates, by the end of 2017, US MNCs had accumulated approximately $1 trillion in foreign holdings of cash and cash equivalents, excluding amounts permanently invested in the companies' foreign operations (Smolyansky, Suarez, and Tabova, 2018). Much of this cash is held in US-dollar denominated fixed income assets such as US Treasury Bonds (Pozsar 2018). There has been significant growth in the amount of permanently reinvested earnings of US MNCs over the last decade. Blouin, Krull, and Robinson (2019) estimate the aggregate permanently reinvested earnings of US MNCs at $808 billion as of 2009. McKeon (2017) reports that the total amount of permanently reinvested earnings held overseas by Russell 1000 companies reached $2.6 trillion in 2016, reflecting a significant growth trend. Arguably, this hoarding of idle foreign cash and excessive investment in foreign operations as a tax reduction strategy can cause inefficiencies in these MNCs, and therefore depress the values of these companies, in addition to the negative impact on US tax collections. For example, Harford, Wang, and Zhang (2017) show that foreign cash is valued less than domestic cash and that this discount is greater than the pure tax effect. They find that MNCs subject to repatriation taxes underinvest domestically and overinvest abroad.

The American Job Creation Act (AJCA), enacted in 2004 as a temporary tax holiday to induce repatriation of foreign earnings and increase tax revenue, was initially successful in encouraging the repatriation of "trapped" foreign cash. The AJCA resulted in repatriation of over $290 billion in foreign earnings (Blouin and Krull, 2009) and reduced the propensity for value-decreasing acquisitions (Edwards, Kravet, and Wilson, 2016). DeSimone, Piotroski, and Tomy (2019) argue that the temporary nature of the AJCA and the discussion of further similar legislation (introduced but not enacted beginning in 2008) resulted in expectations of similar future legislation and created an incentive for MNCs to accumulate even more foreign cash in anticipation of future tax relief. The Tax Cuts and Jobs Act (TCJA), which was passed by the Senate and House on December 20, 2017, and signed into law by President Trump on December 22, 2017, reduced US corporate tax rates, changed the corporate taxation of US MNCs to a territorial system, and created an immediate tax liability for these MNCs' "deemed repatriation" of their past unrepatriated foreign earnings. In this study, we review the pertinent details of the TCJA regarding corporate taxation and its potential impact on US corporations, and examine the impact of these complex changes in the taxation of foreign income and foreign cash holdings on the short-term valuation of US MNCs. Our results indicate the TCJA had a net negative impact on US MNCs' valuation in the short-term, as shown by 3-day and 5-day cumulative abnormal returns. We find that those firms with greater foreign exposure have more negative announcement returns. The remainder of the paper is organized as follows. The next section summarizes the relevant literature. Next, we discuss the data and methodology used in the study. The results are presented in the following section. The paper closes with some concluding comments.

LITERATURE REVIEW

Leading up to the passage of the Tax Cuts and Jobs Act (TCJA) in 2017, the US corporate income tax rate was one of the highest in the world. Specifically, Jahnsen and Pomerleau (2017) estimate that the combined federal and state taxation for US corporations of 38.91% gave the United States the fourth highest statutory corporate income tax rate in the world. According to Bunn (2018), the passage of the TCJA reduced the combined Federal and state corporate tax rate in the US to 25.84%, lowering its rank to 83rd highest in the world. Table 1 provides a summary of statutory corporate income tax rates by region in 2017 and 2018, as reported by Jahnsen & Pomerlau (2017) and Bunn (2018).

Table 1: Average Statutory Corporate Tax Rate by Region or Group

	2017		2018	
Region or Group	**Average Rate**	**GDP Weighted Average Rate**	**Average Rate**	**GDP Weighted Average Rate**
Africa	28.73%	28.20%	28.81%	28.39%
Asia	20.05%	26.26%	20.65%	26.42%
Europe	18.35%	25.58%	18.38%	25.43%
North America	23.08%	37.01%	23.01%	26.22%
Oceania	23.67%	27.10%	22.00%	27.04%
South America	28.73%	32.98%	28.08%	32.20%
BRICS	28.32%	27.34%	28.40%	27.33%
EU	21.82%	26.25%	21.86%	26.03%
G20	28.04%	30.90%	27.37%	27.18%
G7	29.57%	33.48%	27.63%	27.21%
OECD	24.18%	31.12%	23.93%	26.58%
World	22.69%	29.41%	23.03%	26.47%
USA	38.91%		25.84%	

Source: Tax Foundation Fiscal Fact No: 559, Jahnsen and Pomerlau (2017) and Tax Foundation Fiscal Fact No: 623 Dann (2018).

Under the existing US tax code prior to 2017, US based corporations were taxed on foreign earnings only when they repatriated these earnings to the US, with credit for foreign taxes paid. With US tax rates

significantly above the tax rates in most countries where US multinational corporations (MNCs) operate, repatriation of these earnings would result in a significant tax liability for those MNCs. This structure provided a clear incentive for MNCs to keep, accumulate, and invest those funds off-shore, in order to minimize their tax liability. There is a significant amount of evidence to indicate the US MNCs indeed behaved as would be expected given the above incentive structure, and accumulated significant amounts of permanently reinvested foreign earnings, as well as significant amounts of foreign cash. Foley, Hartzell, Tittman, and Twite (2007) show that firms facing higher repatriation tax rates hold higher levels of cash abroad in affiliates in lower tax jurisdictions. Faulkender, Hankins, and Petersen (2019) find that MNCs' foreign cash balances are explained by low foreign tax rates and relaxed restrictions on income shifting. Smolyansky, Suarez, and Tabova (2018) estimate that by the end of 2017, US MNCs had accumulated approximately $1 trillion in foreign holdings of cash and cash equivalents, excluding amounts permanently invested in the companies' foreign operations.

Our estimates based on hand collected data from US corporations' SEC 10-K filings place the aggregate foreign cash holdings of Russell 1000 companies at over $923 billion in 2016 and over $912 billion in 2017. In addition, McKeon (2017) reported that Russell 1000 companies held over $2.6 trillion in permanently reinvested earnings (PRE) in their foreign operations and affiliates in 2016. In addition to the negative impact on US tax collections, this hoarding of idle foreign cash and excessive investment in foreign operations as a tax reduction strategy has numerous real effects for these MNCs. Harford, Wang, and Zhang (2017) show that shareholders place a lower value on foreign cash than domestic cash and that this discount is greater than the pure tax effect. They find that this valuation effect is related to financing frictions and agency problems, as MNCs subject to repatriation taxes underinvest domestically and overinvest abroad. Similarly, Edwards, Kravet, and Wilson (2016) and Hanlon, Lester, and Verdi (2015) find that US MNCs with significant permanently reinvested earnings held as cash make less profitable cash acquisitions of foreign targets. By contrast, Campbell, Dhaliwal, Krull, and Schwab (2018) find that overall excess foreign cash is not discounted relative to domestic cash, but that excess foreign cash held in high agency cost environments carries a discount. They suggest that such a discount is due to the country-specific location of assets and is likely to persist even after corporate tax reform.

Albring (2006) and De Simone and Lester (2018) demonstrate that trapped cash abroad induces MNCs to increase their domestic borrowing to fund shareholder payout and domestic investment. Finally, Fabrizi, Parbonetti, Ipino, and Magnan (2016) show that cash held abroad generates uncertainty among market participants. Greater foreign cash holdings are associated with greater information uncertainty among analysts and causes more dispersed beliefs and abnormal trading volumes among investors. The American Job Creation Act (AJCA) enacted in 2004 provided a temporary repatriation tax holiday to induce repatriation of foreign earnings and increase tax revenue. The AJCA created a onetime dividend received deduction of 85% on extraordinary repatriations of up to $500 million of PRE disclosed in the most recent financial statements, which reduced the effective U.S. tax on those foreign earnings from 35 to 5.25 percent. Blouin and Krull (2009) estimate that the AJCA resulted in the repatriation of over $290 billion of foreign earnings. Smolyanski et al (2018) place the estimated repatriation in 2005 at $312 billion. However, the AJCA was only a temporary solution. DeSimone, Piotroski, and Tomy (2019) find that the temporary nature of the AJCA and discussion of further similar legislation, which was introduced but not enacted beginning in 2008, resulted in expectations of similar future legislation and created an incentive for MNCs to accumulate even more foreign cash in anticipation of future tax relief.

The TCJA addressed the foreign cash hoarding issue by changing to a territorial taxation system for US corporations, where corporate income is taxed in the country it is earned, and only income earned by corporations in the US is taxed in the US. Related changes included a reduction in the top US corporate tax rate to 21%, more in line with rates in the rest of the world. In addition, the TCJA "deemed repatriation" provision imposed a one-time tax of 15.5% on foreign liquid assets and 8% on illiquid assets, payable over eight years, regardless of whether these funds are repatriated (York 2018). Other important provisions

included the minimum tax on global intangible low-taxed income (GILTI), which is explained in detail in Pomerlau (2019); the base erosion and anti-abuse tax (BEAT), explained in detail in Forst and Fuller (2020); the deduction for foreign derived intangible income (FDII), explained in detail in Karnis (2019); 100% deduction for dividends received from 10% owned foreign corporations; and 100% bonus depreciation for most capital expenditures for the next five years. The combined impact of these changes should be to eliminate or reduce the incentive for MNCs to hoard cash abroad, serving the dual purpose of increasing US tax revenue and incentivizing more efficient and value maximizing investments by MNCs. Wagner, Zeckhauser, and Ziegler (2018) review the valuation of US firms during the "legislative period" leading up to the passage of the TCJA, and find that high tax firms were big beneficiaries, while firms with significant foreign exposures lagged. The changes imposed by the TCJA may have both positive and negative impacts on US MNCs. Some possible factors are listed in Table 2. To examine the net impact of the various changes resulting from the TCJA on US corporations, we examine the short-term stock market reaction of large US corporations upon the enactment of the TCJA. In addition, we explore any differences in the market reaction resulting from the extent of these firms' international activities.

Table 2: Factors Resulting from TCJA Impacting Valuation of US Multinational Corporations

Positive Factors	Negative Factors
The elimination of the worldwide taxation of corporate income	A significant immediate tax liability stemming from the "deemed repatriation" provision, resulting in immediate assessment of US taxes on unrepatriated past foreign earnings
Reduction of corporate tax rates applied to future domestic and foreign earnings	Loss of tax advantage from foreign operations relative to US operations
Discounted taxation of past foreign earnings	Impact of the GILTI and BEAT provisions possibly increasing total tax liability for MNCs
Reduced likelihood of tax-driven overinvestment in foreign operations and related inefficiencies	Loss of a significant strategic tax management tool for MNCs relative to domestic counterparts resulting from timing options on repatriation decisions
Favorable treatment of new capital expenditures	
Favorable treatment of foreign derived intangible income (FDII)	

DATA AND METHODOLOGY

To examine the impact of the Tax Cuts and Jobs Act (TCJA) on US corporations, we start with all firms included in the Russell 1000 index in 2018, which roughly represents the largest 1000 US firms by market capitalization. Eliminating Utilities and REITs leaves a sample of 835 firms which have data available on both CRSP and Compustat during the study period. We collect 2014 - 2016 fiscal year financial information from Compustat, along with returns data from CRSP. We also hand collect the amount of cash held in foreign jurisdictions in fiscal year 2016, prior to the enactment of the TCJA, by examining their SEC 10-K filings. Control variables are defined using fiscal year 2016 data. We use the average ratio of pretax foreign income (PIFO) to total revenue for 2014 – 2016 and the ratio of foreign cash to assets as two alternative measures of a firm's foreign exposure. We calculate three-day and five-day cumulative abnormal returns (CARs) in response to the passage of the final bill in both the House and the Senate on December 20, 2017 to estimate the valuation consequences of the TCJA. We also considered the date that the House approved the bill (November 16, 2017), the date that the Senate approved the amended bill (December 2, 2017), the date the House and Senate conference committee unveiled the new version (December 15, 2017), and the date that the President signed the final version (December 22, 2017). At each stage prior to signing, there were various changes made to the bill. Our qualitative conclusions are robust to the use of alternative event dates during the process of announcing, passing, and signing the bill. Those results are available from the authors upon request. We calculate 3-day (5-day) CARs using two methods for robustness. We calculate *CAR3A* (*CAR5A*) as the cumulative sum of the 3-day (5-day) deviations from the firm's average return during the 60-day estimation window. We use the 60 trading days immediately prior to the initial

introduction of the bill in the US House of Representatives as H.R. 1 on November 2, 2017 as the estimation period. For each firm i, the average rate of return $R_{i,ave}$ is calculated as:

$$R_{i,ave} = \frac{1}{60}\sum R_{i,t}, \quad (1)$$

where, $R_{i,t}$ is the daily return over the window from 08/09/2017 to 11/01/2017. The cumulative abnormal return is the cumulative sum of the 3-day (*n*=1) and 5-day (*n*=2) deviations from the firm's average return and is calculated as:

$$CAR_{i,(-n,n),A} = \sum_{t=-n}^{n}(R_{i,t} - R_{i,ave}), \quad (2)$$

where, $R_{i,t}$ is stock *i*'s return on day *t* (*t* = 0 is the TCJA signing date). We calculate *CAR3M* (*CAR5M*) as the cumulative sum of the 3-day (5-day) deviations from the firm's expected return based on the one-factor market model using the CRSP value-weighted index. The one-factor model is used to estimate the beta of the firm β_ι from the regression in equation (3), over the 60-trading day estimation window:

$$R_{i,t} = \alpha_i + \beta_i \times R_t^M + e_{i,t}, \quad (3)$$

where, $R_{i,t}$ is the return on day *t* for firm *i*, R_t^M is the return on the CRSP value-weighted index on day *t*, and $e_{i,t}$ is the error term. The cumulative abnormal return, which is the cumulative sum of the 3-day (*n*=1) and 5-day (*n*=2) deviations from the firm's expected return from the one-factor capital asset pricing model, is calculated as:

$$CAR_{i,(-n,n),M} = \sum_{t=-n}^{n}(R_{i,t} - (\alpha_i + \beta_i \times R_t^M)), \quad (4)$$

where $R_{i,t}$ is the return on day *t* for firm *i*, R_t^M is the return on the CRSP value-weighted index on day *t*, and α_i and β_i are the estimates for firm *i* from equation (3). No 3-day (5-day) CARs are reported for firms with less than 30 days of returns available during the 60-day estimation window or less than two (four) days of returns available during the period from one (two) day(s) before to one (two) day(s) after the event date. Table 3 provides descriptive statistics for our sample of companies. We winsorize all variables except *Size* at the 1% level to minimize the impact of outliers. *Size* is measured as the natural logarithm of total assets; therefore, the logarithmic transformation already reduces the influence of outliers. The descriptive statistics indicate that the average CARs are slightly positive, consistent with Wagner et al (2018). Of the maximum 835 firms in the sample, 621 report foreign income, earning the designation of an MNC. Only 377 firms report their 2016 foreign cash holdings. Yang (2015) documents that the Securities and Exchange Commission (SEC) began issuing comment letters on foreign cash holdings in its review of 10-K filings in 2011. These comment letters were more likely for large firms and those with a lot of permanently reinvested earnings. While the apparent SEC interest in foreign cash holdings increased their disclosure, not all firms choose to disclose this information. Of those reported, the average (median) foreign cash holdings is approximately 10% (5%) of total assets.

Table 3: Descriptive Statistics

	N	Mean	Median	SD	P10	P90
CAR3A	814	0.0017	-0.0009	0.0238	-0.0229	0. 0297
CAR3M	813	0.0057	0.0032	0.0231	-0.0180	0.0316
CAR5A	814	0.0092	0.0045	0.0319	-0.0271	0.0513
CAR5M	813	0.0077	0.0036	0.0309	-0.0254	0.0703
Foreign Cash Ratio	377	0.0990	0.0514	0.1193	0.0092	0.2518
PIFO Ratio	621	0.0446	0.0294	0.0801	-0.0086	0.1445
Size	830	8.4595	8.4742	1.4595	6.7631	10.3172
CapEx	830	0.0362	0.0248	0.0387	0.0022	0.0817
MTB	737	4.0626	3.3288	13.5200	1.1345	9.9862
ROA	832	0.0415	0.0424	0.0894	-0.0312	0.1324

CAR3A (CAR5A) is the 3-day (5-day) cumulative abnormal return, where the abnormal return is defined as the difference between the firm's observed return and the average firm return during the estimation window. CAR3M (CAR5M) is the 3-day (5-day) cumulative abnormal return, where the abnormal return is defined as the difference between the firm's observed return and the predicted return using the one-factor capital asset pricing model. Foreign Cash Ratio is defined as the ratio of prior-year foreign cash to total assets. PIFO Ratio is defined as the average ratio of foreign pre-tax income to total revenue for the prior three years. Size is defined as the natural logarithm of prior-year total assets. CapEx is defined as the ratio of prior-year capital expenditures to total assets. MTB is defined as the ratio of the prior-year market value of equity (product of end-of-fiscal-year price per share and number of shares outstanding) to the book value of common equity. ROA is defined as the ratio of prior-year net income to total assets. All variables are winsorized at the 1% level. SD is the standard deviation. P10 and P90 are the 10^{th} and 90^{th} percentiles, respectively.

RESULTS AND DISCUSSION

In Table 4, we focus on US multinational corporations (MNCs) and present univariate results on the difference in the market response to the Tax Cuts and Jobs Act (TCJA) based on the extent of foreign exposure. We define foreign exposure using two primary variables: the average ratio of foreign pre-tax income to total revenue over the prior three years from 2014-2016 (*PIFO Ratio*) and the prior year ratio of foreign cash holdings to total assets (*Foreign Cash Ratio*). We create two binary exposure variables for each of these two ratios; the first defines high (low) foreign exposure as the top (bottom) quartile of either *PIFO Ratio* or *Foreign Cash Ratio*, and the second defines high (low) foreign exposure as the top (bottom) half of either *PIFO Ratio* or *Foreign Cash Ratio*. That produces a total of four different definitions of foreign exposure which are used in Table 4.

We find that firms with greater foreign exposure have a significantly lower announcement return in both the 3- and 5-day periods surrounding the signing of the TCJA, as shown in column "H-L". For three of the four measures of foreign exposure, we observe that the average cumulative abnormal return (CAR) for high-exposure firms is consistently negative across the different estimations, while the average CAR for low-exposure firms is consistently positive. This initial analysis indicates that while the overall CAR in response to the TCJA was slightly positive for our overall sample of firms, representative of the US market, this reaction was driven by firms with less foreign exposure who likely benefitted more from the reduction in the US corporate tax rate.

Table 4: Univariate Analysis – Cumulative Abnormal Returns by Foreign Exposure

CAR3A							
	High Exposure			**Low Exposure**			**H-L**
Variable	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	
PIFO_Quartile	153	-0.0066	0.0202	147	0.0033	0.0278	-0.0100***
PIFO_Med	308	-0.0033	0.0216	298	0.0033	0.0236	-0.0066***
FCASH_Quartile	94	-0.0116	0.0201	93	0.0035	0.0250	-0.0152***
FCASH_Med	189	-0.0063	0.0207	186	0.0031	0.0241	-0.0094***
CAR3M							
	High Exposure			**Low Exposure**			**H-L**
Variable	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	
PIFO_Quartile	153	-0.0017	0.0187	147	0.0075	0.0272	-0.0091***
PIFO_Med	308	0.0012	0.0206	298	0.0071	0.0228	-0.0060***
FCASH_Quartile	94	-0.0064	0.0172	93	0.0071	0.0242	-0.0135***
FCASH_Med	189	-0.0014	0.0187	186	0.0066	0.0237	-0.0080***
CAR5A							
	High Exposure			**Low Exposure**			**H-L**
Variable	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	
PIFO_Quartile	153	-0.0052	0.0249	147	0.0134	0.0397	-0.0185***
PIFO_Med	308	0.0009	0.0282	298	0.0120	0.0330	-0.0110***
FCASH_Quartile	94	-0.0074	0.0262	93	0.0108	0.0312	-0.0182***
FCASH_Med	189	-0.0014	0.0279	186	0.0111	0.0329	-0.0124***
CAR5M							
	High Exposure			**Low Exposure**			**H-L**
Variable	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	
PIFO_Quartile	153	-0.0049	0.0239	147	0.0117	0.0391	-0.0166***
PIFO_Med	308	0.0006	0.0273	298	0.0104	0.0320	-0.0099***
FCASH_Quartile	94	-0.0077	0.0231	93	0.0092	0.0293	-0.0170***
FCASH_Med	189	-0.0020	0.0265	186	0.0096	0.0320	-0.0116***

*CAR3A (CAR5A) is the 3-day (5-day) cumulative abnormal return, where the abnormal return is defined as the difference between the firm's observed return and the average firm return during the estimation window. CAR3M (CAR5M) is the 3-day (5-day) cumulative abnormal return, where the abnormal return is defined as the difference between the firm's observed return and the predicted return using the one-factor capital asset pricing model. PIFO ratio is defined as the average ratio of foreign pre-tax income to total revenue for the prior three years. High (Low) Exposure for PIFO_Quartile is defined using the top (bottom) quartile PIFO ratio. High (Low) Exposure for PIFO_Med is defined using the top (bottom) half of PIFO ratio. Foreign Cash Ratio is defined as the ratio of prior-year foreign cash holdings to total assets. High (Low) Exposure for FCASH_Quartile is defined using the top (bottom) quartile of Foreign Cash Ratio. High (Low) Exposure for FCASH_Med is defined using the top (bottom) half of Foreign Cash Ratio. H-L is the difference between the reported means for the high exposure minus low exposure categories. All variables are winsorized at the 1% level. SD is the standard deviation. ***, **, and * denote significance at the 1st, 5th, and 10th percentiles, respectively.*

In Table 5, we explore the relation between the market-value reaction to the TCJA and firms' foreign exposure in a multivariate setting. We conduct an ordinary least squares regression specified as:

$$CAR_i = \beta_0 + \beta_1 PIFO\ Ratio_i + \beta_2\, Size_i + \beta_3 CapEx_i + \beta_4 MTB_i + \beta_5 ROA_i + \sum_{j=1}^{9} \gamma_j\, D_j + \varepsilon_i, \qquad (5)$$

where the specified dependent variable CAR_i measures abnormal returns for firm i over various event windows, as described in greater detail below. We use the *PIFO Ratio*, which is the prior three-year average ratio of pretax foreign income to total revenue, as the measure of foreign exposure. In addition, we use various control variables likely to influence security returns. *Size* is defined as the natural logarithm of total

assets. *CapEx* is defined as the ratio of prior-year capital expenditures to total assets. *MTB* is defined as the ratio of the prior-year market value of equity (product of end-of-fiscal-year price per share and number of shares outstanding) to the book value of common equity. *ROA* is defined as the ratio of prior-year net income to total assets. D_j are dummy variables to control for industry fixed effects based on 10 industry groups using two-digit SIC codes. D_j is equal to one for firm *i's* two-digit industry code, or zero otherwise. Since we have used ten industry groups using two-digit SIC, we include nine

industry dummy variables in the regression specification to avoid multicollinearity. Finally, ε_i denotes the error term. All continuous variables except *Size* are winsorized at the 1% level.

We explore four different specifications for CAR: *CAR3A* (*CAR5A*) is the 3-day (5-day) cumulative abnormal return, where the abnormal return is defined as the difference between the firm's observed return and the average firm return during the estimation window. *CAR3M* (*CAR5M*) is the 3-day (5-day) cumulative abnormal return, where the abnormal return is defined as the difference between the firm's observed return and the predicted return using the one-factor capital asset pricing model.

Results indicate the coefficient on the *PIFO Ratio* is negative and significant for all specifications of CAR, indicating the greater the foreign exposure, the lower the market reaction. This confirms the univariate results that the TCJA was perceived as a net negative for multinational firms. In addition, while not tabulated, we note that all industry effects show significant coefficients.

Table 5: Multivariate Analysis – Cumulative Abnormal Returns by Foreign Exposure Using Pretax Foreign Income

	CAR3A	**CAR5A**	**CAR3M**	**CAR5M**
PIFO Ratio	-0.042***	-0.073***	-0.031**	-0.053***
	(0.014)	(0.019)	(0.013)	(0.018)
Size	0.001**	0.002*	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
CapEx	-0.046	0.005	-0.033	0.017
	(0.028)	(0.040)	(0.027)	(0.038)
MTB	-0.000	-0.000**	-0.000	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
ROA	-0.008	-0.001	-0.017	-0.008
	(0.011)	(0.015)	(0.010)	(0.015)
Constant	0.037***	0.046***	0.047***	0.058***
	(0.008)	(0.011)	(0.008)	(0.011)
Industry Fixed Effects	YES	YES	YES	YES
Number of observations	552	552	552	552
R^2	0.312	0.255	0.324	0.285
Adjusted R^2	0.294	0.235	0.307	0.266

This table presents the results from an ordinary least squares regression where the specified dependent variable measures returns over various event windows, specified as $CAR_i = \beta_0 + \beta_1 PIFO\ Ratio_i + \beta_2\ Size_i + \beta_3 CapEx_i + \beta_4 MTB_i + \beta_5 ROA_i + \sum_{j=1}^{9} \gamma_j\ D_j + \varepsilon_i$, *where* CAR_i *measures abnormal returns for firm i over various event windows. CAR3A (CAR5A) is the 3-day (5-day) cumulative abnormal return, where the abnormal return is defined as the difference between the firm's observed return and the average firm return during the estimation window. CAR3M (CAR5M) is the 3-day (5-day) cumulative abnormal return, where the abnormal return is defined as the difference between the firm's observed return and the predicted return using the one-factor capital asset pricing model. PIFO Ratio is the average ratio of pretax foreign income to total revenue for the prior three years. Size is defined as the natural logarithm of prior-year total assets. CapEx is defined as the ratio of prior-year capital expenditures to total assets. MTB is defined as the ratio of the prior-year market value of equity (product of end-of-fiscal-year price per share and number of shares outstanding) to the book value of common equity. ROA is defined as the ratio of prior-year net income to total assets.* D_j *are dummy variables to control for industry fixed effects based on 10 industry groups using two-digit SIC codes. All variables except Size are winsorized at the 1% level. Standard deviations are presented in parentheses. ***, **, and * denote significance at the 1st, 5th, and 10th percentiles, respectively.*

We conduct a secondary multivariate test in Table 6, using the following OLS regression:

$$CAR_i = \beta_0 + \beta_1 ForeignCashRatio_i + \beta_2\, Size_i + \beta_3 CapEx_i + \beta_4 MTB_i + \beta_5 ROA_i + \sum_{j=1}^{9} \gamma_j\, D_j + \varepsilon_i \quad (6)$$

In Table 6, we examine the smaller sample of 377 firms which report foreign cash holdings in their fiscal year 2016 10-K reports. The dependent and independent variables in equation (6) are as described in the

Table 6: Multivariate Analysis – Cumulative Abnormal Returns by Foreign Exposure Using Foreign Cash Holdings

	CAR3A	**CAR5A**	**CAR3M**	**CAR5M**
Foreign Cash Ratio	-0.033***	-0.025*	-0.028***	-0.023*
	(0.010)	(0.014)	(0.010)	(0.014)
Size	0.001	-0.000	0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
CapEx	-0.042	0.050	-0.015	0.072
	(0.039)	(0.053)	(0.037)	(0.051)
MTB	-0.000	-0.000*	-0.000	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
ROA	-0.011	-0.018	-0.014	-0.010
	(0.016)	(0.022)	(0.015)	(0.021)
Constant	0.047***	0.068***	0.055***	0.074***
	(0.011)	(0.015)	(0.011)	(0.015)
Industry Fixed Effects	YES	YES	YES	YES
Number of observations	353	353	353	353
R^2	0.284	0.231	0.288	0.257
Adjusted R^2	0.254	0.199	0.259	0.226

This table presents the results from an ordinary least squares regression where the specified dependent variable measures returns over various event windows, specified as $CAR_i = \beta_0 + \beta_1 ForeignCashRatio_i + \beta_2\, Size_i + \beta_3 CapEx_i + \beta_4 MTB_i + \beta_5 ROA_i + \sum_{j=1}^{9} \gamma_j\, D_j + \varepsilon_i$, *where* CAR_i *measures abnormal returns for firm i over various event windows. CAR3A (CAR5A) is the 3-day (5-day) cumulative abnormal return, where the abnormal return is defined as the difference between the firm's observed return and the average firm return during the estimation window. CAR3M (CAR5M) is the 3-day (5-day) cumulative abnormal return, where the abnormal return is defined as the difference between the firm's observed return and the predicted return using the one-factor capital asset pricing model. Foreign Cash Ratio is the ratio of prior-year foreign cash to total assets. Size is defined as the natural logarithm of prior-year total assets. CapEx is defined as the ratio of prior-year capital expenditures to total assets. MTB is defined as the ratio of the prior-year market value of equity (product of end-of-fiscal-year price per share and number of shares outstanding) to the book value of common equity. ROA is defined as the ratio of prior-year net income to total assets.* D_j *are dummy variables to control for industry fixed effects based on 10 industry groups using two-digit SIC codes. All variables except Size are winsorized at the 1% level. Standard deviations are presented in parentheses. ***, **, and * denote significance at the 1st, 5th, and 10th percentiles, respectively.*

above discussion of equation (5), except the foreign exposure variable is the *Foreign Cash Ratio,* defined as the ratio of prior-year foreign cash to total assets. We once again find that the extent of foreign exposure, as shown by the coefficient on *Foreign Cash Ratio*, is negatively and significantly related to the market reaction to the TCJA for all specifications of CAR. These results indicate that the higher the level of foreign exposure, the more negative the impact of the TCJA on the firm's valuation. The untabulated industry effect variables remain significant in explaining the market response to the TCJA, as well.

CONCLUDING COMMENTS

Prior studies have documented the accumulation of cash and permanently reinvested earnings in US multinational corporations (MNCs) foreign operations. In addition to the loss of US tax revenue, there are additional negative economic impacts, including the inefficient allocation of capital resources driven by tax avoidance considerations. The Tax Cuts and Jobs Act (TCJA), which was signed into law by President

Trump on December 22, 2017, reduced US corporate tax rates, changed the corporate taxation of US MNCs to a territorial system, and created an immediate tax liability for these MNCs' "deemed repatriation" of their past unrepatriated foreign earnings. Upon examining the short-term market impact of the TCJA on large US corporations using 3-day and 5-day cumulative abnormal returns (CARs), we find that the market responded favorably to the TCJA. However, there is a differential market response based on the extent of the foreign exposure of those firms. Using both univariate means tests and multivariate regression analysis, we find that the greater the foreign exposure, the more negative the market reaction to the signing of the TCJA. These results are robust to various definitions of CARs and foreign exposure. We conclude that the immediate tax liability resulting from the TCJA, the impact of the GILTI and BEAT provisions, and the loss of future tax minimization strategies relative to domestic counterparts result in a discount in the values of firms with the greatest foreign exposure.

One of the limitations of the study is the possibility that the results are influenced by the choice of event date. After the initial introduction of the bill in the US House of Representatives as H.R. 1 on November 2017, there were several milestones related to the bill in the House, Senate, and various committees. Each of these events themselves could convey relevant information to the market, and impact valuations. While our reported results use the passage of the bill by the Senate and House as the event date, we also considered the date that the House approved the bill (November 16, 2017), the date that the Senate approved the amended bill (December 2, 2017), the date the House and Senate conference committee unveiled the new version (December 15, 2017), and the date that the President signed the final version (December 22, 2017). Our qualitative conclusions are robust to the use of alternative event dates during the process of announcing, passing, and signing the bill. An additional limitation is the examination of only the short-term impact of the TCJA on US MNCs. While we would like to also examine the long-term impact of the TCJA on US MNCs, the year following the passage of the TCJA was marked by a significant focus by the Trump administration on international trade, and various trade disputes with China, the EU, and other countries, including the imposition of various import tariffs by all the parties involved. These international trade disputes are likely to confound the long-term returns of the US MNCs. We would expect these trade disputes between the U.S. and, most notably, China and the EU, to have a differential long-term impact on US MNCs that cannot be separated from the impact of the TCJA. Our findings show the complicated impacts of tax legislation and have important implications for policymakers considering future tax and trade policy changes. Future research into the real effects of the TCJA is warranted, including its effect on foreign cash holdings, the market valuation of foreign cash holdings, and the profitability of foreign acquisitions. Studies of this nature will reveal if the implementation of the TCJA increased the efficiency of corporate decision-making and may shed light on the long-term valuation effects of the TCJA.

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Accounting & Taxation
Vol. 12, No. 1, 2020, pp. 23-33
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

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THE RELATIONSHIP BETWEEN CRITICAL ACCOUNTING ESTIMATES AND CRITICAL AUDIT MATTERS

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ABSTRACT

Accounting estimates are an essential part of financial statements, are pervasive, and substantially affect a company's financial position and results of operations. As part of Regulation S-K, the Securities and Exchange Commission requires a discussion about critical accounting estimates in management's discussion and analysis section of Form 10-K. As of July 2019, the Public Company Accounting Oversight Board has requirements for disclosing critical audit matters in audit reports. In order to gain insight concerning the estimates that are considered critical to the preparation of financial statements and might potentially be reported as critical audit matters, the disclosures in the 2017 Form 10-K filings for the Dow Jones 30 Industrials were reviewed. The potential linkage between management's disclosures of critical accounting estimates and the newly required auditor reporting of critical audit matters was analyzed, leading to three major predictions, as follows: 1) critical audit matters will most likely reflect items already identified by management as critical accounting estimates; 2) future Public Company Oversight Board inspections will be inclined to note shortcomings in critical audit matters reporting and generate controversy; and 3) management discussion and analysis will address, as critical accounting estimates, any matter raised by auditors as a critical audit matter.

JEL: M41, M42, M48

KEYWORDS: AICPA, CAMs, CAEs, KAMs, PCAOB, SEC, Audit Reports, Financial Statements

INTRODUCTION

The extended stresses arising from the Great Recession have generated a renewed focus on those areas which require critical accounting estimates and subjective judgments in preparing and auditing financial statements. The Public Company Accounting Oversight Board (PCAOB), whose actions can lead to broad change, has two recent related initiatives. First, under the recently enacted Auditing Standard (AS) 3101 (PCAOB, 2017a), the new auditor reporting requirements became effective for audits of fiscal years ending on or after December 15, 2017, with the exception of the requirement to discuss critical audit matters (CAMs) in the auditor's report. For large, accelerated filers as designated under Securities and Exchange Commission (SEC) regulations, the CAM requirement became effective for audits of fiscal years ending on or after June 30, 2019. All other companies subject to the new reporting standard will include discussions of CAMs in the auditor's report for audits of fiscal years ending on or after December 15, 2020. Second, the PCAOB proposed to modify its accounting estimates standard to enhance the quality of audit effort (PCAOB, 2017b). Overall, the proposal urged audit practitioners to do a better job in evaluating management's use of estimates and emphasized the need for maintaining a high level of professional skepticism. The proposal was very cogent and: 1) sought better integration with the risk assessment standards; 2) observed that for PCAOB inspections over 2008-2015, auditing accounting

estimates represented 56% of the deficiencies cited; and 3) discussed phenomena such as how humans process information. Not surprisingly, the PCAOB's proposal was approved by the SEC on July 1, 2019 (SEC, 2019). The amended guidance enhances the requirements for auditing accounting estimates, including fair value measurements, combining three related standards into a single standard that requires a uniform, risk-based approach to auditing accounting estimates. The new rules are effective for audits of financial statements ending on or after December 15, 2020.

Estimates are undeniably essential to financial reporting. For decades, the SEC's Regulation S-K has had an existing requirement for management to discuss critical accounting estimates (CAEs) in the management's discussion and analysis (MD&A) section of the annual report. In addition, auditors have long communicated critical matters and estimates to audit committees; however, they have not previously been required to communicate CAMs to the public in their auditor's report. This paper considers the interrelationship between CAEs and CAMs, and explores the symmetry that can be expected in the content of these communications and reports. In particular, this paper analyzes the current status of management's reporting of CAEs under the SEC rules and regulations that have existed for some time. In addition, the paper describes the PCAOB's new reporting requirement of CAMs by auditors, and derives expectations concerning the impact of the new rules on financial reporting and auditing. Specifically, the paper analyzes the content of management's recent MD&A communications concerning CAEs used in the preparation of financial statements and puts forward three predictions.

While prior research addressed various aspects of audit report quality and content, this study is the first to explore the expected connection between CAEs reported by management and CAMs to be included in auditors' reports under the new PCAOB rules. The analysis presented reveals ten major areas of critical accounting estimates that are important potential candidates for inclusion in CAM reporting. The CAEs contained in recent MD&A reports can serve as a starting point as auditors attempt to identify matters that warrant inclusion in CAM reporting. The remainder of the paper will first discuss the pertinent literature. Second, the data and methodology used to analyze the content of CAEs reported by management will be discussed, and three predictions will be presented. Next, a results section will present observed patterns in CAE reporting, followed by a discussion of a movement toward regulatory alignment as a path forward, and concluding comments along with directions for future research.

Background and Literature Review

In 1972, the Accounting Principles Board issued APB 22 requiring the disclosure of accounting policies as a requirement of generally accepted accounting principles when preparing financial statements (APB, 1972). In 1988, the American Institute of CPAs (AICPA) issued Statement on Auditing Standards (SAS) 57 – Auditing Accounting Estimates. In 2003, the SEC amended Regulation S-K to require a discussion about CAEs in the MD&A section of Form 10-K (SEC, 2003). The SEC urged companies to provide disclosure about CAEs in their MD&A if they have made accounting estimates and assumptions where the impact of the estimates or assumptions: 1) is highly subjective, uncertain, and subject to change; and 2) on financial statements is material. Therefore, public companies have been specifically required to identify and disclose the material estimates that underlie the financial statements for decades. In addition, for all companies, financial statements have been required to highlight critical accounting policies being used, which presumably embrace areas requiring critical estimates. In fact, one would be hard-pressed to identify a critical accounting policy that does not involve a CAE.

It is hard to argue that investors cannot benefit from more disclosure even though additional disclosures may be viewed as repetitious, lengthy, and possibly leading to information overload. In fact, there are other contexts in financial reporting where both management and auditors must separately discuss the same event in their disclosures. In the case of going concern issues, research indicates that the predictive ability of MD&A disclosure in predicting bankruptcy is incremental to the auditor's going concern opinion (Mayew

et al., 2015). Auditors' CAM disclosures and management's CAE disclosures may similarly provide incremental value to one another. Consistent with this possibility, Christensen et al. (2014) find that due to a source credibility effect, investors are more likely to change an investment decision when they receive an auditor's CAM paragraph than when they receive the same CAM information in a management disclosure.

Although the requirements and proposals championed by the PCAOB may be controversial, they reflect a trend that is currently taking hold globally. The International Auditing and Assurance Standards Board (IAASB) of the International Federation of Accountants (IFAC) issued International Standard on Auditing (ISA) 701, requiring auditors to communicate key audit matters (KAMs) in their audit reports (IFAC, 2015), which are very similar to the U.S.'s CAM requirements. While differing adaptations of this requirement have been adopted in various countries, it is difficult to determine whether ISA 701 is improving audit quality and the usefulness of audit reports. Both the United Kingdom Financial Reporting Council and the Association of Chartered Certified Accountants (FRC, 2018) conducted surveys of end users of financial statements as well as auditors and issued news releases stating that focusing on KAMs is valuable and has improved overall audit quality. A recent research study using data from UK firms showed that focusing on KAMs improves audit quality with no impact on audit costs (Reid et al., 2019). However, non-scientific surveys and studies in other countries (France, Canada, and Australia) show that focusing on KAMs and additional disclosures is costly and only marginally improves audit quality and information usefulness.

Importantly, country-specific institutional differences can result in disclosures being more value-added in some countries compared to other countries. Aerts and Tarca (2010) find that management commentary in U.S. financial reporting tends to be more extensive and formal and relies more heavily on technical accounting language than other countries, partly because enforcement is greater in the U.S. than in other countries. The authors conclude that greater expected regulatory and litigation costs in the U.S. result in more elaborate management commentary that reflects a risk-averse explanatory stance that may reduce the value of the commentary (Aerts and Tarca, 2010). The PCAOB's new CAM requirement represents a shift from a more precise to less precise auditor reporting standard. Gimbar et al. (2016) present experimental evidence that because CAM standards are imprecise, CAMs reduce the degree to which precise standards are perceived to constrain auditors' control over financial reporting outcomes, which leads to increased auditor liability. Regardless of the results from empirical and non-scientific studies and surveys, the view held by regulators in countries that have passed a CAM or KAM reporting requirement is that there are significant benefits from auditors' and companies' disclosures of CAMs, KAMs, and CAEs.

For CAEs specifically, a 2017 study supports regulators' view by suggesting that CAE disclosures communicate items of heightened uncertainty, which can be helpful to financial statement users in their task of assessing the degree of uncertainty reflected in accounting estimates (Glendening, 2017). On the other hand, research suggests there is room for improvement in CAE disclosures as some fall short of the SEC's desire for disclosed information to assess the past accuracy of or predict future changes in CAEs (Bauman and Shaw, 2014). The speed by which CAM/KAM requirements are being promulgated and implemented across countries may point to a state of groupthink (Janis, 1982). However, given the interplay between the SEC and the PCAOB, it is important to keep in mind that the U.S. environment is unique by nature. The SEC exercises oversight over the PCAOB. Any new rules put forth by the PCAOB must first be approved by the SEC and, upon approval, become enforceable by the SEC. This interplay between the SEC and PCAOB is highlighted in Palmrose's (2010) description of a meeting of the SEC in 2007 during which the SEC discussed issues related to alignment of SEC proposed management guidance with PCAOB proposed audit standards. Given the requirements of the SEC's Regulation S-K and the PCAOB's CAM disclosures, CAMs discussed in auditor reports are expected to be consistent with CAEs outlined by management in MD&As. While the auditor may spend time assessing other estimates, there is assuredly an expectation that the auditor will also focus on items identified by management as CAEs.

As defined by the PCAOB, CAMs are limited to matters that are communicated or are required to be communicated to the audit committee. The PCAOB's AS 1301 (PCAOB, 2012) already provides specific guidance requiring auditor communication with company audit committees about certain matters regarding the company's accounting policies, practices, and estimates. Since such communications are private, one cannot know what is being discussed regarding estimates. But, best practices would suggest that CAEs be among the issues discussed. Given the commonality of the definitions used for CAEs and CAMs, the auditor is thus already discussing CAMs with the audit committee. Since the new AS 3101 guidance draws upon AS 1301 requirements in defining the items being targeted as CAMs by the PCAOB, there will now be a partial public disclosure of items communicated between auditor and audit committee.

DATA AND METHODOLOGY

The PCAOB defines a CAM as an issue that is worthy of communication to the audit committee and 1) is material to the financial statements, and (2) involves auditor judgment that is especially challenging, subjective, or complex. In addition, the PCAOB discusses other attributes in evaluating potential matters and even presents a flowchart. From the overlap in definitions of CAEs per the SEC and CAMs per the PCAOB, it is logical to expect that:

Expectation 1: CAMs in auditor reports will most likely reflect items already disclosed in management's MD&A as CAEs.

Audit firms and company management understand that there is sensitivity concerning CAM disclosures in audit reports. Under U.S. requirements, if there are no matters that rise to the level of a critical audit matter, auditors must state so in the auditor's report. While PCAOB guidance suggests that at least one CAM disclosure is expected in audit reports, research indicates that disclosing a CAM (as opposed to stating that there were no CAMs) protects auditors against judgments of auditor liability in cases of undetected fraud, which may encourage boilerplate CAM disclosures of the less useful kind (Brasel et al., 2016). Since the identification and selection of a CAM for disclosure is judgmental, firms have been establishing procedures and interacting among themselves to ensure that there is a common understanding of CAMs and a clear underlying approach to selecting CAMs (Banham, 2018). Given that the identification of a CAM for disclosure essentially involves a judgment of judgments, it is inherently susceptible to second guessing. In forthcoming PCAOB inspections of CAM disclosures in audit reports, one might expect the PCAOB to note deficiencies in cases in which firms fail to identify certain matters as CAMs that in the PCAOB's judgment they should have identified. However, it is possible that at least initially the PCAOB will not be overly heavy-handed in its approach to the CAM inspections since the change represents a win for the regulators by having auditors disclose a significant portion of the discussions they have in deliberations with audit committees. Nevertheless, it is reasonable to conclude that:

Expectation 2: The forthcoming PCAOB inspections of CAM disclosures in audit reports will be inclined to note shortcomings and generate controversy.

Under best practices, the areas described by management as CAEs should also be among those items discussed with the audit committee and considered as potential CAMs for discussion in audit reports. But, conversely, if the audit report discusses CAMs not already included in the MD&A (as CAEs or otherwise), then it would seem logical that management would likely modify the MD&A to discuss those items. Given alignment in regulatory guidance and prudence, and assuming that management takes its responsibilities to prepare a comprehensive MD&A and wants to appear informed on all critical matters, it is logical to expect:

Expectation 3: The MD&A will address, as a CAE when applicable, any matter raised as a CAM in the audit report.

In order to gain insight about the estimates that are considered critical to the preparation of financial statements (and therefore may be candidates for CAM reporting going forward), the 2017 SEC filings of the largest 30 U.S. companies were analyzed. First, the year 2017 was selected to ensure that the reports filed constituted the most recent complete set of filings. Next, the 2017 Form 10-K filings for the Dow Jones 30 Industrials (as listed in the Wall Street Journal) were obtained since those companies are likely to have complex operations, provide insight concerning a wide range of critical accounting estimates, and are large accelerated filers. Finally, the CAEs disclosed in the MD&A section of those 30 filings were analyzed and summarized, providing insight into auditors' sizable task of selecting and reporting on CAMs. In total, the sample of CAE disclosures analyzed encompassed 149 observations. The identified areas were inherently predictable and reflected those CAEs that would be potentially applicable to all companies.

RESULTS

Table 1 identifies the top ten most common types of estimates discussed as CAEs in the 2017 MD&As examined and reports the number of companies discussing the different types of CAE disclosures in their annual reports. The findings presented in Table 1 indicate that there is a significant number of and variety of CAEs that auditors must consider for potential CAM inclusion. The analysis revealed interesting patterns of CAE reporting. Within the MD&As, the sample companies specifically entitled their discussions as CAEs 16 times, as Critical Accounting Policies 6 times, and as a combination of these two terms 8 times. In the CAE discussion, a generalized cross-reference to the accounting policy footnote contained in the financial statements was included by 16 companies. Commentary by Home Depot captures the sentiment of overlapping terminology and states that the most critical accounting policies are those that are both important to the portrayal of the company's financial condition and results of operations and that require significant judgment or use of significant assumptions or complex estimates.

Table 1: Top Ten CAEs in 2017 10-K Filings of Dow Jones 30 Industrials

	Commonly Discussed Critical Accounting Estimates	Number of Companies Disclosing CAEs
1	Goodwill, identifiable intangibles, long-lived asset (impairments)	29
2	Income taxes	25
3	Reserves (contra-revenue, warranty, legal contingencies)	17
4	Pension and other employee benefits	16
5	Revenue recognition and contracts	15
6	Valuation of investments	12
7	Valuation of accounts receivable, including allowance for bad debts	10
8	Inventory valuation	10
9	Business combinations, consolidations, restructurings, residuals	8
10	Stock-based compensation and foreign operations	7
	Total CAE disclosures included in sample	149

This table identifies the ten most common types of CAE disclosures in the 2017 Form 10-K filings for the Dow Jones 30 Industrials (as listed in the Wall Street Journal), and reports the number of companies discussing the different types of CAE disclosures in the MD&A section of the 10-K filings. To be included, we required the CAE to be discussed under a separate caption. Counts do not include mere references to the topic in other areas of disclosure.

There was a wide range of discussion detail for CAEs. At one end of the spectrum, Intel noted seven topics presented in a single page of discussion and five other companies presented two pages of discussion: Home Depot, McDonald's, Procter & Gamble, VISA, and Walmart. At the opposite end of the spectrum, Travelers discussed estimating challenges and approaches for each of its nine lines of business plus three other topics using 22 pages of dialogue (the next longest was nine pages by Coca-Cola). In addition, Goldman Sachs

and JP Morgan presented discussions of the internal controls over the processes that generate the estimates being reported. The fewest discussion topics discussed were three by Procter & Gamble, United Health, VISA, and Walmart. The most discussion topics discussed were 11 by Exxon, followed by 10 topics discussed by Caterpillar and Merck. Many accounting areas bearing significant estimation challenges were included as CAE discussion items by each of the companies in our sample. In addition, individual companies had unique areas of emphasis particular to their operations and management's perspectives. The following paragraphs summarize the top 10 CAE discussion items common to most of the 30 companies analyzed. Impairment of goodwill, identifiable intangibles, or long-lived assets was cited most frequently with 29 of the 30 companies discussing them in some manner. VISA was the only company that did not have at least one of these items included in its discussion.

By their nature, impairment assessment and recognition are stressful auditing events, since they are likely to be infrequent but significant when they occur. Goodwill only arises from acquisition accounting in a business combination and was discussed by 18 of the 29 companies. The impairment assessment is a complex calculation conceptually, since business is dynamic and, over time, companies rearrange and restructure their businesses, add new activities, and abandon other activities. Similarly, identifiable intangibles, discussed by 18 of the 29 companies, often arise as a separate asset from a business combination and relate to trademarks, patents, and intellectual property rights. These also have sensitivity, since any adjustment is likely to be material to carrying value. Lastly, since long-lived assets, discussed by 17 of the 29 companies, involve assets such as physical plant and equipment, assessing impairment can be more straightforward in this area of accounting than in the other two areas. Apple presented a unique insight: since its market environment is so fast-paced with innovation, its assessment of manufacturing-related assets is unusually demanding. Apple discussed this challenge in tandem with discussions about inventory valuation. Income taxes was identified and discussed next most frequently by 25 companies. Income taxes inherently involve estimations concerning not only data, but also legal interpretation of tax law including the hierarchy among various taxing jurisdictions. It also requires forecasting how tax matters will evolve over time and the potential tax environment over time. Interestingly, five companies did not have a separate discussion of income taxes. Boeing only mentioned income taxes in an overview paragraph as one of many items. Chevron noted it as one of the items considered under the topic “Contingency Losses,” but also cross-referenced to the financial statement footnotes. Home Depot, United Health, and Travelers did not mention income taxes within their CAE discussions.

Legal, contingency, and contra-revenue reserves was specifically noted by 17 companies under a more general nomenclature of contingency reserves. In seven instances, management elected to present separately a discussion of both contingency and contra-revenue areas. Pensions and employee benefits were mentioned by 16 companies. Since there has been a decline in the number of defined benefit plans over time, and since these plans would usually relate to large workforces, it is more likely this issue relates to larger companies such as the ones reviewed in this study. The estimation issues not only impact reported pension related expense, but also the funding requirements for the plans. These estimation challenges have been known for decades and involve actuaries and other specialists.

Revenue recognition was identified as a lead issue by 15 companies. In 1999, the SEC issued Staff Accounting Bulletin 101 specifically targeting issues related to revenue recognition (SEC, 1999). The Bulletin specifically admonishes auditors to approach an audit with professional skepticism regarding revenue recognition. Revenue often generates ancillary material estimates such as: warranty-type costs mentioned by Apple and Cisco, post-sale discount reserves cited by Caterpillar, vendor allowances noted by Home Depot, commitments for add-on services to customers such as liability for membership rewards expense discussed by American Express, and credit card rewards liability indicated by JP Morgan. Contract accounting, which is a subset of revenue recognition issues, was mentioned as a concern several times and involved both the company delivering services and related profit calculations and commitments to others to take delivery. In addition, estimating challenges were discussed when the underlying contracts were

long-term. To further complicate matters, Accounting Standards Update (ASU) 2014-09, "Revenue from Contracts with Customers" (Topic 606) became effective in 2017 for large filers (FASB, 2017).

Valuation of investments includes issues of impairment as well and was highlighted by 12 companies. This assessment can be especially challenging for those situations where clear market values do not exist. Further, the Financial Accounting Standards Board recently issued ASU 2016-13, "Financial Instruments – Credit Losses" (Topic 326, FASB, 2016), which requires the recognition of current expected credit losses at the time of origination or purchase of a financial instrument (Pinello and Puschaver, 2018). Valuation allowances for accounts receivable is an area that has been a challenge for decades. Topic 326, which applies to valuation allowances, was discussed by 10 companies, including Goldman Sachs, JP Morgan, Caterpillar, VISA, and others. Inventory valuation was similarly cited by 10 companies. For example, Walgreens highlighted cost of sales and inventories combined and Merck discussed the challenges of valuing pre-launch inventories.

Business combinations, consolidations, restructurings, and residuals, including purchase accounting as well as sales of businesses, was mentioned by DowDupont, IBM, Intel, McDonald's, and Pfizer. Discussions included allocating purchase prices to determine the proper recording of assets, liabilities, goodwill, and identifiable intangibles. Merck discussed the difficulties in estimating the cost of restructuring activities. The challenges of consolidation and the difficulties of assessing variable interest entities were mentioned by Coca-Cola. Exxon discussed the stresses of equity accounting and the nature of its joint ventures and stated that it does not invest in these companies in order to remove liabilities from its balance sheet. Estimating residual values was mentioned by Caterpillar and IBM, even though the two businesses would appear to be distinctly different. Yet, they both have business activities involving equipment leasing. Thus, residual values impact both the profitability and the nature of the lease.

Stock-based compensation and foreign operations was mentioned by Caterpillar, Johnson & Johnson, McDonald's, Merck, and Nike. This area is particularly sensitive since it usually involves senior management compensation and requires valuation using various estimation models. Although most of the companies have significant international and financial operations, only Exxon and Nike broke out separate discussions of foreign exchange or hedge accounting challenges. The results of the analysis summarized above are indicative of the complexity of accounting estimates reflected in current-day financial reporting, and may be suggestive of forthcoming CAM disclosures. For some years, the SEC has required managers to publicly disclose the implications of these critical estimates in the MD&A section of the annual report. With the recently passed CAM requirements, the PCAOB now requires auditors to also publicly disclose the implications of accounting estimates, the auditing of which involves subjective and complex auditor judgment. The next section will discuss the alignment of the SEC's and PCAOB's regulatory guidance, as well as the alignment of auditor reporting requirements across countries, as a path forward to meet stakeholder needs in a rapidly changing environment.

A PATH FORWARD: MOVING TOWARD ALIGNMENT

Recent regulatory developments within the U.S. and across the globe point toward two facets of alignment. First, there is movement toward alignment within the U.S. in terms of regulatory guidance: the newly enacted guidance provided by the PCAOB (pertaining to CAM reporting in auditor reports) aligns with the long-standing regulatory guidance provided by the SEC (pertaining to CAE disclosures in MD&As). Second, there is movement toward aligning U.S. auditor reporting requirements with other countries who previously promulgated similar auditor reporting requirements. Both facets of alignment are necessary to meet the needs of capital market participants in a global environment characterized by increasing complexity and uncertainty.

In the U.S., the current and evolving set of regulatory guidance brings three sets of eyes to focus on the critical estimates underlying the preparation of the financial statements. First, management has the responsibility for preparing the financial statements and has the highest level of information and insight to publicly disclose CAEs. Per SEC requirements, management discusses such CAEs in the MD&A. Next, the independent auditor brings objectivity and professional skepticism to the table and, as now required by the PCAOB, will begin to disclose CAMs that will most likely reflect CAEs. Finally, the audit committee and the board of directors bring seasoned experience and inside information to bear on CAMs and CAEs.

These regulatory requirements align management, auditor, and audit committee focus and responsibilities. Under long-standing PCAOB standards, auditors are required to perform a risk assessment and plan the audit to direct effort toward those areas most critical to preparation of the financial statements. The auditor's efforts should logically align with management's CAEs disclosed in the MD&A. In other words, a client company's CAEs would be included in the auditor's risk assessment and testing procedures, and auditors are attesting to CAEs reflected in the financial statements. In addition, the company's internal control over financial reporting should naturally place strong focus on ensuring the proper identification and disclosure of CAEs. Under requirements of the Sarbanes-Oxley Act of 2002, a company's management must assess and report on the effectiveness of its internal control and the auditor must separately attest to the company's internal control effectiveness as well. Since internal controls encompass identification and disclosure of CAEs and the auditor issues an opinion on internal control effectiveness, the auditor implicitly attests to the identification of the CAEs. In addition, the auditor is also required to have comprehensive communications with the audit committee about important matters, such as critical estimates.

The PCAOB's new CAM reporting requirements expand such alignment. Per the PCAOB, CAMs indicate areas in the financial statements that involve the application of significant judgment or estimation by management, including estimates with significant measurement uncertainty. The PCAOB guidance for CAMs clearly aligns with the guidance of SEC regulations regarding CAE disclosures. In order to achieve the benefits of such alignment, auditors should avoid boilerplate CAM disclosures and instead ensure that CAM disclosures provide value-added information incremental to the CAEs already contained in the MD&A section of the annual report.

Given the changes in auditor reporting requirements in the international landscape, the change to CAM reporting in the U.S. increases the comparability of financial reporting in a global setting. It is important to note that differences in the definition of CAMs/KAMs exist across countries, and the execution of CAM reporting is also likely to vary across countries due to institutional differences. It is also the case that an equivalent to the SEC's CAE reporting requirement on the part of management may not exist in other countries. Therefore, while CAM reporting exists in addition to CAE reporting in the U.S., this may not be the case in other countries. In order to provide informative CAM disclosures in the U.S., it is important for U.S. auditors to take into consideration the CAEs that their U.S. clients already report in the MD&A. While great movement toward alignment has been made as discussed above, both requirements of CAE and CAM reporting apply only to publicly listed companies in the U.S. As a result, there is currently a discrepancy in reporting for public versus private U.S. companies. Moving forward, a consideration of aligning reporting requirements for private and public company clients might be beneficial.

CONCLUDING COMMENTS AND SUGGESTIONS FOR FUTURE RESEARCH

As of July 2019, the Public Company Accounting Oversight Board has requirements for disclosing critical audit matters (CAMs) in audit reports. The implementation of CAM reporting in the U.S. follows the pronouncement of similar requirements concerning key audit matters (KAMs) in a number of other countries around the globe as promulgated by the IAASB and IFAC. The potential linkage between the forthcoming auditors' CAM reporting and the existing required reporting of CAEs in the Management Discussion and Analysis (MD&A) section of annual reports under U.S. SEC rulings was deliberated,

leading to three predictions. In order to gain insight concerning the estimates that are considered critical to the preparation of financial statements and might potentially be reported as CAMs, the disclosures in the 2017 Form 10-K filings for the Dow Jones 30 Industrials were reviewed and 149 observations were obtained. Challenging CAEs underlie the preparation of financial statements and having three sets of eyes (management, audit committee, and auditor) focusing on those areas as opposed to one or two sets may result in increased financial reporting quality, audit quality, and investor confidence. Existing efforts when planning and conducting an audit will often bring forth the key issues and audit findings regarding accounting measurement, recognition, and reporting controversies. The analysis conducted in this study indicates that there are ten key areas of financial measurement and reporting involving critical accounting estimates that are important potential candidates for CAM reporting. There is a natural interrelationship between CAEs and CAMs, making it likely that CAMs will reflect these items discussed as CAEs, and vice versa. Even when CAMs and CAEs overlap, the two sets of disclosures will reveal two different perspectives (the auditors' versus management's), each of which is expected to add incremental value. As auditors grapple with first-time implementation of CAM reporting, management's CAE disclosures can provide a starting point.

Our conclusions are limited by the fact that our sample spans only one year and is limited to the Dow Jones 30. The CAEs of other companies not included in the Dow Jones 30 might reflect CAE disclosure patterns that differ from those observed in this study. However, the composition of the Dow Jones 30 reflects the dominant sectors of the U.S. economy, which improves the generalizability of the CAE disclosure patterns documented in this study. In addition, reported CAEs are not expected to vary greatly from year to year. A few open questions should be addressed by future research. First, a scrutiny of future CAM reporting for the Dow Jones 30 Industrials and PCAOB inspections of top audit firms can test the empirical validity of the predictions made in this paper. In addition, future research can determine whether the predicted increases in investor confidence and audit quality materialize as a result of CAM reporting. Furthermore, future research can investigate whether the emphasis on CAMs, in addition to the existing requirements to report CAEs, is worth the cost of additional audit fees and findings of deficiency by the PCAOB during the annual scrutiny of audit firm outcomes.

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Accounting & Taxation
Vol. 12, No. 1, 2020, pp. 35-44
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

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COST OF DEBT AND AUDITOR CHOICE

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ABSTRACT

This paper examines whether auditor choice affects a firm's cost of debt and whether debt sources matter. We find that the choice of a brand name or industry specialist auditor decreases a firm's cost of debt. The additional impact of industry specialization, however, is not significant for the sub-sample of Big N audited firm-years. For the sub-sample of non-Big N audited firm-years, engaging an industry specialist auditor appears to increase cost of debt. A further breakdown of the full sample into a sample with only private debt and a sample with both public and private debt provides more insight. For the sample with both public and private debt, engaging a brand name and specialist auditor decreases cost of debt. But for the sample with only private debt, engaging a specialist auditor increases cost of debt. Our findings provide additional evidence for the role of external auditing in reducing cost of debt and show differences between the two dimensions of auditor differentiation: brand name reputation and industry specialization. Furthermore, our findings suggest that the choice of an industry specialist auditor has different impact on cost of debt for firms that have only private debt and firms that also have public debt.

JEL: M41, M42

KEYWORDS: Auditor Choice, Cost of Debt, Debt Sources, Public Debt, Private Debt

INTRODUCTION

The demand for auditing from debt holders arises because of the agency conflicts between debt holders and managers/shareholders. Auditing is an important external monitoring mechanism that mitigates the agency cost between debt holders and manager/shareholders because it delivers credibility to a firm's financial information that is used to evaluate its debt-paying ability. The benefit from reduced agency costs is shared between firms and debt holders and could result in lower cost of debt. The auditor differentiation literature typically considers large and industry specialist auditors to provide higher-quality audits. Thus the choice of brand name and specialist auditors is expected to further reduce cost of debt. Pittman and Fortin (2004) find that retaining a Big-N auditor lowers cost of debt for newly public firms. Mansi, Maxwell, and Miller (2004) find similar results using the bond market data. Fortin and Pittman (2007), however, find that retaining a Big-N auditor does not affect 144A bond pricing for private firms.

This paper extends the prior literature in three ways. First, using a comprehensive dataset, it examines whether the relation between auditor choice and cost of debt hold in general. Secondly, besides brand name reputation (Big N versus non-Big N distinction), it also examines another important dimension of auditor choice, industry specialization, which has drawn special attention from practitioners and researchers in more recent years. Thirdly, it examines whether the choice of a Big N or industry specialist auditor matters for firms that have only private debt. Given the information and monitoring advantage of private debt holders, it is possible that the impact of choosing Big N/industry specialist auditor on cost of debt is weak for firms with only private debt.

Our sample covers the years from 1988 to 2013. Additional analyses are performed on a sample of firm-years that have both public and private debt and a sample of firm-years that have only private debt. The additional explanatory power of industry specialization is identified by separately analyzing a sub-sample that is audited by Big N auditors only and a sub-sample that is audited by non-Big N auditors.

Our results show that the choice of a brand name or industry specialist auditor decreases a firm's cost of debt. The additional explanatory power of industry specialization is very weak, however, when using a sample of Big N audited firm-years. For the sample of non-Big N audited firm-years, engaging an industry specialist auditor has the effect of increasing cost of debt. A further breakdown of the full sample into a sample with both public and private debt and a sample with only private debt provides more insight. For the sample with both public and private debt, engaging a brand name or a specialist auditor decreases cost of debt. The result holds when using sub-sample of Big N audited firm-years to seek the additional explanatory power of industry specialist. But for the sample with only private debt, engaging a specialist auditor marginally increases cost of debt for both Big-N audited firm-years and non-Big N audited firm-years. The results suggest that engaging a brand name auditor decreases cost of debt in general, but having an industry specialist auditor might not benefit firms that have only private debt.

Our paper contributes to the literature in three ways. It provides additional evidence for the general role of external auditing in reducing agency cost of debt. It suggests differences between brand name reputation and industry specialization. It also shows the different role of external auditing in mitigating agency conflicts for firms that have only private debt.

The rest of the paper is organized as follows. In the next section, we review relevant literature and develop hypotheses. We then present the data and methodology, followed by a discussion of the results. In the last section, we provide concluding comments.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The demand for auditing arises because of agency problems between managers/shareholders and debt holders. External auditing is an important external monitoring mechanism. It delivers credibility to a firm's financial accounting information that is used to evaluate the creditworthiness of a business and its debt-paying ability. So the agency cost theory predicts that external auditing reduces agency cost between debt holders and shareholders/managers. The benefits of reduced agency cost are shared between debt holders and borrowing firms. For firms, the benefits can be reflected in lowered cost of debt.

The auditor differentiation literature typically considers Big N auditors to provide higher-quality audits because they are more competent and independent. Large auditors are generally more competent because of economies of scale and technical expertise. Large auditors are more independent because: (1) relative financial independence enables them to stand up against clients' questionable reporting behaviors; (2) they have more quasi-rent to lose if they fail to deliver high-quality audits; (3) they are more concerned about protecting their investment in reputation capital; (4) litigation risk is higher for large auditors because of their "deeper pocket" (Dye, 1993).

The positive relation between auditor size and audit quality is supported by many empirical auditor differentiation studies using various constructs such as discretionary accruals, management forecast errors, earnings response coefficients, the promptness of disclosing auditor changes, going-concern opinions, other modified audit opinions, and conservatism as defined as asymmetric recognition of gains and losses (Becker et al., 1998; Francis et al., 1999; Davidson and Neu, 1993; Teoh and Wong, 1993; Schwartz and Soo, 1996; Francis and Krishnan, 1999; Kim et al., 2003)

The arguments on differentiated audits for different size auditors have been extended to industry specialization. Prior studies focus more on auditor size. But industry specialization has drawn much attention in the auditing literature since these earlier studies. For example, Lim and Tan (2008) find the relation between non-audit service fees and audit quality differs between firms audited by industry specialists and non-specialists. Gul et al. (2009) find industry specialization also affects the relation between earnings quality and auditor tenure. So we examine the choice of industry specialist auditors as well.

An auditor might build competitive advantage through specializing in certain industries. It invests heavily in industry-specific technologies, recruits and trains professionals and builds organizational structures around this objective. Industry specialization is argued to enhance audit effectiveness because the error characteristics and methods of detection differ across industries (Maletta and Wright, 1996) and knowledge and best practices gained from auditing other clients of the same industry are transferable. As a result, financial statements audited by industry specialist auditors are considered to be of better quality.

As to empirical evidence, financial statements audited by specialist auditors have been found to have lower levels of discretionary accruals (Balsam et al., 2003), higher earnings response coefficients (Balsam et al., 2003), and enhanced disclosures (Dunn & Mayhew, 2004). Krishnan (2005) uses the asymmetric timeliness measure of conservatism and finds that financial statements audited by specialist auditors are quicker in recognizing losses and are therefore more conservative.

In summary, based on the arguments that external auditing mitigates agency conflicts and Big N/specialist auditors provide higher-quality audits, we have the following hypotheses:

Hypothesis 1 (a): Firms with Big N/specialist auditors receive lower cost of debt

Hypothesis 1 (b): Firms audited by specialist Big N auditors receive lower cost of debt

Hypothesis 1 (c): Firms audited by specialist non-Big N auditors receive lower cost of debt

Public and private debt markets differ in monitoring functions and covenant features. Private debt holders have better access to the borrower's private information and they have better information processing capacity. They are typically monitoring experts. There are generally more accounting-based negative covenants in private debt contracts and the covenants are set tighter. Technical violation of private debt covenants is more prevalent. Any technical violation hands over part of the control rights to debt holders who can then step in and enforce their preferred actions (Dichev and Skinner, 2002). In contrast, the incentive to engage in monitoring is weak for diffuse creditors of public debt due to the "free rider" problem (Strahan, 1999). There are less accounting-based debt covenants in public debt and they are set looser.

Due to their information and monitoring advantage, private debt holders are expected to have less demand for the monitoring of external auditors compared to the public debt holders. As a result, the effect of choosing a brand name/specialist auditor on cost of debt is weaker for firms that have only private debt. We therefore have the following hypotheses:

Hypothesis 2 (a): Firms that have private debt only will not receive lower cost of debt for engaging Big N/specialist auditors

Hypothesis 2 (b): Firms that have private debt only will not receive lower cost of debt for engaging Big N specialist auditors.

Hypothesis 2 (c): Firms that have private debt only will not receive lower cost of debt for engaging non-Big N specialist auditors.

DATA AND METHODOLOGY

To test our hypotheses, the following model is used.

$$\begin{aligned} Interest\ rate = {} & \alpha + \beta_1 Auditor(Specialization) + \beta_2 Leverage + \beta_3 Prime\ rate \\ & + \beta_4 Default + \beta_5 Size + \beta_6 Fixed\ assets + \beta_7 Negative\ equity \\ & + \beta_8 Profitability + Industry + Year + \varepsilon \end{aligned} \quad (1)$$

Auditor choice is measured along two dimensions: brand name reputation as designated by Big N and non-Big N auditors and industry specialization. Brand name reputation is coded as a dichotomous variable *(Auditor)* that equals 1 if financial statements are audited by one of the Big N and 0 otherwise. Following prior literature (Craswell et al., 1995; Lim and Tan, 2008), industry specialization *(Specialization)* is measured as an auditing firm's industry market share. To be specific, it is calculated as the audit firm's market share of the client firm's two-digit SIC industry.

$$Specialization_{ik} = \frac{\sum_{j=1}^{J_{ik}} Sales_{ijk}}{\sum_{i=1}^{I_k} \sum_{j=1}^{J_{ik}} Sales_{ijk}} \quad (2)$$

Sales refers to the client firm's sales revenue. The numerator is the sum of sales of all J_{ik} clients of an auditor i in industry k for a specific year. The denominator is the sum of sales of all firms (clients and non-clients of i) in industry k for the same year. The results presented have industry specialization as a continuous variable to avoid the ambiguity of arbitrarily using a cut-off point for dichotomous variables.

Cost of debt *(Interest Rate)* is measured with interest expenses divided by the average total debt. We follow Pittman and Fortin (2004) in selecting the control variables. *Leverage* is the sum of short-term debt and long-term debt divided by total assets. *Prime Rate* is the average prime rate for the year; *Default* is the difference between the yield on BAA-rated corporate bonds and the yield on 10-year government bonds for the year; *Size* is the natural logarithm of total assets; *Fixed Assets* is gross property, plant and equipment divided by total assets; *Neg Equity* equals 1 if the book value of common equity is negative; *Profitability* is income before extraordinary items divided by total assets. *Industry* represents indicator variables coded following Fama-French industry classification (Fama and French,1997); *Year* is also indicator variables to control for year fixed effect.

We follow the practice of Faulkender and Peterson (2006) that use the availability of S&P credit ratings to identify the availability of public debt. A firm-year is considered as having only private debt if S&P long-term domestic issuer credit rating or a short-term domestic issuer credit rating for that year does not exist. This method of segregating public and private debt is also justified by Cantor and Packer (1997) who report that " both agencies (S&P and Moody's) currently have a policy of rating ALL taxable corporate bonds publicly issued in the United States regardless of whether they have been asked by an issuer for a rating". This statement suggests that there are rarely public debt issues that are covered by other rating agencies but not by S&P.

We select our sample from COMPUSTAT Annual that covers the time horizon of 1988 to 2013. We truncate observations falling into the top and bottom 1 percent of all continuous independent variables. There are 130,307 observations in the full sample. The public debt sample has 25,163 observations and the private debt sample has 105,144 observations.

Table 1 presents the summary statistics. The mean (median) interest rate for the full sample is 11.9% (9%). For the public-private debt sample, the mean (median) interest rate is 8.8% (8.2%) while it is 12.8% (9.4%)

for the private debt sample. The statistics show the dominance of Big N auditors that audit 80% of firm-years for the full sample, 97% for the public-private debt sample and 74.6% for the private debt sample. The mean market share measured by client sales revenues for auditors is 16.5%, 23% for the public-private debt sample and 14.5% for the private debt sample. Mean leverage is 33.2%, 39.9% and 31.1% for the full sample, public-private debt sample and private debt only sample respectively. Primate rate is roughly 7.5% and default rate is around 2% for the three samples. The public-private debt sample is much large with a mean (median) total asset of 5,828 (1,958), as compared to 540 (58) for the private debt only sample. Fixed assets are 55.7% of total assets for the full sample, 69.3% and 51.5% for the public-private debt sample and the private debt only sample. 11.3% of firm-years have negative book value of common equity for the full sample, 9% and 12% for the sub-samples. The mean (median) profitability is negative 11.8% (positive 2.1%) of total assets for the full sample, positive 1.6% (3.2%) for the public-private debt sample and negative 16% (positive 1.3%) for the private debt only sample.

Table 1: Descriptive Statistics

	Full Sample			**Public-private Debt Sample**			**Private Debt Sample**		
Variable	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**
Interest rate	0.119	0.09	0.141	0.088	0.082	0.05	0.128	0.094	0.158
Auditor	0.8	1	0.4	0.97	1	0.171	0.746	1	0.435
Specialization	0.165	0.129	0.144	0.23	0.206	0.146	0.145	0.114	0.138
Leverage	0.332	0.277	0.338	0.399	0.351	0.258	0.311	0.237	0.357
Prime rate	7.573	8.25	1.83	7.387	8	1.887	7.631	8.25	1.808
Default	2.033	1.958	0.461	2.083	1.968	0.487	2.017	1.958	0.452
Size	1,804	131	6,540	5,828	1,958	11,380	540	58	2,967
Fixed assets	0.557	0.467	0.423	0.693	0.653	0.436	0.515	0.418	0.41
Neg equity	0.113	0	0.316	0.09	0	0.286	0.12	0	0.325
Profitability	-0.118	0.021	0.618	0.016	0.032	0.13	-0.16	0.013	0.699

This Table shows the descriptive statistics of the dependent and independent variables. Interest Rate is measured with interest expenses divided by the average total debt. Auditor is coded as a dichotomous variable that equals 1 if financial statements are audited by one of the Big N and 0 otherwise. Specialization is measured as an auditing firm's industry market share. Leverage is the sum of short-term debt and long-term debt divided by total assets. Prime Rate is the average prime rate for the year. Default is the difference between the yield on BAA-rated corporate bonds and the yield on 10-year government bonds for the year. Size is the natural logarithm of total assets. Fixed Assets is gross property, plant and equipment divided by total assets. Neg Equity equals 1 if the book value of common equity is negative. Profitability is income before extraordinary items divided by total assets.

RESULTS AND DISCUSSION

Table 2 presents the Pearson correlation. The correlation shows a negative relation between interest rate and the choice of brand name and specialist auditors. This Table also shows that Big N measure of auditor choice and industry specialist measure are highly correlated. To tease out the effect of industry specialization, we also use sub-samples of Big N or non-Big N audited firm-years to perform additional analyses testing H1 (b), H1 (c), H2 (b), and H2 (c).

Table 2: Pearson Correlation

Variables	Interest Rate	Auditor	Specialization	Leverage	Prime Rate	Default	Size	Fixed Assets	Negative Equity	Profitability
Interest rate	1									
Auditor	-0.100*	1								
Specialization	-0.072*	0.484*	1							
Leverage	-0.031*	-0.096*	-0.036*	1						
Prime rate	0.017*	0.060*	-0.094*	-0.026*	1					
Default	0.003	-0.051*	0.084*	0.075*	-0.583*	1				
Size	-0.073*	0.114*	0.179*	-0.012*	-0.080*	0.059*	1			
Fixed assets	-0.080*	0.047*	0.091*	0.113*	-0.003	0.011*	0.076*	1		
Neg equity	0.116*	-0.126*	-0.066*	0.488*	-0.052*	0.079*	-0.068*	0.016*	1	
Profitability	-0.213	0.203*	0.114*	-0.311*	0.076*	-0.121*	0.067*	0.027*	-0.326*	1

This Table shows the Pearson correlation between the dependent and independent variables. Interest Rate is measured with interest expenses divided by the average total debt. Auditor is coded as a dichotomous variable that equals 1 if financial statements are audited by one of the Big N and 0 otherwise. Specialization is measured as an auditing firm's industry market share. Leverage is the sum of short-term debt and long-term debt divided by total assets. Prime Rate is the average prime rate for the year. Default is the difference between the yield on BAA-rated corporate bonds and the yield on 10-year government bonds for the year. Size is the natural logarithm of total assets. Fixed Assets is gross property, plant and equipment divided by total assets. Neg Equity equals 1if the book value of common equity is negative. Profitability is income before extraordinary items divided by total assets.

Table 3 presents the results for the full sample. We find consistent evidence that firms with Big N or industry specialist auditors are rewarded with lower cost of debt, confirming the results in Pittman and Fortin (2004). To explore the additional explanatory power of industry specialization, we run the analysis using Big N-audited firm-years and non-Big N audited firm years. The coefficient for specialization is not significant for the former sub-sample and significantly positive for the latter sub-sample, which suggests that firms pay higher interest rate if you choose a non-Big N specialist auditor.

Table 3: Cost of Debt and Auditor Choice: Full Sample

	Pred. Sign	Brand Name		Industry Specialists		Industry Specialist Big N Audited Firm-years		Industry Specialist Non-Big N Audited Firm-years	
Intercept	+	0.343	(1.00)	0.336	(1.00)	0.116	(1.00)	0.112	(1.00)
Auditor	-	-0.007	(0.00)						
Specialization	-			-0.009	(0.00)	0.002	(0.44)	0.048	(0.02)
Leverage	+	-0.060	(0.00)	-0.060	(0.00)	-0.070	(0.00)	-0.050	(0.00)
Prime rate	+	-0.008	(1.00)	-0.008	(1.00)	0.002	(1.00)	0.005	(1.00)
Default	+	-0.064	(1.00)	-0.062	(1.00)	0.013	(1.00)	0.023	(1.00)
Size	-	-0.005	(0.00)	-0.005	(0.00)	-0.005	(0.00)	-0.005	(0.00)
Fixed assets	-	-0.018	(0.00)	-0.018	(0.00)	-0.017	(0.00)	-0.024	(0.00)
Neg equity	+	0.044	(0.00)	0.044	(0.00)	0.046	(0.00)	0.041	(0.00)
Profitability	-	-0.043	(0.00)	-0.044	(0.00)	-0.047	(0.00)	-0.040	(0.00)
R2		0.089		0.088		0.077		0.086	
Adj. R^2		0.084		0.084		0.075		0.081	

The full sample has 130,307 observations that cover the time horizon of 1988 to 2013. Interest Rate is measured with interest expenses divided by the average total debt. Auditor is coded as a dichotomous variable that equals 1 if financial statements are audited by one of the Big N and 0 otherwise. Specialization is measured as an auditing firm's industry market share. Leverage is the sum of short-term debt and long-term debt divided by total assets. Prime Rate is the average prime rate for the year. Default is the difference between the yield on BAA-rated corporate bonds and the yield on 10-year government bonds for the year. Size is the natural logarithm of total assets. Fixed Assets is gross property, plant and equipment divided by total assets. Neg Equity equals 1 if the book value of common equity is negative. Profitability is income before extraordinary items divided by total assets.

A further breakdown of the full sample into a sample with both public and private debt and a sample with private debt alone provides more insight. For the sample with both public and private debt, the coefficient on specialist is significantly negative. The significant negative relation holds when we use Big-N audited firm-years. For the non-Big N audited firm-years, however, the relation is not significant. The results are presented in Table 4. For the sample with private debt alone, however, the results are the opposite for the sub-samples. Although we find firms that have only private debt pay lower cost of debt when they engage a brand name auditor, the negative relation turns positive for the two sub-samples (Big N-audited firm-years and non-Big N audited firm-years). The results are presented in Table 5. This indicates that despite of their information advantage and monitoring effectiveness, the private debt market still values the monitoring function of Big N auditors. However, the results also suggest that engaging a specialist auditor might be perceived negatively by the private debt holders beyond the brand name consideration.

Table 4: Cost of Debt and Auditor Choice: Public-private Debt Sample

Variables	**Public Debt (25,163 obs)**				
	Pred. Sign	**Brand Name**	**Industry Specialists**	**Industry Specialist Big N Audited Firm-years**	**Industry Specialist Non-Big N Audited Firm-years**
Intercept	+	0.092 (1.00)	0.089 (1.00)	0.087 (1.00)	-0.031 (0.88)
Auditor	-	-0.004 (0.02)			
Specialization	-		-0.007 (0.00)	-0.006 (0.00)	-0.010 (0.68)
Leverage	+	-0.023 (0.00)	-0.023 (0.00)	-0.022 (0.00)	-0.050 (0.00)
Prime rate	+	0.004 (1.00)	0.004 (1.00)	0.004 (1.00)	0.006 (0.61)
Default	+	0.013 (1.00)	0.013 (1.00)	0.013 (1.00)	0.075 (0.33)
Size	-	-0.005 (0.00)	-0.005 (0.00)	-0.005 (0.00)	-0.008 (0.00)
Fixed assets	-	-0.007 (0.00)	-0.007 (0.00)	-0.007 (0.00)	-0.005 (0.49)
Neg equity	+	0.031 (0.00)	0.031 (0.00)	0.031 (0.00)	0.032 (0.00)
Profitability	-	-0.029 (0.00)	-0.029 (0.00)	-0.029 (0.00)	-0.044 (0.05)
R2		0.137	0.138	0.139	0.125
Adj. R^2		0.132	0.132	0.135	0.120

The public-private debt sample has 25,163 observations that cover the time period of 1988 to 2013. Interest Rate is measured with interest expenses divided by the average total debt. Auditor is coded as a dichotomous variable that equals 1 if financial statements are audited by one of the Big N and 0 otherwise. Specialization is measured as an auditing firm's industry market share. Leverage is the sum of short-term debt and long-term debt divided by total assets. Prime Rate is the average prime rate for the year. Default is the difference between the yield on BAA-rated corporate bonds and the yield on 10-year government bonds for the year. Size is the natural logarithm of total assets. Fixed Assets is gross property, plant and equipment divided by total assets. Neg Equity equals 1 if the book value of common equity is negative. Profitability is income before extraordinary items divided by total assets.

Table 5: Cost of Debt and Auditor Choice: Private Debt Only Sample

Variables	Private Debt Only (105,144 obs)				
	Pred. Sign	Brand Name	Industry Specialists	Industry Specialist Big N Audited Firm-Years	Industry Specialist Non-Big N Audited Firm-years
Intercept	+	0.152 (0.00)	0.151 (0.00)	0.194 (0.03)	0.520 (0.00)
Auditor	-	-0.010 (0.00)			
Specialization	-		-0.008 (0.02)	0.007 (0.10)	0.047 (0.04)
Leverage	+	-0.064 (0.00)	-0.063 (0.00)	-0.082 (0.00)	-0.050 (0.00)
Prime rate	+	0.001 (0.00)	0.001 (0.00)	-0.003 (0.54)	-0.015 (0.08)
Default	+	0.001 (0.52)	0.001 (0.34)	-0.011 (0.72)	-0.124 (0.03)
Size	-	-0.004 (0.00)	-0.004 (0.00)	-0.004 (0.00)	-0.005 (0.00)
Fixed assets	-	-0.021 (0.00)	-0.021 (0.00)	-0.019 (0.00)	-0.023 (0.00)
Neg equity	+	0.046 (0.00)	0.046 (0.00)	0.049 (0.00)	0.042 (0.00)
Profitability	-	-0.045 (0.00)	-0.045 (0.00)	-0.049 (0.00)	-0.040 (0.00)
R2		0.074	0.072	0.067	0.087
Adj. R^2		0.070	0.069	0.062	0.080

The private debt sample has 105,144 observations that cover the time periods of 1988 to 2013. *Interest Rate* is measured with interest expenses divided by the average total debt. *Auditor* is coded as a dichotomous variable that equals 1 if financial statements are audited by one of the Big N and 0 otherwise. *Specialization* is measured as an auditing firm's industry market share. *Leverage* is the sum of short-term debt and long-term debt divided by total assets. *Prime Rate* is the average prime rate for the year. *Default* is the difference between the yield on BAA-rated corporate bonds and the yield on 10-year government bonds for the year. *Size* is the natural logarithm of total assets. *Fixed Assets* is gross property, plant and equipment divided by total assets. *Neg Equity* equals 1 if the book value of common equity is negative. *Profitability* is income before extraordinary items divided by total assets.

As a robustness check, we also use two alternative measures that are based on the market share but coded as dichotomous variables. First, an industry specialist auditor is defined as the auditor with the largest industry market share and second it is defined as any auditor with a market share of 24% or more. The results are qualitatively the same when these two alternative measures are used.

CONCLUSION

In this paper, we examine the impact of choosing a brand name or specialist auditor on a firm's cost of debt. We further examine whether the impact differs between firms that only offer private debt and firms that also have public debt. Using a sample that covers the years from 1988 to 2013, we find that engaging a brand name auditor decreases cost of debt. But the additional impact of industry specialist is weak. For firm-year observations that only have private debt, the choice of specialist auditor might even increase cost of debt, once the choice of brand name has been fixed. The findings indicate differences in the two aspects of auditor choice – brand name reputation and industry specialization. The findings also suggest that despite of private debt holders' information and monitoring advantages, they still value the external monitoring provided by Big N auditors. However, their perception of industry specialist auditor differs from that of the public debt holders. Specifically, engaging a brand name auditor decreases cost of debt in general, but having an industry specialist auditor might not benefit firms that have only private debt.

Our paper contributes to the literature in three ways. It provides additional evidence for the general role of external auditing in reducing agency cost of debt. It suggests the difference between brand name reputation and industry specialization. It also shows the different role of external auditing in mitigating agency conflicts for firms that have only private debt. Our paper has practical implication for companies of different finance structure in their decision of hiring brand name or specialist auditor. Although industry specialist auditor has been shown to enhance audit quality, for firms that have only private debt, the benefit in decreasing cost of debt might not justify the additional cost of hiring an industry specialist auditor.

One caveat about our analysis is that our differentiation of public and private debt is based on availability of S&P credit ratings in COMPUSTAT, while a company might be covered by other rating agencies. Although the use of this classification has been well-established in the literature, it is still a best estimate. In the future, with access to private debt database, we can analyze a subset of data to supplement our large-sample analysis in this paper. Another potentially fruitful direction of future research is to examine auditor industry expertise on an office level.

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Accounting & Taxation
Vol. 12, No. 1, 2020, pp. 45-65
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

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THE ECONOMIC CONSEQUENCE OF INTERNATIONAL FINANCIAL REPORTING STANDARDS ADOPTION: EVIDENCE FROM CORPORATE TAX AVOIDANCE IN GULF STATES

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ABSTRACT

We examine whether IFRS as an accounting standard affects firm-level tax avoidance in the context of six economies across the Gulf region. We use a sample of 3,393 publicly listed firm-year observations from 2010 to 2016. Results show that firms adopting higher levels of harmonization with IFRS (full adoption) in the preparation of their financial reports engage less in tax avoidance activities. In contrast, non-adopting IFRS or adopting IFRS with modifications might be not only inappropriate and irrelevant, but also significantly harmful to reporting quality. We use two models in addition to OLS model. The overall results from both the logistic model and quantile model provide extra support to the OLS results. However, when other control variables are introduced in the main model (i.e. reporting losses, institutional ownership concentration and Big N auditors), the results suggest that in the context of GCC countries institutional ownership and Big N auditors, as external governances play negative role in monitoring managerial activities including the tax function. The findings of this paper have implications for tax authorities, investors and researchers.

JEL: M41, H26

KEYWORDS: International Financial Reporting Standards, Tax Avoidance, Gulf Region

INTRODUCTION

In this paper we examine the economic influence of International Financial Reporting Standards (IFRS) adoption on the tax function. Agency theory literature provides direct evidence that managerial diversion has a negative impact on taxation systems (e.g. Desai & Dharmapala, 2009; Guenther et al., 1997). International accounting literature suggests that adopting higher accounting standards like IFRS allows outsiders to better monitor managerial activities and diversions (e.g. Aussenegg et al., 2008; Chua et al., 2012; Liu et al., 2011) including the tax function. However, there is mixed evidence on the economic consequences following IFRS adoption. Therefore, whether, and to what extent, IFRS adoption affects firm-level tax functions remain a pending issue and an important empirical question.

Numerous studies have shown that IFRS has important impacts on measurement and disclosure rules, when compared to many local GAAPs. Further, it provides many capital market benefits, such as increased financial statement comparability that helps investors to evaluate potential investment more easily, with less risk (e.g. Armstrong et al., 2010; Liao et al., 2012), improves liquidity and firm value (e.g. Barth et al., 2008) and decreases cost of capital (e.g. Daske et al., 2013). Armstrong et al. (2010) also highlight the improvement of earnings reporting that result from adoption of IFRS, where firms exhibit lower levels of earnings management and more timely loss recognition relative to a matched sample of firms reported under local GAAP. Moreover, IFRS adoption improves the information environment, since it increases forecast

accuracy (e.g. Bae et al., 2008), and decreases information asymmetry between managers and shareholders (Horton et al., 2013).

Opponents of IFRS adoption, particularly in developing countries, argue that IFRS may have negative economic consequences on the taxation system (Joshi & Bremser, 2003). For instance, Samuel et al. (2013, p. 172) highlight that "IFRS adoption creates a challenge for tax law and a need to revisit the theoretical and practical foundations for the use of accounting as a starting point for taxation of companies". That is, IFRS are independent of tax reporting considerations. Thus, the adoption of IFRS had an important impact over the link between financial accounting and tax accounting, where such relaxation in book–tax conformity increases managers' mutual benefits, which can occur through either extra dividends and compensation or reducing tax-liabilities. In contrast, greater book–tax conformity encourages an additional monitor (Desai & Dharmapala, 2009; Karampinis & Hevas, 2013).

IFRSs are primarily designed to meet the needs of shareholders (Spathis & Georgakopoulou, 2007). However, in most developing countries financial and accounting systems are more likely to address the needs of the state to provide information for the purpose of control. Consequently, the tax system works as an instrument of government to provide the demand of economic and social policy rather than the needs of shareholders (James, 2002). Furthermore, IFRS may contain different practices caused by the inevitable estimations or alternative methods involved in the preparation of financial reporting that are equally acceptable in terms of accounting standards. The choice of which approach is used might be restricted by tax laws (Samuel et al., 2013).

The Gulf Co-Operation Council member states (GCC) provide an interesting and useful research setting for two main reasons. First, in the Gulf region has been the subject of relatively little research both at the individual country and group levels. This study will therefore expand the specific literature on the Gulf region across countries and over time. Second, countries in the region depend on oil revenues. Therefore, their total revenues are highly volatile due to oil price shocks. Thus, for longer-run financial sustainability tax revenues are extremely important for GCC countries. Therefore, since the late 1990's, there has been a continuous implementing reform susceptible of improving the fundamental determining of economic growth, including legal reforms (i.e. regulations governing the status of foreign investments, commercial law, and tax law). In spite of common economic reforms, GCC countries have achieved differing degrees of economic development and regulation framework in term of tax systems, tax disclosure requirements, enforcement score and main tax bases (Al-Shammari et al., 2008; Erdogdu, 2016). In this study we predict that these differences will give rise to between countries differences in level of tax avoidance.

A panel data set of publicly listed firms from six economies across the Gulf region is used to test hypotheses. Using a sample comprising of 3,393 firm-year observations from 2010 to 2016, we provide empirical evidence that tax avoidance is negatively associated with a firms' harmonization level with IFRS. This suggests that firms adopting higher level of harmonization with IFRS in the preparation of their financial report less tax avoidance activities. These results are consistent with prior studies that find evidence of an improvement in reporting quality post IFRS adoption (e.g. Amidu et al., 2016; Barth et al., 2008; Karampinis and Hevas, 2013; Kerr, 2013). Results from the logistic model and quantile model yield similar conclusions to those from the OLS model, thus providing additional support for the previous evidence. Moreover, we extend the previous investigation of the relation between tax avoidance and IFRS adoption to include the effect of firm-level characteristics (i.e. reporting losses, institutional ownership concentration, and Big N). Our results indicate that, in the context of GCC countries, institutional ownership and Big N auditors, as external governances play negative role in monitoring managerial activities including the tax function. Finally, the findings are robust with respect to different measures of corporate tax avoidance and IFRS adoption.

This study contributes to the literature and regulation in several ways. First, it expands existing literature on tax avoidance by providing insights to market regulators and researchers of the complexity and ambiguity of tax law in an IFRS setting. These inferences add to the current debate concerning pros and cons of IFRS adoption to developing countries (e.g. Ballas et al., 2010; Tyrrall et al., 2007). It also seeks to clarify mixed finding of the prior literature on the economic consequences of IFRS adoption. Thus, our study of the GCC setting has important features and contributes to accounting practices within the global business environment, since some of the countries in the region have been early mandatory adopters of IFRS. This, in turn, reflects considerable experience with the use of a mandatory adoption relative to voluntary adoption (Al-Shammari et al., 2008).

Further, our results contain value relevant information useful to tax authorities and investors. Revisiting the links between IFRS adoption and tax function provides some promising changes that can influence the design of information systems and tax administration. To sum up, it encourages reliance on book-tax conformity whenever possible. This, in turn, can have significant benefits such as reducing compliance costs and tax rates. Therefore, a legislative effort to enforce IFRS compliance for tax purposes looks necessary. Similarly, investors must consider how to evaluate tax avoidance activities to ensure that shareholders' interests are being served or not, particularly, in term of recent market valuations view of tax avoidance that no longer recognize tax as a transfer of value from the state to shareholders (Desai & Dharmapala, 2009). This in turn, increases the monitoring role of managers, shareholders and boards and highlights the importance of reviewing and supervising tax activities within firms.

The rest of the paper is organized as follows. First, we provide an overview of our study. Second, we review the relevant prior literature and develop the main hypothesis that posits the associations between IFRS adoption and tax avoidance. Third, our models and results are described in the succeeding section. Finally, we present the implication of the study, followed by the conclusion.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Tax Systems and IFRS Adoption in GCC Countries: An Overview

The Gulf Co-Operation Council member states (GCC) was established in 1981 and it is comprised of six Arabian countries namely, Bahrain, Kuwait, Qatar, Oman, Saudi Arabia, and United Arab of Emirates. While GCC countries achieve economic and financial integration among each other and into the global market, they differ in many ways including regulations, institutional and developments of their markets (IMF, 2015).

The issue of introducing Tax Systems in GCC countries go back to the 1950s. For example, Saudi Arabia introduced personal income, capital gain, and corporate taxes in 1950. Then other GCC countries followed suit, Kuwait in 1955, United Arab Emirates (UAE) in the mid-1960s, while Oman in the early 1970s. To capitalize on their domestic wealth, countries in the gulf region can be classified as non-tax revenues countries comprising, oil exporters, which heavily depend on revenue from oil and other hydrocarbon resources. These countries are mostly small, with limited diversification opportunities because of their small domestic markets. It is generally observed that GCC taxation systems are not very efficient and generate persistently low revenues (IMF, 2015). More precisely, tax revenues in general account for only a small percentage of GDP (1 to 5 percent), due to lower tax rates, limited sources (i.e. international trade, specific goods, and corporate taxes on foreign firms), along with a simple tax structure and revenue administration which could be seen as related to poor governance performance of the region (Erdogdu, 2016).

The rapid economic growth and opening up of capital markets in the GCC countries along with pressure from high volatility in total revenue due to oil price shocks has led the governments to implement a regulation reform to establish a modern tax system and tax institutions. These reforms comprise of enacting

new taxes (e.g. value added taxes-VAT) and new tax laws (e.g. renew income tax act, introducing modern tax practices including reliance on international accepted tax principles and introducing transfer pricing provisions), introducing free zone and tax holidays, reducing tax rates on foreign corporations and using a flat tax rate for all activities (Mansour, 2015). The main objectives of these efforts have been to improve efficiency and to stabilize revenue yield by simplifying the tax system, removing tax obstacles to promote foreign direct investment (FDI) and growth, and modernizing the tax administration. However, the design and timing of tax systems reform differs across GCC countries depending on local needs and constraints ((IMF, 2015; Mansour, 2015). These countries thus constitute an appropriate sample for a comparative analysis linking the new regulation reforms to instructions and economic growth.

With regard to the IFRS adoption, governments in GCC countries have the power to create and enforce specific accounting laws. Further, the accounting profession is in its infancy with little power to license auditors or impose compliance with accounting standards (Al-Shammari et al., 2008). There are no clear instructions about accounting standards that should be followed by various entities in these countries (Al-Qahtani, 2006).

It is well documented that global coercive and mimetic pressures including, foreign investments, trade partnership, and the density of Big 4 offices have led to the adoption of IFRS in GCC countries. The objective is to attract global investments, develop the economy, gain access to capital markets and increase the monetary power (e.g. Irvine, 2008; Joshi & Bremser, 2003). Therefore, GCC countries made a great effort to introduce IAS/IFRS for some or all listed companies. It is noteworthy that the nature of IAS/IFRS adoption by the GCC countries varies across jurisdictions and across time (Al-Shammari et al., 2008).

Some countries mandated the adoption for all listed companies (e.g. Bahrain, Kuwait, and Oman), while others allow voluntary use of IFRS (e.g. UAE), or require IFRS adoption in a specified industry (e.g. Saudi Arabia) (Deloitte, 2015). Studies on IFRS adoption in GCC countries highlight some unique factors such as language, culture and tax legislation requirements, which may impede the successful implementation of IFRS in these countries (e.g. Joshi et al., 2008; Irvine, 2008).

During the last decade, adoption of IFRS has been debated in the accounting literature. Generally, the debate has moved in two directions. The first line of literature focuses on the reasons and relevance of these standards, particularly in developing countries (e.g. Ali & Hwang, 2000; Ballas et al., 2010; Tyrrall et al., 2007). The second strand of literature concentrates on market consequences of these standards adoption and its impact on the quality of financial statements in general and earnings quality in particular (e.g. Barth et al., 2008; Daske et al., 2013).

The findings of these studies provide mixed evidence, which in turn, makes the economic consequence of IFRS adoption an open issue on the firm and country-level. Research regarding economic consequences of IFRS adoption in GCC countries has been sparse both on individual country and on group level. Joshi et al. (2008) and Aljifri and Khasharmeh (2006) conducted a study in Bahrain and United Arab Emirates respectively, finding evidence that applying IFRS improves the effectiveness and value relevance of financial reporting. With the exception of Joshi et al., (2008) and Aljifri and Khasharmeh (2006), prior studies that relate to the Gulf region concentrate on examining compliance level and value relevance of IFRS (e.g. Al-Shammari et al., 2008; Othman and Kossentini, 2015). The current study expands this line of literature and responds to the lack of firm-level empirical studies by providing evidence on the consequences of IFRS adoption on accounting quality to explain and compare a firm level of tax avoidance across six countries in the Gulf region.

IFRS Adoption and Tax Avoidance

Research examining the direct impact of IFRS adoption on tax avoidance is limited. For example, Kerr (2013) examines the effect of IFRS adoption on tax avoidance for 25 countries from 1993 to 2008. Results suggest that IFRS adoption reduces the ability of firms to avoid taxes. This is because IFRS adoption causes an increase in transparency. In a similar framework, Karampinis & Hevas (2013) investigate whether the adoption of IFRS affected tax implications in Greece from 2000 to 2010. The results indicate that IFRS adoption reduced book-tax conformity. In other words, IFRS adoption reduces the impact of tax implications on financial income, which may result in a significant negative determinant of discretionary accruals in the pre-IFRS period. Amidu et al., (2016) confirm similar results in the context of Ghana's firms. In contrast, Doukakis et al. (2007) investigate whether adoption (particularly IAS 12) can be used as tax planning strategies in UK between 2004 and 2006 for non-financial listed firms. The empirical evidence suggests that firms use deferred taxation strategies to reduce future tax expense and meet their tax planning policies. Further, Chan et al. (2010) examine the impact of IFRS on tax adjustments in China. They provide evidence that audit adjustments decrease book-tax conformity post IFRS adoption. This is due to historical Chinese reporting standards that did not differentiate between book and tax accounting.

More recently, Simone (2015) investigates whether adoption of IFRS facilitates income tax-motivated profit shifting by multinational entities MNEs in a sample of 27 EU countries from 2001 to 2010. The results indicate that tax avoidance increases post IFRS adoption since MNEs in high-tax jurisdictions achieve a range of possible tax-advantages. In a similar vein, Braga (2017) finds evidence of higher level of corporate tax avoidance after IFRS adoption in 35 countries from 1999 to 2014. To sum up, collectively prior studies provide mixed results considering the relationship between IFRS adoption and tax avoidance, leaving the question open for additional study. In this study we reinvestigate whether IFRS adoption affects firm-level tax avoidance in the context of GCC countries. One hypothesis is that IFRS adoption has a positive impact on tax function. This is due to the adoption of IFRS within a country being outside the firms' control, as well as the improvement in the information environment that accompanied such adoption. It follows then that IFRS adoption will lead to a decrease in tax avoidance for those firms that experienced high levels of harmonization with IFRS, relative to those that did not adopt IFRS or have adopted IFRS with modification.

An alternative hypothesis is that IFRS adoption increases tax avoidance. To the extent that firms face international pressure to adopt IFRS to meet analyst or market expectations, firms may be unable to keep earnings quality high while also meeting those expectations. Further, to the extent that IFRS adoption was not also accompanied by a change to the country's' tax regime, firms would be powerless to independently improve their earnings quality. It follows that IFRS adoption will lead to an increase in tax avoidance for those firms that experienced high levels of harmonization with IFRS relative to those that did not adopt IFRS or have adopted IFRS with modification. These contradictory views form the first hypothesis:

> *H1: The higher level of harmonization with IFRS is associated negatively (positively) and significantly with the level of corporate tax avoidance.*

IFRS Adoption in Loss Firms and Tax Avoidance

To probe further into the relationship between tax avoidance activities and IFRS adoption, particularly in firms with some unique criteria such as firms reporting losses, we also examine whether firms reporting losses influence the relationship between tax avoidance and IFRS adoption. Apart from Balakrishnan et al. (2012), the accounting literature contains very limited direct empirical evidence on the relationship between firms reporting losses and tax avoidance levels. Dechow & Dichev (2002) show that loss firms have more motivation to report lower earnings quality and suffer from higher levels of information asymmetry. More precisely, loss firms are motivated to be tax planners to cover bad news such as having very low income

(Balakrishnan et al., 2012). In this paper we expect the impact of IFRS adoption on tax avoidance would be stronger in firms reporting losses compare to firms do not reporting losses. This leads to formulate the second hypothesis as follows:

> *H2: The strength of the relationship between the level of harmonization with IFRS and the corporate tax avoidance is stronger (weaker) in firms reporting loss.*

IFRS Adoption and Tax Avoidance in Firms with Strong Corporate Governance

Recent research provides evidence suggesting that corporate governance monitoring mechanisms may assist in limiting managerial opportunism and tax avoidance activities (e.g. Desai & Dharmapala, 2009; Taylor & Richardson, 2013). Thus, firm-level governance is expected to influence tax avoidance levels. The current study extends the previous investigation of the relation between tax avoidance and IFRS adoption to include the effect of two firm-level governance mechanisms comprising institutional ownership and Big N.

Institutional owners can serve as an important corporate governance monitoring mechanism because they have greater power and influence over the board of directors and management than do smaller shareholders. This occurs first, through their substantive leverage, and second, through voting rights that can be directly employed to influence the decisions of management (Fernando et al., 2012; Velury & Jenkins, 2006). Khurana and Moser (2013) examine the relation between institutional investors and tax avoidance. Their results support the effective monitoring role of institutional investors on mitigating the collective-action problem among shareholders in the context of U.S. firms.

Khan et al. (2017) provide an opposite result when they investigate the relation between institutional ownership concentration and tax avoidance between 1988 and 2006 using the Russell index 1000-2000. Their results provide empirical evidence suggesting that an increase in institutional ownership concentration is associated positively and significantly with tax avoidance. However, they suggest that promoting tax avoidance activities by institutional owners is unlikely to be direct. Instead they encourage this incentive indirectly by demanding better firm financial performance or by using a private communication to achieve same effect.

Another important corporate governance monitoring mechanism is the use of an external auditors from one of the Big-N audit firms. Previous literature repeatedly shows that Big-N auditors have positive impact on financial reporting quality (Hodgdon et al., 2009). For instance, Hodgdon's et al. (2009) results reinforce the importance role of Big-N auditors to encourage compliance with IFRS. Meanwhile, it is well documented that global factors such as the density of Big N offices has led to the adoption of IFRS in Gulf countries and other emerging economies (e.g. Irvine; Joshi & Bremser, 2003; Ramanna & Sletten, 2014).

With regard to the role of Big-N auditors in corporate tax avoidance, the literature shows negative impacts. More recently, Jones et al. (2018) examined the impact of Big-N auditors on corporate tax avoidance in 12 developed countries between 2005 and 2013. Their findings suggest that using a Big 4 accountancy firm for auditing purposes specifically in the context of multinational enterprises (MNEs) increases tax avoidance activities through building, managing and maintaining tax haven networks. Jones et al. (2018, p. 175) highlight the role of large accountancy firms as tax advisors, showing that "these firms do not market tax avoidance schemes but also create schemes tailored for individual clients". It is worth mentioning that despite the fact that there have been significant regulatory driven changes via Sarbanes-Oxley Act (SOX) to improve the governance over non-audit services (i.e. tax services), which encouraging firms not to use the tax services of their auditor, it is still not illegal. This paper expects the impact of IFRS adoption on tax avoidance would be stronger (weaker) when there is a high institutional ownership concentration and an existence of Big-N auditors. The previous argument leads to formulate the third hypothesis:

H3a: The strength of the relationship between the level of harmonization with IFRS and corporate tax avoidance is stronger (weaker) in firms with high institutional ownership concentration.

H3b: The strength of the relationship between the level of harmonization with IFRS and corporate tax avoidance is stronger (weaker) in firms audit by Big N auditors.

METHODOLOGY-RESEARCH DESIGN

Sample Selection and Data Source

We use panel regression to analyze pooled data for publicly listed firms in six economies across the Gulf region (GCC). The sample period for the study is 2010 to 2016. We collect the initial sample from the Bureau van Dijk's flagship company (OSIRIS) database for 4,933 firm-year observations. The sample is reduced by 1,540 firm-year observations after excluding companies with insufficient data to calculate all control variables, leaving a sample of 3,393 firm-year observations. To mitigate the influence of outliers, continuous variables are winsorized at the 1st and 99th percentile. See Appendix A for variable definitions.

Variables Construction

Corporate Tax Avoidance (CTA) represents the dependent variable in this study. Following, Hanlon and Heitzman (2010) we define tax avoidance as the reduction of explicit pre-tax earnings via legal tax planning or illegal sheltering. Consistent with prior research (e.g. Balakrishnan et al., 2012; Desai and Dharmapala, 2009; Karampinis and Hevas, 2013; Taylor & Richardson, 2013) firm-level tax avoidance is measured based on so called "book-tax gaps" which incorporates the effects of earnings management. It is well documented that differences between book and tax income provide a signal on the persistence of accruals and earnings growth (Hanlon & Heitzman, 2010). If the book-tax gap for firm *i* in year *t* (measured as pre-tax income less taxable income), scaled by the lagged value of total assets, is denoted by BT_{it} and the performance-adjusted abnormal accruals (Kothari et al., 2005) is denoted by TA_{it}. It is possible to measure corporate tax avoidance via the following regression specification:

$$BT_{it} = \beta_1 TA_{it} + u_i + \varepsilon_{it} \quad (1)$$

Where u_i is the average value of the residual for firm *i* over the sample period, and ε_{it} is the deviation in year *t* from firm *i* and average residual u_i. The residual ($u_i + \varepsilon_{it}$) from this regression (i.e. the component of BT_{it} that cannot be explained by variations in accruals, and hence by earnings management) can be interpreted as a measure of CTA activity. To justify using book-tax gaps as a measure of CTA activity, Desai and Dharmpala (2009) point out it is the only available procedure in the absence of direct observation of firms' tax returns. Moreover, it has the advantage of being similar to what investors can measure.

IFRS adoption represents the independent test variable in this study. Following Ramanna and Sletten (2014) IFRS adoption is measured using an ordinal variable reflecting the level of harmonization with IFRS. Ramanna and Sletten (2014) use actual adoption dates as a gauge for adoption decision dates. Their dagta begins in 2003 because they are interested in IFRS as developed and sponsored by the International Accounting Standards Board (IASB). Furthermore, 2002 was the first full year of the IASB's existence. IFRS variable takes three values: "1" for country-year with no IFRS-related activities; "2" for country-year with partial adoption (i.e., countries with convergence projects, countries allowing voluntary IFRS adoption, and countries requiring IFRS for some listed companies); "3" for country-year with full IFRS adoption for listed firms.

For the purpose of deepening the investigation of the impact of harmonization level with IFRS on CTA activities, we convert the IFRS variable into three dichotomous variables. First, NIFRS the non-adoption

of IFRS measured by a dichotomous variable that takes the value of 1 for the country-year coded one as for IFRS and zero otherwise. Second, PIFRS the partial adoption of IFRS measured by a dichotomous variable that takes the value of 1 for the country-year coded two as for IFRS and zero otherwise. Finally, FIFRS the Full IFRS adoption measured by a dichotomous variable that takes the value of 1 for the country-year coded three for IFRS and 0 otherwise. In coding the country-year IFRS adoption variable for GCC countries two main data sources, provided by Ramanna and Sletten (2014) and Othman and Kossentini (2015), are used. Ramanna and Sletten (2014) and Othman and Kossentini (2015) built a country measure for IFRS variable based on three primary sources of data (1) IAS Plus, operated by Deloitte Global Services; (2) a similar Internet database from PriceWaterhouseCoopers; and (3) data from the World Bank's country Reports on Observance of Standards and Codes (ROSC reports).

Several control variables are included to control for other effects, including firm size (SIZE). Several studies suggest that larger firms are more likely to depress earnings to reduce the amount of corporate taxes payable and thus have greater tax deficiencies relative to their actual tax liability (e.g. Rego, 2003). SIZE measures the natural log of total assets at the end of the year. Consistent with previous research, firm with greater leverage (LEV) have more incentive to reduce tax obligation (e.g. Amiram et al., 2011). LEV measures as total debt divided by total assets at the end of the year.

In addition, following (Adhikari et al., 2005) the book-to-market ratio, BM, controls for growth opportunities of the firm. Firms with stable growth may avoid more tax on average. A cash flow variable (CFO) is included because firms with fewer financial resources are likely to allocate fewer resources to their tax function in comparison to firms without similar constraints (Karampinis and Hevas, 2013). CFO measures the natural log of cash flow from operations divided by total assets at the end of the year. Further, to account for differences in size of economies across GCC countries and differences in regulations, two country specific characteristics variables are incorporated as a control. The variable are market size (MK) and Rule of Law (RL). MK measures as the natural log of market capitalization as a percent of the Growth Domestic Product in U.S. dollars (GDP). RL score of -2.5 to 2.5 from Kaufmann et al. (2014). Finally, to control for the variation in time-based explanations that might lead to a spurious correlation between IFRS and CTA, we include both year and industry fixed effects in the regression. Year fixed effects are categorical variables. Whereas, Industry variables (SIC) are dummy variables and representing two-digit SIC codes based on the Fama-French (Fama & French, 1997) forty-eight industry classification.

RESULT AND DISCUSSION

Descriptive Statistics

Table1, presents the distribution of harmonization level with IFRS across the 4,213 observations to determine IFRS adoption status in the firm-year panel. The rows in Table 1 correspond to the three different adoption statuses described earlier: (1) Non adopter, (2) Partial adoption, comprising countries with convergence projects, countries allowing voluntary IFRS use, countries requiring IFRS for some listed companies, and (3) Full adoption. The columns represent the seven years in the panel, 2010–2016. The number of Full adoptions grows from 402 firms in 2010 to 536 firms in 2016.

Table 2, panel A reports summary statistic for the dependent variable (CTA). The mean of CTA is (-0.002) and varies across GCC countries over the sample period 2010 to 2016. Bahrain and Oman have the highest level of CTA, whereas United Arab Emirates and Qatar have the lowest level of CTA in the region during the sample period. Panel B of Table 1 reports summary statistics for the control variables, incorporating firm specific characteristics.

Table 1: IFRS Adoption Status in the Firm-Year Panel

Adoption Status	2010	2011	2012	2013	2014	2015	2016	Total
Non adopter	88	94	106					288
Partial adoption				111	127	137	143	518
Full adoption	402	440	468	507	522	532	536	3,407
Total	490	534	574	618	649	669	679	4,213

This table provides summary statistics.

Panel C reports the frequency of dummy variables used in the models. While, the majority of sample firms have institutional ownership (69.73 percent), only 17.88 percent of sample firms report losses. The results of the BIGN variable imply that quite a number of sample firms employ the services of the Big-N audit firms (45.96), but a majority of them employ the services of auditors other than Big-N (54.04).

The (non-tabulated) collinearity test was carried out and an average variance inflation factor (VIF) of 1.95 and a highest VIF of 3.31 were found. Groebner et al. (2008) asserted that a VIF below 5 is generally accepted, which suggests that the models used in this study do not present multicollinearity problems.

Table 2: Descriptive Statistics

Panel A: Dependent Variable Corporate Tax Avoidance (CTA), 2010-2016						
	N	**Mean**	**Q1**	**Median**	**Q3**	**Std.**
All sample	3,933	-0.002	-0.007	-0.005	-0.001	0.008
Bahrain	323	-0.004	-0.007	-0.007	-0.005	0.010
Kuwait	1,490	-0.003	-0.008	-0.006	-0.003	0.009
Oman	1,049	- 0.001	-0.007	- 0.004	0.004	0.010
Qatar	283	-0.010	-0.007	-0.007	-0.006	0.004
Saudi Arabia	963	-0.002	-0.005	- 0.002	0.001	0.005
United Arab Emirates	825	-0.010	-0.008	-0.007	-0.006	0.004
Panel B: Control Variables						
SIZE	4,441	12.333	10.877	12.112	13.516	2.052
LEV	3,386	0.525	0.195	0.413	0.682	0.553
CFO	3,399	9.495	8.106	9.582	10.764	2.125
BM	4,846	9.856	5.568	10.008	12.378	5.749
RL	4,709	0.170	0.160	0.160	0.190	0.016
MK	4,916	25.025	23.776	24.808	25.590	0.967
Panel C: Dummy Variables						
		Value	**Frequency**	**%**		
LOSS		0	4,051	82.12		
		1	882	17.88		
PIH		0	1,493	30.27		
		1	3,440	69.73		
BIGN		0	2,666	54.04		
		1	2,267	45.96		

Notes: This table provides a description of country-level tax avoidance, firm-level control and dummy variables for the sample period from 2010 to 2016. All variables are defined in Appendix A.

Table 3 shows Pearson correlation matrix among dependent and independent variables. The univariate tests suggest that higher level of harmonization with IFRS is negatively and significantly associated with the level of corporate tax avoidance activity. Negative and significant correlations between CTA and the control variables (SIZE, BM, and MK) suggest that firms with large size, and book to market value are less likely to engage in tax avoidance activities, particularly in countries with more developed market. In contrast,

there is a positive and significant correlation between CTA and LEV and CFO, suggesting that highly geared firms with high cash flows are more likely to engage in tax avoidance activities.

Table 3: Pearson Correlations Matrix

Variables	CTA	IFRS	FIFRS	PIFRS	NIFRS	SIZE	LEV	CFO	BM	MK	RL
CTA	1.000										
IFRS	-0.075 (<0.0001)	1.000									
FIFRS	-0.084 (<0.0001)	0.940 (<0.0001)	1.000								
PIFRS	0.061 (0.0007)	-0.292 (<0.0001)	-0.601 (<0.0001)	1.000							
NIFRS	0.048 (0.0075)	-0.906 (<0.0001)	-0.708 (<0.0001)	-0.138 (<0.0001)	1.000						
SIZE	-0.093 (<0.0001)	-0.138 (<0.0001)	-0.160 (<0.0001)	0.126 (<0.0001)	0.086 (<0.0001)	1.000					
LEV	0.165 (<0.0001)	0.085 (<0.0001)	0.091 (<0.0001)	-0.058 (0.0006)	-0.060 0.0004	-0.002 (0.895)	1.000				
CFO	0.049 (0.016)	-0.174 (<0.0001)	-0.207 (<0.0001)	0.165 (<0.0001)	0.101 (<0.0001)	0.809 (<0.0001)	0.162 (<0.0001)	1.000			
BM	-0.138 (<0.0001)	0.174 (<0.0001)	0.201 (<0.0001)	-0.156 (<0.0001)	-0.116 (<0.0001)	-0.028 (0.164)	-0.039 (0.023)	-0.130 (<0.0001)	1.000		
MK	-0.067 (0.000)	-0.277 (<0.0001)	-0.396 (<0.0001)	0.461 (<0.0001)	0.082 (<0.0001)	0.330 (<0.0001)	-0.046 (0.006)	0.393 (<0.0001)	-0.140 (<0.0001)	1.000	
RL	-0.056 (0.892)	-0.182 (<0.0001)	-0.038 (<0.0001)	-0.319 (<0.0001)	-0.329 (<0.0001)	-0125 (<0.0001)	0.024 (0.153)	-0.130 (<0.0001)	0.011 (0.420)	0.419 (<0.0001)	1.000

Notes: This table provides the correlation matrix for dependent, test and control variables. All variables are defined in Appendix A.

OLS Regression Results

In this study we estimate Model 1 using pooled Ordinary Least Squares (OLS) regression via the following regression specification:

$$CTA_{it} = \beta_0 + \beta_1 Test\ Var. + \sum_{j=1}^{n} Control\ Vars. + \varepsilon_{ijt} \quad (1)$$

Where, CTA represents the dependent variable of this study. IFRS is our test variable and takes three values: "1" for country-year with no IFRS-related activities; "2" for country-year with partial adoption (i.e., countries with convergence projects, countries allowing voluntary IFRS adoption, and countries requiring IFRS for some listed companies) and "3" for country-year with full IFRS adoption for listed firms (Ramanna and Sletten, 2014). We then convert the IFRS variable into three dichotomous variables. First, for NIFRS the non-adoption of IFRS takes the value of 1 for the country-year coded one as for IFRS and zero otherwise. Second, PIFRS represents the partial adoption of IFRS and takes the value of 1 for the country-year coded two as for IFRS and zero otherwise. Finally, FIFRS indicates Full IFRS adoption takes the value of 1 for the country-year coded three as for IFRS and 0 otherwise. Control variables include firm-specific characteristics comprising firm size (SIZE), Leverage (LEV), Operating Cash Flows (CFO), Book to market ratio (BM); country specific characteristics comprising market capitalization (MK), rule of law (RL), and both year and industry fixed effects.

Table 4 presents the results from pooled OLS regressions for the 2010-2016 periods. Column 1, Table 4, shows the results of testing H1. The results indicate the coefficient estimates on IFRS (the coefficient of interest) is negatively (-0.002) and statistically significant at the 1 percent level, suggesting the level of harmonization with IFRS has a significant effect on corporate tax avoidance activities. These results are in

line with prior studies (e.g. Amidu et al., 2016; Karampinis & Hevas, 2013; Kerr, 2013). However; it is not consistent with a number of researchers (e.g. Chan et al., 2010; Braga, 2017; Simone, 2015). Indeed, the negative association implies that firms that adopt higher level of harmonization with IFRS in the preparation of their financial reports engage less in tax avoidance activities, which is consistent with prior studies that find evidence of an improvement in reporting quality after IFRS adoption (e.g. Barth et al., 2008; Kerr, 2013). This, in turn, suggests that IFRS as a high-quality accounting standard "induced incentives to restrict (exacerbate) upward (downward) financial earnings management for tax purposes" (Karampinis & Hevas, 2013, p. 219).

The results for the control variables show that corporate tax avoidance (CTA) is negatively and significantly associated with SIZE, BM and MK at the 1 percent level. This implies that firms with large size and high book to market values are less likely to engage in tax avoidance activities, particularly in countries with developed markets, which is in line with prior study's findings (e.g. Balakrishnan et al., 2012; Karampinis & Hevas, 2013). Leverage (LEV) and cash flows (CFO), consistent with prior research (e.g. Amiram et al., 2011; Karampinis & Hevas, 2013), are found to have positive and significant relationship with CTA, suggesting that highly geared firms with high cash flows are more likely to engage in tax avoidance activities.

To deepen the results issued in Column 1, Column 2 of Table 4 tests for the effect of full IFRS adoption on CTA. Consistent with the results in Column 1, the coefficient of FIFRS is negative and significant at the 1 percent level (-0.003). Therefore, full IFRS adoption has a substantial impact on CTA, suggesting that firms that fully adopted IFRS are less likely to engage in tax avoidance activities. These results are in line with prior literature (e.g. Daske et al., 2013). Daske et al. (2013) which highlight that serious adopters (classified as adopters experience material changes and are not just adopting IFRS) are associated with better adoption benefits than label adopters (characterized by changing their accounting standards without material changes in their reporting incentives or behavior).

PIFRS is used to examine the effect of partial IFRS adoption on CTA. The positive coefficient of PIFRS, in Column 3 of Table 4, is significantly associated with CTA (0.003). The positive association between PIFRS and CTA suggests that tax avoidance is not only driven by engagement in tax avoidance activities through accruals management, but also by other mechanisms that do not involve accruals. Thus, adopting IFRS with modifications may significantly be harmful to reporting quality (Othman and Kossentini, 2015). Finally, Column 4 of Table 4 reports the results of testing the effect of NIFRS on CTA. The coefficient of NIFRS continues to be positive but less significant at the 5 percent level, which implies that firms that do not adopt IFRS in the preparation of their financial reports engage more in tax avoidance activities. This finding is consistent with supporters of IFRS adoption that highlight the benefits of IFRS adoption including the improvement of earnings property where firms exhibit lower levels of earnings management and more timely loss recognition (Armstrong et al., 2010; Horton et al., 2013). The results of control variables, in Columns 2, 3 and 4, remain qualitatively similar to those reported in Column 1, except the RL variable in Column 3 witch is significant at the 5% level, indicating that tax avoidance is lower in countries with high level of enforcement (measured by rule of law), which is consistent with prior studies (Tang, 2015).

Table 4: Ordinary Least Square Regression for IFRS Adoption (Dependent Variable is CTA)

$CTA_{it} = \beta_0 + \beta_1 Test\ Var. + \sum_{j=1}^{n} Control\ Vars. + \varepsilon_{ijt}$ Model (1)				
Variables	**1**	**2**	**3**	**4**
Intercept	0.045 (6.92)***	0.047 (7.68)***	0.028 (5.47)***	0.029 (5.18)***
IFRS	-0.002 (-5.45)***			
FIFRS		-0.003 (-6.68) ***		
PIFRS			0.003 (5.73) ***	
NIFRS				0.001 (2.55)**
SIZE	-0.001 (-8.52)***	-0.001 (-8.50) ***	-0.001 (-8.44) ***	-0.002 (-8.51)***
LEV	0.002 (5.21***	0.001 (5.48)***	0.001 (5.05) ***	0.002 (4.79) ***
CFO	0.001 (9.13)***	0.002 (9.14) ***	0.001 (9.22) ***	0.001 (9.15) ***
BM	-0.000 (-4.94)***	-0.000 (-4.57) ***	-0.000 (-4.96)***	-0.000 (-5.43)***
MK	-0.001 (-6.96)***	-0.001 (-7.91) ***	-0.001 (-6.64) ***	-0.001 (-5.47)***
RL	-0.020 (-1.56)	-0.013 (-1.09)	-0.025 (-2.00)**	-0.010 (-0.68)
Year fixed effect#	yes	yes	yes	yes
Industry fixed effect#	yes	yes	yes	yes
Pseudo-R^2	10.95	11.72	11.08	10.00
N	3,393	3,393	3,393	3,393
F-value	9.13***	42.14***	39.63***	35.45***

*This Table presents the results from pooled OLS regression of Tax Avoidance on IFRS adoption measures (test variable) and control variables for the sample of firm-year observations over the period 2010 to 2016 (t-statistic in parentheses). All variables are defined in Appendix A. #The coefficients are not reported for brevity. *, **, *** indicate significance at the 10%, 5%, 1% level, respectively*

H2 examines whether firms reporting losses influence the results reported in Table 4. To test H2 we re-estimate model (1) using (OLS) regression via the following regression specification:

$$CTA_{it} = \beta_0 + \beta_1 IFRS_{it} + \beta_2 LOSS_{it} + \beta_3 LOSS * IFRS + \sum_{j=1}^{n} Control\ Vars. + \varepsilon_{ijt} \quad (2)$$

Where, CTA represents the dependent variable of this study. IFRS is the variable capturing IFRS adoption, while LOSS is a dummy variable, which equals one if the firm's income before extraordinary items is less than zero and zero otherwise. LOSS*IFRS is the interactive term of the variable capturing the Losses (LOSS) with the variable capturing IFRS adoption and representing the test variable. Control variables remain similar to those used in Model (1).

Table 5, Column 1 shows that the coefficients on both LOSS*IFRS and LOSS variables are not significant. Consistent with the results in Table 4, Columns 1 and 2 coefficient estimates on IFRS continue to be negative (-0.001) and statistically significant at the 1 percent level, suggesting that high level of harmonization with IFRS improves firms reporting quality. However, these results are not in line with H2, which is unexpected. However, these results are in line with the univariate tests in section 5.1 that show only 17.88 percent of sample firms report losses. Therefore, H2 is rejected in the context of firms reporting losses in the GCC countries.

H3 extends Model (1) to include the effect of two governance mechanisms comprising institutional ownership (PIH) and Big N (BIGN). To test H3 we re-estimate model (1) using (OLS) regression via the following regressions specification:

$$\mathrm{CTA_{it}} = \beta_0 + \beta_1\,\mathrm{IFRS_{it}} + \beta_2\,\mathrm{PIH_{it}} + \beta_3\,\mathrm{PIH} * \mathrm{IFRS} + \sum_{j=1}^{n}\mathrm{Control\ Vars.} + \varepsilon_{ijt} \quad (3)$$

$$\mathrm{CTA_{it}} = \beta_0 + \beta_1\,\mathrm{IFRS_{it}} + \beta_2\,\mathrm{BIGN_{it}} + \beta_3\mathrm{BIGN} * \mathrm{IFRS} + \sum_{j=1}^{n}\mathrm{Control\ Vars.} + \varepsilon_{ijt} \quad (4)$$

Where, CTA represents the dependent variable of this study. IFRS is the variable capturing IFRS adoption. PIH is a dummy variable, which equals one if the percentage of common shares held by institutions over the sample period is above 50%, and zero otherwise. BIGN is a dummy variable coded one if firm i uses the services of a Big N auditors, and zero otherwise. PIH*IFRS and BIGN*IFRS are interactive terms of the variables capturing the institutional ownership (PIH) with the variable capturing IFRS adoption and auditor quality (BIGN) with the variable capturing IFRS adoption, respectively. Control variables remain similar to those used in Model (1).

Table 5: Results of Testing H2 and H3

$CTA_{it} = \beta_0 + \beta_1\,IFRS_{it} + \beta_2\,LOSS_{it} + \beta_3\,LOSS * IFRS + \sum_{j=1}^{n} Control\ Vars. + \varepsilon_{ijt}$ (Model 2) $\mathrm{CTA_{it}} = \beta_0 + \beta_1\,\mathrm{IFRS_{it}} + \beta_2\,\mathrm{PIH_{it}} + \beta_3\,\mathrm{PIH} * \mathrm{IFRS} + \sum_{j=1}^{n}\mathrm{Control\ Vars.} + \varepsilon_{ijt}$ (Model 3) $\mathrm{CTA_{it}} = \beta_0 + \beta_1\,\mathrm{IFRS_{it}} + \beta_2\,\mathrm{BIGN_{it}} + \beta_3\mathrm{BIGN} * \mathrm{IFRS} + \sum_{j=1}^{n}\mathrm{Control\ Vars.} + \varepsilon_{ijt}$ (Model 4)			
Variables	**1**	**2**	**3**
Intercept	0.041 (6.49) ***	0.045 (6.92) ***	0.044 (7.12) ***
IFRS	-0.001 (-4.70) ***	-0.001 (-3.25) ***	-0.002 (-4.56) ***
LOSS	-0.002 (-0.84)		
IFRS*LOSS	-0.001 (-1.34)		
PIH		-0.000 (-0.33)	
IFRS*PIH		-0.000 (-0.41)	
BIGN			-0.000 (-0.11)
IFRS*BIGN			0.000 (0.29)
Control	Yes	Yes	Yes
Year fixed effect#	Yes	Yes	Yes
Industry fixed effect#	Yes	Yes	Yes
Pseudo-R^2	13.26	11.09	10.89
Sample size	3,393	3,393	3,393

This table presents the results of testing H2 and H3 (t-statistic in parentheses). Column (1) shows results of testing Model (2), Columns (2) and (3) report results of testing Models (3) and (4), respectively. All variables are defined in Appendix A. #The coefficients are not reported for brevity., **, *** indicate significance at the 10%, 5%, 1% level, respectively*

Table 5, Column 2 shows that the coefficients on both PIH*IFRS and PIH are not significant. In line with these findings Table 5, Column 3 results indicate that the coefficients estimate on both BIGN*IFRS and BIGN are insignificant. Meanwhile, the coefficient on IFRS remains in columns 2 and 3 negative and significant at the 1 percent level (-0.001) and (-0.002), respectively. These results contradict the traditional view of corporate governance as external monitors (i.e. institutional ownership and Big N) suggested by prior studies (e.g. Fernando et al., 2012; Velury & Jenkins, 2006; Taylor & Richardson, 2013), while it is in line with current studies (e.g. Khan et al., 2017; Jones et al.,2018). For instance, Khan et al. (2017) note that an increases in institutional ownership concentration in U.S. companies are associated with an increases in tax avoidance, however, they suggest that promoting of tax avoidance activities by institutional owners

is unlikely to be directly related. Instead they encourage this incentive indirectly by demanding better firm financial performance or by using private communication to achieve the same effect. Moreover, Jones et al. (2018, p. 175) highlight the role of the large accountancy firms as tax advisors, showing that "these firms do not market tax avoidance schemes but also create schemes tailored for individual clients". Thus, in the context of GCC countries, institutional ownership and Big N auditors, as external governances play a negative role in monitoring managerial activities including the tax function.

Alternative Models

To mitigate the possibility of any validity threats relating to using appropriate and relevant techniques to address research questions two other models were estimated in addition to the OLS model. First, we use logistic regression following Taylor and Richardson (2013). We used as dependent variable 2171 matched-pairs of high and low corporate tax avoidance firm-year observations. We convert the continuous measure of corporate tax avoidance into a dummy variable, where CTA = 0 if the CTA is above the median (indicate high corporate tax avoidance activities), and CTA = 1 if the CTA is below the median (indicate low corporate tax avoidance activities). The results (see Panel A of Table 6) indicate a negative and significant coefficient for IFRS (-0.809, p-value= <.0001). This suggests that firms with lower (relative to higher) corporate tax avoidance activities have higher level of harmonization with IFRS (full adopters of IFRS). Overall results from the logistic model yield similar conclusions to those from the OLS model, thus providing additional support for H1.

Table 6: Alternative Models

Panel A: Logistic Regression			
Variables	**Coefficient**	**t-stat**	**p-value**
Intercept	6.215	13.066	0.0003
IFRS	-0.809	102.110	<0.0001
SIZE	-0.244	26.306	<0.0001
LEV	0.002	0.001	0.9831
CFO	0.226	33.227	<0.0001
BM	-0.043	30.338	<0.0001
MK	-0.101	3.799	0.0513
RL	-2.277	0.453	0.5009
Pseudo-R^2	14.60		
The likelihood ratio	251.6383***		
Wald Chi-square	209.4698***		
Panel B: Quantile Regression			
	Coefficient	**t-stat**	**p-value**
OLS	-0.00156	-5.45	<0.0001
Quantile			
Q10	-0.00065	-4.06	0.0000
Q20	-0.00104	-4.86	0.0000
Q30	-0.00173	-12.04	0.0000
Q40	-0.00189	-10.61	0.0000
Q50	-0.00246	-8.56	0.0000
Q60	-0.00229	-8.62	0.0000
Q70	-0.00282	-5.22	0.0000
Q80	-0.00387	-7.46	0.0000
Q90	-0.00394	-8.54	0.0000
Pseudo-R^2	33.19		
F-value	153.57***		

*This table presents the results from logistic regression of Tax Avoidance on IFRS adoption and control variables in panel A, and Quantile regression in panel B. All variables are defined in Appendix A.# *, **, *** indicate significance at the 10%, 5%, 1% level, respectively*

Second, quantile regression is estimated to examine the relationship between corporate tax avoidance and the level of harmonization with IFRS. Armstrong et al. (2015) asserted that using traditional econometric methods (i.e., ordinary least squares regression) describes the relation between independent variables and the conditional mean of the dependent variable of interest, while quantile regression is more general and describes the relation between the independent variables and any specified percentile of the conditional distribution of the dependent variable. Hence, we expect the relation between various level of harmonization with IFRS and corporate tax avoidance will differ at relatively high and low levels of tax avoidance. In particular, full harmonization with IFRS (high reporting quality and high transparence) should encourage more tax planning at lower levels of tax avoidance and discourage additional tax avoidance when the level is high.

Table 6, Panel B, reports the results of testing differences in coefficients of IFRS across the quantiles, the coefficient at the 90th percentile (-0.0039) is significantly more negative than the coefficient at both the 50th percentile (-0.0025) and the 10th percentile (-0.0006). This result indicates that IFRS adoption does not have a uniform relation with corporate tax avoidance, but that the relation differs according to the level of tax avoidance. More precisely, full harmonization with IFRS discourages engagement in tax avoidance activities through accruals management. Moreover, plots the quantile regression coefficients estimates from Table 6 Panel B (Unreported), shows the relation between IFRS and tax avoidance is generally negative and increasing in magnitude in the right tail of the CTA distribution. Overall, the results suggest that quantile estimate provides evidence of the relationship between harmonization level with IFRS and CTA at other points of the tax avoidance distribution, thus it is more representative compare to OLS model (at the conditional mean of CTA) and logistic model (above and below the median of CTA).

Sensitivity Tests

Bae (2017) reports that CTA (book-tax gaps) measurement has limitations in representing pure tax avoidance, in that, it includes not only opportunistic tax behaviors but also aggressive financial reporting. Thus, to mitigate the possibility of any validity threats relating to Corporate Tax Avoidance (CTA) measurement, the main model (OLS) is re-estimated using different measures of CTA including the GAAP effective tax rate (ETR) (Khan et al., 2017). ETR is widely used as a tax avoidance measure. Further, Hanlon and Heitzman (2010, p. 35) highlight that "the effective tax rate, even if measured over the long run, reflects all of transactions that have any effect on a company's tax liabilities and do not distinguish between real activities that have tax benefits, activities carried out specifically to reduce taxation, and tax benefits obtained via lobbying activities". ETR is the tax expense as a percent of pre-tax income. Then ETR multiply by (-1) so that an increase in ETR reflects an increase in (CTA).

The results (Untabulated) show that the coefficient on IFRS (-0.036) continues to be negative and significant at the 1 percent level (t-statistic = -5.73, p-value= <.0001), implying that the main results are sensitive to different measure of corporate tax avoidance. Moreover, Atwood et al. (2012) argue that there can be a significant variation from one year to the next in the effective tax rate and that considering annual tax avoidance does not minimize the effects of items that are reversed in only one year. Based on this argument, the ETR variable is re-estimated over three years. The results (Untabulated) show that the coefficient of IFRS (-0.036) remains constant (t-statistic = -4.33, p-value= <.0001), indicating that firms that did not participate in tax avoidance activity in the previous period are less likely to engage in this activity in the current and subsequent period, which is consistent with previous studies (e.g. Amidu et al., 2016).

Further, because CTA is measured at firm- level, while IFRS effects in the models are measured at country-year level. Ramanna and Sletten (2014) suggest that firm-level measure of IFRS adoption highlights the benefits of voluntary IFRS adoptions that firms could reflect in reporting quality which in turn can be very important determent of government decision to allow or require it in the future. Thus, we re-estimate Model

(1) using firm-level measure of IFRS adoption as another sensitivity test. We measure IFRS as a dichotomous variable taking the value of 1 if firm adopting IFRS and 0 otherwise (Barth et al., 2008). The coefficient on IFRS (-0.002) remains negative and significant at the 1 percent level (t-statistic = -4.47, p-value= <.0001), implying that the main results are sensitive to firm-level measure of IFRS.

Finally, given that the harmonization level with IFRS varies across GCC countries during the sample period, in most of these countries banks are required to mandatory adopt IFRS earlier than non-financial firms (i.e. Qatar, Saudi Arabia, and UAE). Thus, the OLS regression is re-estimated after excluding financial institutions (the initial sample is reduced by 1116 firm-year observations). Untabulated results show that the coefficient on IFRS remains in the same direction (-0.001) and significant at the 1 percent level, implying that firms from financial institutions do not derive the results.

Implications of the Results

The findings of this study have implications for researchers and policy makers. First, it expands existing literature on tax avoidance by providing insights to market regulators and researchers of the complexity and ambiguity of tax avoidance activities in an IFRS setting. These inferences enhance the current debate concerning pros and cons of IFRS adoption to developing countries (e.g. Ballas et al., 2010; Tyrrall et al., 2007). It also seeks to clarify the mixed finding of the prior literature on the economic consequences of IFRS adoption.

Further, the results from this study contain value relevant information useful to tax authorities and investors. Revisiting the links between IFRS adoption and tax function provides some promising changes that can influence the design of information systems and tax administration. To sum up, it encourages reliance on book-tax conformity whenever possible. This, in turn, can have significant benefits such as reducing compliance costs and tax rates. Therefore, a legislative effort to enforce IFRS compliance for tax purposes looks necessary.

Similarly, investors must consider how to evaluate tax avoidance activities to ensure that shareholders' interests are being served, particularly in term of recent market valuations view of tax avoidance that no longer recognize tax as a transfer of value from the state to shareholders (Desai & Dharmapala, 2009). This in turn, increases the monitoring role of managers, shareholders and boards that highlights the importance of reviewing and supervising tax activities within firms.

CONCLUSION

We examine the impact of IFRS adoption on accounting quality to explain a firm’s level of tax avoidance and to determine whether corporate tax avoidance activities vary across the harmonization level with IFRS. Our results show that higher level of harmonization with IFRS in the preparation of financial reports implies less tax avoidance activities. These results are consistent with prior studies that find evidence of an improvement in reporting quality after IFRS adoption (e.g. Barth et al., 2008; Karampinis & Hevas, 2013; Kerr, 2013). Meanwhile, results from the logistic model and quantile model yield similar conclusions to those from the OLS model, thus providing additional support for the main expectation.

The results of investigation whether the strength of the relationship between IFRS and CTA is affected by firms' characteristics (i.e. reporting losses, institutional ownership concentration, and Big N), suggest that, in the context of GCC countries, firms' characteristics are a weak indicators of corporate tax avoidance. Specifically, institutional ownership and Big N auditors, as external governances play a negative role in monitoring managerial activities including the tax function. Finally, the findings are robust with respect to different measures of corporate tax avoidance and IFRS adoption.

This study had some limitations. First, the study period may be problematic in that it covers only seven years. Prior studies highlight the importance of using longer period which might give a better picture concerning the outcomes of IFRS adoption, since it allows long-term implementation and enables managers to act opportunistically in anticipation of certain IFRS effects. Therefore, future research can extend the study period to cover more than seven years, to better understand the impact of IFRS on CTA. Second, GCC countries that adopted IFRS are still using IAS, thus it is very hard to determine whether the impact that had been seen in the results relates to only an IFRS effect. Third, the study inferences are limited because variation in firms' harmonization level with IFRS may not be exogenous with respect to their level of tax avoidance. Therefore, there is a possibility of reverse causality and correlated omitted variables.

Appendix A: Description of Variables

Dependent Variable	
Corporate Tax Avoidance (CTA)	Is the residual from regressing book-tax gaps (measured as pre-tax income less taxable income, scaled by the lagged value of total assets) on the absolute value of performance-adjusted abnormal accruals (Kothari et al., 2005).
Independent Test Variable	
IFRS	Is an ordinal variable and takes three values: "1" for country-year with no IFRS-related activities; "2" for country-year with partial adoption (i.e., countries with convergence projects, countries allowing voluntary IFRS adoption, and countries requiring IFRS for some listed companies) and "3" for country-year with full IFRS adoption for listed firms (Ramanna and Sletten, 2014).
NIFRS	The non-adoption of IFRS measured by a dummy variable that takes the value of 1 for the country-year coded one as for IFRS and 0 otherwise.
PIFRS	The partial adoption of IFRS measured by a dummy variable that takes the value of 1 for the country-year coded two as for IFRS and 0 otherwise.
FIFRS	The Full IFRS adoption measured by a dummy variable that takes the value of 1 for the country-year coded three as for IFRS and 0 otherwise.
Control Variables	
Firm-specific characteristics:	
Firm size (SIZE)	Natural log of total assets at the end of the year t
Leverage (LEV)	Total debt divided by total assets at the end of year t
Operating Cash Flows (CFO)	Natural log of cash flow from operations divided by total assets at the end of the year t
Book to market ratio (BM)	The book value of equity divided by the market value of equity at the end of the year t
Country specific characteristics:	
Market Capitalization (MK)	Natural log of market capitalization as a percent of the growth domestic product (GDP) in U.S. dollars
Rule of Law (RL)	Score of -2.5 to 2.5 from Kaufmann et al. (2014) where higher values represent stronger quality of enforcement, measured as of sample period from 2010 -2016.
Industry and year controls:	
Industry fixed effects	Categorical variable to classify the firm's industry based on Fama and French's (1997) 48 industry groups
Year fixed effects	Categorical variable to control for year fixed effects
Other Variables	
Institutional ownership (PIH)	Dummy variable coded (PIH =1) if the percentage of common shares held by institutions over the sample period is above 50%, and (PIH =0) otherwise
Auditors quality (BIGN)	Dummy variable coded (BIGN=1) if the firm i uses the services of a Big N auditors, and (BIGN=0) otherwise
Losses ratio (LOSS)	Dummy variable coded (LOSS=1) if the firm i reports negative income before extraordinary items in year t, and (LOSS =0) otherwise
LOSS*IFRS	The interactive term of the variable capturing the Losses (LOSS) with the variable capturing IFRS adoption
PIH*IFRS	The interactive term of the variable capturing the institutional ownership (PIH) with the variable capturing IFRS adoption
BIGN*IFRS	The interactive term of the variable capturing the Auditors quality (BIGN) with the variable capturing IFRS adoption

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ACKNOWLEDGMENTS

The author would like to thank the editor and the anonymous reviewers for their constructive comments and suggestions.

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Accounting & Taxation
Vol. 12, No. 1, 2020, pp. 67-79
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

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AN IMPROVED METHOD FOR ESTIMATING DISCOUNT RATES FOR LISTED COMPANY VALUATION

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ABSTRACT

This study offers a comprehensive overview of estimation methods for the discount rate used in company valuation, and then attempts to improve these methods. Firstly, for the cost of equity estimation method, this study improves the traditional form of build-up model by replacing its size premium with a beta-adjusted size premium, so that the size premiums for firms in different size groups can be better reflected. Next, the study introduces an expanded capital asset pricing model (CAPM) which replaces the ordinary least square (OLS) beta with a shrunk beta. The beta-adjusted average size premium and the firm-specific risk premium were also added to capture unsystematic risk not measured by the traditional CAPM. In addition, this study introduces a target price-based multi-stage Gordon growth model, which adapts the consensus target price as a proxy of the intrinsic value in a manner consistent with the assumption of the basic Gordon growth model. The study continues by offering an effective solution to the estimation of cost of debt for companies above and below investment grade. The marginal tax rate and the forecasted rate on new debt issuance are recommended when estimate cost of debt. Finally, the study suggests a forward-looking target capital structure to combine the cost of equity and cost of debt. The approach involves a three-step process to identify the possible target structure that firms are likely to adopt in the long term.

JEL: G12, G14, C10

KEYWORDS: Discount Rate, Cost of Capital, Company Valuation

INTRODUCTION

Determination of the appropriate discount rate for different companies is one of most challenging works in valuation. This hold especially true in private business valuation where many essential inputs in the cost of capital estimation cannot be observed directly. Relative valuation models, such as price and enterprise value multiples, disclose the intrinsic value of a company on the basis of comparable firms. For these models no discount rate is required. However absolute models rely heavily on the discount rate. Absolute models are commonly over-sensitive to the changes in estimated inputs such as the rate used to discount future cash flows. This occurs because for many companies, especially high growth companies, the estimated terminal value in absolute valuation usually accounts for a large percent of total estimated value. Therefore, estimating an accurate discount rate to fully reflect both the time value of money and the uncertainty of future cash flows is essential to produce reliable valuation results.

Although literature on valuation models exists, this practice-oriented study aims to improve the existing discount rate estimation methods for listed company valuation purposes. This study focuses on the estimation of weighted average cost of capital (WACC), which represents the overall required return on a company's entire capital (equity and debt). The WACC has often been used as a discount rate in free cash flow to the firm valuation. The WACC contains three parts: the cost of equity, after tax cost of debt and target capital structure.

The rest of the study is organized as follows: The literature review section provides a general overview of the discount rate estimation in company valuation. The next section discusses the existing estimation method of WACC followed by the improved WACC estimation method introduced by this study. The paper continues by presenting the existing methods for the estimation key components of WACC such as risk-free rate, beta and equity market premium. Lastly, the paper closes with some concluding comments.

LITERATURE REVIEW

The discount rate is widely used in company valuation to estimate the intrinsic value of company. It is an important component of any absolute valuation models such as the discount cash flow and adjusted present value models. Pratt (2002) states that the discount rate reflects both the time value of money and the risk of expected future cash flows. In valuation practice, the cost of capital of a company has often been used as a discount rate that equates expected economic income with present value. The cost of capital is a forward-looking rate required by the market to attract funds or maintain a current market price level. It consists of the risk-free rate and a variety of risk premiums to reflect t market expectations about the real rate of return, expected inflation and risks (Pratt, 2002). The discount rate must be defined correspondingly in relation to the type of cash flow being discounted. For example, the required return on equity is an appropriate discount rate for the dividend and free cash flows to equity. The free cash flow to the firm only can be discounted by utilizing the weighted average cost of capital (WACC).

Although the capital structure and source vary significantly across different companies, equity and debt are two major sources of financing. Therefore, the cost of capital may refer to the required return on a company's equity capital or debt capital, or both (the weighted average cost of capital). However, no matter the type of capital resources used, the cost of capital must be measured in market value and normally in nominal terms except in the rare situation of unpredictable hyperinflation.

Some confusion can result from the terms required return and expected return which are sometimes used interchangeably. Pinto et al. (2009) argue that the required return is the hurdle rate or minimum level of expected return that the market required, and they can only be used interchangeably when the company is efficiently priced. The authors further point out that although individual investors can form different expectations (expected returns) about the future dividend yield and price appreciation, the required return used to discount future economic income of a company is market driven rather than a personal required return.

Analysts rarely accept any estimated discount rate at face value. Rather, they adjust it based on several factors. Based on a survey conducted by the Association for Financial Professionals (AFP) with more than 300 top financial officers, Jacobs and Shivdasani (2012) conclude that nearly half the respondents admitted that discount rates they use are likely to be at least 1% above or below the company's true rate.

EXISTING METHODS FOR ESTIMATING WEIGHTED AVERAGE COST OF CAPITAL

Cost of Equity

The cost of equity is the rate of return that markets demand in exchange for owning asset and bearing ownership risk, it is an important component of the weighted average cost of capital (WACC). The cost of equity can be directly used as a discount rate for certain valuation model such as the discount dividend model. Normally, a company's equity capital consists of common stock (includes additional paid-in capital and retained earnings) and preferred stock (includes the hybrid security such as convertible preferred stock). Both sources need to be taken into account when estimating the cost of equity. Koller et al. (2010) state that the cost of equity is determined by three factors: the risk-free rate, the market wide risk premium and a risk adjustment factor that reflects each company's riskiness relative to its peers. A wide range of cost of equity

estimation techniques have been developed, and the following sections provide comprehensive overview of these methods.

Build-Up Model: The build-up model is a traditional but widely used multifactor model to estimate the required return on equity capital, especially for small listed companies or private businesses. Pratt (2002) states that the build-up method estimates the cost of equity as the sum of the risk-free rate and a series of risk premiums. Usually the premiums for risk include the equity market premium, size premium, perceived company-specific risk premium and possibly the industry premium and illiquidity premium. In addition, the country-specific premium sometime needs to be considered but it is not required in developed markets such as the United States. The build-up model is ideal for small companies. As Pinto et al. (2009) indicate the sum of risk-free rate and equity market premium is actually the average required return on large-cap listed equity plus an incremental small size premium to reflect the average required return on micro-cap listed equity. Finally, the premium to represent the company-specific risk is added to arrive at the cost of equity for a particular small company. However, application of the traditional build-up model form needs to judge the types of risk premium on a case-by-case basis. This process can be over-complicated when the model contains many premiums each of which must be estimated. Fortunately, there is a simple and convenient form of build-up model available, known as the bond yield plus risk premium model (BYPRP). Pinto et al. (2009) state that the BYPRP is suitable for companies with public traded debt. This model estimates the cost of equity roughly as the sum of the yield to maturity on a company's long-term debt and a risk premium. The authors further indicate the risk premium in this model is aimed to compensate for the additional risk of equity issues compared with debt issues. The risk premium is usually within 3 to 4 percent in the United States.

Capital Asset Pricing Model (CAPM) : The CAPM is a popular single-factor model to estimate the cost of equity for larger listed firms. The model is based on strong theoretical foundation and is easy to apply. According to the AFP survey, Jacobs and Shivdasani (2012) conclude that about 90% of respondents select the CAPM model as their primary tool to estimate cost of equity. The CAPM builds on the assumption that capital markets have four major type of risk: inflation, maturity, systematic and unsystematic risks. The unsystematic risk of individual stock can be easily diversified away in a large and well-diversified portfolio (Pratt, 2002). Therefore, the CAPM only considers the inflation and maturity/interest risks as captured by the risk-free rate, and the systematic risk as measured by the market risk premium. The CAPM measures each stock's riskiness relative to the whole market by the beta risk adjustment factor. However, there are doubts concerning the CAPM as many studies argue it describes risk incompletely. For example, Pinto et al. (2009) state that in reality, the coefficients of determination (R2) for individual stocks' beta regressions usually range from 2 percent to 40 percent, with many under 10 percent.

Gordon Growth Model (GGM): The GGM is also a popular estimation method for the required return on equity due to its forward-looking, simple and direct features. Some studies argue that GGM tends to produce lower cost of equity figures than build-up and CAPM approaches. The GGM is completely different from the single-factor or multifactor models and it has two forms: single-stage and multi-stage.

The single-stage GGM assumes a constant growth rate and estimates the cost of equity as the sum of dividend yield and the dividend growth rate of the firm. The dividend or earnings growth rate must be based on the long-term (5 to 10 year) consensus rate rather than the short-term rate to reflect the steady-state growth after a finite forecast horizon. In addition, Pratt (2002) states that the GGM assumes the current market price equals the expected future returns discounted to a present value at a discount rate that represents the cost of equity capital for the company. Thus, the dividend yield is calculated as the year-ahead aggregate forecasted dividend divided by the intrinsic value per share of the firm. However, analysts tend to use the market price to calculate the dividend yield when applying the GGM to estimate the cost of equity. This produces a market price-implied cost of equity or discount rate, but this goes against the basic assumption of GGM when the mispricing exists.

The implied required return on equity only can be used as a discount rate when the firm is fairly priced. Fitzgerald et al. (2011) argue that the use of market price in the GGM to calculate the discount rate results in an estimated cost of equity that often underestimates the realized cost of equity capital. Another issue in the application of GGM is that not all firms make regular cash dividends. Technology firms in the high growth stage tend to retain earnings for reinvestment. Pratt (2002) recommends defining the "dividend" broadly and introduce a net cash flow to equity (NCFE) as an alternative. The author defines the NCFE as those amounts of net cash flows that could be paid to equity investors without impeding a company's future growth (NCFE = Net income + Noncash charge - Capital expenditure - Additions to net working capital ± Changes in long-term debt). Koller et al. (2010) suggest the cash flow available to equity holder (CFAEH) as another alternative choice to replace the dividend (CFAEH = Earnings*(1- Long term Real Gross Domestic Product grow rate/Long term Return on Equity)).

On the other hand, rather than assume a constant earnings growth rate for the entire lifetime of a firm, the multi-stage GGM incorporates different growth rates at different stages of a firm. This is more reasonable, especially for rapid growing firms. Normally, the multi-stage GGM has two or three stages, and each stage lasts about three to five years. The three stages GGM is more logical as it contains a smooth transition from growth to maturity. Pinto et al. (2009) divide the lifetime of a firm into three stages: growth, transition and mature, and estimate a cost of equity that equates the sum of the present values of the expected cash flows of the three stages to the current market price.

Other Cost of Equity Estimation Methods: In addition to the above equity capital cost estimation techniques, there are many other methods available. Although these methods are less frequently used than the CAPM, they are supplementary to the analyst's toolkit. The multifactor Fama-French model is perhaps the most famous empirical evidence-based model. It is different from the CAPM due to how it defines risk. Koller et al. (2010) states the CAPM defines a stock's risk as its sensitivity to the stock market, whereas the Fama-French three-factor model defines risk as a stock's sensitivity to the market, size and value portfolios. Another multifactor, Pastor-Stambaugh model, adds a fourth factor (liquidity) to the Fama-French Model. This approach represents the excess returns to a portfolio that invests the proceeds from shorting high-liquidity stocks in a portfolio of low-liquidity stocks (Pinto et al., 2009). The liquidity factor usually depends on the size of the interest and the depth and breadth of the market, and also its ability to absorb a block without an adverse price impact. Besides, rather than rely on the fundamental factors of firms to estimate the cost of equity, the macroeconomic model considers economic variables (e.g. business cycle, market timing) that affect the expected future cash flows of companies. The statistical cost of equity estimation methods adapts the historical returns to determine portfolios of factors explain return variation.

Cost of Debt

Cost of debt reflects the average after-tax interest rate that a company pays on its overall debt and is an important component of the WACC. Unlike the government securities, the corporate bond contains a certain degree of default risk especially for companies below investment grade (lower than S&P BBB- credit rating). Thus, the after-tax yield on corporate bonds is determined by the cost of debt, default risk premium and recovery premium. Specifically, recovery premium is influenced by the recovery rate after default. Koller et al. (2010) indicates the default risk premium is largely affected by company's bond rating and amount of collateral, and it relates to a series of factors such as leverage, profitability and the sensitivity of profitability to systemic risk which could influence the company's probability of default (Pinto et al., 2009).

For companies with investment grade debt, the after-tax yield to maturity (YTM) or yield to call (YTC) on the company's liquid, option-free and long-term public traded debt has often been selected as a proxy for cost of debt. The YTM or YTC can be calculated based on the market price of a bond and promised cash flows, or use the credit rating to estimate them if the company only has short term bonds or bonds trade infrequently. In particular, determining a company's credit rating on unsecured long-term debt, and then

examining the average yield on a portfolio of long-term bonds with the same credit rating. Pratt (2002) recommends YTM when the stated interest rate is below the current market rate, otherwise, YTC is preferred. In addition, although over 64% of respondents in the AFP survey choose the company's effective tax rate to estimate the after-tax yield, many studies argue that the marginal tax rate is the most appropriate rate. Pinto et al. (2009) stated the marginal tax rate is able to better reflect the firm's future cost of financing than the effective tax rate, where effective tax rate can reflect nonrecurring items. Moreover, Jacobs and Shivdasani (2012) suggest that when estimating the cost of debt, individuals should focus on the forecasted rate on new debt issuance rather than the current rate on outstanding debt or average historical rate.

It is not appropriate to using the YTM or YTC as a proxy for the cost of debt for companies below investment grade. This because the yield on corporate bonds may be significantly higher than the cost of debt, since the default risk premium and recovery premium are both large. Thus, Koller et al. (2010) suggest using absolute valuation models such as adjusted present value model and free cash flow to equity model, which are based on the cost of equity rather than the WACC to discount future economic incomes.

Capital Structure

Capital structure plays an important role in the determination of a company's WACC and it must on the basis of the market value of debt and equity. This is necessary because book value may significantly deviate from the market value and not reflect the true capital structure. In company valuation, the WACC discounts the expected cash flow from a company's entire lifetime and the WACC should base on the long-term sustainable capital structure. Thus, the forwarding-looking target weight has been frequently used to combine the cost of equity and debt capital. Pinto et al. (2009) indicates that target weight reflects the market expectations about target capital structure the company will tend to use over time. The target weight provides a good approximation when the current weight misrepresents the company's normal capital structure or the structure is expected to change in the future.

IMPROVED METHODS FOR ESTIMATING WEIGHTED AVERAGE COST OF CAPITAL

Cost of Equity

Improved Build-Up Model: This study improves the traditional build-up model by replacing its size premium with beta-adjusted size premium. Rather than applying the size premium, which is estimated by the arithmetic mean return difference between each size category and market index, Morningstar Ibbotson recommends the beta-adjusted size premium which is calculated by dividing NYSE listed firms into 11 size groups (from 1-largest to 10b-smallest) according to their market capitalizations, and each size group has its own average beta. The realized return in excess of what traditional capital asset pricing model (CAPM) estimates (by using the group-specific beta) is the beta-adjusted average size premium. The rational of this method is that the CAPM considers the systematic risk by beta, thus the difference between realized and estimated return is the unsystematic risk premium.

Improved CAPM Model: This study presents the expanded CAPM which is originally introduced by Pratt (2002) and Pinto et al. (2009) to better estimate the cost of equity especially for smaller firms. The general expression is given in equation (1) below.

$$Cost\ of\ Equity = Risk\ free\ rate + Shrunk\ beta * Market\ premium + SP + FP \quad (1)$$

Where: Shrunk beta = (1 – weight) * peer group beta + weight * company beta; Weight = (cross-sectional standard error)^2/[(cross-sectional standard error)^2 + (time series beta standard error)^2]; SP = Beta-adjusted average size premium; FP = Firm-specific risk premium.

The multifactor expanded CAPM is based on the fact that unsystematic risk cannot be fully diversified away especially for median and small cap firms, where total realized returns on smaller companies have been substantially greater than the CAPM would have predicted (Pratt, 2002). Thus, a beta-adjusted size premium is added to reflect the average level of incremental unsystematic risk that smaller firms over larger firms. In addition, the firm-specific risk premium which can be either positive or negative (more or less risky than the average level) is also included to capture the remining unsystematic risk. The estimation of firm-specific risk premiums depends on the subjective judgment of the firm and usually ranges from -2% to +2%.

Firms tend to close to industry average risk level in the long run so beta in the CAPM model should be more forwarding looking. Thus, the shrunk beta is recommended by Morningstar Ibbotson to replace the simple regression raw beta. Rather than adjust beta toward the mean value of one over the long run by Marshall Blume method (1971), shrunk beta is a more reasonable beta toward industry or peer mean value which is estimated by applying the Vasicek Shrinkage technique. In particular, firms with high raw beta or high standard error in their raw beta are subject to more adjustment toward the industry average level (Pratt, 2002).

Improved Gordon Growth Model: According to Pratt (2002) and Fitzgerald et al. (2011), this study introduces a target price-based multistage Gordon growth model (TPGGM) to estimate the discount rate. The general expression is given in equation (2). Note the life stage classification of a firm needs to be judged case-by-case. The TPGGM chooses the consensus target price as a proxy of the intrinsic value per share to consistent with the assumption of the basic Gordon Growth model, in case the market price deviates from the intrinsic value. Fitzgerald et al. (2011) show the target price-based estimate of cost of equity normally outperforms the market price-based estimate. Correlation between estimated and realized cost of equity is consistently positive and statistically significant when derived from target price. In addition, the TPGGM defines the cash flow differently across three stages to reflect the fact that firms in the latter stages tend to distribute earnings rather than retain it, the declining growth rates recommended by Morningstar Ibbotson are also in line with the characteristics of a firm over its lifetime.

$$\mathrm{TP} = \sum_{n=1}^{5} \frac{[\mathrm{CF}_0(1+\mathrm{g}_1)^n]}{(1+\mathrm{r})^n} + \sum_{n=6}^{10} \frac{\mathrm{CF}_5(1+\mathrm{g}_2)^{n-5}}{(1+\mathrm{r})^n} + \frac{\frac{\mathrm{CF}_{10}(1+\mathrm{g}_3)}{\mathrm{r}-\mathrm{g}_3}}{(1+r)^{10}} \tag{2}$$

Where: TP is analyst' consensus target price for the firm in the next 12 month time horizon; CF_0 is the cash flow in the preceding year (growth stage) = Net income + Noncash charge - Capital expenditure - Additions to net working capital ± Changes in long-term debt; CF_5 is the expected cash flow in the fifth year (transition stage) = Net income + Noncash charge - Capital expenditure - Additions to net working capital ± Changes in long-term debt; CF_{10} is the expected cash flow in the tenth year (mature stage) and it is equal to the dividend or Earnings * (1- Long term Real GDP grow rate / Long term ROE); g1, g2 and g3 are the expected cash flow growth rates in the three stages (g1 equals to the firm-specific growth rate, g2 equals to the industry average growth rate and g3 equals to the expected long-term GDP growth rate); r is the constant discount rate (cost of equity) for all the three stages.

Although the TPGGM assigns declining growth rates to three life stages of a firm respectively, it produces a constant cost of equity. The risk behind cash flows from differing stages of a firm should not the same, and the discount rate needs to reflect the underlying risk of each cash flow. Therefore, it is ideal if the discount rate is time-varying, with the cash flow from each stage being discount by its corresponding rate. However, this is not easy to implement in practice, and analyst tend to use a constant discount rate to all the future cash flows for simplicity. Recent studies provide great insight into the dynamic discount rate. Koller et al. (2010) state that if a company is near or already at its target capital structure (in mature stage),

applying a constant weighted average cost of capital (WACC) or cost of equity leads a reasonable valuation result. For firms with expected significant change in capital structure, the authors agree that using a constant discount rate can lead to significant error. Davidson et al. (2013) show an apparent difference between the present value computed under the assumption of a fixed discount rate that lasts indefinitely into the future and present values determined by a time varying discount rate. Lyle and Wang (2013) also criticize the constant discount rate assumption in the Gordon Growth model arguing it can lead to significant valuation errors or poor investment decisions. However, the estimation of different discount rates for cash flows from the different stages of a firm is complex and subject to further study.

Cost of Debt

According to Koller et al. (2010) and Pinto et al. (2010), this study improves existing method and estimates the cost of debt separately. For companies with long-term public traded corporate bonds, the YTM on newly issued LT bonds has often been selected as a proxy of cost of debt. For companies with only short-term publicly traded corporate bonds (no LT credit rating), determine the possible LT credit rating and cost of debt by contrasting the key financial ratios with other firms (firms with LT credit ratings). For companies without publicly traded corporate bond (no credit rating), but with other form of debt such as bank loans, determine the possible LT credit rating and cost of debt by contrasting the key financial ratios with other firms (firms with LT credit ratings). For companies without any form of debt or liability at any time (rare), the cost of debt is zero

Capital Structure

This study presents the following improved target capital structure estimation method. For mature companies already at or near their target capital, the current market value of debt and equity can be directly used to estimate the target weight. For start-up or growth companies with unstable capital structure, Koller et al. (2010) recommend a three-step approach to find out the possible target structure that the companies are likely to adopt in the long term. The approach estimates the company's current market value-based capital structure, then judges the reasonableness of the estimated capital structure according to comparable companies and adjust it if necessary. Finally review management's implicit or explicit approach to financing and its impact on the target capital structure. It has often been found that the purpose of valuation has certain degrees of impact on the target structure. Pratt (2002) finds that valuation with minority interest has little influence, since it is beyond the power of minority stockholder to change the capital structure. However, the peer average or buyer's desired structure should be used to estimate target weight because the control buyer has the power to change the capital structure.

EXISTING METHODS FOR ESTIMATING OTHER KEY COMPONENTS OF WACC

Risk Free Rate

The risk-free rate is an important component of the traditional form of build-up model, equity market premium, capital asset pricing model (CAPM) and so on, the U.S. Constant Maturity rates of Treasury securities have often been selected as proxies. Treasury securities are normally free of default risk thus its yield consists of the real interest rate, expected inflation premium and maturity risk premium.

In terms of the maturity, Morningstar Ibbotson adopts the 30-day Treasury bill Constant Maturity rate as the risk-free rate to minimize the interest risk. Many studies argue that government bonds with longer maturities should be selected to comply with the going-concern assumption of valuation. Pinto et al. (2009) argue that a risk-free rate relative to long-term Treasury bonds should produce a more plausible discount rate in a multi-period context of valuation. Pratt (2002) states that a longer-term yield fluctuates significantly less than short term rate. Thus, a 20-year U.S. Treasury bond is preferred to avoid any short-

term distortion into the actual cost of capital. However, Koller et al. (2010) argue that 20- or 30-year government bond is not a good proxy of the risk-free rate since it lacks liquidity and recommend the 10-year zero coupon note as a better choice. The 10 year Treasury note rate has been supported by recent studies and according to the AFP survey, Jacobs and Shivdasani (2012) conclude that about 46% of survey participants use the 10-year rate, 12% select the five-year rate and only about 4% survey participants use 20-year rate as the risk-rate.

Further, Koller et al. (2010) state it is ideal for each economic income to be discounted by a cost of capital derived from a Treasury security with the same duration or time horizon, but this is not easy to implement in practice. Therefore, the practical principle in valuation is to match the duration of the risk-free rate measure to the duration of company being valued (Pinto et al., 2009). Analysts often choose a Constant Maturity rate on Treasury notes to closely matches the entire future cash flows from the assumed perpetual life horizon of a company.

Beta

Beta is another important element in the CAPM. It measures systematic risk. It can be above, equal to or below one, representing the different degree of individual stock volatility in relation to the market portfolio. The traditional approach to estimating beta of an actively traded stock is by running ordinary least square regression of the total historical return of individual equity on the total historical return of the diversified and market-capitalization weighted index. The slope of the regression equals the raw beta. Alternatively, the regression beta estimation method can also be based on excess return.

In terms of the length of return period, Pratt (2002) states that a five-year period is the most common choice. Longer estimation periods would place too much weight on irrelevant data. Many institutional investors and market intelligencers such as Merill Lynch, Morningstar Ibbotson and Compustat also adopt this choice. Other alternatives such as a two-year measurement period has been chosen by Bloomberg to estimate beta. But, it is more appropriate for emerging markets rather than mature market like U.S. Jacobs and Shivdasani (2012) find that in AFP's survey, over 40% of respondents select five years and only about 13% choose two year data in their estimation of beta. Regarding the frequency of data, Morningstar Ibbotson adopts the monthly data. This choice has been widely accepted although Value Line uses weekly data in its beta estimation. Koller et al. (2010) argue that the use of more frequent return data such as weekly and daily can lead serious systematic error.

Industry-adjusted Company Beta: A range of new techniques have been developed to improve the raw beta generated directly from regression. The industry-adjusted company beta has been recommended by many studies and widely used in practice. It reflects the systematic risk more accurately since it is on the basis of industry or peer average rather than individual company to avoid bias. Usually, companies in the same industry tend to have similar operating or unlevered beta due to similar operating risk. The first step of the estimation of industry-adjusted company beta is to identify a series of comparable firms for the subject company. The second step estimates each company's raw beta by regression. Since the raw beta (levered beta) reflects the capital structure of a firm and also the leverage in its capital structure, the third step removes the effect of leverage for each firm to obtain the unlevered beta. This approach is especially appropriate for a firm with debt levels that significantly differ from its peer average or its own historical mean value (Pratt, 2002). Many studies suggest the formula (Equation 3) to estimate the unlevered beta. The fourth step determines the median value of unlevered beta for peers. The last step re-levers the median unlevered beta with the subject company's target capital structure or industry-average capital structure to obtain the industry-adjusted company beta.

$$B_u = \frac{B_L}{1 + (1 - t)\, D/E} \tag{3}$$

Where: Bu is the unlevered beta; BL is the levered or raw beta; t is the average marginal/effective tax rate of the company during the beta measurement period; D is the average market value of company's debt during the beta measurement period and E is the average market value of company's equity during the beta measurement period

Beta Smoothing Method: The regression raw beta is estimated from historical data. Thus, a so-called "smoothing" adjustment is normally required to be consistent with the forward-looking concept of valuation. This process smooths any extreme estimated beta deviates from the average. Koller et al. (2010) indicates that smoothing is particularly necessary when there are few or even no direct comparable exist. The smoothing method introduced by Marshall Blume (1971) adjusts beta toward the mean value of one over the long run, to reflect the fact firms tend to close to market average risk levels when becoming mature. This method has been adapted by many market intelligencers such as Bloomberg and its expression is given in equation (4) below. Jorion (1986) presents a more advanced smoothing method to adjust raw beta (Equation 5). Rather than adjust the raw beta toward value of one to represent the average market risk, the shrunk beta recommended by Morningstar Ibbotson is more logical since it adjusts beta toward peer mean value.

$$\beta_{adj} = \left(\frac{1}{3}\right)(1) + \left(\frac{2}{3}\right)\beta_{unadj} \tag{4}$$

$$\beta_{adj} = \frac{\sigma_\varepsilon^2}{\sigma_\varepsilon^2 + \sigma_b^2}(1) + \left(1 - \frac{\sigma_\varepsilon^2}{\sigma_\varepsilon^2 + \sigma_b^2}\right)\beta_{unadj} \tag{5}$$

Where: β_{unadj} = Unadjusted beta such as raw beta; σe = Time series standard error of subject company beta; σb= Cross sectional standard deviation of all peer betas

Sum Lagged Beta Technique: The market price of smaller stock tends to react to the movement of overall market with a lag, and the lag is negatively related to the size of company. Ibbotson et al. (1997) argue that the traditional beta estimation method such as regression is likely to underestimate the systematic risk of small firms due to the lag effect. Hence a substantial positive adjustment of beta is necessary. A so-called sum lagged beta technique suggested by the Morningstar Ibbotson is a common approach to adjust raw beta and deal with the return lag effect of small cap firms. It is also an effective solution to the thinly traded stock with underestimated beta. Koller et al. (2010) point out that in the sum lagged beta model, a stock's (excess) return is simultaneously regressed on concurrent market (excess) returns and market (excess) returns from the prior period, the two betas from the regression are summed and the monthly return period is the most common choice.

Equity Market Premium

The equity market premium is the expected excess return that overall stock market provides over a risk-free rate to compensate investors for taking on the relative higher risk. The equity market premium is a key component in the single factor model such as CAPM, and also an important element of the multi-factor model for example the Fama-French model. In the United States, the expected equity risk premium is countercyclical and tends to be high during bad times but low during good times (Pinto et al., 2009). Although equity market premium should be the same at any time for everyone, analysts do not reach this consensus. Jacobs and Shivdasani (2012) find that in AFP's survey, almost half respondents estimate the equity market premium at about 5%-6% during the current US economic recovery, about 23% respondents tend to be more optimistic and choose 3%-4%, only 11% use less than 3%. Hence, the estimation of an appropriate equity market premium is one of the most important tasks in the application of WACC or cost

of equity. Until recent, there are a range of equity market premium estimation methods have been developed and the following sections illustrate them respectively.

Historical Approach: The historical approach is a common choice when the long-term reliable market returns are available, Koller et al. (2010) states that if the level of risk aversion hasn't changed over the past long period, the historical excess returns should be a reasonable proxy for future premiums. The equity market premium in the historical approach is calculated as the difference between the mean realized market index return and the mean government debt return during the selected sample period (see equation (6) below).

In terms of sample period selection, many studies suggest the longest available series of reliable return data. Koller et al. (2010) point out if the market risk premium is stable, a longer history significantly reduces estimation error. Pratt (2002) states that focus on a shorter historical date range would magnify the effect of the most recent unusual events, use a longer range of data places less emphasis on each event and better captures long term performance. The author also recommends an exponential weighting scheme which offers effective solution to the time length selection. This scheme assumes the future will produce a similar economic climate to the recent period, and then averages the historical data to allow more importance to be placed on current data.

On the other hand, the type of mean return selection (geometric or arithmetic) has been a subject of intensive argument. The general view of the difference between them is that arithmetic averages are better forward-looking point estimates, and geometric averages are better for historical analysis of a defined data range (Pratt, 2002). A number of studies indicate the arithmetic average is preferred since the major cost of capital estimation model such as CAPM is single period model. The arithmetic mean return is the average one-period return which best represents the mean return in a single period. Morningstar Ibbotson and Brealey et al. (2011) also support the view that if the equity market premium is estimated from historical returns, the long-term arithmetic average is the best proxy for today's equity market premium. However, Pinto et al. (2009) argue that the geometric mean is increasingly preferred for use in historical approaches, because the geometric mean is a compound rate and the absolute valuation models involve the discounting over multiple time periods. Hence, it is a logical choice for estimating a required return or equity market premium in a multi-period context. Besides, Koller et al. (2010) criticize the arithmetic average as very likely to bias the discount rate upward. The authors then present a method which is originally designed by Marshall Blume to solve the conflict of the geometric and arithmetic mean. This method argues the true market risk premium lies somewhere between the arithmetic and geometric averages. It determines the weights of both types of means according to the time length of future cash flows. Its expression is given in equation (7).

$$\begin{aligned}\text{Excess Return of Market Return over Risk Free Rat2} &= (1 + \text{Market Return})/(1 + \text{Risk Free Return}) - 1 \\ &\approx \text{Market Return} - \text{Risk Free Return}\end{aligned} \tag{6}$$

$$R = \left(\frac{T - N}{T - 1}\right) R_A + \left(\frac{N - 1}{T - 1}\right) R_G \tag{7}$$

Where: R = Equity market premium; T = Number of historical observations in the sample; N = Forecast period of the cash flow being discounted; R_A = Arithmetic average of the historical return and R_G = Geometric average of the historical return

However, the use of historical approaches to estimate the equity market premium has been subject to criticism over time. A number of drawbacks have been discovered. Non-stationarity and survivorship bias are two major issues. Pinto et al. (2009) indicate that the use of historical estimates to represent the equity

market premium going forward is under the assumption that, the return series are constant over the past and into the future (stationarity). Besides, the amount of excess return that investors expect for their future time horizon is assumed to approximately equal to the excess returns that have actually been achieved (Pratt, 2002). However, the stationarity assumption may not hold since the non-stationarity of return time series is a common issue, especially for the emerging markets due to the unstable monetary policy such as sudden and large interest rate change. Thus, in case of an unstable time series of return, a five-year horizon has been recommended by many studies to maintain a reasonable level of stationarity. Besides, Fitzgerald et al. (2011) find evidence that survivorship bias tends to inflate the realized equity market premium, since the realized return does not include firms already failed. Thus, many studies suggest downward adjustment to the historical estimate of equity market premium. For example, Ibbotson and Chen (2001) recommend a 1.25 percentage point downward adjustment to the Morningstar Ibbotson historical mean U.S. equity market premium estimate. Copeland et al. (2000) recommend a downward adjustment of 1.5 percent to 2.0 percent for survivorship bias in the S&P 500 Index, using arithmetic mean historical estimates.

Forward-looking Approach: Due to the drawbacks of the historical approach, the forward-looking approach is a good alternative in the estimation of equity market premium. Since the equity market premium is based only on the expectations for economic and financial variables from the present going forward, it is logical to estimate the premium directly based on current information and expectations concerning such variables (Pinto et al., 2009). The rearranged Gordon growth model is one of the most widely used forward-looking approaches by investment bankers and fund managers to estimate the equity market premium. However, the premium estimated by the Gordon growth model may not be the same as the one produced by the historical approach. Fama and French (2002) find that prior to 1950, the historical and Gordon growth model estimates for the U.S. equity market premium agree, but from 1950 to 1999, the Gordon growth model estimate averages less than half the historical estimate. The authors attribute the difference to the effect of positive earnings surprises relative to expectations on realized returns.

In addition, the macroeconomic model is another type of forward-looking approach. Although less commonly used in practice, Pinto et al. (2009) indicate the macroeconomic model is more reliable when public equities represent a relatively large share of the economy. The model uses the relationships between macroeconomic variables and financial variables that figure in equity valuation model to estimate the equity market premium. Ibbotson and Chen (2003) present a macroeconomic model that estimate the equity market premium according to four variables, its expression is given below.

$$\begin{aligned}\text{Equity market premium} &= [(1+\text{EINFL})(1+\text{EGREPS})(1+\text{EGPE})-1]+\text{EINC} \\ &\quad -\text{Expected risk free return}\end{aligned} \tag{8}$$

$$\text{EINEL} \approx \frac{1+\text{YTM of 20 year maturity T bonds}}{1+\text{YTM of 20 year maturity TIPS}} - 1 \tag{9}$$

Where: EINFL is the expected inflation; EGREPS is the expected growth rate in real earnings per share (real GDP growth rate); EGPE is the expected growth rate in the P/E ratio (if efficient market, EGPE = 0) and EINC is the expected income component which equals to the sum of market index dividend yield and reinvestment return

Regression Approach: The regression approach estimates the equity market premium by using financial ratios such as the aggregate dividend to price ratio, the aggregate book to market ratio, or the aggregate ratio of earnings to price to estimate the expected excess return on market index (Koller et al., 2010). Until recently, there are a number of studies that prove the financial ratio especially the dividend yield is a good

predictor of the long run return. The adjusted R-squared for the regression of future excess market return (equity market premium) on the current aggregate dividend yield is high. The regression coefficient is positive and statistically significant. Cochrane (2005) states the superior predictability of dividend yield is due to the time-varying risk premium. For example, today's high dividend yield is indicative of a low market index, since the overall stock market risk is perceived to be risky due to a forecast of tough economic condition ahead. Thus, future return needs to be higher as well. However, Koller et al. (2010) criticize the regression approach because it generates negative estimated equity market premiums. This is inconsistent with risk-averse investors who demand a premium for bearing higher systematic risk. The authors further argue that the regression approach ignores the fact that dividend yield depends on the earnings growth rate, and the dividend is just one form of the corporate payout. Due to the over-simplicity and drawbacks of regression approach, it is not as popular as the historical approach and forward-looking approach.

CONCLUDING COMMENTS

This study offers a comprehensive overview of the existing estimation methods for the discount rate used in listed company valuation practice, and then attempts to improve these methods respectively, the details are summarized below:

First, for the cost of equity estimation method, this study improves the traditional form of build-up model by replacing its size premium with the beta-adjusted size premium, so that the size premiums for firms in different size groups can be better estimated. This study also introduces an expanded capital asset pricing model. This model replaces the raw beta with the shrunk beta which adjusts the raw beta toward industry or peer mean value. The beta-adjusted average size premium and the firm-specific risk premium have also been added to capture the unsystematic risk that is not fully measured by the traditional form of capital asset pricing. This study further introduces a target price-based multistage Gordon growth model which chooses the consensus target price as a proxy of the intrinsic value to be consistent with the assumption of the basic Gordon growth model. Second, this study offers effective solution to the estimation of cost of debt for companies above and below investment grade. The marginal tax rate and the forecasted rate on new debt issuance are recommended when estimate cost of debt. Third, this study suggests the forward-looking target capital structure might combine the cost of equity and cost of debt. A three-step approach is proposed to identify the possible target structure that the companies are likely to adopt in the long term.

As a result of the above improved methods, a more accurate discount rate can be estimated, and more reliable company valuation results can be generated in practice. This study improves the discount rate estimation method from pure theoretical side. Future study could apply quantitative research approach to verify the effectiveness of the improved methods introduced by this study.

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Accounting & Taxation
Vol. 12, No. 1, 2020, pp. 81-96
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

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ALTERNATIVE TREATMENT OF CONTRIBUTION IN AID OF CONSTRUCTION: THE IMPACT ON INVESTOR-OWNED UTILITY PLANT ASSET REPLACEMENT

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ABSTRACT

This paper proposes an alternative treatment of Contribution in Aid of Construction within the Investor-Owned water and wastewater utility industry. This study analyzes the impact of CIAC on funding utility aged assets by comparing the current amortization (credit) treatment to an alternative depreciation (debit) treatment of CIAC. This paper examines how the establishment of a reserve account for the recovery of plant asset usage through depreciation can fund Investor-Owned utility plant asset replacement. Recommended viability financial ratios and related CIAC ratios are used to consider the efficacy of funding a reserve account to replace retired assets. The results suggest an inverse correlation between the current credit treatment and aged plant assets and a positive correlation between the proposed debit treatment and financing of donated plant assets.

JEL: M4

KEYWORDS: Contribution in Aid of Construction, Investor-Owned Utilities, Credit Treatment, Debit Treatment, Aged Plant Assets, Donated Capital

INTRODUCTION

The United States Environmental Protection Agency (1995) explains that a utility should be able to consistently deliver quality services at a reasonable cost and exhibit financial, technical, and managerial capabilities that will enable it to comply with current as well as proposed regulations. The services of Investor-owned utilities (IOU) are essential for reaching parts of cities and rural areas where municipal utilities are not available. However, most utility infrastructures were placed in service and paid for during World war I or during the U.S. economic boom of the1890's (Kline 2017). Currently, most small water and wastewater utilities are challenged to replace and repair their aged plant assets due to lack of funding (Stanford, 2008). The Congressional Budget Office (2015) reports that the cost of water industry infrastructure replacement rose rapidly in 2003, and this increased cost is exacerbating the difficulties related to replacing and repairing aged IOU water and wastewater infrastructures. Since the 107th congressional session, there have been a series of bills to extend and increase appropriations to the State Water Pollution Control Revolving Fund. These bills were designed to comply with the Clean Water and Safe Drinking Water Acts (CWA) and improve existing aged assets within the water and wastewater industry (Copeland & Tiemann 2010). For utilities to comply with the CWA, they need to upgrade, replace, and install new transmission and distribution infrastructures; these improvements are projected to require a $271 Billion investment (Environmental Protection Agency, 2017).

This study examines the amortization (credit) treatment of Contribution in Aid of Construction (CIAC) and the impact of this approach on IOU utility infrastructure repair and replacement. The study proposes an

alternative depreciation (debit) treatment of CIAC. The remainder of the paper is presented in four sections. The next section presents a review of prior literature and articulates the importance of this issue. The third section presents the OLS research model and data used in this study, and the fourth section provides a discussion of the empirical results. The final section provides concluding thoughts on the implications of the research, associated limitations, and avenues for future research.

LITERATURE REVIEW

For a water or wastewater system to be sustainable and viable, the utility should be able to generate enough revenue to regularly improve, construct, operate, maintain, and manage the utility to comply with local, state, and federal regulations (Washington State Department of Health, 2010). Utilities require practical steps to assess both the viability of and the need for upgrading existing aged assets and infrastructure (Acheampong, Benford, & Volkan, 2018). Mann (1993) explains that capital expenditures (asset replacement) are primarily funded by debt capital or capital contributions (CIAC) and not through the ratemaking process. An insufficient rate base and dilapidated plant assets resulting in diminished collateral equity challenge IOUs ability to raise adequate, less expensive, debt capital, or capital contributions (CIAC) to fund utility asset replacements (Beecher & Mann, 1990). This suggests it is imperative for the water industry to establish practices that will enable utilities to sustain their assets and meet the needs of the populations they serve. The key to assuring the viability of water systems is the judicious use of state regulatory authorities so that only sustainable systems emerge in the first place (Beecher, Higbee, Anthony, and Richard, 1996). A viable utility is one that has the managerial and technical expertise as well as the financial capabilities to consistently meet long-term performance requirements.

The economic viability of an IOU is an essential factor in measuring the rate of return on IOU operating plant assets. Comparing the cost of borrowing to the rate earned by IOUs through ratemaking provides a better assessment of a utility performance (Warford & Julius,1979). The study suggests a debit treatment of CIAC with a reserve account established to reinvest the accumulated, may partially fund donated assets when the need arises. The situation may not be as devastating as it appears now (Acheampong et al. 2018). IOU infrastructure replacement depends heavily on performance dimensions, such as the ability to raise capital to finance these utilities. Unlike municipal utilities, IOUs rely on bank loans and owners' investments (loans to the utilities); the credit treatment of CIAC does not afford owners the recovery of plant usage through depreciation for asset replacement. It is assumed that ratepayers have paid for the initial infrastructure and that they need not pay again for its replacement. CIAC is classified as donated capital by many states; the AICPA (2017) classified CIAC as a representation of capital or property raised by a regulated utility for required services to ensure economical and fair rates to utility users. "CIAC is contributed by a customer that requests an uneconomic connection based on projected consumption and regulator-established utility rates" (AICPA, 2017). The AICPA definition suggests that CIAC is paid by customers and considered donated capital.

The AICPA (2017) recognized that the methodology for calculating CIAC is specific to the regulating bodies of the various states, e.g., Florida Public Service Commission (FPSC); however, they acknowledged that most regulators' methods do not include recovery and replacement of donated infrastructures. Guidance on the accounting treatment of CIAC is minimal, and due to the various regulatory methodologies, the accounting for CIAC is subject to interpretation and requires judgment because CAIC is considered a cost-reimbursement. Lastly, CAIC is not covered by FASB 606 (AICPA, 2017). Utility rate studies serve as a roadmap for planners making decisions about capital expansion, asset replacement, and other improvements (Forrer, Ehart, & Forrer, 2011). During rate case proceedings, regulators consider the plant assets of the utility and award the utility owners adequate returns on their investment. The total assets involved in the provision of utility services are used to establish the rate base for IOUs. The rate of return on utility investments is determined by dividing the net operating income from the test year by the net rate base. An adequate rate of return is the percentage factor that generates enough earnings when multiplied by the rate

base to cover interest and equity requirements of the capital invested in supporting the rate base (Deloitte Center for Energy Solutions 2004). Treating CIAC, as a credit balance offsets the net asset of the utility; however, this does not allow for the recovery of donated capital nor equity earnings of the assets.

F.A.C. 25-30.443 requires all water and wastewater utilities to include in their request for rate filings the beginning balances of all plant assets as well as the ending balances of the test year to determine the rate base. The Florida Administrative Rule 2530.515/ [14] clarifies that CIAC constitutes utility system capacity costs, citing examples as main pipe extension charges and ratepayers' connection assessments (Crahan, 1994). AAWA (2012) explains that a commission that uses the utility approach measures the cost of capital by recovering depreciation expense and return on rate base. They explained that the rate base is primarily made up of plant-in-service plus CIAC less accumulated depreciation. Most states use different methodologies that factor in Accumulated Depreciation and CIAC as a credit. These methodologies affirm the AICPA position on the recovery and replacement of donated capital. Depreciation assesses the decline of the operating plant assets' value as a result of usage. The assessment is used as a justification to replace the plant assets when replacement of the asset is necessary (Brazell & Mackie, 2000). The rate base calculation presents institutional challenges to IOUs; the credit treatment of the CIAC in the rate base formula reduces the rate base for these utilities. Hence, the utilities are not able to recover and replace these assets through the accumulation of funds through rate settings (Acheampong, 2019).

The creation of a reserve account to fund asset replacement and assist the IOUs in sustaining their operations was among the twelve concerns and recommendations to address problems besieging the water and wastewater utility industry (The Study Committee, 2013). They) acknowledged the aging or deteriorating state of IOU utility plant assets and the challenges associated with accessing capital funding at an affordable rate and proposed the creation of a state revolving fund for utility asset replacement. However, they did not directly address CIAC issues related to the replacement of donated assets (Acheampong, 2019). Nevertheless, CIAC may be considered a potential source for the revolving fund. Amortization of CIAC is a contra-expense account, and consequently, utilities do not recoup the amount associated with donated plant assets. Hence, planned replacement of the donated assets is not funded by the current rate case proceedings. This study examines the impact of an alternative treatment of CIAC on asset infrastructure funding. The Study specifically posits reserve account replacement funding can occur if CIAC is treated as a debit balance in the rate base. The study tends to address the question; can a debit treatment of CIAC improve the current infrastructure deficit in the water and wastewater industry? The next section presents the OLS research model and data used in this study.

DATA AND METHODOLOGY

This study compares a debit balance treatment of CIAC on investor-owned assets to tests the impact of the current credit balance treatment. Consistent with Acheampong et al. (2018), the explanatory variables used are financial ratios modified from the NRRI viability model and CIAC related financial ratios (i.e., ratios affected by the total assets of the utilities). A reserve account was created using the depreciation of CIAC assets with interest revenue at a 12-month Treasury bill rate, and the financial ratios were calculated for both the debit and credit balance CIAC treatment. The NARUC implemented accounting standard changes in 2008. The 2008 changes rendered financial filings prior to 2008 inconsistent with later financial statement filings. Besides, utility regulations are state-specific; thus, the data employed in this study were from the state of Florida investor-owned annual filings from 2008 to 2017 (http://www.psc.state.fl.us/). The data is used as a proxy for all other states amortizing CIAC. A random sample of 60% of the Florida IOU annual filings yielded eighty-eight utilities and 74 utilities (655 observations) qualified for the study. Table 1 presents the model predictors.

Table 1: CIAC Credit (CR_) and Debit (DR_) Treatment Independent Variables

The Current Credit Treatment of CIAC (Amortization)		The Alternative Treatment of CIAC (Depreciation)		CIAC Ratios
CR1	CR1_ Total Debt to Total Capital	DR1	DR1_ Total Debt to Total Capital_	Total Debt to Total Capital
CR2	CR2_Net Plant Assets to net worth	DR2	DR2_Net Plant Assets to net worth	Net Plant Assets to net worth
CR3	CR3_ Total Debt to Total Assets	DR3	DR3_ Total Debt to Total Assets	Total Debt to Total Assets
CR4	CR4_ Asset Turnover	DR4	DR4_ Asset Turnover	Asset Turnover
CR5	CR5_ Return on Assets	DR5	DR5_ Return on Assets	Return on Assets
CR6	CR6_ Return on Equity	DR6	DR6_ Return on Equity	Return on Equity
CR7	CR7_ Return on Invested Capital	DR7	DR7_ Return on Invested Capital	Return on Invested Capital
CR8	CR8_ Total Assets Turnover Ratio	DR8	DR8_ Total Assets Turnover Ratio	Total Assets Turnover Ratio
CR9	CR9_ CIAC-total Asset Ratio	DR9	DR9_ CIAC-total Asset Ratio	CIAC-total Asset Ratio
CR10	CR10_ Net Margin	DR10	DR10_ Net Margin	Net Margin
CR11	CR11_ Total Net Assets	DR11	DR11_ Total Net Assets	Total Net Assets
IR 12			Interest Revenue generated from the Reserve account	

Table one presents the predictors for the model; the current treatment of CIAC column presents the corresponding CIAC ratios under the current treatment of CIAC as a credit balance offsetting ratebase in rate establishment. The Alternative treatment of the CIAC column presents the corresponding ratio by treating CIAC as a debit balance, an alternative to the current credit treatment, thereby increasing the total operating assets of a utility with an offset by an accumulated depreciation in the ratebase. The IR12 is the interest revenue generated by the reserve account at the US treasury bill rate.

Descriptive Statistics

Table two presents the demographics of the 74 water and wastewater utilities qualified for the study. Total net assets range from $1,874 to $39,400,000. Some utilities reported the value of the entire real estate development as utility assets.

Table 2: Demographics of the 74 Water & Wastewater Utilities

Data Item (in 1,000 Dollars)	Mean	Std. Dev.	Min	Max
RAcct	2.019	5.842	(0.9059)	57.252
Int_Rev	0.2062	0.6043	(0.0237)	6.183
DR_TotalNe~s	229.58	582.44	0.1874	3,940.0
DR_TotalDe~l	2.244	18.629	(76.123)	212.46
DR_NetPlan~h	0.0000	0.0006	(0.0104)	0.0026
DR_TotalDe~s	0.0002	0.0005	(0.0001)	0.0047
DR_AssetTu~r	0.0001	0.0002	0.0000	0.0017
DR_NetMargin	(0.0002)	0.0013	(0.0253)	0.0001
DR_Returno~s	(0.0000)	0.0002	(0.0023)	0.0001
DR_Returno~y	(0.0857)	0.7888	(12.581)	0.0026
DR_Returno~l	(0.1022)	0.9624	(13.854)	2.982
DR_TotalAs~o	0.0001	0.0004	0.0000	0.0062
DR_CIACtot~l	0.0000	0.0000	0.0000	0.0002
CR_TotalDe~l	(0.9373)	8.107	(79.547)	44.229
CR_NetPlan~h	0.0000	0.0026	(0.0342)	0.0408
CR_TotalDe~s	0.0001	0.0001	(0.0001)	0.0005
CR_AssetTu~r	0.0001	0.0002	0.0000	0.0017
CR_NetMargin	(0.0002)	0.0013	(0.0253)	0.0001
CR_Returno~s	(0.0000)	0.0002	(0.0021)	0.0001
CR_Returno~y	(0.0000)	0.0002	(0.0030)	0.0019
CR_Returno~l	(0.0937)	0.8627	(12.581)	3.084
CR_TotalAs~o	0.0001	0.0004	0.0000	0.0063
CR_CIACtot~l	0.0000	0.0001	0.0000	0.0029
CR_TotalNe~s	218.54	573.77	0.1874	3,940.0

Table two shows the descriptive statistics of the selected sample size; the data item column is the variables for the study, and the Mean column indicates the averages for each variable. The Std. Dev is the standard deviation of the corresponding variable, and the "Min-Max" is the range of the data from the least to the highest for the corresponding variables. The RAcct (reserve account) is the dependable variable for the OLS model. The rest of the variables are the independent variables identified in Table 1.

MODEL RESULTS

Based on a Variance inflation factor (VIF) of 3, seven variables qualified for the initial model. Table 3 shows both the debit and credit treatments of CIAC retained variables.

Table 3: CIAC Retained Variables (VIF of 3 or Less)

Variable	VIF	1/VIF
DR_TotalDe~s	3..02	0.257706
DR_CIACtot~l	1.59	0.629014
CR_TotalDe~s	1.41	0.707369
CR_CIACtot~l	1.17	0.852595
CR_Returno~y	1.02	0.977341
DR_NetPlan~h	1.02	0.978146
CR_NetPlan~h	1.01	0.989169
Mean VIF	2316.36	

Table 3 shows the retained variables for the initial OLS model. The VIF column shows the proportion of the variance measuring the severity of the multicollinearity issues in the OLS analysis, and the 1/VIF column estimates the standard deviation of the VIF. The VIF of 3 was based on standard rounding to accommodate numbers between 3 and 4.

The reserve account was regressed on the seven retained explanatory variables, for both debit and credit treatments of CIAC. The initial OLS model regression estimate of the equation is presented below:

$$R_{Acct}=B0+B1DR3+B2DR9+B3CR3+B4CR9+B5CR6+B6CR2+B7DR7+E_i \quad (1)$$

The DR3 is the alternative treatment total debt to total assets ratio. The Dr9 is the alternative treatment of CIAC total assets ratio; the CR3 is the credit treatment total debt to total assets ratio, and the CR9 is the credit treatment of CIAC total assets ratio. The CR6 is the credit treatment of CIAC return on equity ratio, the CR2 is the credit treatment of CIAC net plant assets to net worth ratio, and the DR2 is the debit treatment of CIAC net plant assets to net worth ratio. Table 4 presents the initial results of the OLS model retained variables.

Table 4: Initial OLS Regression Results

Source	SS	df	MS	Number of Obs	=	653
				F (10, 644)	=	19.57
				Prob > F	=	0.000
Model	389,880,000	7	55,697,000	R-squared	=	0.1752
Residual	1,835,500,000	645	2,845,800	Adj R-squared	=	0.1662
Total	2,225,400,000	652	3,413,200	Root MSE	=	53,346
ReserveAccount	**Coef.**	**Std. Err.**	**t**	**P>|t|**	**[95% Conf.**	**Interval]**
DR_TotalDebttoTotalAssets	319.42	441.09	0.7200	0.4690	(546.7279)	1,185.5660
DR_CIACtotalAssetRatio	92,112	8,164.6	11.280	0.0000**	76,079.5300	108,144.2000
CR_TotalDebttoTotalAssets	(1,641.8)	3,299.1	(0.5000)	0.6190	(8,120.1570)	4,836.5190
CR_CIACtotalAssetRatioTotal	(2,907.7)	1,918.4	(1.520)	0.1300	(6,674.7500)	859.2970
CR_ReturnonEquity	149.998	1,115.4	0.1300	0.8930	(2,040.1960)	2,340.1910
CR_NetPlantAssetstonetworth	16.779	80.250	0.2100	0.8340	(140.8038)	174.3613
DR_NetPlantAssetstonetworth	90.224	355.77	0.2500	0.8000	(608.3766)	788.8237
_cons	5,627.4	3,138.3	1.790	0.0730	(535.1966)	11,790.0000

Table 4 presents the results of the initial OLS model;(RAcct=B0+B1DR3+B2DR9+B3CR3+B4CR9+B5CR6+B6CR2+B7DR7+Ei) the SS indicates the sum of squares of the model, the residual, and the total variance of the model. The df is the degree of freedom of the source (model, residual or error, & total). The MS represents the mean squares (the sum of squares divided by their respective degrees of freedom). Number of obs is the total sample observations used by the model in the analysis. F (10, 644) is the F-value (Mean Square Model divided by the Mean Square Residual). The Prob > F is the p-value of the model measuring the reliability of the independent variable predicting the dependent variable. R-squared and the Adj R-squared measures the proportion of variance in the dependent variance by the predictors. Root MS is the standard deviation of the error term. The Coef. column represents the coefficient of the predictors, the Std. Err column is the standard errors of the coefficients. "t" and P>|t| shows the t values of the predictors. The [95% Conf. Interval] columns indicate the confidence level signifying the range of the population. The overall model was statistically significant but not specified (possibility of omitted independent variables).

As shown in Table 4, the overall model is statistically significant (Prob > F =0.000), however only the total asset ratio for the debit treatment of CIAC was statistically significant (P>0.000). A linktest was employed to ensure a specified model (rule out omitted variables). The Linktest output indicates the overall model is not specified; a significant hatsq p-value = 0.000 suggests the possibility of missing variables that may be significant in establishing the relationship with the funding of the reserve account. Table 5 presents the results of the linktest.

Table 5: Linktest for the Initial OLS

Source	**SS**	**df**	**MS**	**Number of Obs**	**=**	**653**
				F (2, 653)	=	101.41
Model	529,270,000,000	2	264,640,000,000	Prob > F	=	0.0000
Residual	1,696,100,000,000	650	2,609,400,000	R-squared	=	0.2378
				Adj R-squared	=	0.2355
Total	2,225,400,000,000		3,413,200,000	Root MSE	=	51,083
ReserveAcc~t	**Coef.**	**Std. Err.**	**t**	**P>|t|**	**[95% Conf.**	**Interval]**
_hat	2.333	0.2000	11.67	0.0000**	1.941	2.726
_hatsq	0.000	0.0000	(7.31)	0.0000**	0.000	0.0000
_cons	(13,214.1)	3161.5	(4.18)	0.0000**	(19,422)	-7006.2

Table 5 is the Linktest of the initial OLS model; The Coef. column represents the coefficient of the predictors, the Std. Err column is the standard errors of the coefficients. "t" and P>|t| shows the t values of the predictors. The [95% Conf. Interval] columns indicate the confidence level signifying the range of the population. The results are statistically significant (P=0.000), an indication of missing variables.

Mehmetoglu and Jakobsen (2016), recommend further testing to confirm the inclusion of all significant explanatory variables. Shukur and Mantalos (1997) suggest the Ramsey RESET test to identify omitted variables and improper functional models. The Ramsey RESET test indicates omitted explanatory variables in the OLS model, a significant p-value =0.000, indicates the test rejects the assumption that the OLS model is appropriately specified; hence, there is a specification error. Table 6 presents the Ramsey RESET test outcome.

Table 6: Ramsey RESET Test

Ramsey RESET Test Using Powers of the Fitted Values of Reserve Account		
F (3, 642)	=	29.100
Prob > F	=	0.0000**

Table 6 shows the results of the Ramsey RESET test; it is a general specification OLS error test, customarily used to confirm the omission of independent variables, if Prob > F (P-value) is significant, the model is not specified. The results are statistically significant (P=0.000), a confirmation of an unspecified model.

The OLS model was run on the two separate treatments of CIAC; first, it was run on the debit treatment of CIAC, and then it was run on the Credit treatment to assist in adding variables to arrive at a specified model. The credit treatment model was not specified. The Debit treatment model shows that four explanatory variables were statistically significant, the interest generated on the reserve account, the total net assets, the total debt to total assets, and the Debit treatment of CIAC total Assets ratio. Table 7 demonstrates the regression estimates of the alternative treatment (Debit) of CIAC equation 2:

$$R_{Acct}=B0+B1Dr1+B2Dr2+B3Dr3+B4Dr4+B5Dr5+B6Dr6+B7Dr7+B8Dr8+B9Dr9+B10Dr10+B11Dr11+B12IR12+\varepsilon_i \quad (2)$$

The Dr1 through Dr11 are the alternative treatment of CIAC independent variables. The DR1 is the total debt to total capital, DR2 is the net plant assets to net worth, the DR3is the total debt to total assets, the

DR4 represents the asset turnover ratio, the DR5 is the return on assets ratio, DR6 is the Return on Equity ratio, DR7 is the return on invested capital ratio, the DR8 is the total assets turnover ratio, the DR9 represents the CIAC-total asset ratio, the DR10 is the net margin ratio, DR11 is the total net assets, and the IR12 represents the interest revenue from the reserve account. The results are presented in Table 7.

Table 7: Debit Treatment of CIAC OLS Results

Source	**SS**	**Df**	**MS**	**Number of Obs**	**=**	**625**
				F (12, 612)	=	80.020
				Prob > F	=	0.00**
Model	1,351,900,000,000	12	112,660,000,000	R-squared	=	0.6108
Residual	861,590,000,000	612	1,407,800,000	Adj R-squared	=	0.6031
Total	2,213,500,000,000	624	3,547,200,000	Root MSE	=	37,521
ReserveAccount	**Coef.**	**Std. Err.**	**t**	**P>|t|**	**[95% Conf.**	**Interval]**
InterestRevenue	5.924	0.3009	19.690	0.0000**	5.333	6.515
DR_TotalNetAssets	0.0029	0.0005	5.880	0.0000**	0.0019	0.0038
DR_TotalDebttoTotalCapital	(0.0005)	0.0171	(0.0300)	0.9760	(0.0340)	0.0330
DR_NetPlantAssetstonetworth	16.561	254.08	0.0700	0.9480	(482.42)	515.54
DR_TotalDebttoTotalAssets	(2,491.2)	523.18	(4.760)	0.0000**	(3,518.6)	(1,463.7)
DR_AssetTurnover	685.30	2,335.5	0.2900	0.7690	(3,901.2)	5,271.8
DR_NetMargin	104.25	183.85	0.5700	0.5710	(256.80)	465.30
DR_ReturnonAssets	348.84	2,108.9	0.1700	0.8690	(3,792.6)	4,490.3
DR_ReturnonEquity	(0.0602)	0.3274	(0.1800)	0.8540	(0.7030)	0.5827
DR_ReturnonTotalCapital	0.0598	0.3774	0.1600	0.8740	(0.6814)	0.8009
DR_TotalAssetsTurnoverRatio	(78.426)	1,056.4	(0.0700)	0.9410	(2,153.1)	1,996.2
DR_CIACtotalAssetRatioTotal	33,483	5,941.2	5.640	0.00**	21,816	45,151
_cons	600.66	2,496.8	0.2400	0.8100	(4,303)	5,504.0

Table 7 (RAcct=B0+B1Dr1+B2Dr2+B3Dr3+B4Dr4+B5Dr5+B6Dr6+B7Dr7+B8Dr8+B9Dr9+B10Dr10+B11Dr11+ B12IR12+εi)presents the results of the debit treatment of the CIAC and the interest revenue; the SS indicates the sum of squares of the model, the residual, and the total variance of the model. The df is the degree of freedom of the source (model, residual or error, & total). The MS represents the mean squares (the sum of squares divided by their respective degrees of freedom). Number of obs is the total observations used by the model in the analysis. F (12, 612) is the F-value (Mean Square Model divided by the Mean Square Residual). The Prob > F is the p-value of the model measuring the reliability of the independent variable predicting the dependent variable. R-squared and the Adj R-squared measures the proportion of variance in the dependent variance by the independent variables. Root MS is the standard deviation of the error term. The Coef. column represents the coefficient of the predictors, the Std. Err column is the standard errors of the coefficients. "t" and P>|t| shows the t values of the predictors. The [95% Conf. Interval] columns indicate the confidence level signifying the range of the population. The overall model results are statistically significant (P=0.000).

A linktest was run to assess the debit treatment. The linktest reveals _hatsq is not significant with p-value = 0.091, confirming a specified model and a higher possibility that all required variables relevant to explain the relationship between debit treatment of CIAC and the funding of the reserve account are included in the model. The test results are presented in Table 8.

Table 8: Debit Treatment of CIAC-Linktest

Source	**SS**	**Df**	**MS**	**Number of Obs**	**=**	**625**
				F (2, 653)	=	491.66
Model	1,355,800,000,000	2	677,920,000,000	Prob > F	=	0.0000**
Residual	857,640,000,000	622	1,378,800,000	R-squared	=	0.6125
				Adj R-squared=		0.6113
Total	2,213,500,000,000	624	3,547,200,000	Root MSE	=	37,133
ReserveAcc~t	**Coef.**	**Std. Err.**	**t**	**P>|t|**	**[95% Conf.**	**Interval]**
_hat	1.095	0.0647	16.930	0.00**	0.9682	1.222
_hatsq	0.0000	0.0000	-1.690	0.0910	0.0000	0.0000
_cons	(1,017.8)	1,738.3	-0.5900	0.5580	(4,431.5)	2,395.8

Table 8 is the Linktest of the initial OLS model; The Coef. column represents the coefficient of the predictors, the Std. Err column is the standard errors of the coefficients. "t" and P>|t| shows the t values of the predictors. The [95% Conf. Interval] columns indicate the confidence level signifying the range of the population. The results are statistically not significant (P>0.0910), an indication of a specified model.

The Ramsey RESET test was used to confirm whether the debit treatment alone is sufficient to analyze the reserve account relationship with CIAC treatment. The Ramsey RESET test is statistically significant, indicating a possibility of omitted variables, Clarke (2009) explained that the RESET is used to check for general misspecification. When the model is misclassified, it is appropriate to increase the variables to determine a specified model. Table 9 presents the outcome of the Ramsey RESET test.

Table 9: Ramsey RESET Test-Debit CIAC OLS

Ramsey RESET Test Using Powers of the Fitted Values of Reserve Account		
F (3, 642)	=	18.37
Prob > F	=	0.0000**

Table 9 shows the results of the Ramsey Reset test; it is a general specification OLS error test, customarily used to confirm the omission of independent variables, if Prob > F (P-value) is significant, the model is not specified. Table 9 Ramsey RESET test is not specified. It is statistically significant with p-value =0000.

Consistent with Godfrey and Orme (1994), the original VIF results (in ascending order) were used to add variables until a specified model was achieved. The debit treatment of CIAC, the Total Debt to total asset ratio, the interest revenue, the debit total net assets, the debit net margin were all statistically significant with a positive coefficient in funding the reserve account. Table 10 shows the regression estimates equation using both debit and credit treatment variables (equation 3):

$$R_{Acct}=B0+B1DR6+B2CR3+B3DR9+B4DR3+B5IR12+B6CR9+B7CR6+B8CR2+B9DR2+B10DR11+B11CR10+B12DR10+\varepsilon_i \quad (3)$$

The DR 6 represents the alternative treatment return on equity ratio. The Cr3 is the credit treatment total debt to total asset ratio; the DR9 represents the debit CIAC-total asset ratio; the DR3 is the alternative treatment total debt to total assets ratio; the IR12 represents the interest revenue from the reserve account. The CR9 is the credit treatment CIAC-total asset ratio; the CR6 is the credit treatment return on equity ratio. The CR2 represents the credit treatment, net plant assets to net worth ratio, and DR2 represents the debit treatment net plant assets to net worth ratio. The DR 11 represents the alternative treatment, total net assets, the CR10 is the credit treatment, net margin ratio, and the DR 10 is the debit treatment, net margin ratio. Table 10 presents the OLS model results.

Table 10: OLS Model Output for Both Credit and Debit Treatment

Source	**SS**	**df**	**MS**	**Number of Obs**	**=**	**625**
				F (12, 612)	=	81.420
				Prob > F	=	0.0000**
Model	1,361,000,000,000	12	113,410,000,000	R-squared	=	0.6149
Residual	852,520,000,000	612	1,393,000,000	Adj R-squared	=	0.6073
Total	2,213,500,000,000	624	3,547,200,000	Root MSE	=	37,323
ReserveAccount	**Coef.**	**Std. Err.**	**t**	**P>|t|**	**[95% Conf.**	**Interval]**
DR_ReturnonEquity	0.0300	0.1916	0.1600	0.8760	(0.3463)	0.4062
CR_TotalDebttoTotalAssets	3,668.8	2,555.1	1.440	0.1520	(1,348.9)	8,686.6
DR_CIACtotalAssetRatioTotal	36,249	6,641.9	5.460	0.0000**	23,205	49,292
DR_TotalDebttoTotalAssets	(2,830.0)	557.45	(5.080)	0.0000**	(3,924.7)	(1,735.2)
InterestRevenue	5.834	0.3016	19.340	0.0000**	5.242	6.427
CR_CIACtotalAssetRatioTotal	473.96	1,366.5	0.3500	0.7290	(2,209.5)	3,157.5
CR_ReturnonEquity	276.19	872.61	0.3200	0.7520	(1,437.5)	1,989.9
CR_NetPlantAssetstonetworth	(42.332)	56.479	(0.7500)	0.4540	(153.25)	68.583
DR_NetPlantAssetstonetworth	26.470	252.22	0.1000	0.9160	(468.85)	521.79
DR_TotalNetAssets	0.0031	0.0005	6.400	0.0000**	0.0021	0.0040
CR_NetMargin	(4,091.5)	1,971.2	(2.080)	0.0380	(7,962.7)	(220.32)
DR_NetMargin	4,155.8	1,959.9	2.120	0.0340	306.88	8,004.7
_cons	(1,050.1)	2,332.6	(0.4500)	0.6530	(5,631.1)	3,530.8

Table 10 (RAcct=B0+B1DR6+B2CR3+B3DR9+B4DR3+B5IR12+B6CR9+B7CR6+B8CR2+B9DR2+B10DR11+B11CR10+B12DR10+εi) presents the results of both the credit and debit treatment of the CIAC first specified model. The SS indicates the sum of squares of the model, the residual, and the total variance of the model. The df is the degree of freedom of the source (model, residual or error, & total). The MS represents the mean squares (the sum of squares divided by their respective degrees of freedom). Number of obs is the total observations used by the model in the analysis. F (12, 612) is the F-value (Mean Square Model divided by the Mean Square Residual). The Prob > F is the p-value of the model measuring the reliability of the independent variable predicting the dependent variable. R-squared and the Adj R-squared measures the proportion of variance in the dependent variance by the predictors. Root MS is the standard deviation of the error term. The Coef. column represents the coefficient of the predictors, the Std. Err column is the standard errors of the coefficients. "t" and P>|t| shows the t values of the predictors. The [95% Conf. Interval] columns indicate the confidence level signifying the range of the population. The overall model is statistically significant p-value = 0.000

A linktest was run to determine the specification of the combined model. The linktest results show a _hatsq p-value = 0.136, which is better than when only the debit treatment variables were used. Table 11 presents the results of the linktest.

Table 11: Linktest for the Specified OLS Model Output for Both Credit and Debit Treatment

Source	**SS**	**df**	**MS**	**Number of Obs**	**=**	**625**
				F (2, 622)	=	499.38
Model	1,364,000,000,000	2	682,000,000,000	Prob > F	=	0.00**
Residual	849,470,000,000	622	1,365,700,000	R-squared	=	0.6162
				Adj R-squared	=	0.6150
Total	2,213,500,000,000	624	3,547,200,000	Root MSE	=	36,956
ReserveAcc~t	**Coef.**	**Std. Err.**	**t**	**P>|t|**	**[95% Conf.**	**Interval]**
_hat	1.082	0.0636	17.010	0.0000**	0.9574	1.207
_hatsq	0.0000	0.0000	-1.490	0.1360	0.0000	0.0000
_cons	(871.14)	1,724.1	-0.5100	0.6140	(4,256.9)	2,514.6

Table 11 is the Linktest of the initial OLS model; The Coef. column represents the coefficient of the predictors. The Std. Err column is the standard errors of the coefficients," and P>|t| shows the t values of the independent variables. The [95% Conf. Interval] columns indicate the confidence level signifying the range of the population. A _hatsq p-value =0.1360 at 95% confidence level, indicates a specified model.

The Ramsey RESET test was used to confirm the results from the Linktest. The Ramsey RESET test is statistically significant, indicating the possibility of omitted variables. Table 12 presents the results of the Ramsey RESET test.

Table 12: Ramsey RESET Test for the Specified OLS Model

Ramsey RESET Test Using Powers of the Fitted Values of Reserve Account		
F (3, 642)	=	19.26
Prob > F	=	0.0000**

Table 12 shows the results of the Ramsey Reset test; it is a general specification OLS error test, customarily used to confirm the omission of independent variables, if Prob > F (P-value) is significant, the model is not specified. Table 12 Ramsey RESET test is not specified; the result is statistically significant, p-value =0.000.

Godfrey and Orme (1994) caution there may be increased in collinearity when variables are added; hence, a Correlation matrix of coefficients of the OLS model was run to determine if a further increase or decrease in variables presents a fit model. Table 13 shows the results of the Correlation matrix of coefficients. A lower Correlation matrix of coefficients among the significant variables is preferred in OLS models (Swamy, 1970; Wheeler &Tiefelsdorf, 2005). The Debit and credit net margins were significant in the model and highly correlated and were removed one at a time to achieve a specified model with no highly correlated explanatory variables. The OLS model revealed that the debit treatment of CIAC to total asset ratio is statistically significant, with a 3.18 positive coefficient. Suggesting a dollar increase in the donated asset with a possibility of depreciating to recover the asset and invest at the current Treasury bill rate may fund the related asset 3.18 times, subject to an inflation factor. Consistent with the general conception of utility owners providing 40% to 100% equity financing (FPSC 2018), the total debt to total assets ratio had an inverse relationship with the reserve account, and utilities are required to have a minimum of 40% owners' equity. Interest revenue is statistically significant, with a positive 5.90 coefficient. The productive employment of the total utility assets indicates less than one percent impact on financing the reserve account. The equation below represents the final OLS model for the study, where R_{Acct} is the reserve account to fund donated plant asset, B0-11 are the coefficients specified by the model. The regression equation presented below is the final model for the study. Table 14 presents the study's final specified OLS model results without any high correlated variables.

Table 13: Correlation Matrix of Coefficients of the Specified OLS Model (Credit and Debit)

e(V)	**DR_Ret**	**CR_Tot**	**DR_CIA**	**DR_Tot**	**Int_R**	**CR_CIA**	**CR_Ret**	**CR_Net**	**DR_Net**	**D~NetA**	**CR_Net**	**DR_Net**
DR_Return	1.000											
CR_TotalD	0.0673	1.000										
DR_CIACtot	-0.0674	-0.0606	1.000									
DR_TotalD	-0.0427	-0.3687	0.2112	1.000								
InterestR	-0.0185	-0.0811	-0.2456	0.3760	1.000							
CR_CIACto	0.0121	0.0994	-0.3385	-0.2020	-0.0255	1.000						
CR_Returno	0.0214	0.0242	-0.0661	-0.0455	-0.0175	0.0153	1.000					
CR_NetPlan	-0.0043	0.0166	0.0026	0.0134	-0.0237	0.0027	0.0711	1.000				
DR_NetPlan	0.0970	0.0201	-0.0473	0.0081	-0.0025	0.0047	0.0218	-0.0045	1.000			
DR_TotalNe	0.0167	0.2052	-0.1272	-0.8242	-0.4728	0.1629	0.0342	-0.0180	-0.0122	1.000		
CR_NetMag	0.0029	-0.0938	-0.3240	0.0651	0.1088	0.0357	0.0106	-0.0051	-0.0051	-0.0955	1.000	
DR_NetMag	-0.0020	0.0899	0.3236	-0.0724	-0.1169	-0.0307	-0.0100	0.0048	0.0060	0.1037	-0.9957	1.000
_cons	0.0700	-0.5495	-0.3544	0.0114	-0.0435	-0.0073	0.0439	-0.0156	-0.0005	-0.0712	0.1203	-0.1066

Table 13 shows the correlation matrix of the specified model from table 9; it depicts the correlation coefficients of the predictors, and lower correlations between predictors are preferred to higher to avoid multicollinearity issues within the model. The table reveals lower correlations of less than 40% except for the net margin ratio under both the debit and credit treatment, indicating a 99.5% correlation.

$$R_{Acct}=B0+B1Dr6+B2Cr3+B3Dr9+B4Dr3+B5IR12+B6Cr9+B7Cr6+B8Cr2+B9Dr2+B10Dr11+B11Dr10+\varepsilon_i \quad (4)$$

Table 14: The Study Final OLS Model

Source	**SS**	**df**	**MS**	**Number of Obs**	**=**	**625**
				F (11, 613)	=	87.950
				Prob > F	=	0..00**
Model	1,355,000,000,000	11	123,180,000,000	R-squared	=	0.6121
Residual	858,520,000,000	613	1,400,500,000	Adj R-squared	=	0.6052
Total	2,213,500,000,000	624	3,547,200,000	Root MSE	=	37,423
ReserveAccount	**Coef.**	**Std. Err.**	**t**	**P>|t|**	**[95% Conf.**	**Interval]**
DR_ReturnonEquity	0.0000	0.0000	0.1600	0.8710	(0.0000)	0.0000
CR_TotalDebttoTotalAssets	0.3171	0.2551	1.240	0.2140	(0.1838)	0.8180
DR_CIACtotalAssetRatioTotal	3.178	0.6301	5.040	0.00**	1.941	4.416
DR_TotalDebttoTotalAssets	(2,754.6)	557.76	(4.940)	0.00**	(3,850.0)	(1,659.3)
InterestRevenue	5.903	0.3007	19.630	0.00**	5.312	6.493
CR_CIACtotalAssetRatioTotal	0.0575	0.1369	0.4200	0.6750	(0.2114)	0.3264
CR_ReturnonEquity	0.0295	0.0875	0.3400	0.7360	(0.1423)	0.2014
CR_NetPlantAssetstonetworth	(0.0043)	0.0057	(0.7600)	0.4490	(0.0154)	0.0068
DR_NetPlantAssetstonetworth	23.785	252.90	0.0900	0.9250	(472.87)	520.43
DR_TotalNetAssets	0.0030	0.0005	6.210	0.00**	0.0020	0.0039
DR_NetMargin	0.0105	0.0183	0.580	0.5640	(0.0253)	0.0464
_cons	**(467.5)**	**2,321.9**	**(0.2000)**	**0.8400**	**(5,027.4)**	**4,092.4**

The independent variables for the model are represented by Dr's and the Cr's. Dr6 represent DR_ReturnonEquity. It is the return on equity ratio under the alternative treatment (debit) of CIAC. The Cr3 represents CR_TotalDebttoTotalAssets, which is the total debt to total assets ratio under the current credit treatment (credit) of CIAC. The Dr9 represents DR_CIACtotalAssetRatioTotal; it is the total CIAC (donated assets) divided by the total assets of the utility. The Dr3 represents DR_TotalDebttoTotalAssets; it is the total debt to total assets ratio under the alternative treatment (debit) of CIAC. The IR12 represent InterestRevenue; it is the interest revenues, generated by the reserve account at the treasury bill rate. Cr9 represent CR_CIACtotalAssetRatio: is the total asset ratio generated by the current credit treatment of CIAC. Cr6 represent CR_ReturnonEquity: is the return on assets ratio under the existing credit treatment of CIAC. Cr2 represent CR_NetPlantAssetstonetworth: is the net plant assets to the net worth ratio under the current treatment of CIAC. Dr2 represent DR_NetPlantAssetstonetworth: is the net plant assets to the net worth ratio by the alternative treatment (debit) of CIAC. Dr11 represent DR_TotalNetAssets: is the total net assets of the utility by depreciating the donated assets (all assets). Dr10 represent DR_NetMargin: is the net margin ratio treating CIAC as a debit balance. The overall model was statistically significant p-value =0.000 at a 95% confidence level.

A linktest was used to determine the specification of the final model. The linked test reveals a _hatsq p-value = 0.093, confirming a specified model, with a probability of inclusion of all relevant variables necessary to determine the funding of the reserve account. Table 15 presents the results of the linktest.

Table 15: The Study Final OLS Model Linktest

Source	**SS**	**Df**	**MS**	**Number of Obs**	**=**	**625**
				F (2, 622)	=	494.48
Model	1,358,800,000,000	2	679,420,000,000	Prob > F	=	0.0000**
Residual	854,640,000,000	622	1,374,000,000	R-squared	=	0.6139
				Adj R-squared	=	0.6127
Total	2,213,500,000,000	624	3,547,200,000	Root MSE	=	37,068
ReserveAcc~t	**Coef.**	**Std. Err.**	**t**	**P>|t|**	**[95% Conf.**	**Interval]**
_hat	1.094	0.0644	16.990	0.0000**	0.9676	1.220
_hatsq	0.0000	0.0000	-1.680	0.0930	0.0000	0.0000
_cons	(1,005.23)	1,734.3	-0.5800	0.5620	(4,411.0)	2,400.6

Table 15 is the Linktest of the initial OLS model; The Coef. column represents the coefficient of the predictors, the Std. Err column is the standard errors of the coefficients. "t" and P>\|t\| shows the t values of the predictors. The [95% Conf. Interval] columns indicate the confidence level signifying the range of the population. The result indicates a specified model with the _hatsq p-value >0.0930.

A correlation matrix was run on the final model to ascertain the correlation between the included variables. The correlation matrix of the study's final model reveals the highest correlation of 38% between the credit treatment Total Debt to Total Assets ratio and the debit treatment Net Margin ratio. Below 50% correlation is acceptable for the study (Godfrey & Orme.1994). Table 16 presents the results of the correlation matrix.

Table 16: OLS Model Correlation Matrix

E(V)	Dr_Ret	Cr_Tot	Dr_Cia	Dr_Tot	Intere~E	Cr_Cia	Cr_Ret	Cr_Net	Dr_Net	D~Neta	Dr_Net
DR_Returno	1.000										
CR_TotalDe	0.0679	1.000									
DR_CIACtot	-0.0702	-0.0965	1.000								
DR_TotalDe	-0.0429	-0.3650	0.2461	1.000							
InterestRe	-0.0189	-0.0717	-0.2237	0.3719	1.000						
CR_CIACtot	0.0120	0.1033	-0.3458	-0.2049	-0.0296	1.000					
CR_Returno	0.0214	0.0253	-0.0663	-0.0462	-0.0187	0.0149	1.000				
CR_NetPlan	-0.0043	0.0162	0.0010	0.0138	-0.0232	0.0029	0.0712	1.000			
DR_NetPlan	0.0971	0.0197	-0.0518	0.0084	-0.0019	0.0049	0.0218	-0.0045	1.000		
DR_TotalNe	0.0170	0.1980	-0.1679	-0.0823	-0.4673	0.1672	0.0354	-0.0186	-0.0128	1.000	
DR_NetM	0.0096	-0.0381	0.0123	-0.0810	-0.0928	0.0526	0.0056	-0.0033	0.0092	0.0924	1.0000
_cons	0.0702	-0.5446	-0.3358	0.0036	-0.0573	-0.0117	0.0430	-0.0151	0.0001	-0.0605	0.1434

Table 16 shows the correlation matrix of the specified model from table 14; it depicts the correlation coefficients of the predictors, and lower correlations between predictors are preferred to higher correlations to avoid multicollinearity issues within the model. The overall results show lower correlations among the predictors.

Discussion of Results

The study used the OLS to analyze the data and examine the correlation between the explanatory variables and a reserve account to fund the replacement of donated assets when they are retired. None of the results of the empirical tests for the credit treatment of CIAC were significant. This suggests that the current credit treatment of CIAC is not a viable method for replacing IOU donated aged assets. The results of the empirical tests of the debit treatment of CIAC were mixed. Four of the variables (CIAC Total Asset Ratio, Total Debt to Total Asset Ratio, Interest Revenue, and Total Net Asset Ratio) were statistically significant. However, the Total Debt to Total Asset Ratio had an inverse relationship suggesting increases in Debt are associated with lower funding of the reserve account. The results also reveal that the net margin of a utility has a positive impact on funding utility assets; under the debit treatment of a CIAC, the net margin coefficient is positive and statistically significant. The calculation of the net margin under the debit treatment included depreciation of the CIAC. Acheampong (2019) found an average net margin loss of $34,672 for utility abandonments and transfers, suggesting asset replacement funding by net margins may be a challenge. However, the positive statistically significant net margin impact on funding the reserve account suggests a viable investor-owned utility industry will be able to partially fund asset replacement.The interest revenue generated at the treasury bill rate (2019 2nd Quarter rate) had a positive relationship with the reserve account, suggesting another revenue source for funding asset replacement. The accumulated depreciation amount may be invested to accumulate extra revenue in the reserve account until there is the need to replace the donated asset. The debt to total assets ratio reflects the total assets financed by creditors divided by total utility plant assets. A debt to total assets ratio higher than the industry standards is unfavorable to any organization (Remmers, Stonehill, Wright, & Beekhuisen, 1974). Consistent with existing theory and the FPSC minimum 40% equity requirement, financing assets with debt reduces the funding of the reserve account. The debt to total assets ratio had a very high inverse relationship with funding the reserve account

for asset replacement. Taken together, these results support treating CIAC as a debit balance to enable utilities to accumulate depreciation value in a reserve account for the funding of replacement assets.

CONCLUSION

The Tax Reform Act of 1986 treats the CIAC of a regulated public utility as part of the regulated utility income. Representative Robert T. Matsui sponsored a bill to exclude CIAC from income recognition and the rate base of a regulated utility (H.R. 3250, 1987). Due to the severe impact of taxes on utilities, NARUC (1995) passed a resolution for the IRS to exclude CIAC from income recognition, asserting that the disallowance of depreciation by the utilities leads to an increase taxes on utilities. CIAC has been receiving attention since the 1986 Tax Reform. NARUC (1995) explained that utilities are not allowed to depreciate assets that are not recoverable through rate base. However, to continue serving customers (utility ratepayers), plant assets are expected to be replaced when they are retired. CIAC is currently treated as a credit balance to compensate for the donation by reducing the plant asset in the rate base. The rate base is fundamentally composed of the plant-in-service offset by CIAC and the accumulated depreciation (Acheampong, 2019). Thus, the future funding of donated assets cannot depend on other donations; however, utilities must replace these assets when they are retired if they are to continue to serve their ratepayers. The study extends prior research by examining the impact of an alternative treatment of CIAC on asset infrastructure funding for investor-owned utilities. These results have practical implications for owner-investors and regulators as they highlight the necessity of considering funding sources for donated asset replacement. The data used in this study are specific to Florida and thus may not be generalizable to other states which do not amortize CIAC. Future research employing data from these other states may provide additional insights for regulators and owner-investors.

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Accounting & Taxation
Vol. 12, No. 1, 2020, pp. 97-105
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

IBFR
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SMALL BUSINESS OWNERS' PERCEPTION ON VALUE ADDED TAX ADMINISTRATION IN GHANA: A PRELIMINARY STUDY

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ABSTRACT

This paper examines Small Business Owners' knowledge of Value Added Tax obligations to the Government of Ghana, their opinions on Ghana's Value Added Tax system, and attitudes towards the payment of Value Added Tax. Based on a cross-sectional survey, the study employed a snowball sampling technique in selecting 328 respondents for the study. Simple percentages and frequency tables were employed for the data analysis. The paper shows that most Ghanaian small business owners do not understand their Value Added Tax obligations. There is also some willingness to evade Value Added Tax. Further, they view the tax as unfair. Moreover, results show that Ghanaians appear to have accepted the civic responsibility of Value Added Tax payment to the state. Equally important, the author demonstrates that Ghanaian small business owners do not understand the basic procedure in assessment, collection and enforcement of Value Added Taxes legally due the state.

JEL: H21, H30

KEYWORDS: Taxation, VAT Compliance, Tax Evasion, Tax Administration, Ghana

INTRODUCTION

Since Value Added Tax (VAT) was introduced for the first time at the national level in 1954 by France, it has become a major source of tax revenue to both developed countries and developing countries (Olsen, Kugler, Stark, & Kichler 2017) By 2017, taxes on goods and services accounted for 53.7% of total tax revenues in member countries of the Africa Union (AU), with Value Added Tax (VAT) alone contributing 29.4%. Within the same period, direct taxes contribution to tax revenue amounted to 36.2%. With respect to Ghana, taxes on goods and services accounted for 59% of total tax revenues in 2017, with Value Added Tax (VAT) alone contributing 29% of the tax revenues. (OECD, 2019). Moreover, in Ghana, the Value Added Tax (VAT) regime has seen the most rampant and arguably significant changes in recent times. It could inherently have a cascading effect through the different levels of the value chain (PwC, 2019**,** p.6). United Nations' Sustainable Development Goals (UN SDGs) and the Addis Ababa Action Agenda can only be achieved if additional finance is mobilized, in particular domestic resources, to fund public goods and services.

A significant body of research, both internationally and in Ghana, has been devoted to direct taxes. To the best of my knowledge, a study on taxpayers' perception of Value Added Taxation (VAT) in Ghana is currently missing from the literature. This study addresses this gap by examining Small Business Owners (SBOs) knowledge of Value Added Tax (VAT) obligations to the Government of Ghana (GoG), their opinion on Ghana's Value Added Tax (VAT) system and attitude towards the payment of Value Added Tax (VAT). Results show that most Ghanaian small business owners (GSBOs) do not understand their Value Added Tax (VAT) obligations. There is also some willingness to evade Value Added Tax (VAT). Further, they view the tax as unfair. The study discovered that Ghanaians appear to have accepted the civic

responsibility of Value Added Tax (VAT) payment to the state. Further, the author demonstrates that Ghanaian small business owners (GSBOs) do not understand the basic procedure of assessment, collection and enforcement of Value Added Taxes legally due to the state.

The remainder of this paper is organized as follows. The subsequent section describes related literature. Next, the author discusses data and methodology used in this paper. Thereafter, an analysis and presentation of the findings of the study is presented. Finally, the paper closes with some concluding comments.

LITERATURE REVIEW

This section summarizes the previous studies that examines Value Added Tax (VAT) compliance. We focus our literature review primarily on studies specifically related to Ghana. Armah-Atttoh and Awal (2013) provided an important paper on tax administration in Ghana. They examined a total of 2,400 citizens of voting age, using a stratified multi-stage sampling technique. The results show that most Ghanaians are favorably disposed towards paying taxes, and more so paying taxes in return for public services. The results further show that regardless less of whether they can pay or not, most Ghanaians know about the specific taxes they are required to pay by law. Moreover, most Ghanaians perceive tax officials to be involved in corruption. Adams & Webley (2001) observed that some business owners saw Value Added Tax (VAT) as a burden on their businesses, whereas others perceived it as money belonging to the state. Mental accounting accounts for the different perceptions of Value Added Tax (VAT) (Thaler, 1985, 1999). Quantitative studies that focused on income tax compliance have confirmed individual differences with regards to mental accounting practices and associations with tax compliance (Muehlbacher, Hartl, & Kirchler, 2015; Muehlbacher & Kirchler, 2013). This paper extents the work of Armah-Atttoh and Awal (2013) by using a set of data subsequent to the passage of Value Added Tax Act 2013, (Act 870), Revenue Administration Act 2016, (Act 915), Value-Added Tax (Amendment) Act 2017 (Act 954), Value Added Tax (Amendment) Act, 2019 (Act 970), National Health Insurance (Amendment) Act, 2018 (Act 971) and Ghana Education Trust Fund (Amendment) Act, 2018 (Act 972)).

DATA AND METHODOLOGY

Olsen, Kogler, Stark & Kirchler (2017) survey methodology serves as the benchmark for the methodology of this study. A total of 328 Ghanaian small business owners (GSBOs) participated in this study: The sample of Ghanaian small business owners (GSBOs) can further be divided into three branches of industry: (1) Hospitality (n=146), restaurant, bar and hotel owners; (2) Crafts (n=55), basket weavers, kente weavers and smock weavers, etc. and (3) Consulting (n=125), chartered accountants, management consultants and coaches. Female respondents dominated the study (64%), suggesting a majority of Ghanaian small business owners (GSBOs) are females. The finding is consistent with the gender composition of Ghana (see Ghana Statistical Service, 2014). The survey shows that a majority of respondents, about 77%, are below 45 years of age. This suggests that a majority of Ghanaian small business owners (GSBOs) are young people. Only a few respondents (7%) do not have formal education. At least 93% of the respondents are literate with majority (55%) having high school education. This finding is also consistent with the education dynamic of Greater Accra Region (GAR) according to the Ghana Statistical Service (2014). In Table 1, presents socio-*demographic* characteristics of survey respondents.

Data collection took place between June 2019 and November 2019. The author contacted all respondents in person and via WhatsApp and asked them to participate in a questionnaire study on Value Added Tax (VAT). The questionnaire, which took approximately 15 minutes to complete, was given to literate respondents to fill out by themselves with or without the assistance of the author. The author assisted the non-literate respondents in filling out the questionnaire. A questionnaire was employed because it saved the author and the respondents' time. Also, respondents were able to express their views without fear due to the anonymity of the questionnaires. This further helped in generating more valid data. Questionnaires

were handed out to Ghanaian small business owners (GSBOs) in the Greater Accra Region (GAR), and targeted three different branches of industry: (1) *Hospitality*, (2) C*raft*, and (3) *Consulting*. Overall, the response rate was 28.4% (328 out of 1,155 contacted Ghanaian Small Business Owners (GSBOs)).

Table 1: Socio-Demographic Information by Sub Sample

Gender of Respondents	Male	36 Percent
	Female	64 Percent
Respondents' level of education	Non/Informal	7 percent
	Primary	16 percent
	High School	32 percent
	Tertiary	45 percent
Age of respondents	Mean Age	38 years
	Youngest Respondent	19 years
	Oldest Respondent	78 years
	18 - 30 years	54 percent
	31 - 45 years	22 percent
	46 - 60 years	18 percent
	60 years and above	6 percent
Industry distribution of respondents	Hospitality	44.78 Percent
	Craft	16.87 Percent
	Consulting	38.34 Percent

This table illustrates socio-demographic information by sub-sample. For Age, M and SD were computed, whereas the author used Mdn and IQR for the ordinal scales Education. Education was measured with 1 = Non-Formal, 2 = Primary School, 3 = High School, and 4 =
Source: Field survey (2019)

Respondents were identified and selected using snowball sampling. The respondents then referred the author to acquaintances within their circles who would be willing to participate in the study. The initial respondent from the consultancy profession was known to the author through professional networks. That accountant introduced the author to other accountants and so on. With respect to the catering profession, the author approached a Value Added Tax (VAT) registered restaurant owner personally known to him but did not allow her to partake in the study. Instead, that restaurant owner was instrumental in referring the author to other Value Added Tax (VAT) registered Small Business Owners (SBOs) within the catering industry in the Greater Accra Region (GAR). For the craft industry, the author visited the Madina Small Tax Office (STO) of the Ghana Revenue Authority (GRA). The Branch Manager introduced the author to a Value Added Tax (VAT) registered plumber who was instrumental in referring the author to other Value Added Tax (VAT) registered Small Business Owners (SBOs) within the craft industry. This sampling method was beneficial because of the nature of the study.

Potential respondents were understandably wary of participating in a tax compliance related issues and a good number of them went to the extent of enquiring the author's relationship with the Ghana Revenue Authority (GRA). It was much easier to access the population through referrals by their trusted professional colleagues. Their colleagues assured them the author was "safe" and the questions did not pose a risk to them. By taking this approach, the author was able to gather more sensitive data than he set out to collect. Snowball sampling does have its disadvantages. For example, because of sampling bias, it may not be clear whether the sample is sufficiently representative of the population. The initial respondents are likely to have refereed the author to respondents who share their traits. There is a risk that respondents with different traits were not adequately represented. However, the author took steps to vary the characteristics of the respondents to ensure that they did not fall into the same category. No attempt was made to ensure that their ages, sexes and nature and size of their practice varied.

The questionnaire comprised seven sections. Section one served to collect socio-demographic information. The second section assessed participants' knowledge of Value Added Tax (VAT) obligations to the state. Individuals were asked to indicate their agreement with four items of a short version of Value Added Tax

(VAT) obligations to the state by ticking Yes, No and Don't Know. Section three served to assess participants' opinion on Value Added Tax (VAT) system in Ghana. Section four assessed individuals' knowledge of Value Added Tax (VAT) administration. The section is further divided in three sub-sections: Assessment; Time and Modes of Payment and Enforcement of Value Added Tax (VAT) due the state. Participants were asked to indicate their agreement with eight statements ranging from 1 = *Yes* to 3 = *Don't Know* (e.g. In Ghana, when a person files VAT returns, an assessment of income tax is deemed to have been made by that person;" Yes = 21%).

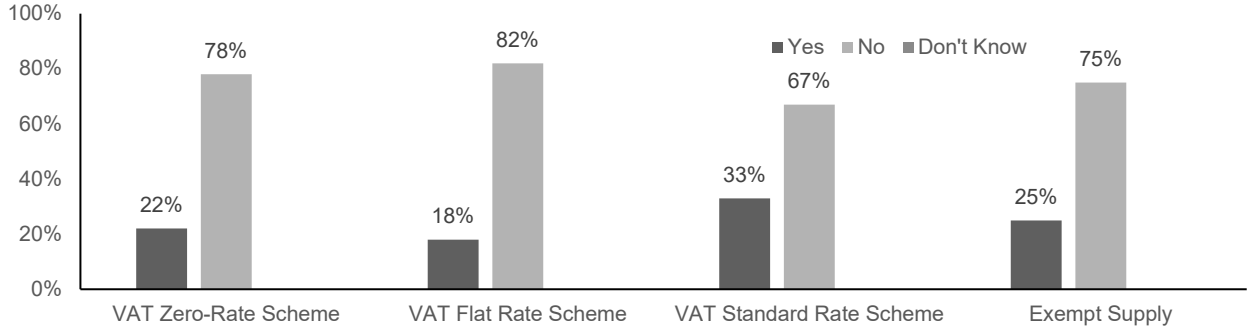
In section five, participants' attitude toward their civic responsibility of paying VAT was measured. Individuals were asked to reply to three multiple choice questions about Value Added Tax (*VAT)* by marking the correct answer from a set of two (e.g., "VAT or other taxes for development?"). Section six served to assess participants' personal attitudes toward compliance with Value Added Tax (VAT). Participants were asked to indicate their agreement with two statements ranging from 1 = *No, would never do that* to 6 = *Don't know* (e.g., "Refused paying VAT to govt. in the past year;" $\alpha = 0.65$). Finally, in section seven, the author explored factors fueling Value Added Tax (VAT) evasion in Ghana.

RESULTS AND DISCUSSION

Knowledge of Value Added Tax Obligations

The Government of Ghana (GoG), through legal instruments, describes three main types of rates for Value Added Tax (VAT) registration purposes: Standard Rate (12.5%); Flat Rate (3%) and Zero Rate (0%). Some supplies are exempt from charging Value Added Tax, such as agricultural inputs; water excluding bottled or packaged water; electricity within specified limit; textbooks, approved supplementary readers, newspapers, atlases, charts, maps and music and domestic transportation (Value Added Tax Act 2013, Act 870 as amended). But do Ghanaian small business owners (GSBO)s know about this? In Figure 1, shows the results of Ghanaian small business owners (GSBOs) knowledge of their Value Added Tax (VAT) obligations to the government. The results show that in general, eight in every ten Ghanaian Small Business Owners (GSBO)s do not know that the Value Added Tax Flat Rate Scheme (VFRS) is only applicable to taxable supplies made by wholesalers and retailers of goods during their taxable activity. Also, a large majority of respondents (75 percent) do not know which supplies are specifically exempted for Value Added Tax (VAT). Another 67 percent do not know that except for supplies considered to be zero-rated or subject to a flat rate of 3% the standard rate of VAT is 12.5%. Finally, about seven in every ten Ghanaian SBOs do not know how the Zero- Rate Scheme works and who is eligible to register under that scheme.

Figure 1: Ghanaian Small Business Owners Knowledge of Value Added Tax Obligations to Government (Percent)



This figure shows. GSBOs knowledge of their VAT obligations to GoG. It sought to assess small business owners (SBOs) knowledge of the three (3) rates chargeable to VAT under Ghanaian law as in; Zero Rate (0%), Flat Rate (35); Standard Rate (12.5%) and what constitutes exempt supply. Source: Field Survey (2019).

Opinion on Value Added Tax System

Economists and Social Philosophers have propounded theories on what constitutes a good tax system including equity; certainty of imposition; convenience of payment and economy in collection. Do Ghanaian small business owners (GSBOs) think the country's Value Added Tax (VAT) system has the attributes of a good tax system? Table 2 presents the results of Ghanaian small business owners (GSBOs) opinion on the Value Added Tax (VAT) system. The results show that in general, Ghanaian Small Business Owners (GSBOs) perceive inherent challenges in the country's Value Added Tax (VAT) system. It is worrying to note that an overwhelming majority claim it is "very difficult or difficult" to identify the correct Value Added Tax (VAT) scheme to register for. About a quarter, however, expressed a contrary opinion. Thus, to Ghanaian small business owners (GSBO)s, the principle of certainty is lacking in the country's Value Added Tax (VAT) system. This could have negative repercussions on compliance. Finally, though an appreciable minority think it is "very easy or easy" to evade Value Added Tax (VAT), the majority (54 percent) claimed it is "very difficult or difficult" to engage in such a criminal conduct.

Table 2: Ghanaian Small Business Owners Opinion on Value Added Tax System

	Response Option	**Percent**
Find out what scheme one is required to register for VAT	Very Difficult + Difficult	72
	Very Easy + Easy	24
	Don't know	4
Find out how govt. uses Revenue from VAT	Very Difficult + Difficult	78
	Very Easy + Easy	16
	Don't know	6
Tax officials corrupt	Some	58
	Most + All of them	54
	None	8
	Don't know	10
Tax authority always right in demanding VAT	Strongly Agree + Agree	92
	Strongly Disagree + Disagree	4
	Neither Agree nor Disagree	3
	Don't know	1
Evading VAT owed	Very Difficult + Difficult	54
	Very Easy + Easy	39
	Don't have to pay taxes	5
	Don't know	2
How often people evade VAT	Never or Rarely	54
	Often or Always	28
	Don't know	18

This table shows GSBOs opinion on the VAT system. It served to assess participants' opinion on the Ghanaian tax system (VAT\). Participants were asked to indicate their opinion on six (6) statements on a three-point scale ranging from 1 = Very Difficult to 3 = Don't Know (e.g Find out what scheme one is required to register for VAT;" Yes = .72). Source: Field Survey (2019).

Knowledge of Procedure in Tax Administration

In Ghana assessment of tax is made by way of self-assessment and by the Commoner General (CG) by way of pre-emptive assessment, adjusted assessment and other assessment. A person who is dissatisfied with an assessment made by the Commoner General (CG), that directly affects that person, may lodge a complaint with the Commoner General (CG) within 30 days of being notified of that tax decision. (Revenue Administration Act 2016, Act 915). Moreover, Value Added Tax (VAT) registered businesses are generally required to submit monthly returns by the 15th day of the following month to which the returns relate. VAT payable ought to be paid by the last working day of the month after the month in which the returns relate (Value Added Tax Act 2013, Act 870 as amended,). With regard to enforcement of taxes due the state, two options are available to the Commissioner General (CG); enforcement directly against the defaulting taxpayer or recovering from third parties. For an objection to a tax decision to be entertained, in the case of

import duties and taxes, the taxpayer must have paid all outstanding taxes including the full amount of the tax in dispute. In the case of other taxes, the taxpayer might have paid all outstanding taxes including 30% of the tax in dispute. The Commoner General (CG) may waive or vary this requirement. The Commoner General (CG) has 60 days to respond to the taxpayer's objection, failure of which means that the Commoner General (CG) did not agree to the taxpayer's objection. A person who is dissatisfied with a decision of the CG may appeal against the decision to the High Court within 30 days of the decision. A further appeal to the Court of Appeal can only be based on matter of law only. A final appeal can be made to the Supreme Court (Revenue Administration Act 2016, Act 915).

Do Ghanaian small business owners (GSBOs) know about the procedures in tax Administration as outlined above? Table 3 shows the results of Ghanaian small business owners (GSBOs) knowledge on tax administration. The results show that a strong majority (79 percent) do not know that in Ghana persons can determine their own Value Added Tax (VAT) liability. About a fifth (21 percent), however, knew that persons can determine their own VAT liability in Ghana. An overwhelming majority of respondents (90 percent) held the erroneous impression that in Ghana the only prescribed mode of paying VAT is on assessment. Another 64 percent also have the wrong impression that in Ghana, where a person fails to pay VAT on due date, the only option available to the Commissioner General is to enforce the VAT legally due directly against that person Thus, the average Ghanaian small business owner (GSBOs) lacks understanding of the basic rules with respect to VAT administration.

Table 3: Ghanaian Small Business Owners Knowledge of Tax Administration

	Response Option	Percent
PANEL A		
In Ghana, persons can determine their own VAT liability.	Yes	21
	No	69
	Don't know	10
In Ghana, only the Commissioner General has powers to determine the VAT liability of persons.	Yes	74
	No	14
	Don't know	12
In Ghana, when a person files VAT returns, an assessment of income tax is deemed to have been made by that person.	Yes	50
	No	41
	Don't know	9
PANEL B		
In Ghana, the only prescribed mode of payment of VAT is on assessment, where the Commissioner General serves the person with a notice of assessment.	Yes	90
	No	6
	Don't Know	4
In Ghana, VAT withheld shall be paid to the Commissioner General within 30 days after the end of each calendar month in which income tax had been withheld.	Yes	82
	No	15
	Don't Know	3
PANEL C		
In Ghana, where a person fails to pay VAT on due date, the only option available to the Commissioner General is to enforce the VAT legally due directly against that person	Yes	64
	No	30
	Don't Know	6
For enforcing VAT liabilities of entities, managers of entities may be jointly and severally liable for the income tax liabilities of the entities	Yes	19
	No	58
	Don't Know	23
In Ghana, where an entity fails to honor her VAT obligations. The Commissioner General may serve notice on the debtors of the defaulting entity to make payment directly to the Commissioner General.	Yes	68
	No	22
	Don't know	10

This table shows GSBOs knowledge on the procedure in VAT administration. Panel A Shows results on GSBOs knowledge on VAT assessment. Panel B shows results on SBOs knows results on SBOs knowledge on time and mode of paying VAT. Panel C shows results on SBOs knowledge on the measures that have been put in place by the Ghanaian tax laws to minimize VAT evasion. Source: Field Survey (2019)

Attitude Toward Value Added Tax

In Table 4, the results of Ghanaian small business owners (GSBOs) attitude towards Value Added Tax (VAT) are presented. The results show that, notwithstanding the perceived problems in the country's VAT system, Ghanaian small business owners (GSBOs) appear to have accepted the civic responsibility of Value Added Tax (VAT) payment to the state. Generally, Ghanaian small business owners (SBOs) are favorably disposed towards paying Value Added Tax (VAT) and more so, paying Value Added Tax (VAT) in return for public services.

Table 4: Ghanaian Small Business Owners Attitude Toward Value Added Tax

	Response Option	**Percent**
VAT or other taxes for development	Pay VAT for development	78
	Govt. imposes other taxes for development	19
	Agree with neither	3
VAT for government services	Higher income taxes, more government services	62
	Lower income taxes, fewer government services	29
	Agree with neither	6
	Don't know	3

This table shows GSBOs attitudes towards their civic responsibility of paying VAT. Individuals were asked to reply to three multiple choice questions about VAT by marking the correct answer from a set of two (e.g., "VAT or other taxes for development?"). The researcher constructed these items for the purpose of this study. Source: Field Survey (2019)

Non-compliance with Value Added Tax Obligations

Table 5 presents results of Ghanaian small business owners (GSBOs) compliance or non-compliance with Value Added Tax (VAT) obligations and their readiness to evade Value Added Tax (VAT). The results show that despite the general willingness to pay Value Added Tax (VAT), some Ghanaians either evaded or were willing to evade Value Added Tax (VAT) owed the state in the past year. While 3 percent of Ghanaian small business owners (GSBOs) said they evaded Value Added Tax (VAT) owed the state in the past year, 25 percent said they did not but would do so if they got the opportunity. The majority (65 percent) however said they would never refuse paying Value Added Tax (VAT) they owed to the state. One possible reason for high self-reported levels of VAT compliance is the perception on the part of Ghanaian Small Business Owners (GSBOs) that VAT evasion is evil. However, one third (30 percent) claimed tax evasion is either "not wrong at all" or "wrong but understandable."

Table 5: Compliance (or Non-compliance) with Value Added Tax Obligations

	Response Option	**Percent**
Refused paying VAT to govt. in the past year	No, would never do this	65
	No, but would do if had the chance	25
	Yes, once or twice	3
	Yes, several times	3
	Yes, often	2
	Don't know	1
Not paying the VAT they ought to pay	Not wrong at all	4
	Wrong but understandable	26
	Wrong and punishable	68
	Don't know	2

This table shows GSBOs personal attitudes toward compliance with VAT obligations and their willingness to evade VAT. This was adapted from the motivational posture's subscale Commitment plus one item from the subscale Disengagement (Braithwaite, 2003; Rechberger, Partner, & Kirchler, 2009). Participants were asked to indicate their agreement with two statements on a six-point scale ranging from 1 = No, would never do that to 6 = Don't know (e.g., "Refused paying VAT to govt. in the past year;" $\alpha = 0.65$). Source: Field Survey, (2019).

CONCLUDING COMMENTS

This paper examines Ghanaian small business owners (GSBOs) knowledge of Value Added Tax (VAT) obligations to the state, their opinion on Ghana's Value Added Tax (VAT) system and attitude towards the payment of Value Added Tax (VAT) using a cross-sectional survey data. The findings offer several insights for tax authorizes: First, Ghanaian small business owners (GSBOs) do not understand their Value Added Tax (VAT) obligations. Second Ghanaian small business owners (GSBOs) perceive inherent challenges in the country's Value Added Tax (VAT) system. Third, study participants do not understand the basic procedure of assessment, collection and enforcement of Value Added Taxes legally due the state. Fourth, there is some willingness to evade Value Added Tax. Further, respondents view the tax as unfair. Overall, Ghanaian small business owners (GSBOs) appear to have accepted the civic responsibility of Value Added Tax payment to the state

This study offers some directions for further research. For an enhanced understanding of Value Added Tax (VAT) compliance attitude and behavior in Ghana, there is the need for a nationwide study on citizens' attitude toward taxation. Further, the paper does not address factors fueling Value Added Tax (VAT) evasion and the relative strength of the various factors. An examination of these factors would produce interesting insights.

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