Accounting & Taxation

CONTENTS

Accounting & Taxation

Editorial Board

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.

DRIVERS OF UTILITY VIABILITY AND SUSTAINABILITY: DO NONFINANCIAL PERFORMANCE MEASURES MAKE A DIFFERENCE?

Isaac Osei Agyemang, University of Electronic Science and Technology of China
Daniel Acheampong, Florida Gulf Coast University, USA
Chrissann Ruehle, Florida Gulf Coast University, USA
Tanya S. Benford, Florida Gulf Coast University, USA

ABSTRACT

The study reviews the growth trend for investor-owned utilities (water and wastewater), adopts the National Regulatory Research Institute's financial viability ratios modified by Acheampong et al., and identifies four categories of nonfinancial performance instruments that drive utility abandonments and transfers. The study observed a downward trend in investor-owned utilities from the sample state (Florida). Prior research has concentrated on financial performance measures (Financial ratios) to determine the sustainability and viability of investor-owned utilities. The study concluded that nonfinancial performance measures are significant in determining investor-owned utility abandonments and transfers comparatively to financial performance measures; the drivers for utility transfers are different from utility abandonments, and each utility class should be treated with its own merits.

INTRODUCTION

Investor-owned utilities (IOUs) are essential in serving rural communities and areas where city and municipal utilities are unavailable; these IOUs serve anywhere from 50 to over 5,000 customers. These utilities must operate continuously to ensure the supply of utility services to ratepayers. The required essential services provided by these utilities and the capital requirement in supplying utility services necessitate the use of authorized territory to avoid competition. Hence, most states, such as Florida, prevent bankruptcy filing by utility companies; consequently, utilities with going-concern issues either abandoned or transferred their operations to another utility. (Acheampong, 2019). The sustainability and viability of these utilities are significant to the various state regulators to avoid abandonments and minimize transfers. These utilities' sustainability should incorporate the utilities' technical, managerial, and financial performance measures (Teumim & Radigan, 2011). Prior research by National Regulatory Research Institute (NRRI, 2009) (NARUC, 2007); Wirick et al. (1997), Acheampong et al. (2018), and other researchers have primarily focused on the financial performance measures (NRRI Viability Ratios) to determine the sustainability of these utilities. Beaver (1966) established six categories of financial performance measures comprising thirty different financial ratios. Wirick et al. (1997) identified three financial performance measures (liquidity, leverage ratios, and earnings trend); these ratios are used to evaluate the financial sustainability of water utility systems.

Teumim and Radigan's (2011) assertion motivates the need to research the inclusion of technical and managerial performance measures in determining the viability and sustainability of the investor-owned utility industry. The study identifies and examines seven financial performance measures. These measures are the capital structure/equity ratios, coverage ratios, leverage ratios, profitability ratios, solvency ratios, efficiency ratios, and activity ratios). The study further identifies four categories of nonfinancial performance measures (output, quality, owner's equity, and regulatory measures) on utility abandonments and transfers (Acheampong, 2019). Most sustainability prediction models for financial distress focus on failures and bankruptcy; this does not directly apply to IOUs abandonments and transfers. This study uses empirical evidence to address the performance measures (financial and nonfinancial) that drive utility abandonments and transfers. The research further assesses the impact of the nonfinancial performance measures on utility abandonments and transfers and addresses the prior research limitations, whether nonfinancial performance makes a difference in evaluating utility abandonments and transfers. The study also assesses the impact of time on utility abandonments and transfers. The rest of the paper is organized by reviewing the literature on the financial and nonfinancial performance of organization sustainability and viability in the literature section. The third section concentrates on the question and hypothesis development for the study, followed by the methodology section. The Methodology section presents the study's empirical approach, the sample size's descriptive statistics, and the development of the logistic regression model for the study. The fifth section presents the empirical findings, and the sixth section offers discussions of the results, with a final part concluding the research.

LITERATURE REVIEW

A sustainable utility system commits to the financial, managerial, and technical capability to meet long-term performance requirements (Miller & Cromwell, 1987). Nonviable or unstable systems are a function of lack of motivation to operate appropriately, lack of ability to function correctly, lack of financial resources to run successfully, and lack of ability to sell services at a reasonable rate due to lack of rate base, size, or geographic location (Beecher et al. 1996). Hence, financial instability is not equivalent to the unsustainability of the entire water system, but it is one variable that contributes to sustainability. The United States Environmental Protection Agency (EPA) (1995) noted that financial distress models are used to assess the financial instability of systems by focusing on the ratios that concentrate on the operating capabilities of the utility in generating revenues. The EPA (1995) defined a sustainable utility as a utility that consistently provides quality services at an affordable cost exhibits financial, technical, and managerial capabilities, and complies with current regulations and proposed rules. The Washington State Department of Health (2013) affirms the EPA definition by describing sustainable water or wastewater system as a utility that can generate enough revenue to improve, construct, operate, maintain, and manage the utility to comply with local, state, and federal regulations continuously.

The universal census is that a sustainable utility should be assessed on financial and nonfinancial performance measures. The reviewed literature establishes a positive correlation between financial and nonfinancial performance measures and the economic returns of an organization separately. However, this study combines the financial and nonfinancial performance measures compared to the prior studies, which separate financial measures from nonfinancial measures and assess their impact on organizational performance improvement (Acheampong, 2019). Financial performance measures such as ratio analysis have been successfully used to predict the viability and sustainability of a firm's ability to continue its operations (Beaver,1966); Neter (1966), (Wilcox, 1971), (Edmister, 1972), (Jordan, Witt, & Wilson, 1996), (Wirick et al., 1997), (Acheampong et al. 2018). However, most of these studies using statistically sophisticated models have focused on medium to large organizations with little or no attention to small firms such as investor-owned water and wastewater utilities. Edmister (1972) asserts that such sophisticated models or comprehensive studies can be done on small businesses, employing financial performance measures. Using the propositions from Beaver's 1966 study, Wilson et al. (1997) extracted ninety-six financial ratios to predict the failures of a small water system. Financial performance measures, especially

ratios, have been used consistently to predict organizations' failures, sustainability, and viabilities, including investor-owned water utilities; however, limited literature exists on the combination of financial and nonfinancial performance measures in assessing small-scale organizations such as investor-owned utilities.

Many studies have focused on seasonal financial performance processes as too accumulated, historical, and lacking appropriate, timely solutions to organizational root challenges (Chow & Van Der Stede, 2006). The periodic nature of financial performance measures does not clarify the root cause of identifying problems with an organization; for instance, an unfavorable variance may have different meanings and different causes, but from a financial performance ratio perspective, it may have a different purpose and total implications (Chow & Van Der Stede, 2006). Hence, complementing financial measures with nonfinancial performance measures may be necessary.

Edmund (1969) used data from the Commerce Department, which captured nonfinancial data, to prove an enhancement of decision-making by financial analysts. Edmund identified the overall corporate product, price deflector, inventory gains, and the involvement of domestic operations to enhance the reporting of a firm's earnings. Neely (1999) examined the economic environment, ranging from manufacturing to politics to commerce, assessing the need to include business performance measures in decision-making. The study revealed that government agencies, corporate management, and academic conferences focus on business sustainability and growth performance measurements. The study examined nonfinancial performance measures identified from the various reported financial statements and determined the impact of nonfinancial performance measures on economic indicators discussed by the various Chief Executive Officers (CEOs). Neely (1999) used the MORI report and concluded that 72% of management surveyed concurs that nonfinancial performance instruments such as the needs of employees, customers, and suppliers will improve shareholder value.

Anderson, Fornell, and Lehmann (1994) examined the Swedish market to determine the impact of nonfinancial measures such as customer satisfaction on superior economic returns. They concluded that nonfinancial measures positively correlate to the financial returns of an organization. Milost (2013) explains that external stakeholders have primarily used accounting financial data to make decisions; however, the financial statements published contain other nonfinancial information that complements the financial data; hence, it is proper to use nonfinancial performance measures to supplement the financial information to obtain sufficient information in defining the future economic value of an organization. The literature review on nonfinancial performance measures confirms that the use improves decisions both within the company and the organization's stakeholders; it has been applied to many different industries ranging from internal information and information from published financial statements. However, the investor-owned utility industry is a regulatory industry and requires various nonfinancial measures compared to other non-regulatory industries. Most of the research evaluated highlights customer satisfaction, quality, size, etc., as nonfinancial performance measures. The study identifies four categories of nonfinancial measures consistent with the regulatory industry. The first category is the output measures, compatible with plant outputs and customer-related measures. The second category focuses on quality measures, measuring compliance with the various required regulatory quality issues; the third group measures the structure of the owners' equity in the utility; and the fourth category is the regulatory measures, measuring compliance with statutory financial reporting and other criteria not related to quality. Table 1 presents the identified nonfinancial performance measure. These measures are integrated with the financial performance measures to assess the drivers of utility abandonments and transfers.

The financial instability of water systems relies heavily on performance dimensions, such as the financial management and technical operation of these utilities and the managerial functions leading to system upgrades and new investments. Regulation by the various state bodies also presents institutional challenges to these utilities by establishing a rate base (Acheampong et al., 2018). The study examines financial and

nonfinancial measures relating to utility abandonments and transfer drivers. The methodology section discusses the logistic regression model and the sample (Florida investor-owned utilities) used in the study.

Table 1: Nonfinancial Performance Measures

Classification	Variables
Output measures	Plant output / (gallonage per customer)
	Plant output /Total Number of Meter Equivalents
	Number of Customers served
Quality Measures	Gross water output per Customer Compliance with FPSC Quality Measures
	Compliance with DEP Quality requirements
Owner's Equity Structure	Compliance with CUP Quality requirements Type of Corporation for Tax filing purposes Management Compensation Owners' Involvement in Direct operations of the Utility Utility Classification Donated Capital -CIAC
Regulatory Measures	Business Taxes - Indirect Taxes, such as Taxes Other than Income (PSC Funding) compliance with the Uniform System Of Accounts (NARUC)
	No deficiency communications from regulatory agencies (financial reporting) Utility Compliance-annual report filing
	Utility Classification
	leverage scale

All IOUs' annual required regulatory filings extracted the eighteen nonfinancial performance measures. IOUs are required to complete additional forms reporting the operating activities of the utilities, which is necessary to determine the continuity of the utility. The nonfinancial performance measures were extracted from the water and wastewater sections of the annual filing. The output measures relate to the utility's productivity, and the quality measures inform regulators about compliance with various regulations. The owners' equity structure information was extracted from the executive summary, and the regulatory measures are associated with compliance with state regulations and federal and external regulatory bodies.

DATA AND METHODOLOGY

The study theorizes that financial and nonfinancial performance measures impact utility abandonments and transfers. However, the variables that impact utility abandonments differ from those that affect utility transfers. Prior research has heavily focused on financial performance; hence, the study identified and introduced nonfinancial performance to determine its impact on utility abandonments and transfers; with the assessment of the nonfinancial performance measures, the research assesses the influence of time on abandonments and transfers. The study addresses the following questions:

RQ1: What financial and nonfinancial performance measures drive utility abandonments and transfers? The study hypothesizes that financial and nonfinancial performance measures impact IOU utility abandonments and transfers compared to prior research that has relied heavily on financial performance measures.

RQ2: Are the drivers for utility abandonments and transfers correspond with each other and by utility classification? The study posits that the drivers for utility abandonments and transfers are different, and the utility classification impacts the abandonments and transfer drivers. Hence, Class A, Class B, and Class C utilities should be treated differently. Transfers and abandonments should be treated on their own merits, not together.

RQ3: Does time impact utility abandonments and transfers? The research theorizes that abandonments and transfers of utilities worsen over time, and the older the utility assets (longer in service), the more likely the utility may abandon or transfer the utility facility.

Identifying and separating the drivers for utility abandonments and transfers by a utility class enhances and promotes finding managerial solutions to the current down-trending of IOUs. Including the nonfinancial performance, measures offer both state regulators and utility owners a new approach to resolve the current down-trending situations, especially dilapidated assets from managerial and financial perception, and urge informed decisions during rate case proceedings.

Research Methodology

Quantitative research empirically examines models by assessing the correlations among variables statistically studied to address a question (Creswell, 2009; Creswell & Creswell, 2017). The study follows Creswell's (2009) proposals and uses a quantitative approach to explore the financial and nonfinancial performance measures that impact the performance of the investor-owned utility industry, using evidence from the state of Florida. The study deductively adopts the modified financial ratios by Acheampong et al. (2018) and identifies sixteen nonfinancial measures in four categories of nonfinancial performance measures of investor-owned as the explanatory variables to predict utility abandonments and transfers. The following logit model is used to conduct the analyses of RQ1, RQ2, and RQ3:

$$IOUi, t = 1/[1 + \exp - 1(\beta 0 + \beta 1 LIQit + \beta 2 LEVit + \beta 3 LEV\_DTit + \beta 4 COVit + \beta 5 GROEFFit + \beta 6 EFF\&PROFit + \beta 7 PROFit + \beta 8 Cust\_Servit + \beta 9 PLTOUTPit + \beta 10 EQVMETERit + \beta 11 GROSS\_REVit + \beta 12 COM\_FPSCit + \beta 13 COM\_DEPit + \beta 14 COM\_CUPit + \beta 15 MAN\_COMPit + \beta 16 MAN\_OPit + \beta 17 UTILTY\_CLit + \beta 18 CIACit + \beta 19 TAX\_CLit + \beta 20 TAX\_TOTIit + \beta 21 COM\_USoAit + \beta 22 NoDCit + \beta 23 COM\_UCARit + \beta k Xk)]\beta 23 COM\_UCAR_{it} + \beta k Xk)]$$

The model is based on the modified Platt and Platt model by Acheampong et al. (2018); the subscripts "i and t" indicate the utility and the period (year), respectively. IUOi,t symbolizes the odds of failure of the ith utility within a period. That is the probability that a selected or qualified investor-owned utility is subject to abandonment or transfers resulting from financial and nonfinancial performance variables within a specific time. The β0 is the intercept, and the βs are the regression coefficients. The predictor or the independent variable LIQ is the liquidity ratio, measuring the utility's abilities to meet operating expenses as they come due; a higher LIQ over one is a good indicator of financial health for the utility. LEV is the leverage ratio measuring the utility's relative debt level to asset and equity; it evaluates the strength of the utility's assets to protect its creditors, Myers (1984) asserts. State commissioners urge utility owners to increase their leverage to about 90% compared to the standard 20%. A higher LEV indicates higher equity or asset in the operating asset of the utility. LEV_DT is the leverage debt to equity ratio, a predictor measured by the long-term debt of the utility divided by the common stock. It measures the degree to which a utility's long-term assets are financed by debt compared to the owner's (common stock). The independent variable COV is the coverage ratio, measuring the utility's ability to honor its financial obligations; a higher ratio is a good indicator of a utility's ability to meet its financial commitments. GROEFF is the growth and efficiency ratio, EFF&PROF is the efficiency and profitability ratio, and PROF is the profitability ratio measuring the efficient use of the operating assets of a utility to generate profit. The model has a total of seven financial performance ratios. These ratios have been widely used in the utility industry. Wirick et al. (1997) and Beecher et al. (1992) used these ratios to predict performance failures in the utility industry.

Sixteen nonfinancial performance measures were identified based on the available information provided by utility filings. Cust_Serv is the number of customers served by the utility, PLTOUTP indicates the plant output (gallonage per customer), EQVMETER is the number of equivalent meters serviced by the utility, and the GROSS_REV is the gross revenue generated by the utility per customer; these are the output measures, directly impacting the gross utility revenues based on the rates set by the state commissioners. The following three predictors are the quality measures assessing the utility's compliance with state and federal quality standards. The COM_FPSC is the compliance with the state quality measures, the COM_DEP measures the utility's compliance with the Department of Environmental Protection (DEP)

quality measures, and the COM_CUP measures the utility's compliance with a consumptive use permit (permit for mining groundwater). The owner's equity structure and participation in the utility operations were also identified as predictors that may drive the utility's abandonments or transfers. The predictor MAN_COMP represents management compensation; most states, such as Florida, do not recognize management salaries as allowable expenses. Hence, the study included it in determining its impact on transfers and abandonments, should the various states allow it to motivate management to improve the efficiency of a utility's operations. MAN_OP is the management's direct involvement in the utility operations; some of the utility is directly operated by the owner (s), and others are not. UTILTY_CL represents the utility's classification; utilities belong to three categories (Class A, B, or C). The CIAC indicates contribution in aid of construction; most states do not allow utilities to recover the use of donated capital in their rate base; hence, it impacts the utility rate-setting (Acheampong & Benford, 2020). The Tax classification of the utility was also included in the owner's equity structure; TAX_CL represents the tax classification of the utility; depending on the tax classification, the net results of the utility will impact the owner's annual taxes directly or indirectly.

The last group is the Regulatory measures, measuring compliance, but different from the quality measures, these predictors require regulatory compliance but do not impact customer service quality. TAX_TOTI is the indirect business taxes (Taxes other than Income Taxes); COM_USoA represents compliance with NARUC (NARUC, 1996) Uniform System of Accounts. NoDC is the No Deficiencies Communication from the regulatory commissioners; the NoDC measures utility compliance with the state utility rules and regulations. COM_UCAR represents the utility's compliance with filing the required annual reports. The study outcome suggests that the drivers for utility abandonments differ from utility transfers; the utility classification impacts the drivers for abandonments and transfers. Hence, Class A utility differs from Class B and Class C. Depending on the utility class, time may also impact the drivers for utility abandonments and transfers.

Sample Selection

The study used all the financial and nonfinancial information measures data of the investor-owned utilities (water and wastewater) from the 2008 to 2018 filing periods (Florida State Utility Data). The data for the sample is publicly available on the Florida Public service Commission website. The study employed the "Rand" command in Excel to randomly select 60% of the utility data. Eighty-seven utilities were chosen randomly; eleven of the utilities selected did not have the required information. They were dropped from the samples, and the final sample size qualified for the study totaled seventy-six utilities, comprising class A, B, and C utilities. To address the relationship between financial and nonfinancial performance measures, the study follows Sormunen and Laitinen (2012) assertion about the instability of financial ratios. Overtime financial ratios undermine the significance of the time interval in distressed utility prediction models; to preserve and maintain the predictive capability of the financial ratios, the study used a robust logistic regression investigation to predict the drivers of utility abandonments and transfers. The Balcaen and Ooghe (2006) study also motivates the adoption of logistic regression. They explained that the statistical importance of financial ratios shifts at various stages; therefore, optimal cross-sectional models change at multiple stages; hence, the logistic regression is used to strengthen the predictive power of the study's model and the Variance Inflation Factor (VIF) to resolve collinearity issues.

The VIF identifies the severity of multicollinearity problems among the explanatory (independent) variables. The VIF is one of the usual; traditional collinearity analytical procedures focused on ordinary or weighted least squares regressions. The VIF recognizes the slope estimate initiated by the nonorthogonality of the independent variables (predictors) on top of the orthogonality variance (Liao & Valliant, 2012). Removing the predictors with collinearity issues reduces the impact of one explanatory variable affecting the other measures. The research explored the VIF to eliminate all predictors with VIFs higher than four. Hair et al. (2010) explained that logistics regression utilizes a maximum likelihood procedure, the

Nagelkerke R2, established as a modification of Cox and Snell R2. The Nagelkerke R2 reinforces the relationship and measures the logistic regression fitness of the data, and it determines the intercept of the logistic regression model. The logistic regression model for the study utilized the Hosmer-Lemeshow Chi-square test and combined it with the R2 to establish the goodness of fit (Sormunen & Laitinen, 2012). The model categorizes, predicts, or measures probabilities into deciles and then calculate the Chi-square to analyze the predictive value of the observed frequencies. The p-value determines the logit linearity test; a higher p-value signifies an excellent fit to the data. The study used abandonments and transfers as the dependent variables. The "Transferred utilities" are investor-owned utilities that could not continue operations and were transferred to another utility or a municipality within the study period. The transferred utility may be reorganized into a new utility with a new name or retain the same name. "Non-transferred" utilities continue operations without interruptions and remain unchanged during the ten-year study period. "Abandoned utilities" are all utilities that handed over the utility operations to the territorial county and all utilities that did not follow the abandonment procedure; however, the owners decided to leave the facility for the county to take over without proper notification. The study classified abandonments and transfers as dependent variables. All the selected financial and nonfinancial performance measures after the VIF elimination process were used as the explanatory variables. The study rejects the null hypothesis If the p ≤ α, which may indicate evidence supporting that these investor-owned utilities' transfers and abandonments depend on the explanatory variables.

RESULTS

The purpose and motivation of the research are to employ financial and nonfinancial performance measures that drive Investor-Owned utility abandonments and transfers. The study created dummy variables to represent transferred and abandonments, using the improved financial ratios by Acheampong et al. (2018). The study further identified twenty nonfinancial performance measures. Sixteen nonperformance measures out of the twenty had data to support the study. The study used the VIF to vigorously examine multicollinearity issues among the independent variables. A typical rule of VIF of ten or less is desirable (Belsley, 1984). However, other authors prefer four and below VIF; the study followed Mason and Perreault (1991) and used a VIF of four and below. PLTOUTP (gallonage per customer) and EQVMETER (the number of equivalent meters serviced by a utility) were excluded from the initial analysis since their VIF was high (EQVMETER 1474.7 & PLTOUTP 1469.22). Table 2 presents the descriptive statistics for the selected samples. Utility codes are the assigned numbers to the selected utilities for the study. The selected sample is an unbalanced sample size with 763 observations.

Financial and Nonfinancial Performance Results

The study examined the financial performance measures (ratios) separately from the nonfinancial measures based on the qualified explanatory variables. The financial performance model used all the 763 observations in the selected sample (transfers and abandonments). The likelihood ratio chi-square of 39.97 with a p-value of 0.0000 indicates a statistically significant model consistent with Acheampong et al. 2018. model. The financial explanatory variables were not statistically significant except for the "Liquidity" ratio. The liquidity ratio signifies the utilities' capability to pay current liabilities as they come due without considering external financial resources. The liquidity ratio improves the utility's ability to cover short-term responsibilities and cash flow needs. The resulting coefficient for the liquidity ratio is negative .019, confirming an inverse association with transfers/abandonment. For every one-unit increase (i.e., moving from 0 to 1), we expect 0.019 reductions in the log odds of being in the transfers and abandonments category, given that all other predictors are held constant in the model. Table 3 presents the results of financial performance measures. A Linktest was used to confirm the specification of the overall financial model. The linktest identifies specification errors and determines if a model possibly included all the relevant variables. A specified model indicates that no significant additional independent variable should emerge unless by chance. The hatsq is not significant with a p-value = 0.070, a confirmation of a specified

model, signifying the possibility of inclusion of all relevant financial explanatory variables to predict the dependent variables. A separate model was run to predict abandonments and transfers using the fourteen nonfinancial performance explanatory variables with a VIF of four or below. The model employed 763 observations in the selected sample based on the VIF results.

Table 2: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
UtilityCode	7,500.3	1,399.6	5,013.0	9,965.0
TransferAb~d	1.494	0.6155	1.000	3.00
LIQ	25.771	221.81	-52.680	5,357.1
LEV	1.3365	22.231	-442.42	281.50
LEV_DT	6,926.9	116,804	-529.07	2,685,696
COV	1.4002	3.373	-33.090	39.990
GROEFF	0.3215	7.397	-198.47	26.320
EFFPROF	0.8275	0.3279	0.0000	3.270
PROF	-1.5813	11.777	-252.82	0.6900
PLTOUTP	403.28	2,759.6	0.0000	35,311.32
EQVMETER	382.95	2,758.3	0.0000	35,311.32
Cust_Serv	457.00	524.66	3.000	2,528.00
GROSS_REV	638.00	897.56	0.0000	12,174.00
COM_FPSC	1.8322	0.3774	0.0000	2.000
COM_DEP	1.9633	0.1881	1.000	2.000
COM_CUP	1.9581	0.2006	1.000	2.000
TAX_CL	2.7837	1.078	1.000	4.000
MAN_COMP	1.4260	0.4948	1.000	2.000
MAN_OP	1.5229	0.4998	1.000	2.000
UTILTY_CL	2.7602	0.5387	1.000	3.000
CIAC	451,347	1,408,583	229,964	12,400,000
TAX_TOTI	20,055	33,619	0.0000	222,844
COM_USoA	1.536	0.4990	1.00	2.00
NoDC	1.831	0.3751	1.00	2.00
COM_UCAR	1.957	0.2036	1.00	2.00

Table two presents the descriptive statistics of all utility classes. Forty-one out of the total observation (763 observations) represent Class A utilities, a hundred and one represent Class B utilities, and six hundred and twenty-one represent Class C utilities. Four hundred thirty-six utilities within the selected period have either transferred into a new utility or merged into a new utility. Forty-nine utilities were abandoned, and 278 utilities did not experience transfer or abandonment.

Table 3: Logistic Regression Output: Financial Performance Predictors

Transfer Abandoned	Coef.	Std. Err.	Z	P>|Z|	[95% Conf. Interval	
LIQ	-0.0185	0.0058	-3.2200	0.0010**	-0.0298	-0.0073
LEV	0.0018	0.0035	0.5100	0.6080	-0.0050	0.0086
LEV_DT	0.0000	0.0000	-0.7000	0.4840	0.0000	0.0000
COV	-0.0206	0.0256	-0.8000	0.4220	-0.0708	0.0296
GROEFF	-0.0089	0.0173	-0.5100	0.6080	-0.0428	0.0251
EFFPROF	0.2014	0.2802	0.7200	0.4720	-0.3477	0.7505
PROF	-0.0284	0.0287	-0.9900	0.3220	-0.0847	0.0279
_cons	-0.3274	0.2653	-1.2300	0.2170	-0.8474	0.1926

Table 3 shows the results of the financial performance measures output.; $TransferAbandoned = \beta0 + \beta1\,(LIQ) + \beta2(LEV) + \beta3(LEV\_DT) + \beta4(COV) + 5\beta(GROEFF) + \beta6(EFFPROF) + 7\beta(PROF) + Ei$ the model number of observations for the selected sample is 763, with a likelihood ratio chi-square of 39.97. Prob > chi2 (the probability of obtaining the chi-square statistic assuming a true null hypothesis) = 0.000. the Pseudo R2 (the model fit) = 0.0384. The liquidity ratio was significant with p-value = 0.0010, at a 0.05 significant level. * p-value < 0.1 level of significance; ** p-value < 0.05 level of significance; *** p-value < 0.001 level of significance

The results show a likelihood ratio chi-square of 259.51 and a p-value of 0.0000, an overall statistically significant model for the nonfinancial performance predictors. Nine out of the fourteen nonfinancial performance measures were statistically significant (compliance with the state quality measures, COM_DEP, tax classification of the utility, management compensation, management's direct involvement

in the operations of the utility, utility's classification, indirect business taxes, No Deficiencies Communication from the regulatory commissioners, & utility compliance with Annual filing). Only one measure (liquidity ratio) was statistically significant compared to the financial performance measures. The coefficients for compliance with the state quality measures, Tax filing classification, Utility classification, No deficiencies communication from the regulatory commissioners, and utility compliance with annual filing were negative, indicating an inverse relationship with the dependent variable (Kremelberg, 2011). All the other regressors had a positive connection with abandonments and transfers. To ensure an unintentional drop of any of the explanatory variables, a linktest was run for the model to determine a specified model. The hatsq is not significant with a p-value = 0.9620, a confirmation of a specified model, suggesting the possibility of inclusion of all relevant explanatory variables to predict the dependent variables. Table 4 shows the results of the nonfinancial performance measures model.

Table 4: Logistic Regression Output Nonfinancial Performance Predictors

TransferAbandoned	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval	
Cust_Serv	0.0000	0.0003	-0.0100	0.9910	-0.0006	0.0006
GROSS_REV	0.0001	0.0001	0.6100	0.5390	-0.0002	0.0004
COM_FPSC	3.5964	0.6182	5.8200	0.0000**	2.385	4.808
COM_DEP	-1.3745	0.4223	-3.2500	0.0010**	-2.202	-0.5468
COM_CUP	-0.4663	0.4210	-1.1100	0.2680	-1.296	0.3588
TAX_CL	-0.4991	0.0978	-5.1100	0.0000**	-0.6908	-0.3075
MAN_COMP	0.7103	0.2020	3.5200	0.0000**	0.3144	1.106
MAN_OP	1.1378	0.2084	5.4600	0.0000**	0.7293	1.546
UTILTY_CL	-0.5852	0.2759	-2.1200	0.0340**	-1.126	-0.0444
CIAC	0.0000	0.0000	-1.7700	0.0770	0.0000	0.0000
TAX_TOTI	0.0000	0.0000	2.5700	0.0100**	0.0000	0.0000
COM_USoA	-0.3743	0.2102	-1.7800	0.0750	-0.786	0.0378
NoDC	-2.1627	0.3169	-6.8200	0.0000**	-2.784	-1.547
COM_UCAR	-1.7197	0.7790	-2.2100	0.0270**	-3.247	-0.1928
_cons	4.4549	1.8456	2.4100	0.0160	0.8376	8.072

Table 4 presents the results of the nonfinancial performance measures output: $TransferAbandoned = \beta0 + \beta1(Cust\_Serv) + \beta2(GROSS\_REV) + \beta3(COM\_FPSC) + \beta4(COM\_DEP) + \beta5(COM\_CUP) + \beta6(TAX\_CL) + \beta7(MAN\_COMP) + \beta8(MAN\_OP) + \beta9(UTILTY\_CL) + \beta10(CIAC) + \beta11(TAX\_TOTI) + \beta12(COM\_USoA) + \beta13(NoDC) + \beta14(COM\_UCAR) + Ei$ *the model number of observations for the selected sample is 763, with a likelihood ratio chi-square of 259.51. Prob > chi2 (the probability of obtaining the chi-square statistic assuming a true null hypothesis) = 0.000. the Pseudo R2 (the model fit) = 0.2490. At a 0.05 significant level, the Compliance with FPSC Quality Measures, Compliance with DEP Quality requirements, tax classification of the utility, management compensation, management's direct involvement in the utility operations, utility's classification, Taxes other than Income Taxes, No Deficiencies Communication from regulatory commissioners, and utility's compliance with annual filing requirements, were statistically significant. * p-value < 0.1 level of significance; ** p-value < 0.05 level of significance; *** p-value < 0.001 level of significance*

Combined Financial and Nonfinancial Performance Results

An overall model combining financial and nonfinancial performance measures was analyzed to test further the significance of nonfinancial performance measures in determining transfers and abandonments. The overall model used twenty-one explanatory variables from the VIF results. The overall model used all the 763 observations in the selected sample. The overall model revealed a likelihood ratio chi-square of 281.85 and a p-value of 0.0000, an overall statistically significant model. The liquidity ratio is the only financial performance measure that is statistically significant. However, ten out of the fourteen nonfinancial performance measures were statistically significant. A linktest test was run to determine the specification for the overall model. The hatsq is not significant with a p-value = 0.0940, a confirmation of a specified model, signifying the possibility of inclusion of all relevant explanatory variables to predict utility abandonments/transfers. Table 5 presents the results of the overall model, employing both financial and nonfinancial performance measures for the selected utilities.

Table 5: Overall Model Output: Financial and Nonfinancial Performance Predictors

TransferAbandoned	Coef.	Std. Err.	z	P>|z|	|95% Conf.Interval	
LIQ	-0.0221	0.0071	-3.100	0.0020**	-0.0360	-0.0081
LEV	0.0001	0.0035	0.0300	0.9770	-0.0068	0.0070
LEV_DT	0.0000	0.0000	-0.5000	0.6170	0.0000	0.0000
COV	-0.0047	0.0334	-0.1400	0.8890	-0.0701	0.0608
GROEFF	-0.0068	0.0194	-0.3500	0.7240	-0.0448	0.0311
EFFPROF	-0.1141	0.3276	-0.3500	0.7280	-0.7562	0.5279
PROF	-0.0196	0.0151	-1.300	0.1950	-0.0493	0.0101
Cust_Serv	0.0001	0.0003	0.2500	0.8030	-0.0005	0.0006
GROSS_REV	0.0001	0.0001	0.8200	0.4110	-0.0002	0.0004
COM_FPSC	3.554	0.6282	5.660	0.0000**	2.323	4.785
COM_DEP	-1.324	0.4225	-3.130	0.0020**	-2.152	-0.4961
COM_CUP	-1.169	0.5359	-2.180	0.0290**	-2.219	-0.1186
TAX_CL	-0.5210	0.1002	-5.200	0.0000**	-0.717	-0.3247
MAN_COMP	0.7010	0.2056	3.410	0.0010**	0.298	1.104
MAN_OP	1.140	0.2133	5.340	0.0000**	0.722	1.558
UTILTY_CL	-0.5465	0.2844	-1.920	0.0540**	-1.104	0.0110
CIAC	0.0000	0.0000	-1.920	0.0540**	0.0000	0.0000
TAX_TOTI	0.0000	0.0000	2.630	0.0080**	0.0000	0.0000
COM_USoA	-0.3724	0.2134	-1.750	0.0810	-0.7907	0.0458
NoDC	-2.259	0.3243	-6.960	0.0000**	-2.894	-1.623
COM_UCAR	-1.330	0.7985	-1.670	0.0960	-2.895	0.2347
_cons	5.309	1.938	2.740	0.0060	1.511	9.107

Table 5 presents the results of the combination of the financial and nonfinancial performance measures output: $TransferAbandoned = \beta0 + \beta1(LIQ) + \beta2(LEV) + \beta3(LEV\_DT) + \beta4(COV) + 5\beta(GROEFF) + \beta6(EFFPROF) + 7\beta(PROF) + \beta7(Cust\_Serv) + \beta8(GROSS\_REV) + \beta9(COM\_FPSC) + \beta10(COM\_DEP) + \beta11(COM\_CUP) + \beta12(TAX\_CL) + \beta13(MAN\_COMP) + \beta14(MAN\_OP) + \beta15(UTILTY\_CL) + \beta16(CIAC) + \beta17(TAX\_TOTI) + \beta18(COM\_USoA) + \beta19(NoDC) + \beta20(COM\_UCAR) + Ei$ *the model number of observations for the selected sample is 763, with a likelihood ratio chi-square of 281.85. Prob > chi2 (the probability of obtaining the chi-square statistic assuming a true null hypothesis) = 0.000. the Pseudo R2 (the model fit) = 0.2705. At a 0.05 significant level, only the liquidity ratio was the financial, statistically significant variable, while the nonfinancial variables had ten significant variables. * p-value < 0.1 level of significance; ** p-value < 0.05 level of significance; *** p-value < 0.001 level of significance*

The study theorizes that the drivers for utility abandonments and transfers are different, and the utility classification influences the drivers for either abandonments or transfers. Analyzing utilities' drivers to determine if utility abandonments correspond with utility transfers, the study used the twenty-one VIF-qualified explanatory variables and created two dummy variables (Abandonments & Transfers). Besides, the utility classification is posited to impact abandonments and transfers differently; hence, the study generated dummy variables for Class A, Class B, and Class C utilities to analyze them separately. The twenty-one VIF variables did not yield a specified model for the abandonment; a further robust check with the Hosmer–Lemeshow test revealed a poor model. The study then used all the twenty-three explanatory variables; for the abandonment model, the model dropped two variables (compliance with DEP and CUP) for perfect prediction. The abandonment model was statistically significant, with Pseudo R^2 of 0.5842 and p-value = 0.0000. The model used 703 observations, dropping 60 of the observations. The model outcome indicates that two financial performance measures (liquidity and the growth & efficiency ratios) were statistically significant. Five nonfinancial performance measures (gross water revenues per customer, utility tax classification, utility classification, compliance with NARUC, and no deficiencies) were statistically significant. Utility Class was significant in the utility abandonment model, having a positive coefficient and a direct relationship between utility classification and abandonment. A linktest to determine if the abandonment model is specified was tested. The model is not specified with _hatsq significant with p-value = 0.0000. the linktest determines the possibility of not including all the explanatory variables in the model. However, all the variables were used in the model. Hence, a further robust test using the Hosmer-Lemeshow goodness of test was run to determine the model's fitness to the data. Hosmer and Lemeshow (1989) established that the suitability of utilizing the chi-square statistics on dichotomous dependent variables (whether the utility is abandoned or not abandoned) with a grouping variable (independent variables) does not count on the significant levels of the chi-square to expose the significance level of the variables.

Nevertheless, the chi-square analysis establishes the significant distance of the explanatory variable from zero. The Hosmer and Lemeshow analysis shows how the logistic regression predictors distance away from zero. The Hosmer and Lemeshow test shows a 0.3631 significance level, indicating that the logistic analysis does not reject the null hypothesis. Hence, the chi-square value of 693.33 at the 0.05 probability level specifies a significant logistic regression model (Hosmer, Lemeshow, & Sturdivant, 2013). Table 6 presents the outcome of the abandonment model.

Table 6: Abandonment Output: Financial and Nonfinancial Performance Predictors

Abandonment	Coef.	Std. Err.	z	P>|z|	|95% Conf.	Interval
LIQ	0.0494	0.0174	2.8400	0.0040**	0.0154	0.0834
LEV	0.0221	0.0199	1.1100	0.2660	-0.0168	0.0610
LEV_DT	0.0000	0.0000	1.3900	0.1630	0.0000	0.0000
COV	-0.0372	0.1446	-0.2600	0.7970	-0.3205	0.2461
GROEFF	0.1785	0.0871	2.0500	0.0400**	0.0078	0.3492
EFFPROF	-2.0455	1.3540	-1.5100	0.1310	-4.6993	0.6082
PROF	0.6323	0.4535	1.3900	0.1630	-0.2566	1.5212
Cust_Serv	0.0010	0.0013	0.7500	0.4520	-0.0015	0.0034
GROSS_REV	0.0013	0.0006	2.3700	0.0180**	0.0002	0.0024
COM_FPSC	68.0020	1537.4940	0.0400	0.9650	-2945.4310	3081.4350
TAX_CL	0.5375	0.2418	2.2200	0.0260**	0.0636	1.0113
MAN_COMP	0.3273	0.5510	0.5900	0.5530	-0.7527	1.4073
MAN_OP	0.4399	0.6004	0.7300	0.4640	-0.7369	1.6166
UTILTY_CL	2.7367	1.2391	2.2100	0.0270**	0.3080	5.1653
CIAC	0.0000	0.0000	0.9000	0.3660	0.0000	0.0000
TAX_TOTI	0.0000	0.0000	-0.6000	0.5510	-0.0001	0.0000
COM_USoA	21.9761	9.0922	2.4200	0.0160**	4.1557	39.7965
NoDC	-25.2432	9.1796	-2.7500	0.0060**	-43.2348	-7.2516
COM_UCAR	-68.4673	1537.4900	-0.0400	0.9640	-3081.8920	2944.9570
PLTOUTP	0.0090	0.0057	1.5900	0.1110	-0.0021	0.0201
EQVMETER	-0.0308	0.0141	-2.1800	0.0290**	-0.0585	-0.0031
cons	-5.4262	4.7071	-1.1500	0.2490	-14.6519	3.7995

Table 6 presents the results of the combination of the financial and nonfinancial performance measures output on utility abandonment: $Abandonment = \beta0 + \beta1 (LIQ) + \beta2(LEV) + \beta3(LEV\_DT) + \beta4(COV) + 5\beta(GROEFF) + \beta6(EFFPROF) + 7\beta(PROF) + \beta7(Cust\_Serv) + \beta8(GROSS\_REV) + \beta9(COM\_FPSC) + \beta10(PLTOUTP) + \beta11(EQVMETER) + \beta12(TAX\_CL) + \beta13(MAN\_COMP) + \beta14(MAN\_OP) + \beta15(UTILTY\_CL) + \beta16(CIAC) + \beta17(TAX\_TOTI) + \beta18(COM\_USoA) + \beta19(NoDC) + \beta20(COM\_UCAR) + Ei$ the model number of observations for the selected sample is 703, with Pseudo R2 of 0.5842 and p-value = 0.0000. The results show that two financial performance measures (liquidity and the growth & efficiency ratios) and five nonfinancial performance measures (gross water revenues per customer, utility tax classification, utility classification, compliance with NARUC, and no deficiencies) were statistically significant. * p-value < 0.1 level of significance; ** p-value < 0.05 level of significance; *** p-value < 0.001 level of significance

The transfer model was statistically significant, with Pseudo R^2 of 0.2705 and p-value = 0.0000. All 763 observations indicate that one financial performance predictor (the liquidity ratio) and eight nonfinancial performance predictors were statistically significant. A linktest to determine the specification of the transfer model resulted in a specified model. The model is specified with _hatsq p-value = 0.0640. the linktest determines the possibility of not including all the explanatory variables in the model. A specified model suggests the possibility of including adequate predictors for the model. Table 7 presents the results of the transfer model.

Table 7: Transfer Output: Financial & Nonfinancial Performance Predictors

Transfer	Coef.	Std. Err.	z	P>|z|	|95% Conf. Interval	
LIQ	0.0221	0.0071	3.100	0.0020**	0.0081	0.0360
LEV	-0.0001	0.0035	-0.0300	0.9770	-0.0070	0.0068
LEV_DT	0.0000	0.0000	0.5000	0.6170	0.0000	0.0000
COV	0.0047	0.0334	0.1400	0.8890	-0.0608	0.0701
GROEFF	0.0068	0.0194	0.3500	0.7240	-0.0311	0.0448
EFFPROF	0.1141	0.3276	0.3500	0.7280	-0.5279	0.7562
PROF	0.0196	0.0151	1.300	0.1950	-0.0101	0.0493
Cust_Serv	-0.0001	0.0003	-0.2500	0.8030	-0.0006	0.0005
GROSS_REV	-0.0001	0.0001	-0.8200	0.4110	-0.0004	0.0002
COM_FPSC	-3.554	0.6282	-5.660	0.0000**	-4.785	-2.323
COM_DEP	1.324	0.4225	3.130	0.002**	0.4961	2.152
COM_CUP	1.169	0.5359	2.180	0.029**	0.1186	2.219
TAX_CL	0.5210	0.1002	5.200	0.0000**	0.3247	0.7173
MAN_COMP	-0.7010	0.2056	-3.410	0.0010**	-1.104	-0.2981
MAN_OP	-1.140	0.2133	-5.340	0.0000**	-1.558	-0.7218
UTILTY_CL	0.5465	0.2844	1.920	0.0550	-0.0110	1.104
CIAC	0.0000	0.0000	1.920	0.0540	0.0000	0.0000
TAX_TOTI	0.0000	0.0000	-2.630	0.0080**	0.0000	0.0000
COM_USoA	0.3724	0.2134	1.750	0.0810	-0.0458	0.7907
NoDC	2.259	0.3243	6.960	0.0000**	1.623	2.894
COM_UCAR	1.330	0.7985	1.670	0.0960	-0.2347	2.895
cons	-5.309	1.938	-2.740	0.0060	-9.107	-1.511

Table 7 presents the results of the transfer model using both the financial and nonfinancial performance measures output: $Transfer = \beta0 + \beta1\,(LIQ) + \beta2(LEV) + \beta3(LEV\_DT) + \beta4(COV) + 5\beta(GROEFF) + \beta6(EFFPROF) + 7\beta(PROF) + \beta7(Cust\_Serv) + \beta8(GROSS\_REV) + \beta9(COM\_FPSC) + \beta10(COM\_DEP) + \beta11(COM\_CUP) + \beta12(TAX\_CL) + \beta13(MAN\_COMP) + \beta14(MAN\_OP) + \beta15(UTILTY\_CL) + \beta16(CIAC) + \beta17(TAX\_TOTI) + \beta18(COM\_USoA) + \beta19(NoDC) + \beta20(COM\_UCAR) + Ei$ *the model number of observations for the selected sample is 763, with a likelihood ratio chi-square of 281.85. Prob > chi2 (the probability of obtaining the chi-square statistic assuming a true null hypothesis) = 0.000. the Pseudo R2 (the model fit) = 0.2705. At a 0.05 significant level, one financial performance predictor (the liquidity ratio) and eight nonfinancial performance predictors were statistically significant. * p-value < 0.1 level of significance; ** p-value < 0.05 level of significance; *** p-value < 0.001 level of significance*

Simultaneous Comparison of the Utility Abandonment and Transfer Models

The study examined the differences in the coefficients between the abandonments and transfers to determine the significant differences between the coefficients. The study used the seemingly unrelated estimation to examine all the abandonment and transfer models simultaneously to determine that the coefficients differ. The simultaneous comparison of the utility abandonments and transfers resulted in different coefficients and variables for the two models. Both models used twenty-one predictors; however, the abandonment model included the plant output per customer and the equivalent output per meter, while these two were not included in the transfer model. The abandonment model rejected compliance with DEP quality measures and compliance with CUP; however, the transfer model included these predictors. All the predictors had different coefficients. The utility class was statistically significant, with a positive coefficient indicating a direct prediction of utility abandonment. George and Mallery (2010) explain that a significant explanatory variable level indicates whether an independent variable significantly affects the dependent variable without interference from the other explanatory variables. The study hypothesis is that utility classification impacts the drivers for utility abandonments and transfers. Table 8 shows the results of the simultaneous comparison of the abandonment and transfer models.

Table 8: Simultaneous Comparison of the Utility Abandonment and Transfer Models

Abandonment	Coef.	Robust Std. Err.	z	P>|z|	|95% Conf. Interval	
LIQ	-0.0419	0.0144	2.920	0.0040**	0.0138	0.0701
LEV	0.0162	0.0104	1.560	0.1180	-0.0041	0.0366
LEV_DT	0.0000	0.0000	1.290	0.1980	0.0000	0.0000
COV	-0.0360	0.1215	-0.300	0.7670	-0.2742	0.2021
GROEFF	0.1595	0.0842	1.890	0.0580	-0.0056	0.3246
EFFPROF	-1.472	1.106	-1.330	0.1830	-3.6395	0.6953
PROF	0.586	0.2708	2.160	0.0300**	0.0552	1.1167
Cust_Serv	0.0005	0.0016	0.3200	0.7510	-0.0026	0.0036
GROSS_REV	0.0007	0.0002	2.880	0.0040**	0.0002	0.0012
COM_FPSC	72.304	21.395	3.380	0.0010**	30.3708	114.2367
TAX_CL	0.3826	0.1683	2.270	0.0230**	0.0528	0.7124
MAN_COMP	0.2334	0.4813	0.4900	0.6280	-0.7098	1.1767
MAN_OP	0.2268	0.5441	0.4200	0.6770	-0.8396	1.2932
UTILTY_CL	7.293	4.041	1.800	0.0710	-0.6275	15.2127
CIAC	0.0000	0.0000	0.9100	0.3620	0.0000	0.0000
TAX_TOTI	0.0000	0.0000	-0.1400	0.8880	0.0000	0.0000
COM_USoA	4.896	2.496	1.960	0.0500**	0.0042	9.7867
NoDC	-7.997	2.693	-2.970	0.0030**	-13.2750	-2.7179
COM_UCAR	-72.580	21.218	-3.420	0.0010**	-114.1657	-30.9947
_cons	-19.762	12.919	-1.530	0.1260	-45.0829	5.5584
Transfer						
LIQ	0.0221	0.0079	2.790	0.0050**	0.0066	0.0376
LEV	-0.0001	0.0041	-0.0200	0.9800	-0.0082	0.0080
LEV_DT	0.0000	0.0000	3.090	0.0020**	0.0000	0.0000
COV	0.0047	0.0286	0.1600	0.8710	-0.0515	0.0608
GROEFF	0.0068	0.0087	0.790	0.4310	-0.0102	0.0239
EFFPROF	0.1141	0.3319	0.3400	0.7310	-0.5364	0.7646
PROF	0.0196	0.0074	2.670	0.0080**	0.0052	0.0340
Cust_Serv	-0.0001	0.0003	-0.2400	0.8120	-0.0007	0.0005
GROSS_REV	-0.0001	0.0001	-1.360	0.1750	-0.0003	0.0001
COM_FPSC	-3.554	0.6064	-5.860	0.0000**	-4.7426	-2.3656
COM_DEP	1.324	0.4081	3.240	0.0010**	0.5243	2.1242
COM_CUP	1.169	0.5706	2.050	0.0410**	0.0506	2.2873
TAX_CL	0.5210	0.0913	5.710	0.0000**	0.3421	0.6998
MAN_COMP	-0.7010	0.2132	-3.290	0.0010**	-1.1189	-0.2831
MAN_OP	-1.140	0.2251	-5.060	0.0000**	-1.5810	-0.6986
UTILTY_CL	0.547	0.2634	2.070	0.0380**	0.0303	1.0627
CIAC	0.0000	0.0000	1.270	0.2040**	0.0000	0.0000
TAX_TOTI	0.0000	0.0000	-2.260	0.0240**	0.0000	0.0000
COM_USoA	0.3724	0.2247	1.660	0.0970	-0.0679	0.8128
NoDC	2.257	0.3946	5.720	0.0000**	1.4853	3.0319
COM_UCAR	1.330	0.8000	1.660	0.0960	-0.2378	2.8982
cons	-5.309	1.844	-2.880	0.0040**	-8.9223	-1.6949

Table 8 presents the results of the simultaneous comparison of the utility abandonment and transfer models to determine the significant differences between the coefficients. The Simultaneous Comparison resulted in different coefficients and variables for the two models. Both models used twenty-one predictors; however, the abandonment model included the plant output per customer and the equivalent output per meter, while these two were not included in the transfer model. The abandonment model rejected compliance with DEP quality measures and compliance with CUP. * p-value < 0.1 level of significance; ** p-value < 0.05 level of significance; *** p-value < 0.001 level of significance

The Utility class has a direct relationship with abandonments with a positive coefficient of 2.74; there are three utility classifications (Class A, B, & C); hence, further analysis of the overall model considering the utility class was analyzed to determine the impact a utility class has on abandonments and transfers, holding the other utility classes constant. The Class A model was statistically significant, with Pseudo R^2 of 0.8999 and p-value = 0.0000. The model used 680 observations with three nonfinancial performances statistically significant, and none of the financial performance measures was statistically significant. A linktest _hatsq = 1 and Hosmer-Lemeshow goodness of test Prob > chi2 = 0.9999, indicating a specified model. Table 9 shows the outcomes of the logistic regression for Class A utilities.

Table 9: Logistic Regression Output for Class A Utilities

Class_A	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval	
LIQ	0.0372	0.0390	0.9600	0.3390	-0.0391	0.1136
LEV	-0.2646	0.2039	-1.300	0.1940	-0.6642	0.1350
LEV_DT	-0.0327	0.0270	-1.210	0.2260	-0.0857	0.0203
COV	2.562	1.567	1.640	0.1020	-0.5091	5.6338
GROEFF	2.156	4.248	0.5100	0.6120	-6.169	10.486
EFFPROF	1.142	3.492	0.330	0.7440	-5.702	7.985
PROF	11.138	7.106	1.570	0.1170	-2.789	25.065
Cust_Serv	0.0155	0.0049	3.150	0.0020**	0.0059	0.0252
GROSS_REV	0.0175	0.0065	2.680	0.0070**	0.0047	0.0303
COM_FPSC	-3.587	26.907	-0.1300	0.8940	-56.324	49.150
TAX_CL	9.858	6.521	1.510	0.1310	-2.924	22.639
MAN_COMP	-12.023	5.527	-2.180	0.030**	-22.856	-1.192
MAN_OP	-4.273	4.214	-1.010	0.3110	-12.533	3.986
CIAC	0.0000	0.0000	0.8700	0.3840	0.0000	0.0000
TAX_TOTI	-0.0001	0.0000	-1.700	0.0880	-0.0001	0.0000
COM_USoA	9.482	3.981	2.380	0.0170**	1.679	17.285
NoDC	-1.943	2.598	-0.7500	0.4550	-7.034	3.149
PLTOUTP	-37.884	44.144	-0.8600	0.3910	-124.41	48.638
EQVMETER	37.822	44.138	0.860	0.3910	-48.687	124.33
_cons	-56.516	61.576	-0.920	0.3590	-177.20	64.170

*Table 9 shows the outcomes of the class A utility impact on the abandonments and transfers, employing both financial and nonfinancial performance measures:Class A = $\beta 0 + \beta 1 (LIQ) + \beta 2(LEV) + \beta 3(LEV\_DT) + \beta 4(COV) + 5\beta (GROEFF) + \beta 6(EFFPROF) + 7\beta (PROF) + \beta 7(Cust\_Serv) + \beta 8(GROSS\_REV) + \beta 9(COM\_FPSC) + \beta 10(EQVMETER) + \beta 11(PLTOUTP) + \beta 12(TAX\_CL) + \beta 13(MAN\_COMP) + \beta 14(MAN\_OP) + \beta 15(CIAC) + \beta 16(TAX\_TOTI) + \beta 17(COM\_USoA) + \beta 18(NoDC) + \beta 19(COM\_UCAR) + Ei$ The Class A model was statistically significant, with Pseudo R2 of 0.8999 and p-value = 0.0000. The model used 680 observations with three nonfinancial performances statistically significant, and none of the financial performance measures was statistically significant. * p-value < 0.1 level of significance; ** p-value < 0.05 level of significance; *** p-value < 0.001 level of significance*

Class B and Class C utilities were also analyzed separately. The Class B model was statistically significant, with Pseudo R^2 of 0.4875 and p-value = 0.0000. The model used 586 observations with six nonfinancial performances statistically significant, and similar to the Class A model, none of the financial performance measures was statistically significant. A linktest _hatsq = 0.000, indicating the possibility of an omitted variable, was confirmed with the Hosmer-Lemeshow goodness of test Prob > chi2 = 0.9999, indicating the model fits the data. On the other hand, the Class C model had one financial performance measure (efficiency and profitability ratio) statistically significant with a negative coefficient of 2.03. The efficiency and profitability ratio analyzes the ability of a utility to generate profits relative to the utility industry standards. There were nine nonfinancial performance measures statistically significant for the Class C utility model Table ten presents the outcome of the Class B logistic regression model, and table 11 presents the results of the Class C utility logistic regression model.

There are no available utility standards to compare these ratios; however, among the three Classes of utilities, Class A and B were not independently significantly impacted by the financial ratios compared to the Class C utility. Ten nonfinancial performance measures were statistically significant. Among the ten is the management participation in the utility operation; this was unique among the three utility classes. Class C was the only utility with a statistically significant outcome for management participation in operations. The coefficient for this explanatory variable is a positive 1.86. An increase in management participation in operating a Class C utility is likely to increase an abandonment by 1.86 times. Plant output per customer was also unique among the three classes of utilities. The Class C model used 680 observations, with a Pseudo R^2 of 0.8293 and p-value = 0.0000. A linktest _hatsq = 0.000, indicating the possibility of an omitted variable, was confirmed with the Hosmer-Lemeshow goodness of test Prob > chi2 =1, indicating the model fits the data.

Table 10:Logistic Regression Output for Class B Utilities

Class_B	Coef.	Std. Err.	z	P>|z|	|95% Conf. Interval	
LIQ	-0.0022	0.0090	-0.2500	0.8050	-0.0199	0.0154
LEV	-0.0057	0.0062	-0.9100	0.3640	-0.0179	0.0066
LEV_DT	-0.0010	0.0026	-0.4000	0.6910	-0.0062	0.0041
COV	0.0318	0.1176	0.2700	0.7870	-0.1987	0.2622
GROEFF	-0.0095	0.0368	-0.2600	0.7970	-0.0816	0.0627
EFFPROF	-0.3619	0.7612	-0.4800	0.6350	-1.854	1.130
PROF	0.4574	0.5258	0.8700	0.3840	-0.5732	1.488
Cust_Serv	0.0018	0.0003	5.120	0.0000**	0.0011	0.0025
GROSS_REV	0.0033	0.0005	6.540	0.0000**	0.0023	0.0043
TAX_CL	0.0714	0.1780	0.4000	0.6880	-0.2774	0.4203
MAN_COMP	0.2220	0.3939	0.5600	0.5730	-0.5501	0.9940
MAN_OP	-0.5904	0.3787	-1.560	0.1190	-1.333	0.1519
CIAC	0.0000	0.0000	-5.510	0.0000**	0.0000	0.0000
TAX_TOTI	0.0000	0.0000	3.770	0.0000**	0.0000	0.0001
COM_USoA	0.0384	0.3577	0.1100	0.9150	-0.6627	0.7395
NoDC	-0.5595	0.4272	-1.310	0.1900	-1.397	0.2777
PLTOUTP	-2.217	0.8999	-2.460	0.0140**	-3.981	-0.4530
EQVMETER	2.217	0.8999	2.460	0.0140**	0.4530	3.981
cons	-2.710	1.404	-1.930	0.0540	-5.463	0.0419

*Table 10 shows the outcomes of the class B utility impact on the abandonments and transfers, employing both financial and nonfinancial performance measures: Class B = β0 + β1 (LIQ) + β2(LEV) + β3(LEV_DT) + β4(COV) + 5β(GROEFF) + β6(EFFPROF) + 7β(PROF) + β7(Cust_Serv) + β8(GROSS_REV) + β9(TAX_CL) + β10(MAN_COMP) + β11(MAN_OP) + β12(CIAC) + β13(TAX_TOTI) + β14(COM_USoA) + β15(NoDC) + β16(PLTOUTP) + β17(EQVMETERI) + Ei The Class B model was statistically significant, with Pseudo R2 of 0.4875 and p-value = 0.0000. The model used 586 observations with six nonfinancial performances statistically significant, and none of the financial performance measures was statistically significant. * p-value < 0.1 level of significance; ** p-value < 0.05 level of significance; *** p-value < 0.001 level of significance*

Table 11: Logistic Regression Output for Class C Utilities

Class_C	Coef.	Std. Err.	z	P>|z|	|95% Conf. Interval	
LIQ	0.0029	0.0112	0.2600	0.7940	-0.0191	0.0249
LEV	0.0166	0.0091	1.840	0.0660	-0.0011	0.0344
LEV_DT	0.0010	0.0041	0.2500	0.8040	-0.0070	0.0090
COV	-0.1646	0.1681	-0.9800	0.3270	-0.4942	0.1649
GROEFF	0.0470	0.0685	0.6900	0.4920	-0.0873	0.1813
EFFPROF	-2.026	0.9429	-2.150	0.0320**	-3.874	-0.1782
PROF	0.0239	0.0410	0.5800	0.5610	-0.0566	0.1043
Cust_Serv	-0.0100	0.0017	-5.700	0.0000**	-0.0134	-0.0065
GROSS_REV	-0.0060	0.0009	-6.600	0.0000**	-0.0077	-0.0042
COM_FPSC	-4.554	11.565	-0.3900	0.6940	-27.222	18.114
TAX_CL	-1.562	0.4381	-3.560	0.0000**	-2.421	-0.7030
MAN_COMP	-0.3268	0.6723	-0.4900	0.6270	-1.645	0.9909
MAN_OP	1.863	0.7083	2.630	0.0090**	0.4742	3.251
CIAC	0.0000	0.0000	2.910	0.0040**	0.0000	0.0000
TAX_TOTI	-0.0001	0.0000	-2.730	0.0060**	-0.0001	0.0000
COM_USoA	-2.241	0.6660	-3.360	0.0010**	-3.546	-0.9356
NoDC	2.075	0.7573	2.740	0.0060**	0.5910	3.559
PLTOUTP	3.866	1.476	2.620	0.0090**	0.9735	6.757
EQVMETER	-3.865	1.476	-2.620	0.0090**	-6.757	-0.9734
cons	23.199	23.473	0.9900	0.3230	-22.808	69.206

*Table 11 shows the outcomes of the class B utility impact on the abandonments and transfers, employing both financial and nonfinancial performance measures: Class C = β0 + β1 (LIQ) + β2(LEV) + β3(LEV_DT) + β4(COV) + 5β(GROEFF) + β6(EFFPROF) + 7β(PROF) + β7(Cust_Serv) + β8(GROSS_REV) + β9(TAX_CL) + β10(MAN_COMP) + β11(MAN_OP) + β12(CIAC) + β13(TAX_TOTI) + β14(COM_USoA) + β15(NoDC) + β16(PLTOUTP) + β17(EQVMETERI) + Ei The Class C model was statistically significant, with Pseudo R2 of 0.8293 and p-value = 0.0000. The model used 680 observations with ten nonfinancial performances statistically significant, and the efficiency ratio was the only financial variable that was statistically significant. * p-value < 0.1 level of significance; ** p-value < 0.05 level of significance; *** p-value < 0.001 level of significance*

The study examined the differences in the coefficients across the utility class to determine if they significantly differ across each utility class. The study employed the seemingly unrelated estimation to examine all three classes simultaneously to determine that the coefficients differ and a Wald chi-square test for the three groups to determine that the predictor variables are statistically significant to improve the

model (William, 2015). The simultaneous comparison of the three classes (Class A, B, & C) for abandonments resulted in different coefficients and variables for each class. Class A and C used nineteen predictors compared to Class B, which used eighteen predictors. Class A had one financial predictor (the liquidity ratio) and two nonfinancial predictors (management compensation & compliance with state quality measures) that were statistically significant. Class B had six nonfinancial predictors that were statistically significant; Class C had two financial predictors (the leverage ratio & profitability ratio) and eleven statistically significant nonfinancial predictors. The overall outcome yielded Wald chi-square results of chi2(3) = 64.93 with Prob > chi2 =0.0000. The coefficients of the utility categories are different, and the number of predictors for each class differs from each other. Table 12 presents the outcome of the simultaneous comparison of the three classes of utility (Class A, B, & C) models.

Table 12:Simultaneous Comparison of the Utility Class Models

Class_A	Coef.	Robust Std. Err.	z	P>|z|	|95% Conf. Interval
LIQ	0.0372	0.0194	1.920	0.0540**	-0.0007	0.0752
LEV	-0.2646	0.1561	-1.700	0.0900	-0.5705	0.0413
LEV_DT	-0.0327	0.0185	-1.770	0.0760	-0.0689	0.0034
COV	2.562	1.695	1.510	0.1310	-0.7599	5.885
GROEFF	2.156	2.109	1.020	0.3070	-1.977	6.290
EFFPROF	1.142	3.276	0.3500	0.7270	-5.278	7.562
PROF	11.138	4.983	2.240	0.0250	1.372	20.904
Cust_Serv	0.0155	0.0068	2.270	0.0230	0.0021	0.0289
GROSS_REV	0.0175	0.0110	1.590	0.1120	-0.0041	0.0391
COM_FPSC	-3.587	0.6755	-5.310	0.0000**	-4.911	-2.263
TAX_CL	9.856	6.585	1.500	0.1340	-3.049	22.764
MAN_COMP	-12.024	6.192	-1.940	0.0520**	-24.161	0.1132
MAN_OP	-4.273	4.899	-0.870	0.3830	-13.875	5.328
CIAC	0.0000	0.0000	0.8500	0.3930	0.0000	0.0000
TAX_TOTI	-0.0001	0.0000	-1.170	0.2410	-0.0001	0.0000
COM_USoA	9.482	7.654	1.240	0.2150	-5.520	24.484
NoDC	-1.943	2.934	-0.6600	0.5080	-7.693	3.8073
PLTOUTP	-37.884	22.058	-1.720	0.0860	-81.117	5.3485
EQVMETER	37.823	22.038	1.720	0.0860	-5.371	81.016
_cons	-56.516	38.002	-1.490	0.1370	-131.00	17.967
Class_B						
LIQ	-0.0022	0.0054	-0.4100	0.6830	-0.0129	0.0084
LEV	-0.0057	0.0037	-1.540	0.1230	-0.0129	0.0015
LEV_DT	-0.0010	0.0008	-1.330	0.1840	-0.0026	0.0005
COV	0.0318	0.0796	0.4000	0.6900	-0.1242	0.1878
GROEFF	-0.0095	0.0154	-0.6200	0.5370	-0.0396	0.0207
EFFPROF	-0.3619	1.157	-0.3100	0.7540	-2.629	1.905
PROF	0.4574	1.211	0.3800	0.7060	-1.916	2.831
Cust_Serv	0.0018	0.0003	5.160	0.0000**	0.0011	0.0025
GROSS_REV	0.0033	0.0004	8.610	0.0000**	0.0026	0.0041
TAX_CL	0.0714	0.1873	0.3800	0.7030	-0.2957	0.4386
MAN_COMP	0.2220	0.3995	0.5600	0.5780	-0.5610	1.005
MAN_OP	-0.5904	0.3836	-1.540	0.1240	-1.342	0.1615
CIAC	0.0000	0.0000	-5.470	0.0000**	0.0000	0.0000
TAX_TOTI	0.0000	0.0000	3.470	0.0010**	0.0000	0.0001
COM_USoA	0.0384	0.3346	0.1100	0.9090	-0.6175	0.6943
NoDC	-0.5595	0.4038	-1.390	0.1660	-1.351	0.2319
PLTOUTP	-2.217	0.6208	-3.570	0.0000**	-3.434	-1.000
EQVMETER	2.217	0.6208	3.570	0.0000**	1.000	3.434
_cons	-2.710	2.106	-1.290	0.1980	-6.838	1.417

Table 12 shows the results of the simultaneous comparison of the Utility classes (class A, B, & C) models to determine the significant differences between the coefficients among the utility classes. The simultaneous comparison of the three classes (Class A, B, & C) for abandonments resulted in different coefficients and variables for each class. The overall outcome yielded Wald chi-square results of chi2(3) = 64.93 with Prob > chi2 =0.0000. The coefficients of the utility categories are different, and the number of predictors for each class differs for each utility class.

Table 3: Simultaneous Comparison of the Utility Class Models (Continued)

Class_C						
LIQ	0.0029	0.0062	0.4700	0.6370	-0.0092	0.0151
LEV	0.0166	0.0045	3.680	0.0000**	0.0078	0.0255
LEV_DT	0.0010	0.0006	1.680	0.0930	-0.0002	0.0022
COV	-0.1646	0.1281	-1.290	0.1990	-0.4157	0.0864
GROEFF	0.0470	0.0281	1.670	0.0950	-0.0081	0.1022
EFFPROF	-2.026	1.034	-1.960	0.0500	-4.053	0.0003
PROF	0.0239	0.0068	3.530	0.0000**	0.0106	0.0371
Cust_Serv	-0.0100	0.0014	-7.040	0.0000**	-0.0127	-0.0072
GROSS_REV	-0.0060	0.0011	-5.350	0.0000**	-0.0081	-0.0038
COM_FPSC	-4.554	0.7999	-5.690	0.0000**	-6.122	-2.986
TAX_CL	-1.562	0.3527	-4.430	0.0000**	-2.253	-0.8705
MAN_COMP	-0.3268	0.6697	-0.4900	0.6260	-1.639	0.9858
MAN_OP	1.863	0.7913	2.300	0.0190**	0.3115	3.414
CIAC	0.0000	0.0000	3.120	0.0020**	0.0000	0.0000
TAX_TOTI	-0.0001	0.0000	-2.710	0.0070**	-0.0001	0.0000
COM_USoA	-2.241	0.5196	-4.310	0.0000**	-3.259	-1.223
NoDC	2.075	0.7187	2.890	0.0040**	0.6665	3.484
PLTOUTP	3.866	1.605	2.410	0.0160**	0.7195	7.0114
EQVMETER	-3.865	1.605	-2.410	0.0160**	-7.011	-0.7194
_cons	23.199	3.729	6.220	0.0000	15.891	30.507

Table 12 shows the results of the simultaneous comparison of the Utility classes (class A, B, & C) models to determine the significant differences between the coefficients among the utility classes. The simultaneous comparison of the three classes (Class A, B, & C) for abandonments resulted in different coefficients and variables for each class. The overall outcome yielded Wald chi-square results of chi2(3) = 64.93 with Prob > chi2 =0.0000. The coefficients of the utility categories are different, and the number of predictors for each class differs for each utility class.

Fixed Effects and Random Effects-Outcome

The study theorizes that abandonments and transfers of utilities are impacted by time. For instance, the length of time the utility has been in existence may impact the utility's ability to abandon its facility or transfer to another utility. The study investigated the panel logistic regression (xtlogit) to determine the impact of time on utility abandonment and transfers. Williams (2015) explains that both fixed and random effects impact the explanatory variables in determining the time impacts on the dependent variable (Abandonments and Transfers). The study explored both fixed effects and random effects on abandonments and transfers. Fixed effects explore the connection between explanatory and dependent variables (Torres-Reyna, 2007). Each utility has features that may or may not impact the explanatory variables; fixed effect assumes that a utility's characteristics may impact its abandonments or transfers (correlation between entity's error term and predictor variables) (Torres-Reyna, 2007). If there is a correlation between the utility's error term and the explanatory variables, a fixed effect removes the time-invariant features to enhance the assessment of the net impact of the explanatory variables on abandonments and transfers.

The study used the Hausman test to determine if the error terms are correlated with the explanatory variables. The study hypothesis is that the random effect model is preferred to the fixed effect model; hence the error terms of a utility are correlated with the explanatory variables. The overall model (both Abandonments and Transfers), Hausman test Prob>chi2 = 1. Torres-Reyna (2007) explains that the fixed effect is recommended if the Prob>chi2 is statistically significant. However, the overall model is not statistically significant; hence, the study used the random effect model to analyze the time impact on utility abandonments and transfers. The Random effect model assumes that the variation across utilities is random and uncorrelated with the explanatory variables. Furthermore, the predictors for utility classes differ based on the prior results; hence, the study assumes that differences across utility classifications impact the abandonments and transfers. Table 13 presents the outcomes of the Abandonment random effect.

Table 13: Abandonment Random Effects-Outcome

Abandoned	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval	
LIQ	0.0026	0.0136	0.1900	0.8460	-0.0241	0.0294
LEV	0.1005	0.1251	0.8000	0.4220	-0.1448	0.3457
LEV_DT	0.0000	0.0000	0.2400	0.8090	0.0000	0.0000
COV	-0.6290	1.143	-0.5500	0.5820	-2.869	1.611
GROEFF	0.8029	2.196	0.3700	0.7150	-3.501	5.107
EFFPROF	-0.6377	5.504	-0.1200	0.9080	-11.425	10.150
PROF	0.8357	1.339	0.6200	0.5330	-1.789	3.460
Cust_Serv	0.0041	0.0068	0.6000	0.5450	-0.0092	0.0174
GROSS_REV	0.0027	0.0023	1.160	0.2460	-0.0019	0.0073
TAX_CL	0.6758	1.432	0.4700	0.6370	-2.130	3.482
MAN_COMP	-8.511	3.481	-2.450	0.0140**	-15.332	-1.688
MAN_OP	-3.061	3.033	-1.010	0.3130	-9.005	2.883
UTILTY_CL	11.830	6.404	1.850	0.0650	-0.7240	24.378
CIAC	0.0000	0.0000	-0.0500	0.9610	0.0000	0.0000
TAX_TOTI	-0.0001	0.0002	-0.4600	0.6460	-0.0004	0.0002
COM_USoA	18.845	5.532	3.410	0.0010**	8.002	29.689
NoDC	-30.991	6.552	-4.730	0.0000**	-43.833	-18.149
COM_UCAR	-5.622	4.578	-1.230	0.2190	-14.594	3.350
Year						
2008	-1.055	3.332	-0.3200	0.7520	-7.586	5.476
2009	0.4402	3.122	0.1400	0.8880	-5.679	6.560
2010	-1.382	4.249	-0.3300	0.7450	-9.710	6.947
2011	-2.315	3.945	-0.5900	0.5570	-10.046	5.416
2012	-2.145	4.462	-0.4800	0.6310	-10.890	6.601
2013	-9.128	7.578	-1.200	0.2280	-23.980	5.724
2014	-8.193	5.363	-1.530	0.1270	-18.704	2.318
2015	-17.922	11.941	-1.500	0.1330	-41.325	5.482
2016	-20.280	9.549	-2.120	0.0340	-38.996	-1.564
2017	0.0000	(empty)				
2018	-19.032	19.914	-0.9600	0.3390	-58.062	19.999
_cons	-3.278	25.402	-0.1300	0.8970	-53.065	46.509
/lnsig2u	5.022	0.4936			4.055	5.990
sigma_u	12.320	3.041			7.595	19.984
rho	0.9788	0.0103			0.9460	0.9918
LR test of rho=0:	chibar2(01) = 98.860			Prob >= chibar2 = 0.000		

Table 13 presents the Abandonment random effect model. The model estimates the odds ratio for a utility to abandon their facility in any given two years at 3,346.56, with a Pearson's correlation coefficient of 0.78 (square = 0.60), indicating a lower manifest than a latent association. The random effect model yielded three statistically significant predictors: management compensation, compliance with NARUC reporting standards, and the No deficiencies communications from the state regulatory body.

The Abandonment random effect had three statistically significant predictors: management compensation, compliance with NARUC reporting standards, and the No deficiencies communications from the state regulatory body. Management charging salary to the utility had a negative coefficient of 8.51, revealing an inverse relationship of utility abandonment. One increase in utilities with management charging salary to the utility has log odds of 8.51 of not abandoning the utility over time. The No deficiencies communications from regulatory agencies had a negative 30.99 coefficient. An indication of one increase in issuing a deficiency notice has a log odds of 30.99 for utility abandoning their facility over time. Compliance with the Uniform System of accounts for abandoned utilities had a positive 18.85 coefficient, indicating that abandoning utilities complied with the annual report of a log odds of 18.85. A utility whose observed propensity equals the sample median reveals a marginal probability for the utility to abandon their facility to be 0.005 (0.5%) within a year, and a joint probability of abandoning the utility facility within any two years is 0.004 (0.4%). The model estimates the odds ratio for a utility to abandon their facility in any given two years at 3,346.56; that is, the odds for a utility to abandon their facility in any given year (e.g., 2008) are nearly 3,346.56 times the corresponding odds for a utility with similar observed attributes in any other year (e.g., 2017). Pearson's correlation coefficient is 0.78 (square = 0.60), which indicates a lower manifest

than a latent association. An abandonment in any given year is explained by 60% of the utility behaviors in another year instead of the continual unobserved traits explaining 98% latent propensity for a utility to abandon their facility in any given year. The Yule's Q is 0.999, with the linear predictor at a median. The probability of any two randomly selected utilities with median observed characteristics within any given two years would be; that an abandoned utility(concordant) exceeds the probability that a utility will abandon its facility (discordant) by 99.9 percentage points. Table 14 presents the results of the Intra-class Correlation and manifest association in random effects for the abandonment model.

Table 4: Abandonment Intra-Class Correlation and Manifest Association in Random Effects

Measure	Estimate	[95% Conf.Interval]			
Marginal probability.	0.0050	0.0000	0.0370		
Joint probability.	0.0040	0.0000	0.0330		
Odds ratio	3,346.6	3,5156.9	1,727.9		
Pearson's r	0.7750	0.5540	0.8800		
Yule's Q	0.9990	1.000	0.9990		
Manifest Association					
Measure	p1	p25	p50	p75	p99
Marginal probability.	0.0000	0.0000	0.0050	0.0650	0.7380
Joint probability.	0.0000	0.0000	0.0040	0.0550	0.7130
Odds ratio	7,1000,000	32,993	3346.6	539.88	269.57
Pearson's r	0.576	0.7140	0.775	0.8390	0.8700
Yule's Q	1.000	1.000	0.999	0.9960	0.9930

Table 14 presents the results of the abandonment Intra-class Correlation and manifest association in the Random Effects Model. The Yule's Q is 0.999, with the linear predictor at a median and a Person's r = 0.775. The marginal probability of abandoning a utility ranges from 0.000 to 0.738 in any given year, from one percentile to the 99th percentile.

The Abandonment Intra-class Correlation output reveals a confidence interval for each measure. The study explored how the measures vary across the selected sample, using the Intra-class manifest association in random effects. The marginal probability of abandoning a utility ranges from 0.000 to 0.738 in any given year, from one percentile to the 99th percentile. The variation in the marginal probability impacts both Pearson's r, and Yule's Q. Pearson's r is higher among the utility more likely to abandon their facility than Yule's Q. Its odds ratio is higher among utilities least likely to abandon their facility. With an average of 74% abandoning their facility within any given year, utilities are associated with a two-hundred-fold increase in the odds of abandoning their facility in another year. However, a utility with 0.00% of abandoning its facility in one year is associated with a seventy-one million-fold increase in the odds of abandoning its facility in another year.

The transfer random effect model indicates that two statistically significant explanatory variables are management compensation, compliance with state regulators' quality measures, and management compensation. Consistent with the abandonment model, the management compensation had a negative coefficient of 4.54, indicating an inverse relationship to utility transfers. One increase in utilities with management charging salary to the utility has log odds of 4.54 of not transferring the utility over time. Utilities complying with state regulatory quality measures are not likely to transfer the utility over time, with an odd log of 10.29. A utility whose observed propensity equals the sample median reveals a marginal probability for the utility to transfer utility to be 0.574 (57%) within a year, and a joint probability of transferring the utility facility within any two years is 0.539 (54%). The model estimates the odds ratio to transfer to a new utility in any given two years at 169.88. The odds for a utility to transfer to a new utility in any given year (e.g., 2010) is nearly 169.88 times the corresponding odds for a utility with similar

observed attributes in any other year (e.g., 2018). Pearson's correlation coefficient is 0.86 (square = 0.74), which indicates a lower manifest than a latent association. A transfer in any given year is explained by 74% of the utility behaviors in another year instead of the continual unobserved traits explaining 97% latent propensity for a utility to transfer in any given year. Table 15 presents the results of the Intra-class Correlation in Random Effects for the transfer model.

Table 15: Transfer Intra-Class Correlation and Manifest Association in Random Effects

Measure	Estimate	[95% Conf.Interval]			
Marginal probability.	0.5740	0.6110	0.5480		
Joint probability.	0.5390	0.559	0.525		
Odds ratio	169.88	68.952	417.98		
Pearson's r	0.8560	0.780	0.9060		
Yule's Q	0.9880	0.9710	0.9950		
Manifest association					
Measure	p1	p25	p50	p75	p99
Marginal probability.	0.2110	0.4340	0.5740	0.7020	0.9860
Joint probability.	0.1850	0.3990	0.5390	0.6710	0.9830
Odds ratio	210.00	169.47	169.88	184.89	1,033.3
Pearson's r	0.8440	0.8560	0.8560	0.8510	0.7680
Yule's Q	0.9910	0.9880	0.9880	0.9890	0.9980

Table 15 presents the results of the Transfer Intra-Class Correlation and manifest association in the Random Effects Model. Yule's Q is 0.988 with the linear predictor at a median, and Pearson's correlation coefficient is 0.86 (square = 0.74). A transfer in any given year is explained by 74% of the utility behaviors in another year instead of the continual unobserved traits explaining 97% latent propensity for a utility to transfer in any given year

The Yule's Q is 0.988, with the linear predictor at a median. The probability of any two randomly selected utilities with a median observed characteristic within any given two years would be; that a transfer utility (concordant) exceeds the probability that a utility will transfer their facility (discordant) by 98.8 percentage points. The transfer Intra-class Correlation output reveals a confidence interval for each measure. The marginal probability of transferring a utility ranges from 0.211 to 0.986 in any given year, from one percentile to the 99th percentile. The variation in the marginal probability impacts both Pearson's r and Yule's Q. Pearson's r is higher among the utility more likely to transfer than Yule's Q, and its odds ratio is higher among utilities least likely to transfer to a new utility. Utilities, with an average of 99% of transferring within any given year, are associated with a thousand thirty-three increase in the odds of transferring in another year. However, a utility with 21% of transferring in one year is associated with a two hundred and ten-fold increase in the odds of transferring in another year. Table 16 presents the outcome of the random effect of the transfer model. The abandonment and transfer analysis results inform the public, practitioners, and academicians of the necessary steps needed to assist in evaluating transfers and abandonments in the nonviable water and wastewater industry. The discussion session analyzes the results, the practical and theoretical implications, as well as recommendations and suggestions for future research.

Table 5:Transfer Random Effects-Outcome

Transfer	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval	
Liq	0.0172	0.0448	0.3800	0.7010	-0.0707	0.1051
Lev	0.0080	0.0201	0.4000	0.6900	-0.0313	0.0473
Lev_dt	0.0000	0.0001	0.0400	0.9690	-0.0002	0.0002
Cov	0.0196	0.2694	0.0700	0.9420	-0.5085	0.5476
Groeff	-0.0256	0.1120	-0.2300	0.8190	-0.2451	0.1939
Effprof	-1.545	2.762	-0.5600	0.5760	-6.959	3.8688
Prof	-0.0477	0.0476	-1.000	0.3160	-0.1410	0.0456
Cust_serv	0.0027	0.0019	1.460	0.1430	-0.0009	0.0064
Gross_rev	0.0004	0.0013	0.3000	0.7640	-0.0022	0.0030
Com_fpsc	-10.286	4.122	-2.500	0.0130**	-18.365	-2.207
Com_dep	4.225	11.826	0.3600	0.7210	-18.952	27.403
Com_cup	-2.293	3.123	-0.7300	0.4630	-8.415	3.828
Tax_cl	1.445	0.8326	1.730	0.0830	-0.1875	3.076
Man_comp	-4.543	1.588	-2.860	0.0040**	-7.656	-1.430
Man_op	-2.161	1.722	-1.2600	0.2090	-5.536	1.214
Utilty_cl	3.128	3.208	0.9700	0.3300	-3.160	9.415
Ciac	0.0000	0.0000	0.6700	0.5020	0.0000	0.0000
Tax_toti	0.0000	0.0000	-0.4400	0.6620	-0.0001	0.0001
COM_usoa	2.631	1.675	1.570	0.1160	-0.6525	5.914
Nodc	4.828	2.520	1.920	0.0550	-0.1111	9.766
Com_ucar	8.224	5.223	1.570	0.1150	-2.013	18.461
Year						
2008	-0.3323	2.699	-0.1200	0.9020	-5.622	4.957
2009	-0.8613	3.094	-0.2800	0.7810	-6.926	5.204
2010	-0.2518	2.704	-0.0900	0.9260	-5.552	5.048
2011	-0.3020	2.780	-0.1100	0.9130	-5.751	5.147
2012	-0.2153	2.554	-0.0800	0.9330	-5.220	4.790
2013	0.1215	2.530	0.0500	0.9620	-4.838	5.081
2014	-0.6438	2.578	-0.2500	0.8030	-5.696	4.408
2015	-3.799	2.330	-1.630	0.1030	-8.365	0.7677
2016	-3.779	2.292	-1.650	0.0990	-8.272	0.7138
2017	0.0000	(empty)				
2018	-4.207	2.455	-1.710	0.0870	-9.019	0.6059
_Cons	-13.600	27.603	-0.4900	0.6220	-67.701	40.501
/Lnsig2u	4.794	0.444			3.924	5.663
Sigma_u	10.989	2.437			7.115	16.972
Rho	0.9735	0.012			0.9390	0.9887
LR test of rho=0:	chibar2(01) = 641.98			Prob >= chibar2 = 0.000		

Table 16 presents the Transfer random effect model. The model estimates the marginal probability of transferring a utility ranges from 0.211 to 0.986 in any given year, from one percentile to the 99th percentile. The model estimates the odds ratio to transfer to a new utility in any given two years at 169.88. the transfer random effect model indicates that two statistically significant explanatory variables are management compensation, compliance with state regulators' quality measures, and management compensation

CONCLUDING COMMENTS

The investor-owned utility industry is a growing-cost industry; state regulators, during rate case proceedings, focus on the short-term rate settings instead of the long-term sustainability of these investor-owned utilities by providing appropriate resources for the essential services and a return on investments to shield the interest of investors and continuousness provision of services to the citizens (Beecher et al., 1993). The study's primary objective is to empirically determine the drivers of utility abandonments and transfers and analyze financial and nonfinancial performance measures to determine if nonfinancial measures, as applied to other industries, are helpful to the utility industry. The study evaluated the relationship of both financial and nonfinancial performance measures with utility abandonments and transfers, together and separately, to answer the question; What are the financial and nonfinancial

performance drivers of utility abandonments and transfers, and do the nonfinancial performance measures make a difference? Besides, the study analyzed the time effect on utility abandonments and transfers. The study results indicate that utility abandonments and transfers had different drivers impacting the utility's ability to transfer or abandon its facility. Analyzing the financial performance measures separately, the overall model was statistically significant, with only the liquidity ratio being significant among the seven financial variables. The investor-owned utilities are most likely to abandon or transfer their facility if they have cash flow issues and cannot meet the current payments as it comes due. All the other ratios were not independently significant. The study identified eighteen nonfinancial performance measures, and fourteen qualified for the study. The variables are the plant output equivalent units, obtained by dividing the plant output by the total number of meter equivalents as a measure of efficiency. The no deficiency communication from regulators shows that the utility complies with the regulatory requirement. Compliance with the department of environmental protection, the tax filing classification of the utility, the operating style of management measuring utility run by owners or others, and owners charging salaries to the utility were nonfinancial performance measures that were independently significant. The only nonfinancial performance measure that was not independently significant is utility compliance with a consumptive use permit, which allows a utility to mine or withdraw a stipulated amount of water from the ground. The efficiency ratio was consistently significant throughout the analysis combining abandonment and transfers and treating them separately. Utilities that cannot turn over their plant assets to generate enough revenues are likely to transfer or abandon their facility. The study also reveals that a Class C utility's probability of abandoning its facility was higher than Class A and B utilities. Utilities operated by owners and utilities that owners charge salary as part of the management team, over time, are likely to maintain the utility and not abandon the facility. The abandonment analysis identified and accepted ten explanatory variables, two financial and eight nonfinancial variables; however, the transfer model identified and used thirteen performance measures, three financial and ten nonfinancial performance measures. Class A and B utilities were likely to transfer into a new entity or merge into one organization compared to Class C utilities. The study indicates that regulators, investors, owners, and ratepayers should consider the identified nonfinancial performance measures in assessing utility viability and sustainability.

The study compared the established framework of other industries and used it to establish a framework for the utility industry; nonfinancial performance measures make a difference in analyzing utility viability and sustainability, similar to other industries. The study results also determine that the viability of transfers and abandonments should be treated differently. The number of explanatory variables used to predict utility abandonments differs from utility transfers. Some variables, such as the consumptive use permit, were not accepted as a predictor for abandonment but were included in the transfer predictors. The study has significantly contributed to the utility viability and sustainability assessment and has established a framework for the utility industry employing financial and nonfinancial performance measures. The study has shown that nonfinancial performance measures make a difference in assessing utility transfers and abandonments. A further study is recommended using dominance analysis to determine if the nonperformance measures dominate the performance measures. The dominance analysis will further reinforce the established framework for utility viability and sustainability; it will assist regulators, practitioners, and academicians in apportioning resources during rate case analysis. The study outcomes are limited to states that follow similar utility regulations as Florida; other states may have to expand on the study for its applicability to IOUs. Data on capital funding was not readily available; another limitation that could have expanded the financial performance measures beyond the NRRI-modified ratios by Acheampong et al.

REFERENCES

Acheampong, D (2019). The Financial and Nonfinancial Performance Measures That Drive Utility Abandonments and Transfers in the State of Florida. Available from ProQuest Dissertations & Theses Global

Acheampong, D., Benford, T., & Volkan, A. (2018). Modelling utility financial viability using logistic regression: Evidence from Florida. Accounting & Taxation, 10(1), 87-96.

Anderson, E. W., Fornell, C., & Lehmann, D. R. (1994). Customer satisfaction, market share, and profitability: Findings from Sweden. Journal of marketing, 58(3), 53-66.

Balcaen, S. & H. Ooghe (2004). 35 years of studies on business failure: An overview of the classic statistical methodologies and their related problems. The British Accounting Review, 38 (1), 63–93.

Beecher, J. A., Higbee, J., Manzel, A., & Dooley, R. (1996). The regionalization of water utilities: Perspectives, literature review, and annotated bibliography.

Beecher, J. A., Mann, P. C., & Stanford, J. (1993). Meeting water utility revenue requirements: Financing and ratemaking alternatives.

Beaver, W. (1966). Financial ratios as predictors of failure. Journal of Accounting Research, 4, 71-111. doi:10.2307/2490171

Belsley, D. (1984). Demeaning conditioning diagnostics through centering. The American Statistician, 38(2), 73-77.

Chow, C. W., & Van Der Stede, W. A. (2006). The use and usefulness of nonfinancial performance measures. *Management accounting quarterly*, *7*(3), 1-8.

Creswell, J. W. (2009) Research design: Qualitative, quantitative, and mixed methods approach. Los Angeles, California: Sage Publications, Inc.

Creswell, J. W., & Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approach. Los Angeles, California: Sage Publications, Inc.

Edmister, R. (1972). Financial ratios as discriminant predictors of small business failure. The Journal of Finance, 27(1), 139-140. doi:10.2307/2978517

Edmund A. Mennis. (1969). New Tools for Profits Analysis. Financial Analysts Journal, 25(1), 25-33. Retrieved from: http://www.jstor.org.ezproxy.lib.usf.edu/stable/4470455

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

Hair, J. F. J., Black, W., Babin, B. J., & Anderson, R., E. (2010). Multivariate data analysis (Seventh edition). New Jersey: Prentice-Hall

Hosmer, D. W., Jr., Lemeshow, S., & Sturdivant, R. X. (2013). Applied logistic regression (Vol. 398). John Wiley & Sons.

Hosmer, D. W., Jr., & Lemeshow, S. (1989). Applied logistic regression. John Wiley & Sons.

Jordan, J. L., Witt, H. J., & Wilson, J. R. (1996). Modeling water utility financial performance 1. *JAWRA Journal of the American Water Resources Association*, *32*(1), 137-144.

Kremelberg, D. (2011). Practical statistics: A quick and easy guide to IBM SPSS statistics, SATA, and other statistical software. California: Sage Publications Ltd.

Liao, D., & Valliant, R. (2012). Variance inflation factors in the analysis of complex survey data. Survey Methodology, 38(1), 53-62.

Mason, C. H., & Perreault Jr, W. D. (1991). Collinearity, power, and interpretation of multiple regression analysis. Journal of Marketing Research, 28(3), 268-280.

Miller, W., & Cromwell, J. (1987). Wade Miller Associates, Inc. Water Supply.

Milost, F. (2013). Information power of nonfinancial performance measures. International Journal of Business Management & Economic Research, 4(6), 823-828.

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

National Association of Regulatory Utility Commissioners. (2007). Recommended by the NARUC: Retention policies. Retrieved from http://www.naruc.org /resolutions/2007AnnualResolutions.pdf

National Regulatory Research Institute. (2009). Effective regulation: Guidance for public-interest decision-makers. Columbus, OH.

Neely, A. (1999). The performance measurement revolution: why now and what next? International Journal of Operations & Production Management, 19(2), 205-228.

Neter, J. (1966). Discussion of financial ratios as predictors of failure. Journal of Accounting Research, 4, 112-118. doi:10.2307/2490172

Sormunen, N., & Laitinen, T. (2012). Late financial distress process stages and financial ratios: Evidence for auditors' goingconcern evaluation. *Liiketaloudellinen Aikakauskirja*, (1), 41-69.

Stanford, M. J. (2008). Small water systems: Challenges and recommendations. National Regulatory Research Institute, 08(02). Retrieved from: http://nrri.org/download/2008-02-small-water-systems_-challenges-and-recommendations/

Teumim, P. S., & Radigan, F. W. (2011). The small water company dilemma: Processes and techniques for effective regulation. Retrieved from: https://pubs.naruc.org/pub/FA86616F-D985-AEE6-C854-FD5421C8737A

Torres-Reyna, O. (2007). Panel data analysis fixed and random effects using Stata (v. 4.2). Data & Statistical Services, Princeton University, 112.

The United States Environmental Protection Agency. (1995). Methods for assessing the viability of small water systems: A review of current techniques and approaches.

Washington State Department of Health. (2013). Financial viability for small water systems (DOH 331-405).

Wilcox, J. (1971). A simple theory of financial ratios as predictors of failure. Journal of Accounting Research, 9(2), 389-395. doi:10.2307/2489944

Williams, R. (2015). Group Comparisons: Differences in Composition Versus Differences in Models and Effects. Handout. Sociology University of Notre Dame.

AUTHORS BIOGRAPHY

Isaac Osei Agyemang is a Ph.D. candidate at the School of Information and Communication Engineering, UESTC, and a research assistant at the multi-agent and robotics lab (MAR's Lab, UESTC). His research areas include deep learning, unmanned systems, structural health monitoring, continued education improvement, and computer vision.

Daniel Acheampong is the Managerial Accounting Course Coordinator and Assistant Accounting Professor at Florida Gulf Coast University. Daniel's research interest is in accounting technology and analytics; he teaches accounting analytics and audit and extends his research into robotics analytics in utility accounting and the sustainability of public utilities.

Chrissann Ruehle is a Management Instructor II at Florida Gulf Coast University (FGCU). She received a Doctor of Business Administration (D.B.A.) in information technology from the University of South Florida (USF). Chrissann's research interests include Artificial Intelligence Ethics and Corporate Governance, AI-Human Interactions, AI Chatbots, and Virtual Agents in Healthcare.

Tanya Benford, Accounting Department Chair and Associate Professor at Florida Gulf Coast University, Dr. Benford teaches Accounting Information Systems, has published numerous refereed journal articles, and has successfully competed for both internal and external research grant funding. Prior to entering academia, she was Director of Finance for the Atlanta Symphony Orchestra. She has also held senior management positions in the airline and insurance industries and began her career as a staff accountant at Coopers & Lybrand (PwC) in Miami, Fl.

FASB FIN 48 DISCLOSURES: EVIDENCE ON USER PERCEPTIONS

Thomas Smith, University of South Florida
Adrian Valencia, Florida Gulf Coast University
Ara Volkan, Florida Gulf Coast University
Jordin Vorisek, Spoor Bunch Franz

ABSTRACT

This study analyzes how financial statement users (users) interpret disclosures related to Financial Accounting Standards Board (FASB) Interpretation No. 48, Accounting for Uncertainty in Income Taxes (FIN 48). While past research has examined the decision usefulness of various aspects of FIN 48 balances reported in the financial statements, there are no studies that examine the impact that FIN 48 disclosures have on the financial decisions the users make. This study aims to fill this gap by conducting an experiment to find evidence that users find FIN 48 disclosures useful in evaluating the conduct of a firm's management. Specifically, the study examines and finds that users regard FIN 48 disclosures as more of an indication that the management is enhancing the transparency of the financial statement information provided rather than using aggressive tax strategies. The finding of this study is important to standard setters as it suggests that users are interpreting the disclosures consistent with the intention of the FASB. This finding is also important to companies who may be hesitant to increase the robustness of FIN 48 disclosures as this study suggests that the outcome of such practices would likely improve the perception of the company in the users' eyes.

JEL: M42

KEYWORDS: Uncertain Tax Positions, Educated Non-Professional Investors, Information Usefulness, Financial Statement Transparency, Aggressive Tax Strategies

INTRODUCTION

Financial Accounting Standards Board (FASB) Interpretation No. 48: Accounting for Uncertainty in Income Taxes (FIN 48) was issued in 2006 to provide information on how a company should account for uncertain tax positions that may exist in their current and past tax returns (FASB, 2006) and was effective for financial reports issued after December 21, 2006. While tax positions that benefit the company and reduce tax payments may be taken at any time, firms must review all tax positions taken and identify those beneficial positions that will more likely than not (50% or more likelihood) be overturned upon an audit and when challenged by tax authorities. Thus, companies are required to record a liability for an uncertain tax benefit taken on the tax return that is not recognized as a deferred tax asset. They are also required to provide additional information about these expected future tax payments through a FIN 48 disclosure which include the cumulative beginning and ending balances of the reporting period and the details of the changes that occurred during the period. The main objective of FASB standards is to provide authoritative guidance that must be used in the preparation of financial information that is understandable to potential and current non-professional investors who have a basic level of education or understanding concerning business and economic activities and financial reports that describe those activities. With companies disclosing information on uncertain tax positions, it is worthwhile to examine how financial statement users (users) perceive these disclosures. For example, users might interpret FIN 48 disclosures

as an indicator of improved transparency about the firm's tax planning strategies as well as the management's willingness to enhance the transparency of the financial statements as a whole. On the other hand, users may interpret FIN 48 disclosures as an indicator of management's use of aggressive tax practices and, by extension, the use of aggressive overall financial accounting policies.

It is therefore an empirical question as to how users view these disclosures, and the findings are important to both the FASB and companies involved. If the disclosures are viewed in a positive light, it suggests that users are interpreting the disclosures consistent with the intention of the FASB. A favorable finding would also bring comfort to companies that may have been hesitant to increase the robustness of these disclosures and suggest that such practices would likely improve the perception of the company in the users' eyes. The results would be beneficial to the FASB as it studies the impact of FIN 48 as part of its 2023-2024 post-implementation review cycle that aims to determine if published standards are achieving their intended outcomes. The study uses an experimental setting with 77 users and finds evidence that users view the FIN 48 disclosures as both an indicator of improved transparency and aggressiveness. Further analysis reveals that users view the FIN 48 disclosures as more an improvement of transparency than a signal of aggressive financial reporting, when considered together with tax strategy and financial reporting. The following sections first discuss the prior literature and provide background on FIN48 accounting rules, followed by the development of the research hypotheses and methodology. The results of the experiment are presented and discussed next followed by concluding remarks.

BACKGROUND AND LITERATURE REVIEW

FIN 48 was put in place to specify the requirements for accounting and reporting of a company's uncertain tax positions arising from an entity's tax filing uncertainties under various Internal Revenue Service (IRS) tax regulations (Mynatt, Schroeder & Wiggins, 2014). An uncertain tax position (UTP) is a position taken on a previously filed tax return or a position that a firm expects to take on a future tax return. Uncertain tax positions arise when tax laws don't have a specific application for a position that a firm is taking. While tax law validates tax positions, sometimes the law is subject to interpretation, and an entity is forced to choose the best way to report its position (Sogoloff & Wong, 2006). Examples of UTPs include decisions of classifying certain transactions as taxable or tax-exempt, including or excluding income on a return due to tax period uncertainties, filing or avoiding to file state tax returns, shifting income due to transfer pricing, or characterizing expenses as deductible vs. non-deductible. UTPs create unrecognized tax benefits (UTBs) that are recorded as liabilities and the income tax expense reported in the income statement is increased when the current tax payable or the future tax liability was or will be reduced due to the position taken.

Before the implementation of FIN 48, there was no specific guidance on how to account for UTPs under FASB Statement No. 109, Accounting for Income Taxes. Because of the lack of regulation on accounting for UTPs, many companies used the FASB Statement No. 5, Accounting for Contingencies, as a guide for reporting their UTPs which required the recognition of a liability and an expense if the future occurrence was probable (typically, an 80% or higher probability). Under this guidance, companies estimated the amount of additional taxes they would be held liable for upon an IRS audit and reported it by debiting the current tax expense and crediting a reserve account for the liability (Mynatt, Schroeder & Wiggins, 2014). The main purpose of FIN 48 was to increase comparability of financial reporting of income taxes across companies and recognize all possible liabilities that more likely than not (MLTN) will be realized (typically, a 50% or higher probability). There was concern that income tax assets and liabilities weren't being reported uniformly across entities, making it difficult for investors to compare and understand the effects of these transactions on the financial statements. To achieve these goals, FIN 48 provides guidance on how companies should recognize, calculate, report, and disclose UTBs on their financial statements (Blouin, et al., 2007). FIN 48 determines the recognition of the consequences of the UTBs in a two-step process. The first step requires the company to make a hypothetical assessment on whether their position is 50% or more likely to be upheld if they were to undergo an audit by a taxing authority. During this assessment, they

should take into account the support they have to back their position. The support does not necessarily need to be a legal tax opinion; it could be a tax opinion from any qualified expert.

Another important aspect that FIN 48 explains is that there are certain administrative practices and precedents that can be considered when evaluating a tax position. Although many tax positions are deemed violations of the tax law, exceptions can occur when widely understood practices and precedents have been established as meeting the recognition criteria. This is established based on the fact that if, and when, a taxing authority examined their position, it would not be objected to. With this information, an entity can then determine whether they believe a taxing authority with full knowledge of relevant information would agree with their position (Blouin, et al., 2007). It is also important for companies to evaluate each position separately rather than accumulating different tax positions together even if they think they would potentially offset each other (Sogoloff & Wong, 2006). However, the standard allows management to decide the unit of accounting. Management may decide to aggregate certain tax positions that are similar and evaluate the probability of the aggregate position to be more than 50%, whereby several probabilities in the total may be above 50% and offset the impact of those tax positions that have less than 50% probability of surviving an audit by tax authorities. Thus, the recognition and disclosure of a UTPs and their UTB depend on which unit of account is used to determine these positions and a determination of the probability of successfully sustaining these positions. A US firm operating, for example, in Chile and Mexico and filing a consolidated tax return, may decide to evaluate similar UTBs that exist in each country as one position or two separate positions. If both positions have equal UTBs in US dollars but one has a probability of success of 48% and the other 51%, it pays to aggregate the positions and have a probability of over 50% which means that there is no need to establish reserves. It is clear that management has much discretion in this area and can either minimize the amount of the reserves reported under FIN 48 or can take an aggressive stance and maximize them (Furner, 2017). Once an entity has determined that the position satisfies the MLTN criteria, the second step is to determine the amount of the reserves that must be recognized. To determine this amount, an entity must consider the amounts and the probabilities that those outcomes will be realized upon a settlement with a taxing authority. The company should start by identifying the largest possible benefit and determine if it is more than 50% likely to happen. If it isn't, they should move to the next largest benefit, and determine the cumulative probability of this outcome. They need to continue to do this analysis until they reach a 50% or higher cumulative probability. Once this probability is met, they can recognize the amount that remained below the MLTN level multiplied by the current tax rate as the tax expense and liability on their financial statements (Sogoloff & Wong, 2006).

To improve the transparency of the financial statements, there are several other factors that need to be disclosed along with the amount of the UTB. For example, FIN 48 requires financial statement footnotes disclose a detailed roll forward of tax benefits taken that weren't qualified to be recognized in the financial statement. In addition, firms must disclose: 1) the total amount of UTBs that would impact the effective tax rate if they were recognized; 2) where interest and penalties are classified on the balance sheet; 3) the amount of interest and penalties recognized on the balance sheet and income statement for current and prior periods; and 4) the amount of those positions that they believe are reasonably possible to experience a significant increase or decrease in probability of success within 12 months of the reporting date (Mynatt, Schroeder & Wiggins, 2014). FIN 48 not only addresses how to recognize UTBs, but also how to derecognize them when the position exceeds the threshold criteria. The entire benefit must be derecognized because FIN 48 does not allow the use of valuation allowance accounts (Sogoloff & Wong, 2006).

With FIN 48, companies would also need to recognize their previously unreported and unrecorded tax reserves (for those positions that had between 50% and 80% probability) that they maintained prior to the effective date of the standard as a one-time cumulative adjustment to the beginning balance of retained earnings. Blouin, et al (2010), analyzed how firms reacted to the cumulative adjustment recognition requirement and found that, between the issuance and effective dates of FIN 48, firms took an aggressive stance and increased the settlement of disputes with tax authorities which led to an overall reduction in

existing contingent liability reserves when FIN 48 was implemented. Thus, instead of a projected increase in future tax liabilities, there was a slight decrease in reserves. Additionally, Mills, Robinson, and Sansing (2010) found that many firms took a passive stance and were deterred from entering into transactions that would generate UTPs and the audit rates by tax authorities increased.

FIN 48 is specific to income taxes and does not apply to other taxes such as property, sales, and payroll taxes. The implementation helped create a more uniform and transparent disclosure of UTPs that investors of both public and non-publically traded companies benefit from (Blouin and Robinson, 2012). In addition, the implementation likely increased both the transparency of the financial statements and the tax burden of large companies who benefited from the information asymmetry accruing to them during the pre-FIN 48 period (Tomohara, Lee, and Lee, 2011). In a study conducted during the five years following the implementation of FIN 48 (2007-2011), Mynatt, Schroeder & Wiggins (2014) investigated the S&P 100 and found that the cumulative effect of FIN 48 was immaterial for most companies at the time of adoption. However, they document that UTB balances have been rising over time. They also found increases in UTB balances to be small and stable in comparison to stockholders' equity and different across industries. It is therefore reasonable to assume that the transparency of the financial statements has improved and this disclosure has become more important for professional investors over time.

Another piece of academic literature researched the effect FIN 48 had on the amount of tax reserves disclosed from 2005 to the first quarter of 2007 (Blouin, et al, 2007). Data was gathered for the 100 largest and 100 smallest non-financial and non-regulated firms to describe disclosures related to tax reserves. They found that the smaller firms were less likely to discuss the effect of UTBs prior to the issuance of FIN 48 because they had low reserves or may not have ever even recorded reserves previously. After 2006, more companies began disclosing reserves and they were more likely to increase reserves or not change reserves to minimize the likelihood of getting audited by the IRS. In the case of large firms, the result was the opposite. Before the adoption of FIN 48, the large firms increased their stockholders' equity by releasing approximately $2 billion to reflect a decrease in the tax reserves. Large firms did this because they were constantly audited by the IRS and they wanted to have a clean slate when they started implementing FIN 48. Thus, FIN 48 increased the transparency of financial reporting by all firms and reduced the level of aggressiveness large firms display in implementing tax strategies.

Several researchers addressed the effect of FIN 48 on the audit process. Erickson, Goldman, and Stekelberg (2016) analyzed the impact of FIN 48 on audit fees and found that, while the costs first increased in 2007, they went back to the pre-FIN 48 levels after that year. Aier and Visvanathan (2019) studied the impact of FIN 48 reserves on the auditor's going concern opinions. They determined that the existence of reserves reduced the probability of the issuance of going concern opinions except for those firms that also reported tax related material weaknesses. The FASB is interested in ascertaining whether FIN 48 meets the goals of improving the transparency of the tax expense amounts and the level of aggressiveness in selecting tax strategies that firms report. Robinson, Stomberg, and Towery (2016) analyzed the effect of FIN 48 on the relevance of income tax accounting to economic decision makers and found no evidence that the reported amounts increased the ability of tax expense to predict future tax cash flows. In fact, the predictive ability of future tax cash flows decreased as the FIN 48 impact became more restrictive. Later, Gleason, Markle, and Song (2017) found that FIN 48 disclosures incrementally improved the ability to forecast future tax cash flows for firms that face a high probability of audit by tax authorities.

While the impact is very limited, findings suggest that FIN 48 marginally improved the relevance of tax reserves and current tax expense and suggests that the prior study was not sufficiently detailed to capture this slight improvement in transparency of financial reports. Another facet of the impact of FIN 48 was analyzed by Goldman, et al (2021) who used the comparison of the number of patent applications by public (treatment group-subject to disclosure rules) and private (control group-not subject to disclosure rules) firms prior to and after the issuance of FIN 48. There was a measurable decrease in the patent applications

attributable to incremental innovation of the public firms since those transactions are subject to uncertainties and use aggressive tax strategies more often than other UTPs.

Others analyzed the use of UTP liability reserves in earnings management after FIN 48 was issued. Cazier, et al (2012) examined whether UTB accruals are used to manage earnings. They found that firms that have pre-tax earnings that are below consensus analyst forecast are likely to reduce their tax reserves to meet the forecasts. While the rate of use in the management of these reserves show a slight decline when compared to the rate that existed during the pre-FIN 48 period, managers continue to use their discretion upon these reserves to meet earnings forecasts. Contradicting these general findings, Gupta, Laux, and Lynch (2016) investigated whether firms use tax reserves to meet analysts' forecast and found that while firms managed this reserve to meet earnings forecasts during the pre-FIN 48 period, the use stopped after FIN 48 became effective. In a related study, Bauman and Bowler (2018) found that those firms that are found to manage earnings in the past, increased their use of the deferred tax asset valuation allowance accruals in the post-FIN 48 period to mitigate the restrictive impact of FIN 48 on their UTB accruals.

This may explain the contradictory research results by Cazier, et al (2014) and Gupta, Laux, and Lynch (2016) and shows that both the transparency of the financial reports and the level of aggressiveness in selecting tax strategies increased. The use of aggressive tax positions and tax avoidance were also examined by researchers. The aggressive tax behavior of firms was analyzed by Borkowski and Gaffney (2021) and found that, contrary to FASB's intentions, the use of aggressive tax behaviors by global corporations increased during the post-FIN 48 period (indicated by the increased use of UTBs, unrepatriated earnings, and tax havens). Gupta, Mills, and Towery (2014) studied the effect of FIN 48 disclosure requirements on multistate tax avoidance and found that both firm specific and total state level tax payments increased when FIN 48 was first implemented. Thus, FIN 48 mandates increased the transparency of reporting and decreased the level of aggressive tax strategies employed by firms. Gleason, Mills, and Nessa (2018) studied the impact of FIN 48 on the accuracy of tax reserves because there was a difference between the adequacy of such reserves depending on the firms' use of auditor-provided tax services during the pre-FIN 48 period. The results showed that these differences were eliminated during the post-FIN 48 period, supporting one of the outcomes the FASB wanted to achieve.

Finally, Furner (2017) examined the impact of FIN 48 on the transparency of financial statements and the level of the use of aggressive tax strategies by firms using the debt covenants and auditor agreement with the management's choice of the unit of account as variables of interest. First, the managements choice of the level of disaggregation (evaluating each UTP separately) or aggregation (evaluating several UTPs together) used was determined. Next, the auditors' agreement with the managements' choice was analyzed. The results showed that management overwhelmingly selected the level of aggregation that resulted in a greater than 50% probability for UTBs to be upheld by tax authorities and auditors agreed with those choices when they reduced the negative consequences (e.g., violating debt covenants) of setting up additional tax liabilities. This indicated a self-serving bias on the part of the auditors. The impact on debt covenants was studied by Alexander, et al (2017) and found that there were negative cumulative abnormal returns for the stock price of those firms that had very little debt covenants slack and aggressive tax strategies. While, the majority of the firms increased their UTP tax reserves, those who had little debt covenant slack had relatively much smaller increases than those who had large amounts of slack.

It is clear that UTB reserves may be manipulated by management and the auditors may accept the positions management takes, especially when increasing the UTB reserves has large negative financial consequences for the firm. In addition, many research studies have examined the impact of FIN 48 on the transparency of financial statements and the level of aggressiveness in the tax strategies that firms adopt. Finally, a large number of studies analyzed the impact of FIN 48 on the decisions made by financial analysts, auditors, and other professional investor groups. However, there are no studies that address the impact of FIN 48 on the economic decisions made by users. Therefore, it is worthwhile to examine the level and areas of decision

usefulness these balances command when users use them and how they view these disclosures. The following sections will present the methodology and data sources of an experiment that will address these questions, followed by the discussion of results and concluding comments.

DATA AND METHODOLOGY

The purpose of this study is to examine how users perceive and use FIN 48 disclosures. Specifically, the study analyzes whether a user interprets a FIN 48 disclosure as an indicator of: 1) improved transparency of tax strategies; and/or 2) aggressive tax planning. In addition, the study addresses whether the FIN 48 disclosures appear to influence a user's perception about the transparency/aggressiveness of the overall financial statement reporting. How users perceive FIN 48 disclosures is an empirical question, and it is reasonable to expect two outcomes from this analysis. The first potential outcome would result from users interpreting FIN 48 disclosures to be an indicator of improved transparency of tax strategies. Disclosure of uncertain tax positions is not a costless activity, as it provides information to not only users but also the IRS and other tax authorities. As discussed in the previous section, prior to the implementation of FIN 48, many corporate managers thought the IRS would use the amount of tax reserves disclosed as an indication of tax aggressiveness and increase the chance of an audit. So, in 2006, right before the effective date of FIN 48, they decreased their reserves to reduce their visibility to the IRS (Blouin et al., 2007). Therefore, to the extent that firms provide additional disclosures despite the increased potential for IRS scrutiny, it is reasonable that a user would interpret the disclosures in a positive light and see them as evidence that management is willing to be transparent. The second potential outcome would lead users to interpret FIN 48 disclosures as indicators of an aggressive tax strategy. All else equal, companies with higher reserves are likely receiving more unsustainable tax benefits on their tax returns. It is therefore reasonable to assume that a user could interpret FIN 48 disclosures consistent with an indication of aggressiveness. Finally, by extension, users may view FIN 48 disclosures as an indication of both enhanced financial statement disclosures and increased use of aggressive accounting policies. Given the lack of compelling support for either set of potential outcomes, this study examines the following research questions (RQs):

RQ1: Do users interpret FIN48 disclosures as an indicator of improved transparency of uncertain tax disclosures?

RQ2: Do users interpret FIN48 disclosures as an indicator of aggressive tax strategies?

RQ3: Do users interpret FIN48 disclosures as an indicator of improved transparency of overall financial statement reporting?

RQ4: Do users interpret FIN48 disclosures as an indicator of aggressive overall financial statement reporting?

The data was obtained from 77 senior accounting majors who were enrolled in the two Intermediate Financial Accounting III course sections during the 2014 fall semester at a doctoral level research university with AACSB accredited business programs and separately accredited accounting programs. This group was chosen because those students were exposed to accounting and reporting rules for UTPs and UTBs during the course and had sufficient education concerning the use of financial accounting data in decision making. Given the level of knowledge and analytical reasoning these students possessed, they were considered to represent an educated group of users. After the required human subjects research permission was obtained, a survey was created which used an actual company's (name deleted and dates revised to retain anonymity) FIN 48 disclosures obtained from the Securities and Exchange Commission (SEC) Form 10-K filings. All 77 students participated and were required to answer a series of questions about their assessment of the disclosures. The first four questions of the instrument asked participants whether the FIN48 disclosures represented transparency or aggressiveness. To reduce the potential for ordering effects to bias the results,

two versions of the survey were created. The first version of the survey displayed two positive questions followed by two negative questions, whereas, the second version displayed the two negative questions first, followed by two positive questions. The fifth question asked the students' beliefs concerning the management's: 1) overall trustworthiness; 2) truthfulness of financial disclosures; 3) management's overall honesty; 4) management's honesty in tax position disclosures; and 5) appropriateness of the management's actions on behalf of stockholders. The sixth question asked students to rank the level of attractiveness of the company as an investment. The last two questions asked students if they are currently investing in the stock markets and if they plan to make investments during the next five years, respectively.

The first six questions asked the students to indicate their degree of agreeability (questions 1 – 4), beliefs (question 5), and rating (question 6) on a scale of one to seven. Questions 7 and 8 had yes/no answers. The answers to the five parts (5a – 5e) of question 5 were averaged into one answer, where the negative question (5b) was reverse coded. A copy of the survey instrument used in this study is included in the Appendix. To test the levels of agreement/disagreement with questions one through four, level of belief/non-belief of question 5, and the level of rating (high/low) in question 6, a two-tailed differences in the means (student's t-test) was used to discover the statistical significance of the differences between the means of questions one through six and the neutral mean result (mean = 4). A probability statistic (p value) of .05 or smaller would indicate a statistically significant difference from the mean assertion average of 4 with at least a 95% or higher certainty. While a probability of .10 may also be used, the assertion would not be as powerful (a 90% certainty) or dependable.

RESULTS

The first column of Table 1 shows the results from the 77 survey responses. Although only 21 percent (16 of 77) of the users report having personally invested in the stock market (question 7), 82 percent (62 of 77) indicate that they plan to invest in the stock market within the next five years (question 8). In addition, the users are neutral when they evaluate their beliefs of the management's trustworthiness (question 5, mean=4.06) and their rating of the attractiveness of the company as an investment (question 6, mean=3.92). Regarding the variables of interest, it is certain that users interpret the FIN 48 disclosure as an indicator of tax disclosure transparency (mean = 4.70; greater than neutral 4, p-value<0.01) and financial statement disclosure transparency (mean=4.57; greater than neutral 4, p-value<0.01). In contrast, the data shows that users do not view the FIN 48 disclosure as an indicator of tax aggressiveness (mean=4.21; greater than neutral 4, p-value = 0.17). Additionally, there is marginal support for the users' perception of financial statement aggressiveness (mean = 4.22; greater than neutral 4, p-value=0.08). To ascertain if users view FIN 48 disclosures as indicators of management's transparency rather than aggressive behavior, the differences in the mean answers to questions one and three (tax strategies) and two and four (financial reporting) were examined. The results show that users provide a significantly greater rating for transparency relative to aggressiveness for both the tax strategies (p-value= 0.02) as well as the financial statement reporting as a whole (p-value=0.06).

The remaining columns of Table 1 report survey responses separately for the 16 participants that indicated prior investment experience and the 61 that had not (based on their response to Q7). Interestingly, we only observe a difference between these two subsamples in the magnitude of difference between their ratings of transparency and aggressiveness for financial statement reporting. Specifically, those with investment experience assigned an even greater rating to transparency relative to aggressiveness (p-value=0.05).

Table 1: Survey Response Statistics and Test Results

Question	(1) Full Sample (n=77)		(2) Q7 = Yes (n=16)	(3) Q7 = No (n=61)	
	Mean	Mean = 4 p-value	Mean	Mean	(2) vs (3) p-value
Q1	4.70***	<0.01	5.06	4.61	0.24
Q2	4.57***	<0.01	4.94	4.48	0.15
Q3	4.21	0.16	4.25	4.20	0.89
Q4	4.22*	0.08	3.88	4.31	0.16
Q5	4.06	0.58	3.91	4.10	0.50
Q6	3.92	0.65	4.44	3.79	0.12
Q7	0.21	N/A			
Q8	0.82	N/A			
		Mean = 0 p-value			
Q1-Q3	0.49**	0.02	0.81	0.41	0.44
Q2-Q4	0.35*	0.06	1.06	0.16	0.05**

This table shows a two-tailed differences in the means (student's t-test) that was used to discover the statistical significance of the differences between the means of questions one through six and the neutral mean result (mean = 4). In addition, it shows if users view FIN 48 disclosures as indicators of management's transparency rather than aggressive behavior by analyzing the differences in the mean answers to questions one and three (tax strategies) and two and four (financial reporting). */**/*** indicate significance at the 0.10/0.05/0.01 level, where Q1-Q8 refer to the questions asked per the survey (see Appendix).Q5 is calculated as the average response to the five trust related questions where the negative question (5b) is reverse coded.

There are a few different takeaways from the data. A major goal of FIN 48 was to increase comparability and understandability among financial statements for both sophisticated professional investors (e.g., financial analysts) and educated non-professional investors (e.g., those with accounting or other business degrees). Overall, users in this study appear to view the FIN 48 disclosures consistent with this goal. In addition, disclosing UTPs and UTBs under FIN 48 achieves a major goal of standard setting as it increases the usefulness of the financial reports as users consider these disclosures as an indication of enhanced transparency in financial reports. Finally, there is strong indication that users view FIN 48 disclosures as an indicator of transparent rather than aggressive behavior. While not as certain as the results indicating transparency, our findings also suggest that users appear to view the FIN48 disclosure as an indicator of overall financial statement aggressiveness, which may be an unintended negative consequence of increased disclosure surrounding a complex accounting standard.

As previously mentioned, approximately half of the students received a survey with the first two questions asking about the aggressiveness of the firm's tax strategy and overall financial statements followed by two questions asking about the transparency of the firm's tax strategy and overall financial statements. The other half of the students received surveys with the questions reversed. This was done to see if there was any evidence of order bias in the responses. The statistical tests show that it was important to vary the ordering of the questions since the order of the questions did impact how participants answered the subsequent questions, as participants that were asked aggressive (transparent) questions first (second), were more likely to answer the remaining questions negatively (positively). Failure to use this approach would have made the results favoring transparency and lack of aggressiveness stronger and may have eliminated the weak evidence that users view FIN 48 disclosures as an indication of aggressive financial reporting.

CONCLUDING COMMENTS

The main objectives of FASB standards are to report financial information that is understandable to potential and current financial statement users in making economic decisions. This study uses an experiment to examine if users view FIN 48 disclosures as indicators of enhanced transparency in describing tax

strategies and financial reporting by management or as aggressiveness in tax strategies and the use of accounting policies. Finding a perception of enhanced transparency would support the goals of the FASB and give comfort to companies that are reluctant to disclose sensitive information that can be used by the IRS in audits. Results show that most users view FIN 48 disclosures as indicators of increased transparency of tax strategies and financial reporting, suggesting that users interpret the disclosures consistent with the intention of the FASB. While there is no evidence that users view FIN 48 disclosures as aggressive tax behavior, there is weak evidence that they view the disclosures as aggressive use of accounting policies. Overall, these findings should encourage companies to increase the robustness of this disclosure given that such practices would likely improve how educated non-professional investors perceive the company's financial information. The use of senior level students in one university limits the generalizability of the results. Future research may duplicate the experiment with different groups of users. Such groups may be senior students in one or a combination of two or more other universities. Other prime targets are participants at regional and national professional and academic accounting meetings. The results would be beneficial to the FASB as it studies the impact of FIN 48 as part of its 2023-2024 post-implementation review cycle that aims to determine if published standards are achieving their intended outcomes.

APPENDIX

All 77 students enrolled in the two sections of the course participated in this survey. They were provided with the FIN 48 disclosures shown below and were asked to answer the same questions. Questions 1 and 2 were presented after questions 3 and 4 for half of the participants. The FIN 48 text (6 paragraphs) and the financial disclosures (Tables 2, 3, and 4) were taken verbatim from the SEC Form 10-K filing of an actual firm. The company name was deleted and the years in the disclosures were changed to ensure anonymity.

FIN 48 Disclosure Footnote Survey Questionnaire

Please carefully examine the FIN 48 disclosure footnote below and answer the questions that follow to the best of your ability. Additional financial statement information about this publicly traded company can be found after the survey questions document should you wish to use it to help you with your responses.

Uncertain Tax Positions

Tax positions are evaluated in a two-step process. The Company first determines whether it is more likely than not that a tax position will be sustained upon examination. If a tax position meets the more-likely-than-not recognition threshold it is then measured to determine the amount of benefit to recognize in the financial statements. The tax position is measured as the largest amount of benefit that is greater than 50% likely of being realized upon ultimate settlement. The Company classifies gross interest and penalties and unrecognized tax benefits that are not expected to result in payment or receipt of cash within one year as non-current liabilities in the Consolidated Balance Sheets. As of September 27, Year 3, the total amount of gross unrecognized tax benefits was $4.0 billion, of which $1.4 billion, if recognized, would affect the Company's effective tax rate. As of September 28, Year 2, the total amount of gross unrecognized tax benefits was $2.7 billion, of which $1.4 billion, if recognized, would affect the Company's effective tax rate. The aggregate changes in the balance of gross unrecognized tax benefits, which excludes interest and penalties, for Year 3, Year 2, and Year 1, is as follows (in millions), (see Table 2).

Table 2: Uncertain Tax Benefit Balances for Years 1, 2, and 3

	Year 3	Year 2	Year 1
Beginning Balance	$ 2,714	$ 2,062	$ 1,375
Increases related to tax positions taken during a prior year	1,295	745	340
Decreases related to tax positions taken during a prior year	(280)	(118)	(107)
Increases related to tax positions taken during the current year	882	626	467
Decreases related to settlements with taxing authorities	(574)	(592)	(3)
Decreases related to expiration of statute of limitations	(4)	(9)	(10)
Ending Balance	$ 4,033	$ 2,714	$ 2,062

The Appendix and the data in the table above is based verbatim on an actual firm's 10-K (page 65-66).
The link is: https://www.sec.gov/Archives/edgar/data/0000320193/000119312514383437/d783162d10k.htm#toc783162_26

The Company includes interest and penalties related to unrecognized tax benefits within the provision for income taxes. As of September 27, Year 3 and September 28, Year 2, the total amount of gross interest and penalties accrued was $630 million and $590 million, respectively, which is classified as non-current liability in the Consolidated Balance Sheets. In connection with tax matters, the Company recognized interest and penalty expense in Year 3, Year 2, and Year 1 of $40, $189, and $140 million, respectively.

The Company is subject to taxation and files income tax returns in the U.S. federal jurisdiction and in many state and foreign jurisdictions. During the fiscal year ended September 27, Year 3, the U.S. Internal Revenue Service (IRS) concluded its review of the period covering 6 years prior to year 0, which resulted in the Company reducing its gross unrecognized tax benefits by $570 million and recognizing a tax benefit of $166 million. The IRS is currently examining the years 0 and 1. In addition, the Company is also subject to audits by state, local and foreign tax authorities. In major states and major foreign jurisdictions, a 7-yaer period generally remains open and could be subject to examination by the taxing authorities.

Management believes that an adequate provision has been made for any adjustments that may result from tax examinations. However, the outcome of tax audits cannot be predicted with certainty. If any issues addressed in the Company's tax audits are resolved in a manner not consistent with management's expectations, the Company could be required to adjust its provision for income taxes in the period such resolution occurs. Although timing of the resolution of audits is not certain, the Company does not believe it is reasonably possible that its unrecognized tax benefits would materially change in the next 12 months.

Survey Questions

1- Indicate the perceived *likelihood* that management is being transparent about their tax strategies.

1	2	3	4	5	6	7
Very Unlikely			Neutral			Very Likely
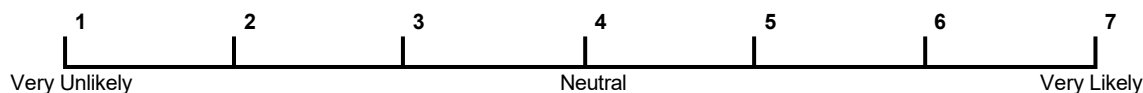
2- Indicate the perceived *likelihood* that management is being transparent in other areas of financial statement reporting.

1	2	3	4	5	6	7
Very Unlikely			Neutral			Very Likely
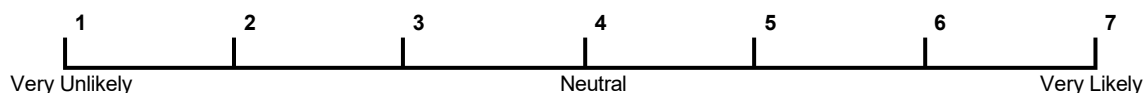
3- Indicate the perceived *likelihood* that Management is engaging in aggressive tax strategies.

1	2	3	4	5	6	7
Very Unlikely			Neutral			Very Likely
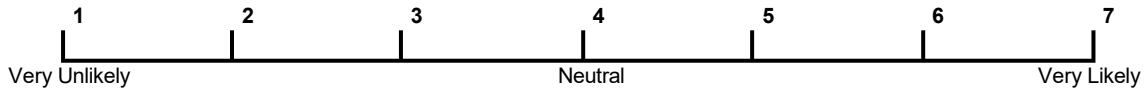
4- Indicate the perceived *likelihood* that management is aggressive in other areas of financial statement reporting.

1	2	3	4	5	6	7
Very Unlikely			Neutral			Very Likely
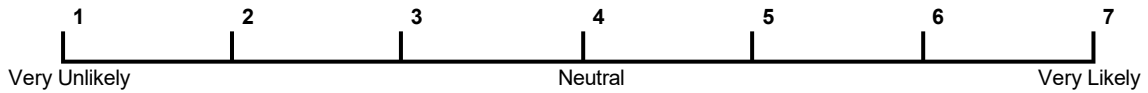
5- Indicate your beliefs about each of the following statements regarding management's trustworthiness.

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
a. I believe that management is very trustworthy.	1	2	3	4	5	6	7
b. I believe that management may *not* be truthful in their financial disclosures.	1	2	3	4	5	6	7
c. I believe that management is very honest.	1	2	3	4	5	6	7
d. I believe that management was honest when describing their uncertain tax positions	1	2	3	4	5	6	7
e. I believe that management acts in the best interest of the shareholders.	1	2	3	4	5	6	7

6- How would you rate the attractiveness of this company as an equity investment?

1	2	3	4	5	6	7
Very Unlikely			Neutral			Very Likely
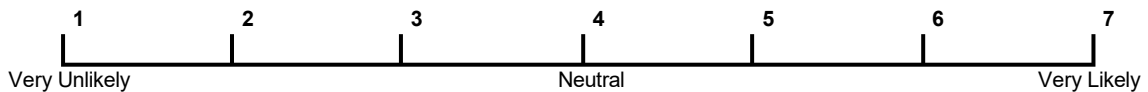
7- Have you ever personally invested in the stock market? Yes No (circle one)

8- Do you plan to personally invest in the stock market in the next five years? Yes No (circle one)

Additional Financial Statement Information

Table 3: Consolidated Balance Sheets (In millions, Except Number of Shares Which Are Reflected in Thousands and Par Value)

	September 27, Year 3	September 28, Year 2
ASSETS:		
Current assets:		
Cash and cash equivalents	$ 13,844	$ 14,259
Short-term marketable securities	11,233	26,287
Accounts receivable, less allowances of $86 and $99, respectively	17,460	13,102
Inventories	2,111	1,764
Deferred tax assets	4,318	3,453
Vendor non-trade receivables	9,759	7,539
Other current assets	9,806	6,882
Total current assets	68,531	73,286
Long-term marketable securities	130,162	106,215
Property, plant and equipment, net	20,624	16,597
Goodwill	4,616	1,577
Acquired intangible assets, net	4,142	4,179
Other assets	3,764	5,146
Total assets	$ 231,839	$ 207,000
LIABILITIES AND SHAREHOLDERS' EQUITY:		
Current liabilities:		
Accounts payable	$ 30,196	$ 22,367
Accrued expenses	18,453	13,856
Deferred revenue	8,491	7,435
Commercial paper	6,308	0
Total current liabilities	63,448	43,658
Deferred revenue – non-current	3,031	2,625
Long-term debt	28,987	16,960
Other non-current liabilities	24,826	20,208
Total liabilities	120,292	83,451
Commitments and contingencies		
Shareholders' equity:		
Common stock and additional paid-in capital, $0.00001 par value; 12,600,000 shares authorized; 5,866,161 and 6,294,494 shares issued and outstanding, respectively	23,313	19,764
Retained earnings	87,152	104,256
Accumulated other comprehensive income/(loss)	1,082	(471)
Total shareholders' equity	111,547	123,549
Total liabilities and shareholders' equity	$ 231,839	$ 207,000

Table 4: Consolidated Statements of Operations (In Millions, Except Number of Shares Which Are Reflected in Thousands and Per Share Amounts)

				Years Ended			
		September 27, Year 3		September 28, Year 2		September 29, Year 1	
Net sales	$	182,795	$	170,910	$	156,508	
Cost of sales		112,258		106,606		87,846	
Gross margin		70,537		64,304		68,662	
Operating expenses:							
Research and development		6,041		4,475		3,381	
Selling, general and administrative		11,993		10,830		10,040	
Total operating expenses		18,034		15,305		13,421	
Operating income		52,503		48,999		55,241	
Other income/(expense), net		980		1,156		522	
Income before provision for income taxes		53,483		50,155		55,763	
Provision for income taxes		13,973		13,118		14,030	
Net income	$	39,510	$	37,037	$	41,733	
Earnings per share:							
Basic	$	6.49	$	5.72	$	6.38	
Diluted	$	6.45	$	5.68	$	6.31	
Shares used in computing earnings per							
Basic		6,085,572		6,477,320		6,543,726	
Diluted		6,122,663		6,521,634		6,617,483	
Cash dividends declared per common	$	1.82	$	1.64	$	0.38	

REFERENCES

Aier, J., and G. Visvanathan (2019) "Auditor Going Concern Opinions and FIN 48 Reserves," J*ournal of Managerial Issues*, vol. 31(4), p. 371-387.

Alexander, R., A. Gross, G. R. Huston and V. Richardson (2017) "Market Response to FIN 48 Adoption: A Debt Covenant Theory," *Advances in Taxation*, vol. 24, p. 1-36.

Bauman, M. and C. Bowler (2018) "FIN 48 and Income Tax-Based Income Management: Evidence from the Deferred Tax Asset Valuation Allowance," *Advances in Taxation*, vol. 25, p. 29-50.

Blouin, J., C. Gleason, L. Mills, and S. Sikes (2007) "What Can We Learn About Uncertain Tax Benefits from FIN 48," *National Tax Journal*, vol. LX (3), p. 521-535.

Blouin, J., C. Gleason, L. Mills, and S. Sikes (2010) "Pre-Empting Disclosure? Firms' Decisions Prior to FIN No. 48," *The Accounting Review*, vol. 85(3), p. 791-815.

Blouin, J. and L. Robinson (2012). *Post-Implementation Review of FIN 48: A Summary of the Academic Literature*. Financial Accounting Foundation: Norwalk, CT.

Borkowski, S. and M. Gaffney (2021) "FIN 48 and the Tax Aggressive Behaviors of Transnational Corporations: A Decade Later," *J. of International Accounting, Auditing, and Taxation*, vol. 42, p. 1-17.

Cazier, R., S. Rego, X. Tian and R. Wilson (2012) "Did FIN 48 Limit the Use of Tax Reserves As a Tool for Earnings Management?" *Applied Economics*, vol. 44(32), p. 4239-4248.

Erickson, M., N. Goldman and J. Stekelberg (2016) "The Cost of Compliance: FIN 48 and Audit Fees," *Journal of the American Taxation Association*, vol. 38(2), p. 67-85.

Gleason, C., L. Mills and L. Nessa (2018) "Does FIN 48 Improve Firm's Estimate of Tax Reserves?" *Contemporary Accounting Research*, vol. 35(3), p. 1395-1429.

Gleason, C., K. Markle and J. Song (2017) "Did FIN 48 Improve the Predictive Ability of Tax Expense? Evidence from a Comparison with IFRS Firms," Paper Presented at the 2017 *National Tax Association Annual Conference*, November 10, 2017, Philadelphia, PA.

Goldman, N., N. Lampenius, S. Radhakrishnan, A. Stenzel and J. Almeida (2021) "FASB Interpretation Number 48 (FIN 48) Disclosures and Corporate Innovation," *Proceedings of Hawai'i Accounting Research Conference*, January 7, 2021, Honolulu, HI.

Gupta, S., R. Laux and D. Lynch (2016) "Do Firms Use Tax reserves to Meet Analysts' Forecasts? Evidence from the Pre- and Post-FIN 48 Periods," *Contemporary Accounting Research*, vol. 33(3), p. 1044-1074.

Gupta, S., L. Mills and E. Towery (2014) "Multistate Tax Avoidance," *Journal of the American taxation Association*, vol. 36(2), p. 203-229.

FASB (2006). *Financial Interpretation No. 48: Accounting for Uncertainty in Income Taxes: An Interpretation of FASB Statement No. 109*. FASB: Norwalk, CT.

Furner, Z. (2017) "Assessment of FIN 48 Liabilities: A Proposed Experiment Highlighting Flexible Uncertainty," *Southwestern Economic Review*, vol. 44(2), p. 75-98.

Mills, L., L. Robinson, and R. Sansing (2010) "FIN 48 and Tax Compliance," *The Accounting Review*, Vol. 85(5), p. 1721-1742.

Mynatt, P., R. Schroeder and C. Wiggins (2014) "The Effect of FIN 48 on Financial Reporting," *CPA Journal*, vol. 84(4), p. 44-49.

Robinson, L., B. Stomberg and E. Towery (2016) "One Size Does Not Fit All: How the Uniform Rules of FIN 48 Affect the Relevance of Income Tax Accounting," *The Accounting Review*, vol. 91(4), p. 1195-1217.

Sogoloff, R. and H. Wong (2006) "Uncertainty in Income Taxes," *Heads Up*, vol.13(7), p. 1-10.

Tomohara, A., H. Lee and S. Lee (2011) "Did FIN 48 Increase Companies' Tax Payments? Trade-Off Between Disclosure and Tax Burdens," *Applied Economics*, vol. 44(32) p. 4239-4248.

AUTHOR BIOGRAPHIES

Thomas Smith, Ph.D., CPA is an Associate Professor of Accountancy in the Lynn Pippenger School of Accountancy at University of South Florida. He is a Certified Public Accountant and a member of the American Accounting Association. Dr. Smith earned his Ph.D. in Accounting from The Florida State University in 2010 and has published in a variety of academic and professional journals.

Adrian Valencia, Ph.D., CPA is an Associate Professor of Accounting in the Lutgert College of Business at Florida Gulf Coast University. He is a Certified Public Accountant and a member of the American Accounting Association and the Florida Institute of Certified Public Accountants. Dr. Valencia earned his Ph.D. in Accounting from The Florida State University in 2011, and his research has been published in a variety of academic and professional accounting journals.

Ara Volkan, Ph. D., CPA is a professor of accounting at FGCU. He served as the Chair of the Accounting Department during 2006-2014. He received his doctorate in accounting from the University of Alabama in 1979 and CPA (FL, 1989). Dr. Volkan is a member of the FICPA, AAA, as well as other academic and professional organizations. He published numerous articles in academic and professional accounting journals and in other publication outlets.

Jordin Vorisek is a Senior Tax Accountant at Spoor Bunch Franz. Miss Vorisek earned Bachelor of Science in Accounting from University of South Florida in 2014. While at USF she participated in the Provost Scholars Program. Prior to joining Spoor Bunch Franz, Miss Vorisek was a Tax Associate at Cherry Bekaert LLP.

CURRENT TRENDS IN CORPORATE TAX INVERSIONS

James N. Mohs, University of New Haven
Martin A. Goldberg, University of New Haven
Rajendra Shrestha, University of New Haven

ABSTRACT

The objective of this paper is to describe how changes in corporate tax rates affect the relocation of Corporations to lower tax jurisdictions. Historically, there was a direct correlation between high tax rates and the relocation of Corporations to lower tax jurisdictions. By further examining the relationships that tax rate cuts may have on future onshoring relocations and how changes in government tax policies will affect the relocation of multinational corporations to avoid or minimize tax liabilities. This paper extends the work of Mohs, Goldberg, Butler, and Heath (2016), which noted that there is a correlation between divergent tax rates. By analyzing existing tax legislation, Treasury regulations, and tax rates, this paper develops a framework for supporting strategic global tax efficiencies and initiatives. The conclusions, recommendations, and implications reached are generalizable and appropriate for developing best practices in tax efficiency and fiscal policy.

JEL: G14, G38, H25

KEYWORDS: Tax Inversion, Tax Rate Changes, Reorganizations, Onshoring, and Inversion Cases

INTRODUCTION

As discussed by Mohs et.al, 2016 corporate inversions which are also called tax inversions, is a tax-planning technique that arose in effect from Globalization and a distinctive feature of the United States tax code. A tax inversion is a corporate reorganization and as such may take on many different forms. The most common format is a statutory merger between a domestic and foreign corporation that would be tax-free at the corporate level organization pursuant to section 368 of the Internal Revenue Code. In this form of reorganization, the roles of the entities invert. The international subsidiary of the former domestic parent becomes the parent corporation, and the U.S. parent becomes the wholly owned subsidiary. Once the U.S. corporation becomes a subsidiary of a foreign parent, the foreign-earned income of that parent would not be subject to U.S. income taxes. The resultant inversion would then eliminate U.S. taxation on foreign-earned income as well.

As discussed in a subsequent section the inversion may subject the shareholder to a de facto liquidation which may subject the shareholder to recognize a potential capital on the transaction without actually disposing of the equity position. With the decrease in the level of tax inversions and corporate reorganization discussions, caused by decreasing tax rates, corporate inversion strategies have begun to move from the forefront of public and Congressional attention. Compounding political concerns with the supply chain issues emanating from the reliance on China's manufacturing capacity and lower tax rates more attention is being paid to onshore sourcing.

On March 9, 2023, President Biden released the fiscal year 2024 budget for the United States. The multi-trillion-dollar budget contained tax changes that are aimed at corporations paying their fair share. One of

the proposed tax changes would be to raise the corporate marginal rate from the TCJA rate of 21 to 28 percent. This paper will examine the implications that tax changes have on potential corporate inversions as well as the impact of other economic considerations.

LITERATURE REVIEW

In this section, we will briefly discuss the history of tax inversions, the trends, and the correlation between the increase and decrease in tax rates and the causal effect of related policy decisions.

Tax Inversion a Historical Perspective

Ranish, Menz, and Mohs (2015) discussed various base erosion and income-shifting methods that corporate entities utilize to reduce their tax burdens and increase value. These strategies have existed since the start of global corporate taxation. Amongst these strategies are transfer pricing, inversions, and other profit-shifting techniques. The increase in globalization gave rise to an opportunity to accelerate the tax inversion strategy and reduce the corporation's overall tax expense. Listed below in table 1 is a historical presentation of the Marginal tax rates in the United States. These are the Federal marginal rates, and it should be noted that where applicable there are also State taxes that are not part of this analysis. Table 2 shows the corporate inversions from 1983 to 2014 by county. In each inversion, the tax rate in the new domicile was less than those reflected in the United States.

The current form of inversion has been active since 1982. In general, the first major inversion of this era was the 1983 McDermott International relocated to Panama. After that, in 1993, followed by U.S. cosmetics company Helen of Troy became a subsidiary of a Bermuda-based shell corporation (Mohs et. al, 2016). As the inversion trend started to rise, in 1996 the U.S. government tried to restrict U.S. companies from moving abroad solely to avoid U.S. taxes. Comparing the marginal tax rates in table 1 to table 4 will illustrate the differentials which would quantify tax savings from a potential inversion. In the same period, the Treasury Department introduced the "check the box" regulation which allows U.S. companies with Controlled Foreign Corporations (CFCs) to opt those subsidiaries out of Subpart F with sufficient tax planning (Henchman, 2011). As noted in Bloomberg, in 2002 when additional regulations were issued making inversion ineffective. The practice of inversion was completely stopped but only for a short period. It was further noted, that since the anti-inversion bill passed in 2004, there have been more than 40 corporate inversions till then.

In order to further discourage the practice of inversion, Congress enacted Section 7874 of the Internal Revenue Code. Section 7874 provided in part that if 80% of a foreign company's shareholders are U.S. based, in the U.S., it would be considered a U.S. corporation for tax purposes. This would in effect eliminate any benefit from the tax inversion. The section further provided that additionally if the inverted corporation does not have substantial foreign operations and sixty percent of the shareholders are domiciled in the U.S., then the inverted foreign corporation would be subject to U.S. taxes. Another drawback to the 2004 legislation is the surrogate foreign corporation provision that in effect taxes transfers of assets out of the U.S. if the assets are transferred out of the U.S. before the expiration of a ten-year holding period.

Despite the 2004 legislation, the corporate inversion rate reached its pre–section 7874 level by 2008, and as a result, Congress strengthened the ownership test in 2009 by clarifying the statutory language in Notice 2009-78 (Fichtner and Michaluk, 2015). In September 2014, Treasury announced regulations increasing the cost of corporations seeking to leave the United States. September 22, 2014, Notice describes future regulations that can be separated into two categories: (I) Special rules regarding ownership threshold requirements (ii) Rules targeting certain tax planning after an inversion, primarily to access foreign earnings of the U.S. acquired corporation (DeNovio et al. 2014). The main purpose of these regulations was to reduce the tax benefits available to companies that have inverted, while also creating difficulties for making new

inversions. Again, on November 19, 2015, Treasury announced another new regulation in which the non-U.S. company is artificially made bigger before a merger to follow that 80% threshold. It is said that these rules build on existing tax laws that prevent companies from escaping the U.S. tax system unless they merge with a foreign firm (Rubin, 2015).

During the announcement of the guideline for Corporate Tax Inversion on April 04, 2016, Treasury Secretary Jacob Lew said the actions would "further rein in" inversions but said that only legislation in Congress could prevent such deals (Calmes, 2016). In this new guideline, along with the guidelines announced in September 2014 and November 2015, Treasury is also proposing tackling the practice of post-inversion earnings stripping with new limits on related-party debt for U.S. subsidiaries. The main purpose of this continuous effort is to eradicate the Corporate Tax loophole that exists in this Country. It is believed these guidelines will be able to create tougher restrictions for U.S. companies to invert. The current U.S. corporate tax rate is 21 percent. Before the enactment of the Tax and Jobs Act of 2017, the federal was 35 percent with the highest marginal of 39 percent. Appendix A reflects the U.S. Tax rates that were in effect since 1982. It should be noted that in the United States, corporations may be subject to State and local income taxes as well. The State liability if any may also be considered.

According to Lyon (2020), the Tax Cuts and Jobs Act (TCJA) made significant revisions to the existing corporate tax and the international tax rules, along with some specific revisions to discourage future inversions. The most substantial revision was reducing the corporate tax rate from 35 percent to 21 percent. This reduction had the effect of creating parity in tax rates with the rest of the world. The TCJA provisions will sunset if not renewed in 2025.

METHODOLOGY AND DATA

Subsequent to the enactment of the 2017 TCJA inversions remained relatively stable. Total business acquisitions remained stable between 2017 and 2018 but inversions dropped significantly between 2018 and 2019, the majority of the declines were accounted for in Ireland and the Netherlands (Bureau of Economic Analysis, 2019). Lyon (2020) indicated that foreign acquisitions of U.S. firms dropped by 25% in 2018 and 2019, compared to 2016 and 2017, while U.S. acquisitions of foreign firms rose by 50%. Attributing this change to other provisions of the TCJA which include increased domestic deductions and changes in the sourcing of foreign income. (Lyon, 2020). As noted in Table 1 the U.S. corporate income tax rate also decreased to a historical low of 21 percent in 2018. In comparing this to the Table 3 marginal tax rates the U.S. tax rate, with the exception of Switzerland the United States has a lower overall rate.

According to the Congressional Research Service, 47 U.S. corporations have reincorporated overseas through corporate inversions from 2004 to 2014, far more than during the previous 20 years combined. In total, 75 U.S. corporations have inverted since 1994 – with one other inversion occurring in 1983. Table 2 reflects the results from a May 2014 Congressional Research Service report that shows a gradual rise in the inversion trend from 1994 to 2002 and then from 2004 to 2014 clearly showing the rapid rise in the number of corporations that are reincorporating overseas seeking to lower their taxes. So, it adds urgency to a legislative solution to control this trend (Rubin, 2015).

Similarly, the data presented in Table 2 shows until 2015 the inversion trend continued with U.S. companies shifting their place of incorporation to another country and tended to pick ones with low or no corporate income taxes. From the data in Table 3, it would appear that Bermuda, the Cayman Islands, and Ireland were the most popular destinations a decade ago. Bermuda and the Cayman Islands are considered to be tax havens since there is no tax on corporate earnings, but it should be noted that other U.S. Tax sourcing policies may apply.

Table 1: Historical United States Corporate Tax Rates

Year	Marginal Tax Rate
1982 and 1983	40%
1984-1986	46%
1987	42%
1988-1992	39%
1993-2017	35%
2018-2022	21%
2023-2025	Unless repealed

This table reflects the statutory marginal corporate tax rates from 1982 to 2025. Source: Internal Revenue Code (Title 26 USC) as amended

Table 2: United States Tax Inversions from 1983 to 2015

Current Name	Previous U.S. Headquarters	New Headquarters	Year Completed
Cyberonics Inc.	Texas	England	2015
Wright Medical Group Inc.	Tennessee	Netherlands	2015
Steris Corp.	Ohio	England	2015
Civeo Corp.	Texas	Canada	2015
Mylan Inc.	Pennsylvania	Netherlands	2015
Medtronic Inc.	Minnesota	Ireland	2015
Burger King Worldwide Inc.	Florida	Canada	2014
Horizon Pharma Inc.	Illinois	Ireland	2014
Theravance Biopharma Inc.	California	Cayman	2014
Endo International Plc	Pennsylvania	Ireland	2014
Tower Group International Ltd.	New York	Bermuda	2013
Liberty Global Plc	Colorado	England	2013
Perrigo Co. Plc	Michigan	Ireland	2013
Actavis Plc	New Jersey	Ireland	2013
Tronox Ltd.	Oklahoma	Australia	2012
Rowan Cos. Plc	Texas	England	2012
Aon Plc	Illinois	England	2012
Eaton Corp. Plc	Ohio	Ireland	2012
Jazz Pharmaceuticals Plc	California	Ireland	2012
Stratasys Ltd.	Minnesota	Israel	2012
D E Master Blenders 1753 NV	USA	Netherlands	2012
Alkermes Plc	Massachusetts	Ireland	2011
Valeant Pharmaceuticals Intl. Inc.	California	Canada	2010
Altisource Portfolio Solutions	USA	Luxembourg	2009
Tim Hortons Inc.	Canada	Canada	2009
Invitel Holdings A/S	Washington	Denmark	2009
Ensco Plc	Texas	England	2009
Altisource Portfolio Solutions SA	USA	Luxembourg	2009
Argo Group International Holdings Ltd.	Texas	Bermuda	2007
Western Goldfields Inc.	USA	Canada	2007
Lazard Ltd.	New York	Bermuda	2005
Nabors Industries Ltd.	Texas	Bermuda	2002

Table 2: United States Tax Inversions from 1983 to 2015 (continued)

Noble Corp. Plc	Texas	England	2002
Weatherford International Ltd.	Texas	Ireland	2002
Cooper Industries Plc	Texas	Ireland	2002
Vista Print NV	Massachusetts	Netherlands	2002
GlobalSantaFe Corp.	Texas	Cayman	2001
Ingersoll-Rand Plc	New Jersey	Ireland	2001
Foster Wheeler AG	New Jersey	Switzerland	2001
APW Ltd.	New York	Bermuda	2000
Everest Re Group Ltd.	New Jersey	Bermuda	2000
Arch Capital Group Ltd.	Connecticut	Bermuda	2000
PXRE Group Ltd.	New Jersey	Bermuda	1999
White Mountains Insurance Group Ltd.	Vermont	Bermuda	1999
Fruit of the Loom Ltd.	Kentucky	Cayman	1999
Transocean Ltd.	Texas	Switzerland	1999
XOMA Ltd.	California	Bermuda	1998
Gold Reserve Inc.	Washington	Canada	1998
Tyco International Plc	New Hampshire	Ireland	1997
Loral Space & Communications Ltd.	New York	Bermuda	1996
Triton Energy Ltd.	Texas	Cayman	1996
Helen of Troy Ltd.	Texas	Bermuda	1994
McDermott International Inc.	Louisiana	Panama	1983

This table lists the published inversions from 1983-2015. The second column identifies the pre-inversion domicile and column 3 indicates the destination domicile. Source: Congressional Research Service: Inversion Comparisons 1983 to 2015

Table 3: Foreign Corporate Tax Rates from 1980-2022

Country	Marginal Tax Rates	Comments
Australia	46-30%	
Bermuda	0%	Considered a Tax Haven
Canada	51-30%	Excludes Provincial Taxes
Cayman	0%	Considered a Tax Haven
England	52-19%	
Ireland	45-12.5%	
Israel	36-23%	
Luxembourg	39.39-24.94%	
Panama	50-25%	
Netherlands	48-25.8%	
Switzerland	21.6-14.87	Includes Canton Surtaxes

This table reflects the range of marginal tax rates with the left range being the most current. Multiple sources as follows: Sources: Statutory corporate income tax rates are from OECD, "Table II.1. Statutory corporate income tax rate," PwC, "Worldwide Tax Summaries

Table 4: Historical Tax Rates for Major Trading Partners from 1980-2022

Country	Marginal Tax Rates	Comments
China	55-25%	Excludes Enterprise Zones
Indonesia	45-22%	
India	60-30%	
Republic of Korea	31-27%	
Mexico	42-30%	
Viet Nam	28-20%	

This table reflects the marginal tax rates for the U.S. trading partners as well as its competitors. Sources: Statutory corporate income tax rates are from OECD, "Table II.1. Statutory corporate income tax rate," PwC, "Worldwide Tax Summaries

RESULTS

Trends in Corporate Tax Inversion

As previously noted, a corporate inversion can be viewed as a transaction in which a U.S.-based multinational restructures so that the U.S. parent is replaced by a foreign parent to avoid high U.S. taxes. In 2017 the Tax Cuts and Job Act was enacted which in effect lowered the U.S. corporate tax rate to 21 percent and placed the U.S. in a favorable position making inversions not as attractive. It should be noted that if an inversion is for reasons other than tax considerations, such as supply chain or value chain concerns an inversion may still be viable.

The higher corporate tax rates in target countries caused many inversions which appeared to be based primarily on tax considerations subject to certain potentially adverse tax consequences. However, the continued occurrence of these transactions indicates that for many corporations these consequences were acceptable in light of the potential tax detriments. For example, one planned inversion by Assurant Inc. was revised to retain the headquarters in the United States. Ohio-based Dana, Inc. announced plans to merge and moved the headquarters to the U. K., although the merger would leave the U.S. shareholders with less than 60% ownership, and therefore not make them subject to anti-inversion penalties (Francis & Francis, 2018).

Current Issues on Tax Inversion

Many existing loopholes and flaws in the U.S. code have adversely affected the share of the government's revenue through corporate income tax. In addition to tax inversions, there are a variety of other vehicles that U.S. corporations can use to reduce or otherwise mitigate taxation in high-rate countries. These vehicles are collectively referred to as Base Erosions and Profit Shifting (BEPS) techniques. The Tax Cuts and Jobs Act was not able to fix these flaws, instead causing the corporate tax income of the government to fall to the lowest level since the 1930s despite skyrocketing corporate profits. Not only the tax cuts are responsible for the largest share of the loss in government revenue, but profit shifting has been more challenging to control for the government as well. No matter how many tax cuts are implemented, profit shifting to tax havens does not seem to be reduced by these tax codes.

Over the past several years, many corporations have been using different tools and techniques to shift income from the U.S. to lower-taxed countries and have been able to erode tax liability in the U.S. One of the examples is payment made under royalty, patent, and higher management fees. Mohs, Goldberg, Butler, and Heath (2016) further noted that international tax strategies have been around since the inception of the United States Tax Code due in part to a distinctive feature relating to the taxation of worldwide income.

As discussed at length in Mohs, Goldberg, and Buitrago (2017) base erosion typically occurs when multinational organizations engage in cross-border transactions that will shift income, expenses, or assets from one tax jurisdiction to another. The tax strategies employed to reduce an organization's overall tax burden give rise to a zero-sum game at the jurisdictional or county level, where one country will lose tax revenues, and another will gain revenues. The overall tax-shifting strategy is referred to as BEPS. The three predominant strategies embodied in the BEPS protocols center around transfer pricing, interest stripping, and supportive expenses. These strategies in part would act to increase the expenses for U.S.-based companies while increasing income for the foreign parent companies. Such income shifting to lower-taxed country benefits through lower tax liability for these corporations. To limit such income-shifting techniques, in a newly created IRC Section 59A, the Tax Cuts and Jobs Act added a new tax called base erosion and anti-abuse tax (BEAT).

The BEAT provisions impose a tax on base erosion payments, which include amounts a taxpayer pays or accrues to a related foreign party that the taxpayer may deduct such as transfer pricing or other income-shifting techniques. The taxpayer may be eligible to reduce BEAT liability by recovering costs as the cost of goods sold which are not deductions, by using the Uniform Capitalization Act. An exception to the potential BEAT liability applies to inversions that occur after November 9, 2017, where payments to a foreign parent or any affiliated firm for the cost of goods sold are included in BEAT.

Another modification is attribution rules. Under these rules, the constructive ownership rule for purpose of deciding 10% U.S. shareholders, whether a corporation is a CFC, and whether parties satisfy certain relatedness tests, was expanded in the 2017 tax revision. Specifically, this new rule treats stock owned by a foreign person as attributable to a U.S. entity owned by the foreign person (so-called "Downward Attribution"). As a result, the stock owned by a foreign entity may generally be attributed to (1) a U.S. corporation, 10% of the value of the stock of which is owned, directly or indirectly, by the foreign person; (2) a U.S. partnership in which the foreign person is a partner, and (3) certain U.S. trust if the foreign person is a beneficiary or, in circumstances, a grantor or a substantial owner.

Recent Changes to the Law

President Biden in the 'Made in America Tax Plan', released in April 2021, anticipated the changes needed to strengthen the U.S. corporate tax and raise revenues. The reforms included in the 'Build Back Better framework' announced last October reflect these goals and would require an increase in corporate taxes. While the main goal of this plan is to increase tax revenues, it also has the effect of limiting profit-shifting trends. This plan appears to also be consistent with Organization for Economic Corporation and Development (OECD) agreement. Although President Biden's Build Back Better agenda passed the House of Representatives, it stalled in the Senate. The corporate tax provisions limiting profit shifting were not included scaled-down successor to the Build Back Better, Inflation Reduction Act of 2022.

After years of negotiations, 136 nations including all the largest economic countries were able to reach an agreement designed to rein in corporate tax avoidance and modernization of international tax rules. On October 8, 2021, the OECD was able to create a final framework named "Two-Pillar Solution to Address the Tax Challenges Arising from the Digitalization of the Economy. This agreement would establish a global minimum tax rate for these multinational corporations and make other changes to limit the incentives to shift profits to lower tax jurisdictions. Table 4 illustrates the tax rates in Major U.S. trading partners. This agreement also ensures that countries where economic activities occur receive tax revenues commensurate with that activity.

The Current Thoughts and IRS Position concerning Tax Inversion

Treasury introduced new rules to restrict the ability of American companies for inversion just to lower their tax bills. These rules mainly focus on two parts to limit internal corporate borrowing that shifts profits out of the United States.

First, the government focused on the companies that have engaged in multiple inversion transactions, addressing "Serial Inverters". The rules would disregard three years of past mergers with U.S. corporations in determining the size of the foreign company. Treasury's action restricts serial inversions by not counting inversions or foreign acquisitions of U.S. firms occurring within the last three years when applying the formula that determines whether an inversion is subjected to penalties or blocked by existing tax code rules (Zeints and Hanlon, 2016). That means that companies cannot use a recent inversion or a recent foreign acquisition to enable an inversion and avoid triggering penalties. After a merger, to get around the US Treasury's rule that a company that is still 80% US-owned following a takeover cannot be domiciled in another country. If they own at least 60%, some restrictions apply but the company is still considered foreign (Rubin, 2016). That would lead companies to keep their inversions below 60% and prompted the government to propose rules halting various techniques for doing so.

Second, the government issued regulations against earnings stripping. Earning striping is the moves done after an inversion or after a foreign company buys a U.S. firm, which erodes the U.S. corporate tax base and puts other firms at a competitive disadvantage. Treasury addresses earnings stripping by modifying certain related-party interest payments as dividends that cannot be deducted – in other words, preventing debt that doesn't finance new investments in the United States from receiving a tax break (Zeints & Hanlon, 2016). The rules would give the government more authority to treat those debt transactions as equity movements under the tax code. During the announcement of new rules, Treasury has said that it will continue reviewing its authority under existing law to limit, and where possible stop, corporate inversions.

The Treasury's Reaction to Corporate Tax Inversion

Two days after the regulation was issued, Pfizer withdrew from its merger with Allergen, an Irish-based company that was an inverted firm. It appears that this merger was affected by the multiple-entity rule, which has come to be called "serial inversion" (American for Tax Fairness, 2016). But recently, Pfizer's CEO has shown that deals are still on hold generally while tax reform is being considered. The CF industries merger with OCI NV (based in the Netherlands) was also called off. However, some mergers still stayed active and new mergers were announced, there have been such mergers between Shire (Ireland-based) and Basalta, and between HIS and Mark, it Group inc. (U.K. based) went forward. A merger between Konecranes (a Finnish firm) and Terex was scaled down to an acquisition of a share of Terex with the U.S. firm owning 25%, thus avoiding the effect of the regulation (American for Tax Fairness, 2016).

In May 2016, Cardtronics Inc. announced a plan to move to the U.K. using the substantial business activities tests Also in 2017, Praxair, a U.S. gas company, announced its plant to move out through a merger with Linde AG, a German gas and technology company, owning half of the new company. Even though statistical data suggest a decrease in the rate of inversions from 2015 to 2016, and again from 2016 to 2017, the new inversion process was still being announced and some old inversions remain active.

Under the 2017 legislation, a corporate's existing untaxed income held in a foreign country is taxed under a deemed repatriation rule, but at a lower rate (8% for earnings reinvested in noncash assets and 15.5% for earnings held as cash or cash equivalents). A special recapture rule applies to deemed newly inverted repatriated corporate firms. This recapture rule applies to a firm when it becomes an expatriated entity at any time during the 10 years beginning on December 22, 2017. In such a case, the tax rate will increase from 8% and 15.5% to 35% for the entire deemed repatriation with no foreign tax credit allowance for the

increase in the tax rate. This additional tax is due in full amount in the first tax year in which the entity becomes an expatriated entity.

Corporate Reaction after New Tax Inversion Policy

There are different reactions to this tax inversion policy. Robert Holo, a tax partner at Simpson Thatcher & Bartlett LLP, called the regulations a "significant escalation of the attack on inverted companies." The first two sets of rules "made inversions a little harder but didn't fundamentally change the calculation," he said. "This one is much more aggressive. Not only does it attack the ability to invert but puts the single greatest benefit of doing so -- earnings stripping -- on the chopping block" (Mider, Z, 2017). Similarly, Kevin Kedra, an analyst at Gabelli & Company expressed the new policy as funny since the new policy almost fit perfectly with Pfizer and Allergan's deal (Merced and Pickler, 2016).

Subsequent to the announcement of the new inversion policy of April 2016, New York-based Pfizer plans to domicile in Ireland by buying Allergan, a U.S.-run pharmaceutical company with an Irish tax domicile, and the companies expect to complete their merger in the second half of 2016. But this deal was stopped due to a new inversion rule announced by Treasury Department in April. The proposed $150 billion deal between Pfizer and Allergan, which would create the world's largest drug maker, prompted renewed strategies. In a joint statement, Pfizer and Allergan said they would review the Treasury policy but would not speculate on its possible effects (Dunsmuir & O'Donnell, 2016). The absence of any additional inversion cancellation data would suggest that the effect of tax rate reductions TCJA, has brought a temporary session in inversions solely for tax purposes.

Path Forward

On March 9, 2023, President Biden released the fiscal year 2024 budget for the United States. The multi-trillion-dollar budget contained tax changes that are aimed at corporations paying their fair share. One of the proposed tax changes would be to raise the corporate marginal rate from the TCJA rate of 21 to 28 percent. Whether the budget clears the legislative process in its current form is a matter of political debate and a variable worth consideration.

Inversion studies are extremely costly and time-consuming. The benefits are often further subject to subsequent legislative changes. Future tax savings at the corporate level may not offset thecosts. Marples and Gravelle, 2021). The data reflected in this paper suggests that tax savings alone should not be the sole catalyst for the inversion decision. The de facto liquidation at the shareholder level causing potential capital gains and supply and value chain issues also need to be factored in and considered. By using cost-benefit analysis and other techniques an informed inversion decision can be made.

CONCLUDING COMMENTS

There are many reasons why organizations may want to consider a corporate inversion. Two forms of corporate tax policies are particularly relevant to the corporation's motivation for tax inversion decisions: the corporate income tax rate and territorial taxation of foreign source earnings. Other reasoning may be related to supply chain or value chain propositions such as freight, labor, the acquisition of natural resources, or proposed legislation.

From this analysis it becomes intuitively obvious that lowering the corporate tax rate could have a huge impact on the inversion decision, it further indicates it would that the level of tax rate reduction could prevent these activities. The data suggests that the lower the home country's tax rate decreases the less beneficial an inversion would be. Conversely raising the home country's rate may make inversions more beneficial. If revenue neutrality is a goal of the current fiscal year, there may not be enough base area to

spread tax to offset revenue cuts in corporate income for the government. Even though such areas were found, they might have their limitations and other negative consequences. Reducing corporate tax rates without a proper base simply results in chronic budget deficits for the government.

REFERENCES

American for Tax Fairness. (April 5, 2016). New treasury dept. Anti-inversion rule would Prevent Pfizer's estimated $35 billion tax break. https://americansfortaxfairness.org/issue/new-treasury-dept-anti-inversion-rule-would-prevent-pfizers-estimated-35-billion-tax-break

Calmes, J. (2016), A Treasury secretary at the center of Obama's most pressing policies. The New York Times. https://www.nytimes.com/2016/04/08/business/the-treasurysecretary-steps-reluctantly-into-the-limelight

Congressional Research Service. (May 2021), The budget reconciliation process: The senate's "Byrd Rule". Congressional Research Service Report https://sgp.fas.org/crs/misc/RL30862.pdf

Dawson, C and Francis, T (March 9, 2018), Despite the U.S. tax overhaul, Ohio-based Dana considers a move abroad. Wall Street Journal. https://www.wsj.com/articles/dana-to-take-over-gkns-automotive-driveline-business-1520614366

DeNovio N., Stein, L., Doyle D and Murphey L. (2014), Treasury announces inversion regulations; Reach extends to other cross-border M&A. Client Alert Commentary No 1747. https://www.lw.com/thoughtLeadership/lw-inversions-new-regulations.

Dunsmuir, L and O'Donnell, C. (April 04, 2016), New rules on tax inversions threaten the Pfizer-Allergan deal. Reuters. https://www.reuters.com/article/us-usa-tax-inversions/new-u-s-inversion-rules-threaten-pfizer-allergan-deal-idUSKCN0X1299

Fichtner J., Michaluk C and Michel A. (2015), Locking out prosperity: The Treasury Department's misguided regulation to address the symptoms of corporate inversions while ignoring the cause. Mercatus Center, George Mason University. https://www.mercatus.org/publications/government-spending/locking-out-prosperity-treasury-department-misguided-regulation

Feyman, Y. (April 6, 2016), Tax inversions don't destroy US jobs. CNBC. https://www.cnbc.com/2016/04/06/tax-inversions-dont-destroy-us-jobs-commentary.html

Henchman J. Tax Foundation, (November 2011), Special Report No. 197. http://taxfoundation.org/sites/taxfoundation.org/files/docs/sr197.pdf

Lyon, A. (October 2, 2020), Insights on trends in U.S. cross-border mergers and acquisitions after the Tax Cuts and Jobs Act. Tax Notes, 497-507. https://www.taxnotes.com/special-reports/cross-border-mergers-and-acquisitions/insights-trends-us-cross-border-ma-transactions-after-tax-cuts-and-jobs-act/2020/10/23/2d2m8

Marples, D and Gravelle, J (June 17, 2021), Corporate expatriation, inversions, and mergers: Tax Issues, Tax Notes, Tax Issues 24(3568). https://sgp.fas.org/crs/misc/R43568.pdf

Merced, M and Picker, L (April 5, 2016), Pfizer and Allergan are said to end the merger as tax rules tighten. The New York Times. http://www.nytimes.com/2016/04/06/business/dealbook/tax-inversion-obama-treasury

Merle, R. (April 4, 2016), Treasury Dept. tries again to stop companies from giving up U.S. citizenship for lower taxes. The Washington Post. https://www.washingtonpost.com/news/business/wp/2016/04/04/treasury-dept-tries-again-to-stop-companies-from-giving-up-u-s-citizenship-for-lower-taxes

Mider Z, (March 2017), Tracking Tax Runways, Bloomberg, U.S. Edition. https://www.bloomberg.com/graphics/tax-inversion-tracker

Mohs, J. N., Goldberg, M. A., Butler, L. W and Heath, A. M., (2016) Corporate inversions: New challenges, new opportunities, International Journal of Accounting and Taxation, Volume 4, Issue 2, 25-35

Mohs, James, Goldberg, Martin, and Buitrago, David (2017). Base Erosion and Profit Shifting: Options, Opportunities and Alternatives, International Journal of Accounting and Taxation, 5(1), 10-21

Rainish, R. M., Mensz, P and Mohs, J. N. (2015), Global financial model for the value chain. Journal of Finance and Accountancy, 18,16

Rubin, R. (November 19, 2015). The U.S. unveils rules to make corporate inversions more difficult: Move intended to stop American companies from putting their addresses in foreign countries to reduce tax bills. Wall Street Journal, English Edition. https://www.wsj.com/articles/u-s-unveils-rules-to-make-corporate-inversions-more-difficult-1447970935

Tax Foundation, Sources of Government Revenue in the OECD, 2022, https://taxfoundation.org/publications/sources-of-government-revenue-in-the-oecd

Velarde A. (May 2016). Terex-Konecranes Merger Downsized After Lost Tax Benefits. Tax Notes, pp. 1032-1033. https://www.taxnotes.com/search-page-list

Zachary R. Mider, Z and Drucker, J. (March 2017). Tax Inversion: How U.S. companies buy tax breaks. Bloomberg. http://www.bloombergview.com/quicktake/tax-inversion

Zients, J. and Hanlon, S. (April 8, 2016). The corporate inversions tax loophole: What you need to know. The Whitehouse, 16.12(22). https://www.whitehouse.gov/blog/2016/04/08/corporate-inversions-tax-loophole-what-you-need-know

AUTHOR BIOGRAPHIES

James N Mohs M.S.A., D.B.A., is an associate professor at the University of New Haven Pompea College of Business in West Haven Connecticut. Prior to embarking on a career in academia, he spent nearly 40 years in public accounting and large publicly traded corporations. His work has been published in the International Journal of Accounting and Taxation, Journal of Business and Economic Policy, Journal of Global Business Management, Journal of International Business and Economics, Review of Contemporary Business Research, Strategic Management Quarterly, Journal of Human Resource and Adult Learning, and the Journal of Finance and Accountancy. Articles to appear in Real Estate Taxation and Practical Tax Strategies.

Martin A. Goldberg J.D., LL.M. in Tax, is an associate professor at the University of New Haven Pompea College of Business in West Haven Connecticut. Prior to embarking on a career in academia, he spent 20 years in the practice of law. His work has been published in the International Journal of Accounting and Taxation and the Journal of International Business and Economics. Articles to appear in Real Estate Taxation and Practical Tax Strategies.

Rajendra Shrestha graduated from the University of New Haven in January of 2023 with an M.S. in Accounting. This publication is based in part on her graduate capstone research project with Dr. Mohs.

DIGITALIZATION OF TAX ADMINISTRATION: A REVIEW OF THE ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD) GUIDELINES

Sonia B. Dhaliwal, University of Guelph
Dua Sohail, University of Guelph
Keeley Hafer, University of Guelph
Sehar Azam, University of Guelph
Bryn Hafer, University of Guelph

ABSTRACT

Tax administrations worldwide are being digitally transformed at a rapid pace. The increased capabilities of modern information technology to extract, process, and manage data is leading tax administrators to adopt new approaches in order to make taxation more efficient, effective, and transparent. This paper critically evaluates Tax Administration 3.0: The Digital Transformation of Tax Administration, a set of guidelines created by the Organisation for Economic Co-operation and Development (OECD). It reports on how leading countries have adopted each recommended building block in the OECD report, highlighting successes, challenges, and next steps on the road to digitalization for each country. The paper contains specific commentary related to Canada, which like the United States lags behind many other advanced economies in its implementation of the OECD recommendations. A detailed breakdown is performed pertaining to leading countries regarding the building blocks of Tax Administration 3.0, their journey towards its implementation, the challenges faced as well as the methods used to overcome them, and the next steps that will be taken towards further advancement. The OECD guidelines, although aspirational in nature, have been adopted and implemented by certain countries selectively, while others like Canada and the US lag. A key finding from this study is that no one country has yet been able to implement all the Tax Administration 3.0 guidelines.

INTRODUCTION

Tax digitalization is inevitable given the increasingly digital nature of modern economies and the services provide. The Organisation for Economic Co-operation and Development (OECD) has estimated that the future of tax services will increasingly be digitized, suggesting that structural changes to the way we compute, and even the way we think about tax, will change over the coming years (OECD, 2016). In 2020, the Forum of Tax Administration (FTA), a body of commissioners from tax administrations from OECD and G20 countries across the globe, published the OECD's findings on the future of the digitalized tax world, aptly titled *Tax Administration 3.0: The Digital Transformation of Tax Administration*, referred to herein as *Tax Administration 3.0. Tax Administration 3.0* is a set of aspirational guidelines put out by the OECD as recommendations for national tax administrations to follow. Since every

country operates in a unique tax environment, with differences in tax policies and approaches to tax administration between them, the OECD recognizes that a standardized approach with a mandated set of rules for all countries is not feasible (OECD 2020, page 8). This paper explores the guidelines contained within the *Tax Administration 3.0* report and draws out the recommendations that would most help countries meet the FTA's goal of ensuring fairness, competence, and efficiency in tax administration (FTA, 2021).

The OECD's report is split into four main sections. The first section explains how tax administration developed into its current state. A few leading countries on various areas have been highlighted in here. The second section evaluates this current state, while the following considers the merits of change versus stagnation. The report concludes by providing concrete recommendations for the future of tax administration. Throughout, the report highlights digital transformations and how technology has shaped, and continues to shape the evolution of tax administration.

Current tax administration has evolved from the previous setting of paper-based reporting to being more digitalized, which has since increased the competence of tax administration (OECD, 2020 The paper-based reporting model was inefficient, relied excessively on user-provided information, and was slow and costly (OECD, 2021). From the perspective of tax administrations, it was wasteful in terms of both the time and human labor involved in processing filing—resources that could have been allocated to other areas apart from monitoring compliance. *Tax Administration 2.0* introduced numerous elements in the advancement of digitalization, including faster and more reliable tax-paying services, systems for reporting, expansion of the ability to report using third parties, and heightened discovery of tax non-compliance (OECD, 2020). Consequently, the system contained numerous restrictions, including significant reliance on unforced disclosure and submission of taxes in addition to considerable costs and discipline required in understanding the nature of calculations and reporting of taxes, requiring substantial adjustments (OECD, 2020).

Today, most developed nations in the industrialized world have a significant digital tax infrastructure, with online services such as the automation of some tax structures and analytics programs that are increasingly competent at detecting errors and non-compliance. These countries are implementing these structures from the top to the bottom of their governments (Corydon et al., 2021). While the systems themselves are still mostly reliant on the user to provide and input information, some systems in development are designed to reduce the burden on taxpaying individuals and corporations, which is where the transition from *Tax Administration 2.0* to *3.0* truly begins. However, the Canadian taxation system is lagging in comparison to the world leaders in Digitalization, and an overhaul of systems, legislation, and information technology is required to catch up.

Tax Administration 3.0 is a suggested system and guidelines based on the underlying principle that tax administration should not have to rely on labour or information provided by taxpaying individuals or corporations to function. Instead, data inputted once at source should be utilized, and obtained automatically through various government systems that connect and share data amongst federal organizations within these developed nations. Although tax is not voluntary, the widespread use of the term "voluntary compliance" recognizes that, currently, taxpayers make choices with respect to the reporting, calculation, and payment of tax (OECD 2020, page 11). This is true for the Canadian tax system, for example: despite the system having some capability to automatically transfer certain income records (ex: employment and investment income earned through financial institutions), taxpayers are still required to enter information related to other sources of income, such as rental income and associated permitted deductions. This may lead to a tax gap which is the difference between how much tax a country should be collecting and how much tax is actually collected. Based on tax gap analysis, as measured in a number of countries that are part of the Forum on Tax Administration (FTA) that includes over fifty tax administrations across the globe, a reasonable estimate for the average tax gap across FTA members is probably in the range of 5% to 10% (OECD 2020, page 11).

Research indicates that Digitalization has helped generate some positive movement in closing the tax gap in many of these countries. According to the OECD (2019), the average e-filing rates for corporate income taxes have increased from about seventy-six percent in 2014 to nearly ninety-five percent in 2020. In addition, the use of technology for tax purposes has drastically increased since 2018. Only about twenty-two percent of administrations within the OECD do not currently use technology to assist with completing tax administration processes (OECD, 2019).

This paper builds on existing commentary on this matter by offering an in-depth view of the steps that countries have made towards transitioning to the *Tax Administration 3.0* system, and provides insights on what Canada – and the world – can do to incrementally improve the process of tax administration for taxpayers and administrators alike. Simultaneously, it also explores how countries that do not adopt *Tax Administration 3.0* standards will suffer in the long run. The paper begins with a literature review and provides background on the building blocks of *Tax Administration 3.0*. The section that follows outlines the methodology behind choosing the countries explored in this article. The subsequent two sections portray the results of countries that have led in implementing digitalization in tax administration, as well as the risks and considerations involved in their decisions to move forward with digital processes. Canada's performance in comparison is discussed later in the paper under "Results". The final two sections offer insight into a path forward, which includes a recommendation to encourage higher education institutions to implement courses that will enable students to develop the skill sets necessary to implement forward-looking recommendations such as those included in the *Tax Administration 3.0* guidelines, followed by a conclusion.

LITERATURE REVIEW AND BACKGROUND

Tax Administration 3.0, which is based on six core building blocks, encourages countries to develop and implement a new digital infrastructure to improve tax administration (OECD 2020). The key to successfully progressing along the digital spectrum is to integrate these core building blocks over time to achieve significant benefits of seamless tax administration by partnering with other parts of governments, with the private sector, and across borders (OECD 2020 page 42). The six building blocks that form part of *Tax Administration 3.0* are summarized and discussed below, followed by a discussion of methodology and results from countries that have successfully implemented elements of these core building blocks. Our research shows that the *Tax Administration 3.0* building block that has had the largest uptake to date has been "Taxpayer Touchpoints" (see Table 1), which all countries reviewed in this study have implemented.

Building Blocks of Tax Administration 3.0

i) Digital Identity

To integrate the key services provided to and key systems used by taxpayers, *Tax Administration 3.0* suggests that a "digital identity" for each taxpayer should be developed. This "digital identity" is in the form of a unique identification (i.e., tax identification number) that would allow the taxpayer to access fundamental services offered by the government and private sector organizations. To ensure taxpayer personal data is secure, a two-factor authentication should be required for entry into the platform. Further security measures should be in place for cross-border data transfers.

The goal outlined in this building block is to enable taxpayers to use their singular "digital identity" to access various administrative services. For instance, a taxpayer could use the same identity to access their personal tax data and tax information relating to their small business. Interaction between the different systems, both governmental and private sector systems, is key to ensuring a seamless experience for the taxpayer, and the central platform should update the taxpayer's data from each service in real-time.

There are a few factors that should be considered before the development of digital identities. An analysis should first be conducted on the benefits that taxpayers and the tax administration organizations will receive in addition to potential challenges that may arise in integrating this technology. It is also important for the "digital identity" to be developed collaboratively with governmental organizations, tax administrators, and key private sector organizations to ensure it is compatible with the services they provide. Services of higher priority should be identified first to ensure the benefits of integrating them are recognized by both the administrators and taxpayers. A leading nation with respect to the digital identity building block is Singapore, with its *SingPass* digital identity for individuals and *CorpPass* for corporations. Singapore's digital identities are discussed further in the *Leading Countries* section of this paper.

ii) Taxpayer Touchpoints

Key to an effective and well-running tax administration system is interaction and engagement with the users of the system, the taxpayers. Therefore, touchpoints should be set up to allow for interaction between the tax administrators and taxpayers when there are issues relating to comprehension, special taxpayer circumstances, problems with a tax administration process, inefficiencies in tax processes, and for general tax-related inquiries. *Tax Administration 3.*0 suggests that engagement with taxpayers can take place in the form of in-person interactions, phone conversations, web chats, and e-services through cross-functional websites and management systems. Efforts should also be made to decrease the burden on taxpayers by implementing systems such as "pay as you earn" (PAYE), which allow automatic transfer of tax data. Functions such as pre-filling or automated tax returns will also reduce taxpayer burden for individuals and businesses. Alternative channels of communication should also be available for taxpayers who are not able to access and use digital platforms to interact with tax administrators. Lastly, to enable a more seamless and efficient process, artificial intelligence tools should also be incorporated into taxpayer platforms to not only help taxpayers, but also to provide automatic assessment of taxpayer liabilities.

To fully realize this building block of *Tax Administration 3.0*, several functions must be developed and implemented. Taxpayers must have access to real-time support to ensure any problems are resolved rapidly. As common issues arise among taxpayers, the systems should be modified to allow for real-time resolution in ways that preclude future occurrences of the same issue. The system or administrators facilitating the touchpoints should be able to present analytical data to help taxpayers better understand the issue in addition to guidance on how to resolve the issue. Consideration should also be paid to how common issues can be eliminated over time by integrating specific services and touchpoints. Kenya is a leader regarding the implementation of the Taxpayer Touchpoints building block for digital tax payments, which is discussed in the *Leading Countries* section of this report.

iii) Data Management and Standards

The current tax administration's focus in most countries is on the accessibility and standard of data. There is an emphasis on the quantity of data that can be obtained and the ways in which it will be stored, such as in a business's own digital filing system, on a third-party website, or in the cloud. However, under *Tax Administration 3.0*, the focus shifts from data location and volume to the type of information that can be extracted and its accuracy. Under the Tax Admin 3.0 regime, the tax administration is increasingly managing the availability, quality and accuracy of data which will be drawn remotely from taxpayers' wider natural systems (e.g. a corporation's internal SAP system) as and when needed (OECD 2020).

The objective is to have taxpayers' data integrated into central databases so that it is easily available to tax administration organizations. As for third party data collection, there is a shift towards the pre-filling of tax returns, which requires the development of high-level standards for data collection. By contrast, some national tax administrations, such as Brazil's, are choosing to focus on more structured data collection methods, such as e-invoicing. Furthermore, with taxpayers' data being electronically exchanged, privacy

assurance frameworks will need to be implemented and monitored. This will require that strong data security be integrated within data collection systems to avoid cyber-attacks, and that legal frameworks be implemented regarding data privacy and the exchange or use of the taxpayers' data.

To incorporate taxpayers' personal data into the central databases, there are a few factors that need to be taken into consideration. Elevated standards and legal requirements should be developed regarding data collection, its exchange, and assurance. For example, if a taxpayer has provided their data for social security reasons, there need to be clear legal restrictions and guidance on how that data can be used for the purposes of tax administration.

iv) Tax Rule Management and Application

The current process for "tax rule management and application" requires multiple steps and is time-consuming. It focuses on aspects such as using forms, paper or electronic, which make the taxpayer responsible for inputting appropriate and accurate information. In terms of communications with tax payers, there is an emphasis on tax law guidance in relation to deadlines and compliance, which is released through various mediums such as support chats and websites. However, with *Tax Administration 3.0*, technical tax rules and information will be integrated within the taxpayers' own systems (e.g. for businesses) to facilitate tax processing. For example, in *Tax Administration 3.0,* a business accounting system would incorporate tax laws into the system itself, alongside its computation and other functions.

The tax rules for various reporting systems and taxes will need to be published and distributed, which can then be integrated and tested within the taxpayers' own systems. However, the challenge most taxpayers face relates to the difficulty and costs associated with changing longstanding processes. Therefore, to realize the Tax Rule Management and Application building block, organization leaders will need to work closely with their IT departments to monitor their systems once the rules have been integrated. Further, systems will require either regular or intermittent updating as tax rules evolve. In addition, assurance for international guidelines will be needed regarding compliance with their tax rules and standards. Here, artificial intelligence (AI) could be helpful in answering questions and providing advice in how to update systems to comply with new rules.

v) New Skill Sets

To support the future digitalization of tax administration, it is crucial that preparations be made to support the new knowledge and abilities involved with automated platforms and technology (OECD, 2020). Since *Tax Administration 2.0*, where more digital systems were introduced, the abilities required to support customer-focused digital platforms have evolved. According to the OECD (2019), in 2017 most individuals involved in tax administration were engaged in auditing, customer assistance, or tax return remittance processes. Under *Tax Administration 3.0*, many of the tasks associated with these processes could be conducted primarily by AI. As a result, a new set of skills will be required by tax administrators and both individuals and employees than have been required in the past.

Organizations must take a variety of measures to implement *Tax Administration 3.0*'s "new skill sets" building block. Individuals involved with tax administration should expect, and be prepared for, changes in tax laws leading to changes in taxpayer behavior, and should be able to adapt to organizational changes and develop new digital-oriented skills when required (OECD, 2020). Finally, *Tax Administration 3.0* involves bringing together the knowledge of tax professionals to enhance data analytics and the development of e-services (OECD, 2020). The skills required will be more focussed on supporting the operation and evolution of the tax administration system as a whole. This will require an expansion in the number of IT professionals, programmers, data scientists, behavioural scientists and strategists (FTA, n.d.).

One country that leads in skill set development is Finland, which has developed COTS software to eliminate previous legacy systems and save in IT expenses each year. According to the OECD (2020), the primary purpose of the COTS system is to achieve excellence in online services for its customers while ensuring increased efficiency for personnel supervising the program, thus freeing up time for them to complete more important tasks. With the extensive increase in automation in their tax system, Finland has been able to process and examine data at aggressive rates, which will continue to cement its leadership in *Tax Administration 3.0* skills building in the future (OECD, 2020).

vi) Governance Frameworks

The final building block of *Tax Administration 3.0*, governance frameworks, recognizes that effective tax administration must take into account numerous global factors including technology, society, politics, and culture. With this broader perspective in mind, the aims of the governance frameworks building block involve making data collecting more convenient through secure and private networks, simplifying reporting for better tax compliance, and guaranteeing sanction controls (OECD, 2020).

To comply with *Tax Administration 3.0*, organizations following the "governance framework" building block should aim to achieve several key objectives. Most saliently, it is crucial to provide authority frameworks regarding the portrayal of tax administration that combines public and private districts at both the domestic and international levels to ensure tax compliance (OECD, 2020). Organizations must also consider, and agree upon, underlying concerns to face regarding collaborative practices in addition to outlining the efficacy of tax administration and the ability to adapt to changes where necessary while assuring the protection of data for all (OECD, 2020). To prevent cyber-attacks, a legal framework should be put in place to control the use of data to protect privacy, procedures for accountability should be established, and clear rules regarding the resolution of disputes and appeals should be set out.

Tax monitoring is central to the "governance framework" building block of *Tax Administration 3.0* in that it outlines the importance of voluntary participation from taxpayers while enforcing "digital identity" and e-invoicing. Russia is a leading country with a tax monitoring framework that has incorporated cooperative tax compliance with enhanced digitalization of documents and transactions in addition to the implementation of encryption keys to allow for the safe storage of accurate data (OECD, 2020). This has allowed the country to gain the trust of more taxpayers to strengthen the position of the Federal Taxation Service of Russia.

DATA AND METHODOLOGY

The approach undertaken for this study was to review nations for systems, mindsets, and other critical infrastructure that demonstrated a digitalized approach to taxation following the OECD *Tax Administration 3.0* guidelines. The countries profiled below were chosen because they have taken great strides towards improving tax administration in their jurisdictions relative to the OECD *Tax Administration 3.0 guidelines*. They are Russia, Kenya, Brazil, Australia, and Singapore. Here, it should be noted that Kenya and Singapore are not members of the OECD, but are worth highlighting because of the significant digital tax administration advances they have implemented, which in many ways align with the building blocks outlined in *Tax Administration 3.0*. Further, the OECD itself has referenced them when discussion leading countries in terms of adopting and implementing the building blocks it provides (OECD 2020). In addition to summarizing the OECD findings on how countries are doing in terms of moving towards *Tax Administration 3.0*, the below section also highlights the next steps for countries to take to continue down this path.

RESULTS

A key observation that comes from reviewing countries leading in tax administration digitalization is that no one country has been able to accomplish all recommendations from *Tax Administration 3.0*. This is an expected result as *Tax Administration 3.0* is a collection of guidelines and "golden rules" that have been suggested for adoption by the OECD countries, not a systematic program designed to be implemented all at once.

Table 1: Progress by Country Towards Achieving *Tax Administration 3.0*, Divided by Building Block

Country	Digital Identity	Taxpayer Touchpoints	Data Management & Standards	Tax Rule Management & Application	New Skill Sets	Governance Frameworks
Russia	Progressing given the recent introduction to e-filing; however, lack of two-factor authentication to date	Progressing – digital copies of tax forms can be downloaded; however, digital payments for all types of transactions not yet introduced	Enhanced privacy and security of tax monitoring and e-filing	Lacks full compliance with international guidelines; however, progressing in that taxpayers are identified through financial institutions	Progressing-- new skill sets will emerge with more guidance surrounding performance management	Leading – Cooperative tax compliance through enhanced digitalization of documents and transactions
Kenya	Each taxpayer has their own Tax Identification Number (TIN); however, the country is emerging in this area as mobile devices have only recently started being used for digital identity	Leading – M-PESA provides taxpayers with real-time support for e-payments and e-transfers	Emerging – Data exchange has just been implemented using M-PESA, yet no security measures in place to date	Emerging –Taxpayers continue to register via the tax administration office, not financial institutions, to file tax returns	Progressing – Increased awareness of how technology impacts staffing with regards to tax administration, yet taxpayer behaviour under M-PESA not yet fully studied	Emerging –Tax inspectors review returns, but country is moving to automated assessment of returns through M-PESA
Brazil	Adoption of one billing model followed by all corporations, individuals, and taxpayers.	Progressing – The Brazilian Tax Management Support Program (PROFISCO) enabled corporations to digitize their accounting books and shift towards a fully electronic process regarding invoicing.	Leading – Focus on structured data collection such as e-invoicing and digitized accounting books.	Leading – Digitizing the invoicing process and accounting books for corporations lead to simplifying the administrative process allowing for higher tax collection and lower cost in relation to tax compliance.	Progressing – The Inter-American Development Bank (IDB) had to distribute funds to the Federal District and 22 states to provide training to the workforce regarding usage of the program. Furthermore, it helped them upgrade their technology to support the implementation of e-invoicing.	Leading – The Fiscal Management Commission (COGEF) was formed which included the Ministry of Economy, IDB, state representatives, and their federal revenue service. This was a means for consensus and unity to allow easier transition regarding the e-invoicing process.
Australia	Taxation systems have been digitized for taxpayer ease	Progressing – Less reliance on taxpayer-inputted data for streamlined reporting	Progressing – Australian payroll system has been automated for ease of use	Progressing – Automatic flagging of unusual reporting assists compliance	Progressing – Taxpayers have come to accept digital tax services	Progressing – Corporate benchmarks improve compliance records
Singapore	National digital identities have been developed for individuals (*SingPass*) and businesses (*CorpPass*).	Progressing – Government agency assists taxpayers through websites, webchats, virtual assistants, and call centers. Services such as auto-filling of tax returns is also available.	Leading – Taxpayer data and other government services are easily accessible through their *SingPass* or *CorpPass* portals.	Leading – Through the Inland Revenue Integrated System, simple tax returns can be assessed automatically, creating a more efficient tax filing process for individuals and corporations.	Leading – Taxpayers and staff were led and trained by the nation's leaders in adopting new tax processes. With the digitalization of tax services, employees have been reallocated to complex tasks from administrative related work.	Leading – The federal government has piloted the tax digitalization projects, calling for more structured and digitalized processes.

A recent report published by the OECD stated that many of the elements of *Tax Administration 3.0* are on the aspirational end of the digital maturity spectrum (OECD 2022). Another critical aspect is that tax administrations operate in varied environments; therefore, the way in which they each administer their taxation system differs in respect to their policy and legislative environment, as well as their administrative practice and culture. As such, a standard tax administration approach across countries may neither be practical nor desirable (OECD 2020). Table 1 provides a summary of each of the building blocks of *Tax Administration 3.0* with the leading country for each building block.

Russia

Country Overview

With a population of over 144 million people as of 2020, the Russian Federation is one of the largest countries in the world. Its economy is enmeshed in a global system of exchange where it engages in both importing and exporting with numerous countries worldwide (The World Bank Group, 2022). Adapting to the evolving digital economy, Russia has noted its plans to expand digitally to uphold the needs and desires of its population in addition to the countries with which it trades.

The Federal Tax Service of Russia is the country's primary agency for tax reporting at the federal, regional, and municipal level. Its mandate includes working with individuals and businesses to facilitate their financial operations and enhance tax services. As of February 2022, the tax authority enabled the use of electronic filing, known as e-filing, for large taxpayers with the required software in addition to the implementation of further tax monitoring (Federal Tax Service of Russia, 2022).

Tax Monitoring & Electronic Filing (E-Filing) in Russia

Despite many of the current issues the country faces, Russia has proved to be a leader in the digitalization of tax administration through its implementation of tax monitoring techniques. Rather than creating a new idea to stretch across the Russia's full tax system, tax monitoring is an optional system that taxpayers may use in order to increase their compliance with tax authorities, thereby reducing tax fraud (OECD, 2020). The main idea of the system is to grant the Federal Tax Service of Russia access to taxpayers' reporting systems using application programming interfaces (APIs) to ensure secure digital tax reporting (OECD, 2020). The system focuses on allowing taxpayers to voluntarily digitally report taxes by providing the Federal Tax Service of Russia with the ability to monitor daily transactions to ensure quality and accuracy of data provided to the government (OECD, 2020). Based on findings from the OECD (OECD; 2020), voluntary participation in the system will result in a limited amount of source documents to be reviewed during a tax audit, thus reducing the time necessary for the audit, increasing turnaround of conflict resolution cases, and mitigating tax problems that could arise in future transactions. This would increase trust between taxpayers and tax authorities, reduce costs associated with tax reporting, and improve the reputation of the corporation through transparently reporting transactions that can be reviewed by the Federal Tax Service of Russia and other tax authorities (OECD, 2020).

Country Achievements – Tax Monitoring and Electronic Filing (E-filing)

While tax monitoring programs have been introduced in many countries, Russia was one of the first to implement them in 2015. There are many positives of implementing tax monitoring systems, including achieving reliable internal tax controls to reduce the amount of requested documents during an audit from the Federal Tax Service of Russia, should the agency have concerns (Lemetyuynen & Sergeeva, 2018). Tax monitoring also allows tax authorities to review a company's data in real, or near real, time, which in turn eliminates the need for formal audits and reduces or eliminates potential tax-related fines (Lemetyuynen & Sergeeva, 2018). It also allows companies to spend less on tax compliance, since the required

documentation is online for the tax authorities to access themselves. Increased tax compliance through tax monitoring contributes to the improvement of a company's reputation, as a positive working relationship between companies and tax authorities lowers the potential for certain risks associated with taxes (Lemetyuynen & Sergeeva, 2018).

There are several advantages to electronic filing for tax purposes. First, having the ability to complete filings electronically, such as by mobile phone or using the Internet on a computer, drastically reduces the amount of time required to submit transactions. According to the Federal Tax Service of Russia (2022), any transaction may be sent from a taxpayer office to the tax authorities at near real time and thus does not require a hard copy. As a result, the number of errors present during reporting is reduced since the software that is currently limited to specific taxpayers identifies tax and accounting errors to ensure compliance with the relevant standards to reduce human error (Federal Tax Service of Russia, 2022). The software also ensures confidentiality through enhanced security measures when filing online, including the use of encryption on data for added privacy measures (Federal Tax Service of Russia, 2022). Finally, human error is further reduced by software's ability to automatically check all system inputs, allowing for increased efficiency associated with increased accuracy (Federal Tax Service of Russia, 2022).

Next Steps

According to the OECD (2020), with new challenges associated with the world's increasingly digital economy come new tools required to support the tax system during this evolution. Going forward, some of the innovative technology to be implemented by the Federal Tax Service of Russia include the following (OECD, 2020): Digital identity (DI); Block chain; Cloud technologies; Big Data; Artificial Intelligence (AI); Robotic Process Automation (RPA); and the Internet of Things (IoT).

At the moment, digital identity appears to be the priority of the Russian Federation over the next few years, which involves using cryptocurrency and other aspects of crypto to enhance the security of system authentication, improving legal frameworks and electronic signatures, and enhancing information technology (IT) systems (OECD, 2020). Through these measures, Russia aims to build trust between taxpayers and tax authorities to encourage voluntary compliance with taxation policies. As of February 2022, the Federal Tax Service of Russia has made certain taxpayers eligible to e-file directly to the tax authorities such that they obtain the necessary software that has not been released to the public to date (Federal Tax Service of Russia, 2022). With the most recent introduction of its e-filing system, the country is well situated to implement a digital identity program with the aid of artificial intelligence (AI) and the Internet of Things (IoT).

Observations – Tax Administration 3.0

Overall, it is evident that Russia is a leader in tax administration through the implementation of e-filing for tax purposes and tax monitoring to enhance cooperative compliance. Though under harsh economic sanctions at the moment stemming from its invasion of Ukraine, Russia would generally be considered a leader in terms of Tax Administration 3.0's sixth building block involving "Governance Frameworks," given that its tax administration is governed by politics, society, and technological factors (OECD, 2020). In addition, the governance provided by Russia's tax authorities includes the goal of obtaining high compliance regarding taxes whilst minimizing tax fraud using secure, accessible data (OECD, 2020). This area of focus allows taxpayers to be reassured when it comes to reporting taxes, which enforces transparency through its compliance, touching on the "Digital Identity," "Tax Rules," and "Taxpayer Touchpoints" building blocks of *Tax Administration 3.0* (OECD, 2020). Through the enhanced privacy and security of tax monitoring and e-filing within the country the "Data Management" building block also ties to the possibility of expansion to "New Skill Sets" (OECD, 2020). By introducing tax monitoring and e-filing systems to comply with *Tax Administration 3.0*, the Russian Federation is well on its way to becoming

a leader in tax administration, a status it can further solidify by implementing cloud technologies and digital identity (DI) with the use of AI.

<u>Kenya</u>

Country Overview – Digitalization and M-PESA

Since 2007, Kenya has distinguished itself among sub-Saharan African countries with regards to its digital economy, specifically in mobile banking. In 2007, Safaricom, the country's dominant mobile network provider, announced the release of a new program to assist individuals in transferring money using their own mobile devices, known as M-PESA (Mbele, 2016). By 2013, Safaricom had noticed a drastic increase in the usage of M-PESA that the Kenya Revenue Authority (KRA) broadened the capacity of the program to allow taxpayers to make online tax payments from any mobile device within the country (OECD, 2020).

Challenges Faced by Kenya

Prior to 2013, taxpayers were forced to go to their bank or physically attend a meeting at a KRA office to make payments relating to their annual taxes (KRA, 2019). This was problematic, as there was a low level of service delivery to taxpayers, leading to low customer satisfaction and compliance, which in turn increased the risk of fraud.

The primary purpose of the expansion of M-PESA to include the ability to pay taxes through mobile devices was to target individuals without bank accounts, indicating that the technical aspect required adjustments to satisfy the demands of these specific customers (IFC, n.d.) As a result, Safaricom and its parent company, Vodafone Group, were faced with the issue of sustainability, since most of the platforms available for purchase during the implementation phase of M-PESA were created for advanced economies. The company therefore decided to create its own service despite the cost and additional time required (IFC, n.d.). Despite the initial expenses, designing its own platform was the best idea, since the platform they arrived at featured a special layout that enabled the platform to target specific, less well-off customers. This was a big factor in the success of M-PESA in collecting taxes and tax information (IFC, n.d.)

Another significant challenge the country faced in implementing M-PESA included obtaining trust from its taxpayers regarding the use and location of their money. The International Finance Corporation (n.d.) outlined those agents within Kenya that were servicing M-PESA and were regularly accused of committing fraud because of absent or postponed taxreceipts. Overall, just over 4% of individuals have claimed to have had their funds transferred incorrectly (IFC, n.d.). Today, M-PESA is widely popular and experiences very few challenges related to trust, which were common in tax administration prior to the platform's implementation.

Achievements – M-PESA

Kenya has achieved numerous tax administration successes since Safaricom implemented the M-PESA platform. Prior to the introduction of M-PESA, the country was prepared for the introduction of modern technology, given that most of the population 15 years of age and older had access to cell phones and other mobile technology (IFC, n.d.). As a result, much of the population was familiar with the use of mobile technology, including how to send text messages and make phone calls (IFC, n.d.). This allowed for a smooth transition for most of the population with regards to the introduction of the M-PESA platform since text messaging was required in order to transfer funds.

Upon development by Vodafone Group, M-PESA was known as the first service for transferring money online in Kenya (IFC, n.d.). According to the International Finance Corporation (n.d.), with an increasing

desire to reduce dependency on cash to enhance security whilst decreasing the time it takes customer money to be transferred, a high demand for new tax services existed. Previously, due to a relative lack of vehicles in Kenya, individuals were required to trust family members or strangers with their money for it to be transferred in certain villages (IFC, n.d.). With no significant market competitors at the time, Safaricom was able to seize the digital money transfer and tax payment market

How Did Kenya Do It?

Before the development of the M-PESA platform, a strong initial emphasis was placed on understanding the needs and desires of the people of Kenya rather than marketing the platform (IFC, n.d.). Safaricom identified the platform's biggest strength as the convenience through which people could send money through a mobile device, thus limiting the need to carry cash on hand.

An M-PESA pilot program began in October of 2005 that allowed for the opening of multiple stores and included over 500 participants within 3 domestic locations of Kenya, the primary purpose of which was to gain trust between agents and customers for completing transactions, specifically when it came to withdrawing funds since the instructions were sent via text message.

Training proved to be a significant limitation on Safaricom's decision to launch M-PESA in the initial stages of the pilot program since agents were required to understand virtually all areas of the M-PESA platform to help customers with questions or technical concerns (IFC, n.d.). To counter this, numerous resources were provided weekly in addition to constant training on the operation of the platform to uphold a strong understanding of the system to ensure complete satisfaction for customers. As a result, trust between customers and agents drastically increased which led to millions of Kenya shillings transferred using the new platform, encouraging Vodafone Group and Safaricom to launch the platform sooner rather than later.

Next Steps

After the success of M-PESA, as of August 1, 2021, the Kenya Revenue Authority adopted electronic tax invoices (KRA, 2021). All taxpayers that are registered for value-added taxes (VAT) are required to comply with these requirements within twelve months of the adoption date (KRA, 2021). The new system, known as the Tax Invoice Management System (TIMS), is said to be an improved version of the Electronic Tax Register (ETR) system that was originally implemented in 2005, which will make the management of electronic tax invoices easier to deal with, primarily through delivery to the KRA in real-time (KRA, 2021). In addition, the Kenya Revenue Authority (2021) emphasizes that complying with the new system will allow for pre-filled VAT returns, which will simplify the process of filing and ensure a quicker movement of refunds relating to VAT for customers on top of automatically activating the Electronic Tax Register. The success of the TIMS system will be illustrated through increased VAT compliance, measured in part through reduced fraud and a general rise in tax revenue.

Though AI uptake remains limited in Kenya's digital economy, Bayhack (2022) emphasizes the potential for mobile banking in Kenya to continue to advance contactless payments, registration using online portals, and social aspects relating to tax administration. Allen and Okpali (2022) suggest that Africa has already started thinking about AI through technologies such as surveillance and drones, and in analytic platforms like the EarthRanger conservation program used in Kenya. In addition, Strathmore University (2019) in Kenya indicates that AI may be tailored to services surrounding health, transportation, education, public services, food development, and individuals with disabilities in the future. With regards to healthcare, an AI solution such as the Sophie Bot, created by a start-up company in Kenya that allows for individuals to discuss questions and concerns regarding sexual and reproductive health with a chatbot free of charge, is crucial in maintaining a strong connection between individuals and government organizations (Strathmore

University, 2019). Although this service is used for healthcare, it may one day be expanded to tax administration within Kenya, to assist users of M-PESA and other competing tax payment services by simplifying the tax reporting process to enhance tax compliance. Given that transactions completed using M-PESA increased by 45% from the first quarter of the COVID-19 pandemic lockdowns in comparison to the previous year, there is a high probability of the implementation of AI into the platform, or emerging mobile tax platforms, in the near future (Seal, 2021).

Observations – Tax Administration 3.0

Overall, Kenya is considered advanced with regards to automation of tax services given its M-PESA platform and the forthcoming implementation of electronic tax invoices. To date, the country acquires $1.1 million USD monthly in tax revenues from mobile banking alone (OECD, 2020). Between fiscal years 2019 and 2020, the OECD (2020) noted a 95% increase in mobile tax payments, which is expected to continue to rise in the future. Also according to the OECD (2020), the M-PESA platform controls 98% of Kenya's digital money transfer market: it had over 58 million subscribers in 2019 despite the country's population being approximately 46 million people.

The popularity of the M-PESA platform for transferring money and paying taxes shows Keyna to be a leader in terms of implementing tenets of *Tax Administration 3.0*. Specifically, the country ranks high in the OECD's "Taxpayer Touchpoints" building block, since M-PESA offers real-time support while providing accurate analytical data in addition to allowing for integration to assist with taxpayer needs (OECD, 2020). Moreover, the platform allows for numerous services to be performed, including e-payments and e-transfers, and the program assists those who are not used to the option of online payment and transfers; this feature conforms with the accessibility strategy outlined under "Taxpayer Touchpoints" (OECD, 2020). In addition to this, Kenya's M-PESA platform revolves around the use of access controls and authorization, tax filing and payments, the Tax Authority of Kenya on top of its major banks, and numerous software developers that enhance the technology. As a result, Kenya also finds itself leading under the "Digital Identity," "Data Management," "New Skill Sets," and "Governance Frameworks" building blocks outlined under OECD *Tax Administration 3.0*. By introducing the electronic tax invoice system in 2021, Kenya continues to evolve regarding tax automation and will continue to do so through incorporating AI in its tax administration in the future.

Brazil

Country Overview – Digitalization and The Brazilian Tax Management Support Program   (PROFISCO)

In the past 14 years, Brazil has made leaps regarding the Digitalization of invoices. As a nation, it has shifted from traditional methods of invoicing towards a fully electronic process, becoming a market leader in e-invoicing in South America (Koch, 2021). The process of investing in e-invoicing began in 2008 because of Brazil's need to increase funds to provide better public services without burdening citizens with new taxes (Aragaki, n.d.). Additionally, companies were finding it costly to pay their taxes, and the Brazilian government was facing difficulty ensuring tax compliance (Aragaki, n.d.). Brazil started the process of digitizing its invoicing with the technical advice and financing of the Inter-American Development Bank (IDB), leading to the creation of the Brazilian Tax Revenue Management and Integration Support Program (PROFISCO). As stated in the loan proposal by the IDB, the PROFISCO program's purpose was to streamline and allow transparency regarding fiscal management to boost the state's revenue, strengthen oversight of public spending, and provide better public services.

Challenges Faced by Brazil

Brazil had to overcome multiple challenges to transition to Digitalization including digital invoicing. Their major obstacle was obtaining consensus among the central government and 27 federate entities regarding the adoption of a single billing model (Aragaki, n.d.). To address this challenge, the Fiscal Management Commission (COGEF) was established. This body included the Ministry of Economy, the IDB, state representatives, and the federal revenue service (Aragaki, n.d.). Digitalization. Furthermore, Brazilian policymakers recognized that many organizations and employees would lack technological proficiency to properly implement PROFISCO. To overcome this challenge, IDB distributed approximately US $586.2 million to the Federal District and 22 states (Aragaki, n.d.) for workforce training on how to use the program and to help them upgrade their technology to support it.

Achievements - PROFISCO

PROFISCO played a key role in Brazil's digital transformation as it enabled the government to automize its administrative legislation which also led to all tax dispute procedures being executed electronically (Azevedo et al., 2021). Alongside e-invoicing, PROFISCO also enabled corporations to digitize their accounting books (Aragaki, n.d.). As a result of implementing PROFISCO, the Brazilian government can now access a corporation's books and confirm that the tax paid matches the invoicing throughout the tax period (Aragaki, n.d.). The implementation of PROFISCO has resulted in the simplification of administrative processes, a rise in the collection of tax, and lower tax compliance costs for both companies and government (Aragaki, n.d.).

How Did Brazil Do It?

PROFISCO had four major elements including "integrated strategic management, tax administration and litigation, financial and property management and internal control, and management of strategic resources" (IADB, n.d.). Integrated strategic management involved upgrading current practices and technology to aid strategic management alongside gathering data to support decision-making. Tax administration and litigation focused on increasing Brazil's collection of revenue by improving the tax administration's performance. Financial and property management and internal control involved strengthening the control of public spending by enhancing economic management performance. The management of strategic resources focused on developing and enhancing support methods along with tools and systems to improve "institutional performance and interaction with society" (IADB, n.d.).

Next Steps – PROFISCO II

Brazil is in the process of implementing PROFISCO 2. Its objective is to provide the State of Amapá with financial sustainability (IADB, n.d.).

Observations – Tax Administration 3.0

Based on our research, it is evident that Brazil is a leader in e-invoicing. Despite the lack of technology and trained workforce, Brazil has built a digitized system that allows transparency regarding tax compliance and creates ease of use for its government, businesses, and citizens. In this sense, Brazil is taking concrete steps towards acheiving *Tax Administration 3.0* by implementing the building blocks of "Taxpayer Touchpoints" as well as "Data Management and Standards." While Brazil has had to overcome challenges by updating its technology and investing in its workforce, it has in many ways outpaced more developed countries in digitizing tax administration. To developed countries, Brazil provides a model for how to overcome the obstacle of obtaining consensus regarding one billing model: establish a centralized committee with wide representation to bring multiple perspectives to the table and enhance the chances of

cooperation from all parties. Once there is agreement among all parties, the transition towards Digitalization will be much smoother for developed countries in comparison to developing countries considering the greater amount of resources available.

Australia

Country Overview

Australia is among the more digitally advanced nations of those explored in this paper. It has adopted key policies and technologies for every pillar of the OECD *Tax Administration 3.0*. These include a superb Single-Touch Payer (STP) payroll system, a well-developed benchmarking system for corporate compliance, and the automation of many compliance activities. While there are still significant hurdles to clear before Australia reaches compliance with all *Tax Administration 3.0* guidelines, Australia should be looked at as one of the early adopters of the suggestions put forward by the OECD.

Achievements

Australia's taxation system has evolved in recent years to increasingly rely on big data. The government has shown a willingness to legislate policies that favor the integration of the OECD's recommendations on Digitalization, and it is this willingness that has led to its Single Touch Payroll system (Australian Tax Office, 2021). With the stated goal of reducing the burden on employers by integrating most taxation information that was previously done by employers into the payroll tax software, the new system has digitized all relevant data, and thereby reduced the risk of accidental non-compliance or compliance mistakes significantly.

With the aim of reducing non-compliance, Australia has also developed a system to help its 1.7 million taxpaying business check their reporting against benchmarks set out by the government (Australian Tax Office, 2020). The system works via an application wherein taxpayers can enter their reporting information and check to confirm that they fall within the benchmarks. If they do not, they are encouraged to confirm so that their figures are accurate before submitting, as being outside the benchmarks makes their return significantly more likely to be flagged for review by the system.

How Did Australia Do It?

Australia, like most developed countries, has extensive existing taxation infrastructure, such as legacy structures and codes, that risk impeding digital progress (Hirshhorn, 2021). These structures and codes make sweeping overhauls to the tax systems difficulty. Australia has therefore gradually begun moving away from a taxpayer reliant system in ways that are not likely to cause significant disruption towards automated processes that leave less room for human error (Hirschhorn, 2021). Australia has begun to think of user data in an abstract sense, in that the higher quality of the data inputs, the higher the likelihood of compliance to the tax code. It has separated data as an idea into six levels, with Level 1 being the weakest data, and Level 6 being data so precise and accurate that the system can use it with little to no input from the filer. Current systems, such as that found in Canada's existing tax infrastructure, are heavy on 'Level 1', or weak taxpayer-provided datasets that are difficult to verify and do not help reduce non-compliance. Recent developments in these sorts of systems involve some implementation of, at best, Level 4 data, such as Canada's Auto Fill My Return (AFR) (Government of Canada, 2019). While this system is a good start, its current focus is on individual taxpayers with significantly less development on the corporate side The ideal system makes use of the highest quality datasets to improve outputs (Hirshhorn, 2021), which Australia has been working to do. The Australian legislature has recognized what the OECD has recommended for over a half-decade: that digitizing the taxation system is crucial to improving the efficiency of tax delivery in the internet era (OECD, 2015).

Governments must recognize that to meet the OECD's *Tax Administration 3.0* standard, some things are going to have to change from both a legislative and a systems perspective (Corydon et al., 2021). Per Corydon et al. (2021), to meet the high standard set out for a digitized nation, four elements must be present: services, processes, decisions, and data sharing all must be addressed to go fully digital. Services and processes go hand in hand, with automatic data input processing simplifying the process of completing the tax return itself. Changing processes means that services ought to be changing, which often requires both information technology overhauls and government support, neither of which is easy to accomplish without a concerted effort. Data sharing is likewise difficult to accomplish with multiple agencies involved in various elements of financial and taxation matters (in most developed countries, at least). But it is important, as interagency data sharing reduces inefficiencies at a fundamental level (OECD, 2015).

Next Steps

Australia has committed to furthering the Single Touch system, with plans to expand the STP programme to other areas of tax by end of 2022 (Australian Tax Office, 2020). The benchmarking process that Australia has laid out is sure to be refined and fine-tuned to maximize tax compliance by Australian corporations as the Australian Tax Office continues to try to implement the OECD guidelines that it has chosen to focus on. Expectations are that the overhauls to the tax system as noted by Mr. Hirshhorn (2021) are likely to continue, with further Digitalization and automation of systems, services, and software on the horizon.

Observations – Tax Administration 3.0

Australia's focus on reducing the burden on taxpaying corporations, and their visionary benchmarking system, are elements of taxation that are likely to be mimicked by many other OECD countries in the coming years as more nations aim to comply with the Tax Administration *3.0* guidelines. Australia is one of the countries that has most effectively implemented the building blocks of both "Data Management" and "Taxpayer Touchpoints" in particular. The expectation is that the taxation authorities in Australia intend to further optimize the system with less taxpayer input from corporate entities themselves, to create a digital identity for enterprises.

Singapore

Country Overview – Inland Revenue Authority of Singapore (IRAS)

A leader in the global Digital Revolution, Singapore aims to leverage Digitalization and technology in its economy and government to become a high-tech-driven nation, what its government refers to as a Smart Nation (Smart Nation, 2022). The Singapore Digital Government pillar seeks to serve its citizens, businesses, and public officers by developing efficient, resilient, and protected digital services based on citizens and business needs. By providing reliable and convenient digital systems, Singapore aims to enable its citizens to utilize digital services confidently. In 2020, 94% of the services offered by the government of Singapore could be accessed and completed digitally. This percentage is expected to rise to 100% by 2023 (Smart Nation, 2022).

The Inland Revenue Authority of Singapore (IRAS) is a government agency created to address high outstanding amounts of tax revenue each year, high staff turnover, and overall public dissatisfaction (Bird & Oldman, 2000). The establishment of the IRAS has yielded countless benefits to the Government of Singapore, including lower tax arrears, improved audit functions, up-to-date property evaluations, lower staff turnover, and a notable increase in public satisfaction with tax administration. All these goals were achieved without increasing the size of the government's labour force (Bird & Oldman, 2000). A survey in 2000 revealed the satisfaction rate with IRAS services for individual taxpayers and corporate taxpayers was 95% and 83%, respectively (Bird & Oldman, 2000).

The IRAS developed an integrated tax database system, the Inland Revenue Integrated System (IRIS), to convert hard copy documents into a virtual imaging system. This digital imaging system enables tax documents to be accessed immediately through network terminals (Teo & Wong, 2005; Bird & Oldman, 2000). As of 2005, this has allowed for the automatic assessment of around 80% of simple returns (Teo & Wong, 2005). The efficient assessment process provides taxpayers with timely confirmation of their tax payments, and wither what they continue to owe or can expect as a refund. It has enabled the IRAS to send assessments and collect tax revenue faster than before. The IRIS, therefore, can serve as a useful model for implementing other digital government initiatives (Teo & Wong, 2005).

In addition to IRIS, Singapore has implemented several systems related to the Digitalization of tax administration, including e-filing, e-payments, and *SingPass* and *CorpPass* for national digital identities.

Challenges Faced by Singapore

One of the most significant challenges faced by the IRAS was convincing taxpayers to e-file their returns. Since a faster assessment meant a faster deadline to pay taxes, there was low motivation from taxpayers to e-file (Teo & Wong, 2005). Security was another major concern for the IRAS, given the large volume of transactions and sensitive nature of the data (Teo & Wong, 2005). How Singapore mitigated both these challenges is discussed in a subsequent section.

Achievements - E-Filing

E-filing is one of the 1,600 digital public services provided by the IRAS. With an e-filing system, taxpayers can file their income tax returns using the internet or a telephone (Teo & Wong, 2005). By integrating all systems at the government level, employers can supply taxpayer information directly to the IRAS (Bird & Oldman, 2000). In addition, IRAS has also integrated data with the Central Depository (which pays out dividends from Singapore's public companies), allowing for access to dividend income for taxpayers from Singapore's publicly listed companies (Bird & Oldman, 2000). The integration with employers and the Central Depository has allowed the IRAS to automate the reporting of employment and dividend income. The IRAS can also obtain tax data for charitable donations directly from charities (Teo & Wong, 2005). If these are the main sources of income and deductions for taxpayers, the taxpayer can file their returns in just twelve clicks. This 12-click feature, introduced in 2004 by the IRAS, enables taxpayers to file, print, and save any documents from the IRAS relating to their tax return with minimal effort (Teo & Wong, 2005). The feature is convenient for taxpayers as it has low levels of data entry and allows for mobile e-filing and re-filing if errors are made (Basu, 2002, 2003). Through continuous integration with government systems, tax returns from 98% of individuals are e-filed (OECD, 2020). This has not only increased convenience and taxpayer satisfaction, but it has also improved tax compliance, as data in tax returns are automatically entered from the source (Bird & Oldman, 2000).

Taxpayers can also file their returns through IRAS' phone-filling systems (Bird & Oldman, 2000). This capacity addresses accessibility issues. IRIS also has an automated phone line that is available 24-hours and enables taxpayers to obtain general information on taxes and specific information for themselves through their personal identification number (Teo & Wong, 2005). The challenge with using a telephone for e-filing is that due to its nature, the system can cause discomfort for taxpayers who want visual confirmation of their transactions (Teo & Wong, 2005).

When it began to implement e-filing, the IRAS had two main objectives: to achieve operational effectiveness and to improve services provided to customers (Teo & Wong, 2005). Manual filing and assessment of tax returns required both more staff labour and delayed tax revenue collection. With e-filing, the IRAS has been able to achieve operational effectiveness with lower transcribing errors and higher accuracy as taxpayer information is automatically sent from employers to the IRAS (Teo & Wong, 2005).

Manual filing has an error rate of 18% compared to the e-filing error rate of 1% (Teo & Wong, 2005). E-filing also reduces the burden for taxpayers as their employment income details are automatically inputted. As the key users, IRAS places great emphasis on the quality of services offered to the nation's citizens and taxpayers (Teo & Wong, 2005). Reflecting this commitment, the IRAS and hosted annual focus group sessions with taxpayers to obtain user feedback, and incorporated this feedback when revamping their tax administration process (Teo & Wong, 2005).

The cost to develop and maintain Singapore's e-filing system for three years was US$ 6.84 million (Teo & Wong, 2005). Although this is a high figure, with less labour required, less time screening tax returns, less time spent on data entry, and overall less time and effort spent on records management, mailing, and posting, the IRAS has seen a substantial cost saving since it moved to e-filing (Teo & Wong, 2005). Indeed, the implementation of e-filing has allowed Singapore to save US$ 4.93 for each tax form. As more taxpayers utilize e-filing, maintenance costs will further decrease and the e-filing systems will contribute to additional cost savings (Teo & Wong, 2005).

Achievements - Digital Identities

To enable citizens to perform digital transactions with the Government of Singapore and organizations in the private sector, Singapore developed national digital identities for individuals (*SingPass*) and for corporations (*CorpPass*) (OECD, n.d.). For convenience, SingPass can be accessed via mobile devices through biometric authentication, creating a quick and secure login experience (OECD, n.d.) Through the mobile application or website, SingPass users can access services offered by the government such as child support forms and paying property tax, or access services from private sector companies, such as purchasing insurance and filing claims (OECD, n.d.).

Importantly, the Myinfo portal in SingPass and CorpPass can share personal or corporate data with public or private agencies when requested (OECD, n.d.). For instance, individuals or corporations can apply for a credit card or a line of credit directly through their SingPass/CorpPass profile using the Myinfo feature, as all relevant data is already securely stored in the system. SingPass/CorpPass are also conveniently integrated with the IRAS. Citizens can access their *myTaxPortal* portal directly through their SingPass/CorpPass account to review tax returns and make tax payments (OECD, n.d.).

How Did Singapore Do It?

One of the key factors behind Singapore's success has been dedicated leadership and support for digital innovation by political leaders (Bird & Oldman, 2000; Teo & Wong, 2005). Singapore was a leader in the global digital revolution and trained staff to ensure they can carry out their responsibilities (Bird & Oldman, 2000; Teo & Wong, 2005). Rather than making incremental technological improvements to its existing tax administration systems, Singapore revamped all components of their systems with new, re-engineered technology (Bird & Oldman, 2000).

Singapore outsourced the development of their e-filing platform and database server hosting and management to the National Computer System (NCS) (Teo & Wong, 2005). In addition to web servers, the IRAS also maintains additional copies of taxpayer data at an independent registrar, CISCO (Teo & Wong, 2005). Taxpayer authentication is required for entry into the system and the data is encrypted from end to end. To provide additional support, the IRAS has hosted user support hotlines with employees from all departments on hand to help customers during tax filing months (Teo & Wong, 2005).

The new digitalized systems and services were thoroughly planned and released in stages to taxpayers. Each taxpayer service was carefully, and continuously monitored, and extensive feedback was taken from users on an ongoing basis (Bird & Oldman, 2000). The next question is how Singapore got its citizens on board

with e-filing. The first step to change this was to educate taxpayers and employers. Singapore did this through the distribution of brochures outlining all details and steps relating to e-filing, answering taxpayer questions through helplines, allowing taxpayers to experience what e-filing is like by establishing demonstration booths, and hiring volunteers to answer taxpayer questions at community clubs (Teo & Wong, 2005). The IRAS also utilized television and magazines to educate taxpayers on the benefits of and provide tips on e-filing. To ensure that taxpayers are not held back from e-filing due to lack of access to technology, the IRAS also supplied community clubs with computers (Teo & Wong, 2005). Lastly, to incentivize e-filing, the IRAS developed lucky draws for taxpayers that used and/or assisted others with e-filing their returns (Teo & Wong, 2005). These steps were crucial to the success of the e-filing systems as educating taxpayers and providing them with the required support and assurance ensured they could not use only the system but also felt comfortable using it. A significant reason for Singapore's success in piloting such drastic changes to their tax administration systems was the trust they built and developed with their citizens (Bird & Oldman, 2000).

Bird and Oldman (2000) suggest that although Singapore was able to completely restructure its systems, other nations may first have to fix their current tax structures before they can implement modern technology. Teo and Wong (2005) also discuss that Singapore's e-filing experience would be more applicable to nations with a well-established IT infrastructure and a citizenry with high IT literacy. Therefore, before complex information technology can be incorporated into their systems, countries should first establish tax identification numbers for their taxpayers to make the most use of the technology (Bird & Oldman, 2000).

Observations – Tax Administration 3.0

Nations can learn from how Singapore educated its citizens, obtained their trust, and got them on board with digitalization, specifically e-filing. Singapore has effectively implemented several systems enabling it to become a Smart Nation. Through tax administration digitalization initiatives taken at the government level, Singapore has met the "Governance Frameworks" building block outlined in *Tax Administration 3.0*. Singapore's SingPass and CorpPass systems enable taxpayers to access key government and private sector services through one unique identification number, enabling Singapore to meet the "Digital Identity" framework in *Tax Administration 3.0*. Singapore also offers various "Taxpayer Touchpoints" as discussed in *Tax Administration 3.0*, such as support offered through the integrated IRAS website, webchats, call centres, and a virtual assistant on the SingPass and CorpPass websites.

<u>Canada's Performance</u>

Canada has developed and implemented tax systems that reflect the Digitalization of the modern world, such as the Autofill function in Canadian tax software and electronic filing for many returns. It has divested from paper in most cases, with a few notable outliers such as the delivery of paper tax slips. In theses ways, Canada has met the criterion for *Tax Administration 2.0*. The country struggles, however, with the existing infrastructure of the current tax code, which is the case for many developed countries, and Canada is no exception. Indeed, developing nations are more likely to successfully implement *Tax Administration 3.0* policies in accordance with the OECD guidelines precisely because they can implement 3.0 systems from scratch rather than having to adapt existing systems (Corydon et al., 2021).

Canada faces similar challenges to many developed nations with regards to its legacy system, wherein compliance is not built into existing taxation. The current Canadian system relies heavily on voluntary compliance, whereas the ideal *Tax Administration 3.0* system relies on benchmarks, high-quality data, and simplified or automatic compliance, with few chances for corporate or personal taxpayers to be non-compliant (Hirshhorn, 2021). In fact, though Canada's existing system does have some risk assessment elements (Government of Canada, 2019), it still relies heavily on post-assessment audits. A key aspect of

Tax Administration 3.0, by contrast, is that the system automatically detects non-compliance issues before filing and prompts the taxpayer to correct issues at the pre-filing stage.

Comparative View of the Leading Countries

Countries such as Russia, Kenya, Brazil, Australia, and Singapore continue to evolve and innovate in the area of digital tax administration through investing in tax monitoring, e-filing, e-invoicing, e-payments, and digital identity. Our research shows that the most common *Tax Administration 3.0* building block that each of the countries above have achieved is "Taxpayer Touchpoints" (see Table 1). This goes to show that to successfully digitalize tax administration practices, the experience of key users of the system, the taxpayers, should be the main focus. Educating taxpayers on tax policies and practices and ensuring they have continuous support throughout tax administration processes is at the core of achieving *Tax Administration 3.0.*

A further common theme identified through looking at the above country profiles is the importance of trust between the government and its taxpayers. Russia's optional tax monitoring system has increased trust between taxpayers and the tax authorities as taxpayer data, including daily tractions, can now be monitored and verified by the Federal Tax Service of Russia. This permission granted to the tax authority has increased the government's trust in taxpayer data being reported. A similar observation can also be made for other countries that have incorporated automated reporting of taxpayer data into their tax returns. Russian authorities believe that enhancing taxpayer trust will encourage voluntary compliance with their tax policies. On the other hand, obtaining taxpayer trust proved to be a challenge for Kenya in implementing M-PESA. Looking at Singapore, the government's success in revamping its tax administration system and introducing significant changes was met with positive feedback from its citizens, largely due to the relationship of trust the government had built with citizens in this area. The experiences of these nations show that as government agencies introduce changes to their tax administration policies, it is important to ensure a relationship of trust exists with the taxpayers or that there are systems in place to gain their trust as changes are launched.

RISK CONSIDERATIONS AND CHALLENGES

While there are countries such as Russia, Kenya, Brazil, Australia, and Singapore that have digitally transformed their tax administration practices, there are many nations that are lagging, despite the importance and need for tax digitalization. A country in this situation is China. China's strengthening digital economy provides both an opportunity and a challenge regarding tax management (Chun-Xiao, 2021). The exponentially increasing amount of internet users, increasingly profitable Internet of Things industry, and increasingly popular cloud computing industry have highly contributed to China's increasing digital economic national income. However, China's current tax management process has been identified as inefficient and proven to be costly, resulting in large tax losses (Chun-Xiao, 2021).

E-filing and other e-government practices must be implemented at the government level as government bodies are the sole entity with the capability and capacity to bring together private and public sector organizations and government agencies to implement tax digitalization practices (Shao et al., 2015). Transforming into a digital economy has been recognized as a goal by the Chinese government with plans in place for e-government services (Shao et al., 2015; Chun-Xiao, 2021). In China, e-tax filing was first adopted by the city of Guangzhou (Shao et al., 2015). By 2005, e-filing was adopted by further provinces and the process was standardized at the government level. However, despite investments from the Chinese government to progress to e-government, the nation has faced overwhelmingly low levels of participation from its citizens (Shao et al., 2015).

Shao et al. (2015) conducted a study with 96 enterprises in China to test 9 environmental, technological, and organizational factors to determine which impact business adoption of e-filing practices. Their research results revealed that the factor which contributed most significantly to a businesses' intention to adopt e-filing practices is the level of government oversight, this includes the government's attitude towards e-filing adoption and incentives offered by the government to accelerate adoption by businesses (Shao et al., 2015). A second factor that was found to impact tax e-filing adoption is the level of complexity of the system. Adopting a new digitalized practice for the first time can be intimidating. However, even if the new system is complex, if it is automating the existing tax filing process, there is an incentive to adopt it as it is lowering the business administrative costs related to tax filing and increasing the efficiency of the process (Shao et al., 2015). Executive support was the third factor that was found to significantly impact e-filing adoption, but in this case, it was a strong negative relationship. Executive attitudes towards e-filing can severely impact the business's intention, especially since China has not mandated tax e-filing (Shao et al., 2015). The final factor revealed to significantly affect business intentions to adopt tax e-filing is human resources. A positive correlation was identified as the demand for and supply of individuals specializing in IT has been relatively balanced with China's commitment to IT acceleration. Therefore, business intentions of tax e-filing have been positively affected by more specialized IT personnel (Shao et al., 2015). Lastly, Shao et al. (2015) revealed that business size and type of business organization have a strong negative effect on a business's intention to adopt e-filing practices. Their study revealed that state-owned corporations and larger-sized corporations are less inclined towards e-filing practices due to their reservations about complex technology being adopted into their already complex business systems.

A PATH FORWARD

Based on the above case studies of countries that have successfully implemented the building blocks of *Tax Administration 3.0*, countries that are keen on digitizing their tax administration processes should recognize that unless systems are adopted and processes put in place at the national level, change will be slow to occur. That's because businesses that may want to update their internal systems would look to the government for guidance on the direction the country is headed in, with regards to tax administration digitalization, before committing to taking action unilaterally. With a general trend towards digitalization overall, the population of a country at large needs to have the skill sets required to sustain, maintain and advance the digitalized systems underway. On this front, there is a need to advance digital literacy education as part of school curriculums. Higher education institutions can also add specific courses that will aid in developing skill sets similar to the ones required to achieve the standards under Tax Administration 3.0

For companies and businesses looking to move forward on the path of digitalization, an important step would involve developing human resource plans that provide sufficient training to staff and efficiently allocate scarce resources, providing support at the executive level to employees in communicating the high-level IT strategy and internal resource management, and reducing the complexity of modern technologies being adopted (Shao et al., 2015). With government oversight being identified as the most significant factor affecting business intention to adopt e-filing, governments should ensure there is sufficient coordination at all levels of government to oversee the regulations and implementation of incentives for adoption (Shao et al., 2015). Shao et al. (2015) also discuss the importance of government bodies providing support for businesses, such as offering training and consultation. Lastly, the findings on business size and type of business ownership discussed above also imply that given their complexities, support or type of incentives offered should be uniquely designed for state-owned corporations and larger businesses to encourage higher adoption levels (Shao et al., 2015).

Tax Revenue, GDP, and Digitalization

It has been argued that Digitalization provides a net negative impact on the future of tax, for example in Vito Tanzi's article, *Globalization, tax competition and the future of tax revenue* (as cited in Hanrahan,

2021). Tanzi considered each new advancement in technology, including e-commerce, as a "fiscal termite" that would result in a significant decline in revenues of OECD countries in comparison to GDP (Hanrahan, 2021). As a result of this warning, it is important to review Digitalization measures against tax revenues within all 36 of the OECD countries, specifically since 8 of the top 10 countries for e-commerce sales around the world fall under the OECD.

As the countries profiled in this article illustrate, digitizing tax administration improves the performance of tax authorities. Among other things, e-filing and more organized record keeping has increased taxpayer compliance and improved the efficiency of tax collection. Further, Digitalization is an important aspect of innovation and growth, which is associated with improving the capability to increase revenues in the future for government agencies. It may assist with economic growth, productivity, international trade, and many other economic indicators given that there has been no evidence of tax revenues being affected by "fiscal termites." Indeed, national tax revenues have increased between 1990 and 2018, the period where digital tax administration processes became widespread across OECD countries.

Observations – 2007-2020

Static analysis results completed by Hanrahan (2021) indicate that Gross Domestic Product (GDP) per capita was negatively correlated to tax revenues in addition to the value-added, contributed by agriculture, and the unemployment level including the previous banking crisis. Based on findings from Gnangnon and Brun (as cited in Hanrahan, 2021), countries that reduce their Internet gap would be able to increase tax revenue collected through digital means. In this area, low-income countries stand to benefit the most. Given that Hanrahan observes a negative correlation between GDP and tax revenues, it is possible that Digitalization may actually impede the ability of tax organizations to increase tax revenue/compliance in highly digitized jurisdictions (Hanrahan, 2021). This supports Tanzi's theory of "fiscal termites," indicating that Digitalization is placing pressure on revenues, which in turn could explain the role that policymakers in OECD countries are increasing pressure on solutions to tax issues relating to digitalization (Hanrahan, 2021).

On the other hand, dynamic analysis results from 2007 to 2018 illustrate that digitalization is positively correlated with tax revenues at the 10% level, suggesting that the increase in mobility in recent years has created a positive effect on tax revenues (Hanrahan, 2021).

According to the OECD (2021), tax revenues as a percentage of GDP fell by 0.1 percentage point between 2018 and 2019, from 33.5% to 33.4%, primarily from a decrease in corporate tax revenues offset by an increase in personal tax revenues. On the other hand, tax revenues as a percentage of GDP increased by 0.1 percentage point between 2019 and 2020, from 33.4% to 33.5%, due to GDP decreasing more than nominal tax revenues during the COVID-19 pandemic (OECD, 2021). This means that despite a continuous push for tax administration to become more digitalized, digitalization itself may not be a significant factor in increases or decreases in tax revenues as a percentage of GDP. This data supports the findings of Hanrahan (2021).

In African countries, including Kenya, tax transparency and exchange of information (EOI) standards have been in place since 2009 to assist in reducing tax evasion (Global Forum on Transparency and Exchange of Information for Tax Purposes, 2021). Since then, EOI standards have helped African countries collect over EUR 1.2 billion in revenue from tax, interest, and penalties (Global Forum on Transparency and Exchange of Information for Tax Purposes, 2021). This is a clear indication that the use of EOI standards in the future will provide nations with more tax-related revenue whilst reducing domestic and cross-border tax evasion. In addition, these countries have implemented, or are looking to implement, automatic exchange of information (AEOI) standards to further increase tax revenues without the need to request information from companies (Global Forum on Transparency and Exchange of Information for Tax

Purposes, 2021). As of July 6, 2021, Kenya has agreed to provide the KRA with exchanges of information of various companies automatically commencing September 2022 (Ogutu, 2021). The implementation of this new standard is expected to decrease tax evasion while exponentially increasing tax compliance and tax revenues, illustrating that the Digitalization of tax administration may indirectly lead to changes in tax revenues in relation to GDP (Global Forum on Transparency and Exchange of Information for Tax Purposes, 2021).

<u>Where Canada Stands</u>

Canada's system of taxation has come a long way since the days of paper filing, paper slips, and manual taxation. As a result, *Tax Administration 2.0* standards as laid out by the OECD have been largely met. At present, about 95% of individuals in Canada file their tax returns electronically (Government of Canada 2023). The Canada Revenue Agency's MyAccount system has improved year-over-year, with new features added with every passing taxation cycle. Slips are now recognized by the system and can be automatically pulled from the CRA's database and inputted into most tax software programs. Many returns, such as GST/HST filings, can be done digitally through the NETFILE service.

Despite this, when contrasted with some of the achievements of the countries examined above, Canada has been slow in achieving positive results through digital innovation in tax administration. Canada does not have interagency data sharing as seen in Singapore, nor is filing as simple as in Singapore (try filing Canadian tax returns in twelve clicks or less). Canada lacks the ingenuity of the benchmarking system in Australia, as well as lacks the ability to confirm a business' details online in mere seconds, as can be done in Brazil, which would save both taxpayers and the government money spent on costly compliance auditing. Kenya has fully developed e-invoicing due to the rapid development of its digitized tax administration and payment systems, which is also lacking in Canada.

Even if the will exists, Canada will struggle in certain regards to mimic these achievements of other nations. As noted repeatedly in the *Tax Administration 3.0* guidelines, changing from 2.0 to 3.0 is neither painless nor straightforward. Governments and corporations alike must choose to accept these advances for them to be successful. However, with functional systems in place, convincing leadership to change from a working system to something new, even with the long-run benefits listed above, is an uphill battle. Implementing new systems can cost organizations millions of dollars, as noted in the above research on Singapore. Governments and corporations can also learn from China's experience of resistance from taxpayers and additional factors that must be considered to motivate and support taxpayers to use the digitalized tax services offered by their government.

Based on discussions with industry personnel in Canada, many Canadians companies continue to be tax reactive: they do not want to commit to big digital investments within their organizations until there is more government guidance or regulations introduced. This is consistent with research findings by Shao et al (2015), discussed above, which support that a key factor that contributes most to a businesses' intention to adopt digital practices is the level of oversight, which includes the government's attitudes towards adoption of digital initiatives such as e-filing adoption and incentives offered by the government to accelerate adoption by businesses.

CONCLUSION

This paper reviewed the most important aspects of the *Tax Administration 3.0* report by the OECD and highlighted countries that have been successful in adopting the guidelines contained therein, structured around a set of core building blocks. One key finding based on our review was that no country has been able to fully adopt all recommendations, underscoring the aspirational nature of the OECDs report. Canada has seen great technological advances in taxation over the past two decades with the growth of the internet,

but there are nations, developed and developing alike, that have taken greater strides and are comparatively ahead on the digitalization spectrum.

There remain many ways in which tax administration in Canada can be rendered more accurate and efficient through digital means, which is evident by the standards obtained by other countries. Kenya's automation of tax payment services, Brazil's online dispute management system, and Singapore's complete digital identity for taxpayers, to use just a few examples, demonstrate why Canada must continue to modernize its systems and services. Increased transparency, long-term cost savings, and increased efficiency are just some of the many benefits of further digitizing tax administration.

Future research can benefit from investigating the relationship between tax digitalization and sustainability reporting in taxation. .Recent times have seen a substantial increase in discussion on Environmental, Social and Governance (ESG) related topics including ESG and sustainability reporting. The underlying goal with both digitalization and sustainability reporting in taxation is transparency. The impact of digitalization of tax administration will enhance sustainability reporting and this research will be beneficial and will inform corporate decisions on both the digitalization and sustainability reporting front.. ESG reporting, driven by investor and consumer demands for transparency, has significantly increased over the past few years. ESG is the responsibility governments and organizations have towards the environment, society and the governance framework followed. There has been some research conducted linking digitalization and ESG (See Kai Chang 2023), however no such research has been conducted from a tax perspective.

REFERENCES

Airtel. (2022). *Background*. Airtel. https://www.airtelkenya.com/aboutus

Allen, N. & Okpali, M. (2022, February 2). *Artificial Intelligence Creeps on to the African battlefield*. Brookings .https://www.brookings.edu/techstream/artificial-intelligence-creeps-on-to-the-african-battlefield/

Aragaki, B. (n.d.). *Brazil Reaps Benefits of Digitizing Its Invoices*. Inter-American Development Bank. https://www.iadb.org/en/improvinglives/brazil-reaps-benefits-digitizing-its-invoices

Australian Taxation Office. (2021). *Single touch payroll*. Australian Taxation Office. https://www.ato.gov.au/business/single-touch-payroll/

Australian Taxation Office. (2020). *Small Business Benchmarks.* Australian Taxation Office. https://www.ato.gov.au/business/small-business-benchmarks/

Azevedo, M.C.M.D.D., Ferreira, S.N., Dezolt, A.L., Bakaj, P., & Fritscher, A.C.M. (2021, May 03). Inter-American Center of Tax Administration. https://www.ciat.org/ciatblog-profisco-improves-the-procedures-related-to-brazilian-tax-litigation-by-driving-the-digital-transformation-part-i/?lang=en

Bayhack, J. (2022, January 27). *Innovations That Will Reshape Businesses in Kenya in the Future*. Geospatial World. https://www.geospatialworld.net/blogs/innovations-that-will-reshape-business-in-kenya-in-the-future/

Bird, & Oldman, O. (2000). Improving Taxpayer Service and Facilitating Compliance in Singapore (Vol. 48). World Bank, Washington, DC

Canada Revenue Agency. (2019, August 8). *Government of Canada*. Canada.ca. https://www.canada.ca/en/revenue-agency/services/forms-publications/publications/rc4188/what-you-should-know-about-audits.html

Government of Canada. (2023, March). *Individual Income Tax Return Filing Statistics for the 2023 tax filing season.* https://www.canada.ca/en/revenue-agency/corporate/about-canada-revenue-agency-cra/individual-income-tax-return-statistics.html

Chun-xiao, Z. (2021). Analysis on tax collection and management of digital economy. Les Ulis: EDP Sciences. doi:http://dx.doi.org/10.1051/e3sconf/202125303046.

Corydon, B., Ganesan, V., & Lundqvist, M. (2021, June 23). *Transforming Government through Digitalization*. McKinsey & Company. https://www.mckinsey.com/industries/public-and-social-sector/our-insights/transforming-government-through-Digitalization

Dosunmu, D. (2021, September 22). *Airtel Money users in Kenya to receive funds from 129 countries, free of charge.* TechCabal. https://techcabal.com/2021/09/22/airtel-kenya-partners-with-worldremit/#:~:text=Airtel%20Money%20is%20a%20Mobile,to%20make%20and%20receive%20payments.

Federal Tax Service of Russia. (2022). *How to file electronically?* Russian Government and Ministry of Finance. https://www.nalog.gov.ru/eng/e_filing/htd/

Federal Tax Service of Russia (2022). *What are the advantages of e-filing?* Russian Government and Ministry of Finance. https://www.nalog.gov.ru/eng/e_filing/watae/

Forum on Tax Administration (FTA). (2021). *2021 FTA "PARIS" PLENARY COMMUNIQUE*. OECD. https://www.oecd.org/tax/forum-on-tax-administration/

Forum on Tax Administration (FTA) (n.d.) https://www.oecd.org/tax/forum-on-tax-administration/tax-technology-tools-and-digital-solutions/strategy-governance-and-new-skills.htm (accessed March 2023)

Gichuru, A. (2021, January 17). *Can Airtel Money Compete with M-PESA in Kenya?* https://agichuru.medium.com/can-airtel-money-compete-with-M-PESA-in-kenya-71a4dc6cda00

Global Forum on Transparency and Exchange of Information for Tax Purposes. (2021, May 26). *Tax Transparency in Africa 2021*. OECD.org. https://www.oecd.org/tax/transparency/documents/Tax-Transparency-in-Africa-2021.pdf

Hanrahan, D. (2021). Digitalization as a Determinant of Tax Revenues in OECD Countries: A Static and Dynamic Panel Data Analysis. *Athens Journal of Business & Economics*, *7*(4), 321–348. https://doi.org/10.30958/ajbe.7-4-2

Hirshhorn, J. (2021, September). Digital Transformation – Australia as a World Leader. Pearcey Oration and Victorian Entrepreneur Award. Melbourne, Australia.

Inter-American Development Bank. (n.d.). *Fiscal Management Modernization Project for the State of Amapá*. Inter-American Development Bank. https://www.gtai.de/resource/blob/215594/104cfbbe0eb50d5c0d674d498ed32ad3/pro202001295015-data.pdf

Inter-American Development Bank. (n.d.). *Loan Proposal PROFISCO*. Inter-American Development Bank.
https://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-1645349919-36

International Finance Corporation (IFC). (n.d.). *Safaricom M-PESA*. Case Study - M-PESA Kenya.
https://www.ifc.org/wps/wcm/connect/e0d2a9bd-16b9-4a36-8498 0b2650b9af8b/Tool%2
B6.7.%2BCase%2BStudy%2B-%2BM-PESA%2BKenya%2B.pdf?MOD=AJPERES&CVID=jkCVy-n

Chang, K., Cheng, X., Wang, Y., Liu, Q., & Hu, J. (2023). The impacts of ESG performance and digital finance on corporate financing efficiency in China. *Applied Economics Letters, 30*(4), 516-523.
doi: 10.1080/13504851.2021.1996527

Kenya Revenue Authority (KRA). (2019). *Leading Country Example; Kenya*. OECD.
https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/tax-administration-3.0-kenya-country-example.pdf

Kenya Revenue Authority (KRA). (2021, August 1). Guidelines to VAT Registered Taxpayers on Compliance with the Value Added Tax (Electronic Tax Invoice) Regulations, 2020. Kenya Revenue Authority Publications. https://www.kra.go.ke/images/publications/Guidelines-for-VAT-Taxpayers-2021.pdf

Koch, B. (2021, February 08). *E-Invoicing/E-Billing International Market Overview and Forecast*. Billentis. https://www.billentis.com/einvoicing_ebilling_market_overview_2021.pdf

Lemetyuynen, I. & Sergeeva, V. (2018, December 12). *Russia: Tax monitoring becomes popular in Russa.* KPMG, International Tax Review.
https://www.internationaltaxreview.com/article/b1f7n2fl6c3gkm/russia-tax-monitoring-becomes-popular-in-russia

Mbele, L. (2016, May 11). *Why M-PESA failed in South Africa*. BBC News.
https://www.bbc.com/news/world-africa-36260348

Mureithi, C. (2022, January 10). *Airtel Money Africa's CEO explains its mobile payment spinoff from its telecom parent.* Quartz Africa. https://qz.com/africa/2109686/airtel-money-africa-ceo-vimal-kumar-explains-mobile-money-spin-off/

OECD. (n.d.). *A brief look at National Digital Identity – Singapore*. https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/tax-administration-3.0-singapore-country-example.pdf.

OECD. (2015). Recommendation of the Council on Digital Government Strategies.
https://www.oecd.org/gov/digital-government/Recommendation-digital-government-strategies.pdf

OECD. (2016). *Rethinking Tax Services: The Changing Role of Tax Service Providers in SME Tax Compliance*. https://read.oecd-ilibrary.org/taxation/rethinking-tax-services_9789264256200-en#

OECD (2019). *International Compliance Assurance Programme Pilot Handbook 2.0*. OECD Publishing, Paris. www.oecd.org/www.oecd.org/tax/forum-on-tax-administration/publications-and-products/international- compliance-assurance-programme-pilot-handbook-*2.0.htm*

OECD (2019). *Tax Administration 2019: Comparative Information on OECD and other Advanced and Emerging Economies*, OECD Publishing, Paris. https://doi.org/10.1787/74d162b6-en

OECD (2020). *Tax Administration 3.0: The Digital Transformation of Tax Administration.* OECD Publishing, Paris. https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/tax-administration-3-0-the-digital-transformation-of-tax-administration.pdf

OECD (2021). *Revenue Statistics 2021: The Initial Impact of COVID-19 on OECD Tax Revenues*, OECD Publishing, Paris. https://doi.org/10.1787/6e87f932-en

OECD (2022). *Forum on Tax Administration: Tax Administration 3.0 Action Plan Update – January 2022*. https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/tax-administration-3-0-action-plan-update.pdf

Ogutu, F. (2021, September 1). *Kenya makes strides towards enhancement of tax transparency.* Deloitte. https://www2.deloitte.com/za/en/kenya/pages/tax/articles/kenya-makes-strides-towards-enhancement-of-tax-transparency-by-f.html

Ozlanski, M.E., Negangard, E. M., & Fay, R. G. (2020). Kabbage: A Fresh Approach to Understanding Fundamental Auditing Concepts and the Effects of Disruptive Technology. *Issues in Accounting Education, 35*(2), 77–86. https://doi.org/10.2308/issues-16-076

Seal, T. (2021, July 23). *Vodafone CEO Hints at Spin-Off of Mobile Money Platform M-PESA.* Bloomberg. https://www.bloomberg.com/news/articles/2021-07-23/vodafone-ceo-hints-at-spin-off-of-mobile-money-platform-M-PESA

Shao, B., Luo, X. (Robert), & Liao, Q. (2015). Factors influencing e-tax filing adoption intention by business users in China. *Electronic Government, 11*(4), 283–305. https://doi.org/10.1504/EG.2015.071408

Smart Nation Singapore. (2022, February 16). *Digital Government*. Smart Nation Singapore. https://www.smartnation.gov.sg/about-smart-nation/digital-government

Strathmore University. (2019). *Artificial Intelligence for Africa: An opportunity for Growth, Development, and Democratisation*. Access Partnership. https://pic.strathmore.edu/wp-content/uploads/2019/03/PIC_AI_for_Africa_Whitepaper.pdf

Teo, T. S. H., & Wong, P. K. (2005). Implementing Electronic Filing of Tax Returns: Insights from the Singapore Experience. *Journal of Information Technology Case and Application Research, 7*(2), 3–18. https://doi.org/10.1080/15228053.2005.10856062

Wakoba, S. (2015, May 26). *Airtel Money Partners with KRA to Allow Mobile Tax Payments.* Techmoran. https://techmoran.com/2015/05/26/airtel-money-partners-with-kra-to-allow-mobile-tax-payments/#:~:text=KRA%20services%20can%20be%20paid,based%20on%20amounts%20being%20paid.

World Bank Group. (2022). *Russian Federation.* World Bank. https://data.worldbank.org/country/russian-federation?view=chart

World Bank Group. (2018, October 3). *What Kenya's mobile money success could mean for the Arab world*. World Bank. https://www.worldbank.org/en/news/feature/2018/10/03/what-kenya-s-mobile-money-success-could-mean-for-the-arab-world

BIOGRAPHY

Sonia Dhaliwal is an assistant professor at the Lang School of Business, University of Guelph, Ontario, Canada. Sonia has a Masters degree in Taxation and is a Chartered Professional Accountant (CPA). Sonia's research aims to produce knowledge that speaks directly to issues faced by accounting & tax practitioners, policy setters and regulators. She focuses on research areas that are of interest and relevance to accounting and tax practitioners with a goal to mobilize the knowledge beyond the academic world.

Dua Sohail obtained her Bachelor of Commerce degree, with a specialization in Accounting, from the Lang School of Business and Economics. Dua has also obtained a Graduate Diploma in Accounting. Dua currently provides assurance and tax services to individuals and corporations in the public accounting industry. Her speciality is providing assurance related services to mid-size Canadian firms. Dua is in the process of obtaining the Chartered Professional Accountant designation.

Bryn Hafer is an accountant specializing in tax preparation, and private corporation audit. He graduated from the University of Guelph. Through his writing, he simplifies complex taxation concepts for general use. He lives in, and currently works in, the greater toronto area for MNP LLP.

Originally from Mississauga, Ontario, Keeley Hafer moved to Guelph, Ontario after high school to further her interest in accounting at the University of Guelph. She graduated with an undergraduate Bachelor of Commerce degree in Accounting, with Co-op, followed by a Graduate Diploma in Accounting. Her interest in accounting and taxation led her to work in the field of public accounting from various co-op work terms to a full-time position. Keeley is currently pursuing her Chartered Professional Accountant (CPA) designation.

DOES CURRENT EXPECTED CREDIT LOSS ACCOUNTING REFLECT A BEST ESTIMATE? TIME SERIES EVIDENCE FROM CREDIT LOSS REPORTING

Arianna Spina Pinello, Florida Gulf Coast University
Ernest Lee Puschaver, PricewaterhouseCoopers, Retired Partner

ABSTRACT

The current expected credit losses (CECL) accounting model became effective January 1, 2020. This paper examines the relationship between actual loan losses, allowances for credit losses (ACLs), and provisions for credit losses (PCLs) reported by three of the largest U.S. banks for the three years pre-CECL-adoption and the three years post-CECL-adoption. Data was obtained from the banks' filings with the Securities & Exchange Commission on Forms 10-K and 10-Q, including disclosure commentaries by management, as well as earnings releases and transcripts from earnings conference calls with analysts. Our results indicate that CECL has generated faster and greater responses to the macroeconomic environment. However, there has also arisen greater complexity and apparent instances of management control over the estimating process through model input assumptions and the weighting of various forecast scenarios, such that at times, the ACL levels being established appear inconsistent with the related management disclosures about economic outlook. Further, by utilizing analytics with different scenarios and assigning variable weighting of importance, a resulting ACL may not represent management's "best estimate" but instead may reflect "contingency" considerations for relatively improbable adverse economic developments.

JEL: M41

KEYWORDS: CECL, Credit Losses, PCL, ACL, Provision for Credit Losses, Allowance for Credit Losses

INTRODUCTION

Accounting, financial reporting, and auditing are fundamentally responsive to social policy needs which require impartial insight about financial performance. However, since companies are always evolving with new products and the business and social environment is in a constant state of flux, the adjustment or establishment of new accounting principles and their application tend to lag behind developments. The proper valuation of financial instruments is a key assertion when preparing financial statements under generally accepted accounting principles (GAAP), and is an especially challenging estimate to make when there are no external reference points such as trading markets from which to draw comparisons. For banks, which are a critical component of the country's economic health, a proper valuation of loans, which are generally reported on a historical cost basis, is achieved by establishing an appropriate allowance for credit losses (ACL) through a provision for credit losses (PCL). The ACL reflects the estimated amount that is expected to be uncollectible from the outstanding loans and is reported as a contra-asset account on the balance sheet, with the PCL being the related estimated expense reported on the income statement. When a loan is identified as actually being uncollectible, the lender writes off the loan receivable by drawing down the ACL. Such net charge-offs (NCOs) are reflective of actual bad debts.

In 2016, the Financial Accounting Standards Board (FASB) issued significant new guidance that became effective January 1, 2020, requiring management to estimate ACLs based on a "current expected credit

loss" (CECL) accounting model, replacing decades of practice that had recognized ACLs based on an "incurred loss" accounting model. This change arose out of insights from the 2008-2009 Financial Crisis that the recognition within the financial statements of evolving and potential collection problems had severely lagged behind the changing economic environment. CECL requires management not only to assess the collectability of the loan portfolio using traditional tools such as portfolio composition, collectability assessments and historical experience, but also to include a consideration of evolving macroeconomic trends including the use of modeling forecasts. At a fundamental accounting theory level, the use of estimates is inevitable, and in that sense, there is no difference in the financial reporting goals of the CECL approach vis-à-vis the incurred loss approach, other than CECL requiring broader consideration of factors in forming an estimate of the ACL needed by including forecasts through modeling, including macroeconomic factors, etc. Nevertheless, the consequences of changing to the CECL approach have been significant, as we document in this paper. CECL requires consideration of macroeconomic forecasts and scenarios for collectability assessments, which is new to the challenge of determining an appropriate ACL. However, such considerations have been regularly used for asset/liability management as interest rates and fund flows change daily. Recent stresses in the banking industry resulting from various abrupt deposit withdrawals, typically described as a "run on a bank," have led to the failure of several banks. Such adverse situations evidence the challenges inherent to using modeling techniques.

Under the CECL model, no management team can defend not having an adequate allowance for credit losses recorded on a timely basis; hence, one can conclude that the social policy need for conservative bank loan loss reporting has been met. At the same time, it can be said that CECL has provided a pseudoscience accounting framework for management to establish a baseline ACL estimate while retaining flexibility to record whatever level it feels is appropriate at the moment. As a consequence, accounting rigor may be largely circumventable. Schroeder (2023) calls for research that investigates whether CECL achieved its intended objective to provide more decision-useful information about expected credit losses. Our investigation directly addresses this call for additional research. We investigate how the variability of the provisioning for credit losses under the current expected credit loss accounting model compares to the actual loan losses being experienced. In particular, we employ a case study approach to examine the evolution of reporting from a pre-CECL to a post-CECL era for three of the largest U.S. banks: JPMorgan, Bank of America, and Wells Fargo Corporation. Our analysis draws from data available in annual Form 10-K's and quarterly Form 10-Q's, as well as press releases and supplemental information provided by management to the public when reporting financial results. We present analyses of patterns in macroeconomic variables, including gross domestic product (GDP) and unemployment, as well as quarterly NCOs and PCLs for the three banks in our sample for the six-year period 2017-2022 surrounding CECL's implementation as of January 1, 2020. Our analysis of baseline economic trends in GDP and unemployment reveals the tremendous impact of the COVID-19 pandemic beginning in Q1-2020, with relative economic stability returning by Q1-2021. Banks recorded a CECL transition adjustment at January 1, 2020 based upon a CECL/ACL assessment as of December 31, 2019, and Q1-2020 was the first quarter of recalculating the ACL under CECL in the face of the emerging pandemic-related uncertainties.

Notwithstanding the extreme uncertainty the pandemic raised, we document that NCOs were remarkably steady over the entire six-year period, including the pandemic period. In fact, NCOs show a downward trend over the six-year period for all three banks. Patterns in the three bank's ACL/PCL reporting reveal that PCLs were generally similar to NCOs and there was not great variability in the pre-CECL era. However, such was not the case in the post-CECL era for which we document significant differences in PCLs versus NCOs and substantial variability for all three banks. In the initial implementation period, just as the pandemic was manifesting itself, such variability is readily attributable to the macroeconomic forecasting required by CECL in such an uncertain environment. But one would expect some degree of stabilization, as it became clear by the end of 2020 that the economy was stabilizing and management teams had gained experience in applying CECL requirements. While banks built their ACLs in 2020, for 2021 we document a pattern of near universal PCL reversals for the three banks, while 2022 demonstrates differing

behaviors across the three banks, some of which seem inconsistent with the underlying disclosures of macroeconomic assumptions being used by the banks. The three banks studied disclosed that they used scenario analytics which by its nature implies a range of underlying CECL/ACL calculations, but the degree of detail disclosed and insight provided was very different and not comparable across the banks, thereby reducing its utility for investors. CECL is an improved, more forward-looking accounting model that has met social policy needs for banks to provide timelier credit loss provisioning. However, the relative constancy of NCOs over the last six years compared to ACL/PCL fluctuations demonstrates that CECL may have actually harmed the utility of credit loss provisioning for consistency and comparability purposes while meeting the social policy need for conservative reserving. To overcome this issue, additional guidance should be issued to require that various aspects of the CECL/ACL determinations are more comprehensively disclosed and discussed by management in a manner consistent across all banks, specifically the input assumptions driving the CECL macroeconomic modeling and the nature and weighting of scenarios with a discussion of sensitivity. This paper proceeds as follows. In the next section, we review related literature and provide background regarding loan loss accounting. Thereafter, we describe our data and methodology, and we present our findings for the three banks. We then close with concluding comments including limitations in our research and suggestions for additional research.

LITERATURE REVIEW

A very critical social policy need is that the banking system maintain public confidence and accurately reflect exposure to loan losses, and thereby evidence its sustainability through difficult times. After the tremendous strains arising from the 2008-09 Financial Crisis, it became obvious to all that the "incurred loss" accounting model for establishing reserves for credit losses had failed to adequately respond to the eroding business environment and the exposure to credit losses that banks were facing. In hindsight, that "incurred loss" accounting model actually prohibited the commonsense action of preparing for expected financial losses from a known economic hurricane coming ashore until the actual waves began to hit by limiting what insights management was allowed to consider in establishing the allowance for credit losses (ACL) it thought was necessary. In light of the shortcomings of the "incurred loss" model, the current expected credit losses (CECL) accounting model was issued in 2016, which requires management to use insight from historical data and experience combined with macroeconomic forecasting models and projections to help in determining what level of ACL is considered prudent and appropriate. Although CECL applies to all financial instruments and credit commitments other than those accounted for on a fair value basis, the new model was intended to address the accounting stresses encountered during the 2008-09 Financial Crisis and is especially relevant to the banking industry with its extensive lending activities. Effective January 1, 2020, banks adopted CECL under its required modified retrospective method and recorded a transition adjustment to their ACLs. Unforeseeably, the new CECL accounting standard became effective and hence had to be implemented coincident with the 2020 COVID-19 pandemic and all the attending great uncertainties it created. Theoretically, after the transition adjustments, the banks then had a commonality of starting points, although each ACL at CECL's adoption would still have reflected management's judgment and the particulars of each lending portfolio and historical experience.

The purpose of ACLs is to achieve proper valuation in order to fairly present financial/loan assets. Generally accepted accounting principles (GAAP) seek the "best estimate" of the valuation needed – it is not a discretionary or contingency reserve. In theory, once established, ACLs are then reduced over time as subsequent net charge-offs are experienced. At the same time, as an always-moving estimate target, such reserves are always being reassessed and additional provisions for credit losses (PCL) are recorded as necessary. Moreover, under CECL, the ACL includes consideration of both actual loans outstanding and commitments to lend. Generally, the portion relating to existing loans is reported as a valuation reduction of reported loans, while the portion relating to unfunded commitments is reported in other liabilities, and the financial statement footnote disclosure includes both segments. However, the PCL is generally reported as one overall amount within the income statement and its components are then disclosed in the footnote.

Pinello and Puschaver (2020) point out the stresses and disconnects that arose during CECL's implementation. In particular, the critical input variables regarding forecasts of gross domestic product (GDP) and unemployment appeared disjointed among various banks in contending with pandemic uncertainties. Pinello and Puschaver (2022) explored further discontinuities that were evolving during the post-pandemic period, finding that management judgment was playing an increasingly important role in setting ACL reserve levels, either by influencing the major input variables used in forecasting models or by overtly using additional judgment to intercede and record what management thought was appropriate notwithstanding the modeling. This type of situation brings to mind many adages about the differences between having an opinion versus facts and begs the question: How does one adjust when the forecast "opinion" becomes the selected "fact" used in the CECL modeling to determine a needed ACL level? As pointed out below in the discussion of GDP and unemployment trends, forecasting uncertainties invariably will be shown to be off-target when actual results become known.

Given their importance to the economic health of the banking system and thereby the country itself, bank loan loss reserves have been a subject of debate for years. Due to its significant change in the underlying accounting model and its recent implementation, the issuance of CECL has generated fresh research. One consideration is the degree that users of financial statements might or might not benefit with the CECL approach, and disagreement is evident. Gee et al. (2023) conclude that CECL is decision-useful for investors because it renders credit loss allowances as more relevant and improves their ability to predict future credit losses. Similarly, Lopez-Espinosa et al. (2021) suggest that the switch to expected credit loss provisioning results in higher information content to assess bank risk.

In contrast, according to Bonsall et al. (2022), CECL causes analyst provision forecasts to be associated with reduced accuracy and coverage, and with increased dispersion, consistent with investors perceiving analyst provision forecasts to be less informative post-CECL-adoption. Such a reduction in analytic capability reduces the utility of the information being provided. As determined by our research, the additional complexity of CECL has increased the volatility of PCLs and the complexity involved gives mixed messaging to users of financial statements. Jacobs (2019) investigated 14 alternative CECL modeling approaches and concluded that CECL poses challenges to temporal and cross-institution comparability of results because of the substantial variability of estimates depending on model specification. Extant research highlighting the underlying stresses of the CECL requirement to use macroeconomic forecasting insights is consistent with our findings presented below that the use of scenarios with attending weighting and probability assessments actually results in less insight.

Terminology commonly encountered is that management is "building" the ACL when a quarter's PCL exceeds net charge-offs (NCOs). Conversely, it is "drawing down" the ACL when a quarter's PCL is less than NCO, inferring that management is using previously established reserves. If the PCL is actually negative and increases income, it is characterized as a "reversal." Reporting has become overt in this regard with management presentations often displaying two components of the PCL to demonstrate the "build reserve" portion, etc. At times, the term "release" is used to characterize a drawdown or, more frequently, when a reversal occurs. That is, one can infer that management is reporting that a previous high level for the ACL is no longer needed, which is usually regarded as arising from an improvement in the macroeconomic outlook, and is therefore releasing it back into income. In practice, under the previous "incurred loss" accounting model, it would have been unusual to encounter a PCL of zero or a reversal and, if reported, it would have tended to relate to smaller institutions. Under the CECL model, such has been happening much more widely, but that may be attributable to pandemic stresses.

CECL's Macroeconomic Stresses

The economic environment is characterized by recurring business cycles of good times then bad/recession times, and so forth. While the major 2008-09 Financial Crisis generated much higher loan losses and morphed into the Great Recession, it was still a business cycle. The COVID-19 crisis also created an extreme, but atypical, business cycle which unexpectedly did not result in major loan losses for various reasons, including government intervention. At the current time, we are contending with the uncertainties of a more typical business cycle such as the Federal Reserve increasing interest rates to stem inflation and concerns over GDP growth or possibly a recession. There are always outlooks and concerns to be weighed and considered and, most assuredly, each time there are very differing views of what is likely to happen.

Under CECL, macroeconomic considerations have evolved to include forecasts of what the future macroeconomic environment might look like and to consider how it would impact loss expectations. However, auditors have no baseline/recourse on how to challenge the critical base input assumptions used by management for GDP and unemployment, and such input assumptions are becoming part of recurring disclosure commentary. Furthermore, CECL modeling and forecasting has also evolved to include various "what if" scenarios. However, it is unknown whether the scenarios are driven by using various input assumptions to see what various ACL forecasts using CECL would result and then working backward to select the input assumptions that achieve a particular desired ACL level, or whether the scenarios somehow add sensitivity analysis to the basic input assumptions. An example of such complexity is outlined by Bank of America (BAC) in its 2021 Form 10-K:

"*The [ACL] is estimated using quantitative and qualitative methods that consider a variety of factors, such as historical experience…current credit quality…and economic outlook…Qualitative reserves cover losses that are expected but, in the Corporation's assessment, may not be adequately reflected in the quantitative methods or economic assumptions…The [macroeconomic] scenarios that are chosen each quarter and the weighting given to each scenario depend on a variety of factors including recent economic events, leading economic indicators, internal and third-party economist views, and* industry trends (emphasis added)*…a baseline scenario…a tail risk scenario similar to the severely adverse scenario used in [regulatory]* stress testing (emphasis added)*, a scenario to account for inflationary risk….*"

When one considers the additional judgment factor that management can utilize beyond the CECL calculations themselves, management essentially has great flexibility regarding how much PCL is needed at any particular quarter to achieve a desired ACL. In BAC's earnings conference call on January 13, 2023, the following exchange occurred which highlights this issue: an analyst asked, "*… how much of the reserve building is what might be referred to as management overlay relative to what the models are specifically dictating on reserve building?*" Brian Moynihan, CEO, responded: "*We don't disclose that. But you might assume that there's a fair amount – 3 components to this: one is what the models say; two is basically uncertainty, imprecision and other things we overlay and then a judgmental, and you might think that there's a fair amount of that right now with the uncertainty. But – so the model piece of that would be a portion of it.*"

As a point of information, the regulatory stress tests are designed to assess the potential for the banking system to survive an unexpected calamity; they are in no way designed to reflect expectations of likely evolving economic circumstances and their results would not be a valid consideration for estimating an ACL under current GAAP. Yet, commonsense would lead one to infer that the ACL determined under CECL's requirements would trend higher if management's selected GDP and unemployment input assumptions were worsening from the prior reporting period, or, conversely, that the ACL need would trend lower if those input assumptions were improving from the prior reporting period.

Credit Loss Recognition Cycle

By its nature, determining an appropriate ACL requires judgment – it is a critical accounting estimate relating to the valuation assertion. To estimate it, consideration must be given to known troublesome credit situations, the current composition of the credit portfolio, historical experience, and now, under CECL, also forecasts of the evolving macroeconomic environment. After determining an appropriate ACL level, the resulting PCL is actually just the amount needed to adjust the previous reserve level to the new level; however, in practice it is perceived as a critical figure by analysts and others as representing an action taken by management. As previously noted, the ACL generally has two components: a portion attributable to loans and leases currently outstanding and a portion attributable to unfunded lending commitments. Generally, an outstanding commitment gets activated and becomes an outstanding loan before it then might become a charge-off. In contrast to CECL, such expected potential progression was not universally reflected under the incurred loss accounting model. An easy example is to consider credit card lending with its pre-established credit lines. A likely progression is that a potentially troubled borrower might gradually increase the outstanding amount under the credit line before deteriorating into a collection problem and possibly becoming a charge-off situation. With this context, the recognition of NCOs is somewhat anticlimactic within the estimating cycle for credit loss provisioning and reserving.They are a later manifestation/confirmation of what management previously estimated. However, they are important as Jamie Dimon, CEO of JPMorgan, advised during the January 13, 2023 earnings conference call: "*These [CECL/ACL] are all probabilities and possibilities and hypothetical numbers. And if I were you, I'd just look at charge-offs, like actual results.*" Moreover, BAC commented in its 2022 Form 10-K: "*The estimate of credit losses includes expected recoveries of amounts previously charged off (i.e., negative allowance).*" Also, banking regulators bring a consistency discipline across the banking industry regarding charge-off practices. As a consequence, the practice and methodology of actually recording NCOs would have remained constant under both the prior incurred loss model and the new CECL model. After the catch-up adjustment upon adopting CECL at January 1, 2020, there is no inherent reason that CECL would create increased or decreased credit loss provisioning other than as a possible reflection of the macroeconomic environment, and it would also not impact the reporting practices for NCOs.

DATA AND METHODOLOGY

We employ a case study approach to investigate the evolution of credit loss reporting in the pre- and post-current expected credit loss (CECL) eras. Our sample of quarterly data spans the six-year period 2017 through 2022. The three years prior to 2020 (2017-2019) mark the pre-CECL window during which the incurred loss model was applicable, while the three years 2020-2022 mark the post-CECL window during which the CECL model was in effect. This six-year period reflects a suitable timeframe to examine the progression of credit loss reporting and holds constant the length of time examined pre- and post-CECL adoption. Note that including more years in pre-CECL window would not provide meaningful additional insight as the business environment was fairly stable and there is possible data distortion from mergers pre-2017. Included in our sample are three of the largest U.S. banks measured based on assets: JPMorgan (JPM) which is the largest bank in the country, Bank of America (BAC) which is the second largest, and Wells Fargo Corporation (WFC) which is ranked fourth in size. The third largest U.S. bank is Citigroup. In order to focus largely on the U.S. lending environment, we did not include Citigroup in our sample because it has relatively more extensive international operations compared to the other banks in our sample. Additionally, the three banks included in our sample are comparable in size, have similarly large loan portfolios that represent a good cross-section of lending activity including both corporate and consumer lending, with consumer lending representing nearly half of their lending portfolios.

Furthermore, these three banks' CECL processes and modeling are likely to have a similar degree of sophistication and like characteristics besides the inputs by management as suggested in Pinello and Puschaver (2018). Pinello and Puschaver (2020, 2022) examined CECL-related practices for the 15 largest

banking entities in the country as contrasted to 15 smaller banks near the 100th size ranking. Overall, their investigations revealed similar themes regarding CECL implementation stresses for the large and smaller institutions alike. Thus, an examination of the three large banks included in our sample may be considered to be reflective of banks generally. Nevertheless, highly specialized banks that significantly focus on particular areas of lending such as credit cards, automobile financing, boat lending, etc. and regional or community banks with particular credit portfolio geographic concentrations might have special situations impacting their CECL deliberations. For example, while national forecasts of gross domestic product (GDP) and unemployment data would be applicable for the large banks, such might not be as applicable to the localized area of regional or community banks. Our analysis draws from data available in annual Form 10-K's and quarterly Form 10-Q's, as well as press releases and supplemental information provided by management to the public when reporting financial results (all of these are available through the banks' respective websites under Investor Relations). Importantly, we reviewed the banks' Form 10-K disclosures for the compositions of their loan portfolios at yearend 2017 compared to yearend 2022 and noted that they have remained fairly stable. Therefore, changes in allowance for credit losses (ACL)/provision for credit losses (PCL) reporting can be attributed to each bank's historical experience, their views as to the evolving macroeconomic environment, and CECL forecasting requirements, rather than being attributed to a major change in portfolio composition.

RESULTS

We begin our results section by presenting an analysis of patterns in macroeconomic variables, including gross domestic product (GDP) and unemployment. We then present comparative patterns across the three bank's quarterly net charge-off (NCO) history, followed by an analysis of each bank's provision for credit losses (PCL) as compared to their respective NCO history and disclosure patterns for the six-year period 2017-2022 surrounding the implementation of the current expected credit loss (CECL) model as of January 1, 2020. While each of the three banks would have particular idiosyncrasies relative to their loan portfolios, individual historical experience, modeling techniques, etc., they each must consider the same historical economic data when determining the forecasting parameters deemed most appropriate to use in developing their allowance for credit loss (ACL) analysis under CECL's guidance. From the various disclosures by management and discussions about their efforts to determine CECL forecasts, it is unequivocal that GDP and unemployment are universally considered as major modeling inputs. However, CECL modeling likely includes many other variables such as inflation (both overall and possibly for particular commodities), changes in housing prices, interest rate levels, national trends versus regional and local trends, etc. Accordingly, Figure 1 displays historical quarterly trends in GDP and unemployment for the three years before CECL's implementation at January 1, 2020 and for the subsequent three years (per the Bureau of Economic Analysis and the Bureau of Labor Statistics). While historical data form a basis for modeling, CECL also requires consideration of macroeconomic *forecasts*. Therefore, Figure 1 also includes GDP and unemployment forecasts for the fourth quarter of 2022 and all four quarters of 2023 and 2024 as published by The Conference Board on December 14, 2022. This would be an example of a dataset available as inputs to management as it developed its yearend CECL/ACL needs.

Of course, various management teams likely have their own economic forecasting models or have other sources whose insights they prefer to use, but the Conference Board is a widely recognized institution; hence, we have chosen to display its forecasts as a baseline. However, management has a wide array of possible external input forecasts to select from in addition to any internal forecasting developed by its own economists. For example, on December 23, 2022, the Federal Reserve Bank of Atlanta released its view that Q4-2022 GDP was tracking at 3.7% compared to the Conference Board's 0.7% forecast. This substantial disparity is indicative of just how divergent and judgmental selections of input variables can be, and the difficulty auditors face in evaluating the reasonableness of whatever management decides to use as inputs. But in hindsight, the first estimate of Q4-2022 GDP was reported as 2.9% by the Commerce

Department on January 26, 2022 (Cox, 2023) – obviously both estimates were off significantly, but at the same time the Commerce Department report itself is also only a "first estimate" that will be revised later.

Figure 1: Baseline Economic Trends: Quarterly Gross Domestic Product (GDP) and Unemployment Data

Baseline Economic Trends
Historical Q1 2017 – Q3 2022 plus Forecasts through Q4 2024
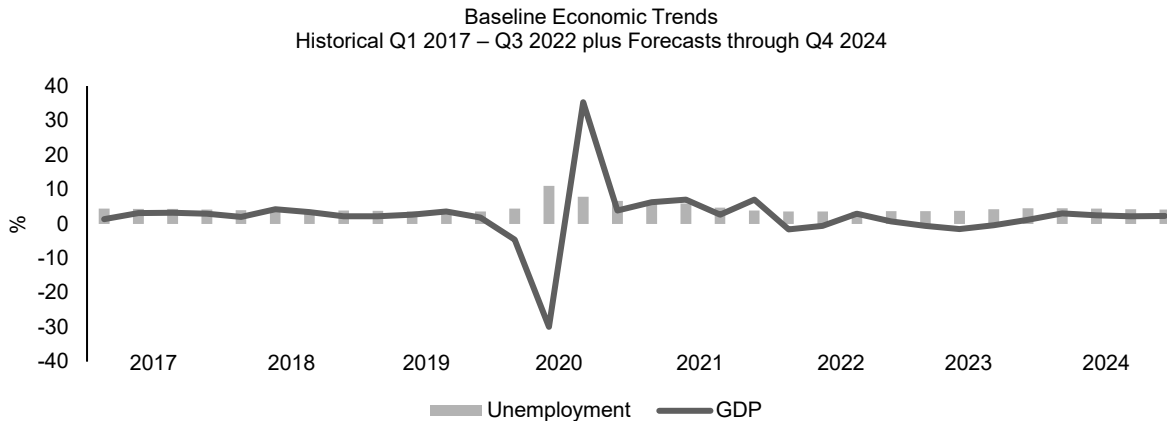
This figure depicts quarterly data trends for U.S. GDP and unemployment for the three years before CECL implementation and the three years after the CECL implementation on January 1, 2020 (per the Bureau of Economic Analysis and the Bureau of Labor Statistics). While historical data form a basis for modeling, CECL also requires consideration of macroeconomic forecasts. Thus, this figure also depicts forecasts for the fourth quarter of 2022 and all four quarters of 2023 and 2024 as published by The Conference Board on December 14, 2022, which reflects the dataset available to management as it developed its yearend CECL/ACL needs.

The frustration of the situation and using forecasts for CECL macroeconomic modeling to establish ACL levels was captured well by Jamie Dimon, JPM CEO, during an earnings conference call with analysts on April 13, 2022 discussing the firm's Q1-2022 results: "…I just want to caution this. First of all, I can't forecast the future any more than anyone else. And the [Federal Reserve] forecasts it, and everyone forecasts it, and everyone's wrong all the time." In this inherent environment of uncertainty, with the issuance of Auditing Standard (AS) 2501, Auditing Accounting Estimates, Including Fair Value Measurements (issued December 20, 2018 and effective for audits of financial statements with fiscal years ending on or after December 15, 2020), the Public Company Accounting Oversight Board (PCAOB) has been pressing for greater attention in auditing estimates. Likewise, in an effort to improve audits of estimates, the American Institute of Certified Public Accountants (AICPA) issued Statement on Auditing Standards (SAS) 143, Auditing Accounting Estimates and Related Disclosures (issued July 2020 and effective for audits of financial statements with fiscal years ending on or after December 15, 2023). Despite these efforts, in its Spotlight December 2022 release, even while noting some progress with CECL auditing efforts, the PCAOB went on to be critical of the efforts put forth by auditors noting: "Auditors reviewed management's memorandum describing assumptions used in determining CECL but did not evaluate the qualitative factors or evidence supporting certain assumption changes from the prior year, or lack of changes, when evaluating the reasonableness of such assumptions" (PCAOB, December 2022, page 15). In addition, the PCAOB issued AS 3101, The Auditors Report on an Audit of Financial Statements When the Auditor Expresses an Unqualified Opinion (issued 2017 and effective for audits of financial statements with fiscal years ending after December 15, 2020) which requires that the auditor discuss "critical audit matters (CAMs)" highlighting those audit areas that "…involved especially challenging, subjective, or complex auditor judgment...." Pinello et al. (2020) examined the relationship between CAMs and other SEC regulations that require management to discuss critical accounting matters in Form 10-K filings noting that the requirements overlap and, as a consequence, ACLs are universally considered as a CAM when auditing banks.

The challenge in auditing CECL estimates is substantial. It is difficult to audit with any objectivity what management decides to adopt as a particular forecast view and the qualitative factors management chooses

to consider at each reporting date. Making CECL macroeconomic input decisions is a great deal more judgmental than attempting to determine a warranty reserve or a reserve for litigation based on evolving trends and developments. Each quarter the economic environment changes and, as stated above, there is always a wide variance in what is being forecasted by diverse, but competent groups. There is no single primary frame of reference against which auditors could evaluate the reasonableness of management input selections and, clearly, management sentiments can change significantly quarter to quarter. Overall, the data in Figure 1 demonstrate the tremendous impact of the pandemic beginning in Q1-2020, but it does not capture the great uncertainty everyone faced in considering what the economic consequences of the pandemic would be. At that time, economic prognosticators were widely disparate and generally very pessimistic, and hoped-for government efforts to alleviate the crisis were speculative and contemplated actions that had never been done before. As reported by Pinello and Puschaver (2020), this great uncertainty led to discontinuities in the first application of CECL in Q1-2020. However, Pinello and Puschaver (2022) reveal that soon thereafter, the environment began to stabilize and the various forecasts began to become more stable and consistent, yet there still were aberrations in Q2-2020 CECL/PCL assessments and afterward. But the data presented in Figure 1 evidence relative economic stability returning by Q1-2021. Establishing an ACL estimation under CECL requires three critical aspects – one, historical experience and the insight that provides; two, the composition and credit status of the lending portfolio at any particular point in time; and three, forecasts of the macroeconomic environment and how the existing portfolio might manifest losses under that scenario. However, as depicted in Figure 2, reported NCOs for our three sample banks over the past six years are a reality check regarding those assessment efforts. The data in Figure 2 evidence that NCOs have been remarkably steady over the six-year period, including the pandemic period notwithstanding the extreme stresses and concerns it raised. In fact, NCOs show a downward trend over the past six years for all three banks. The relative magnitudes of the NCOs appear consistent with the relative size of the three banks.

Figure 2: Net Charge-Off History for JPM, BAC, and WFC Spanning 2017-2022
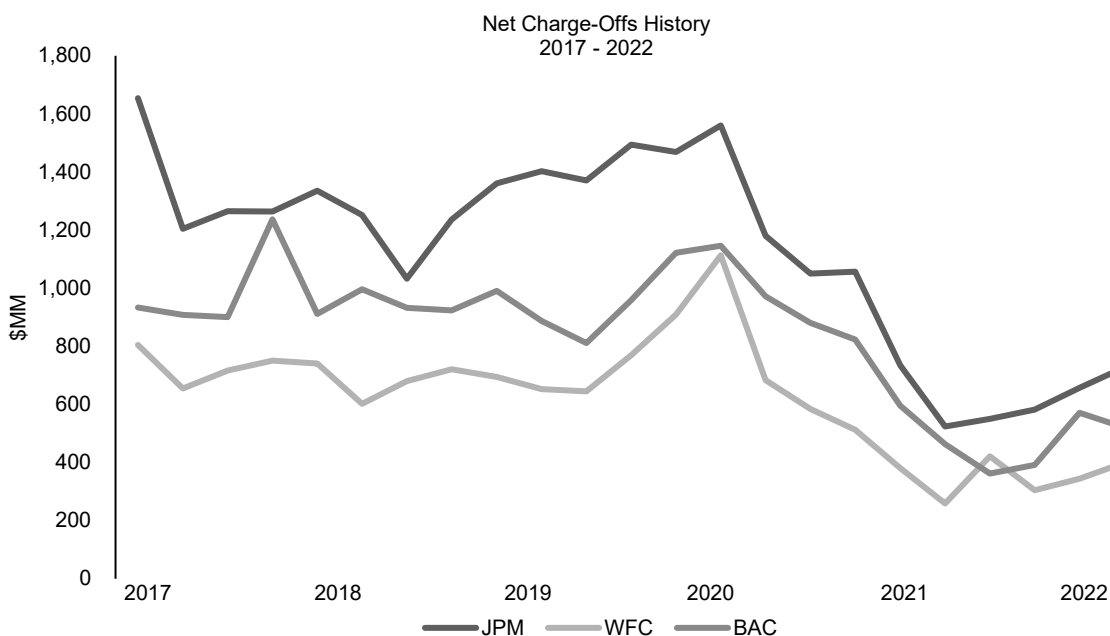
This figure depicts quarterly net charge off history for our three case studies, JPMorgan (JPM), Bank of America (BAC), and Wells Fargo Corporation (WFC), from the first quarter of 2017 through the fourth quarter of 2022.

Given the history of GDP, unemployment, and NCOs examined in Figures 1 and 2, we next review the patterns in each of the three bank's ACL/PCL reporting and discuss each of the bank's related disclosure patterns. Recall that CECL was implemented as of January 1, 2020, at which time banks recorded a transition adjustment calculated as of December 31, 2019. Hence, Q1-2020 was the first quarter of recalculating the ACL under CECL which occurred in an emerging pandemic situation during which great uncertainty and variability arose. We begin with JPMorgan (JPM) which is the largest bank in the country with a wide-ranging array of lending activities. In our reviews of the last several years, JPM has been informative with its related disclosures. It had already been recording and disclosing an allowance for lending-related commitments prior to CECL. At the time of CECL adoption, JPM increased its ACL by 30% up to $18.6B, citing a need to increase it for its credit card operations and a need to decrease it for its wholesale lending portfolio. As depicted in Figure 3, in the pre-CECL window, JPM's PCL was generally similar to its NCO levels and there was not great variability. In fact, for those three years combined, JPM had PCLs aggregating $15.746B closely matching its NCO of $15.872B.

Figure 3: JPMorgan's Quarterly Provision for Credit Losses and Net Charge-Offs for 2017-2022
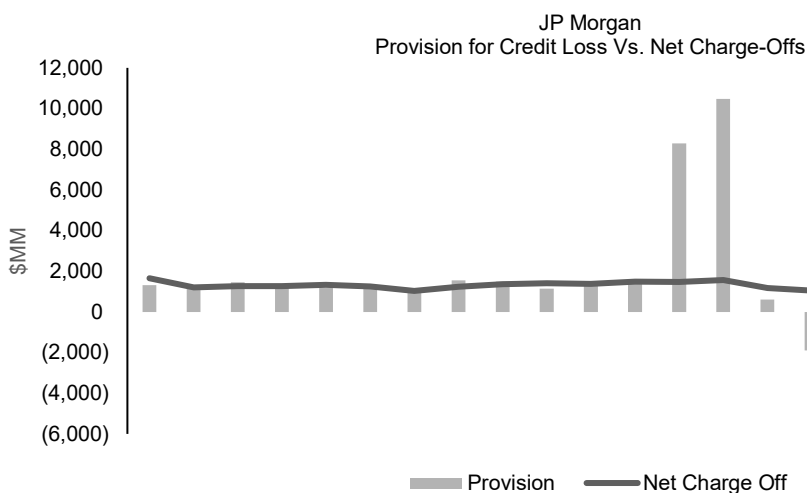
This figure depicts JPMorgan's quarterly PCLs and NCOs for the first quarter of 2017 through the fourth quarter of 2022.

Pinello and Puschaver (2022) noted that management teams were often disclosing the forecast assumptions for GDP and unemployment which are critical for gaining insight, and speculated that such might become normal practice. JPM was one of the most forthcoming with such disclosures and has been including them regularly in its Form10-Q and Form 10-K filings, disclosing in a tabular format input assumptions for GDP and unemployment for three future quarters reaching out eighteen months combined with some explanatory narrative. In reviewing those disclosures and comparing them to PCL activity, the following observations are noteworthy. As the pandemic hit, JPM built up its initial reserves with significant provisioning in Q1-2020 and Q2-2020, which is reasonable and expected. Additionally, it disclosed the underlying economic assumptions it was using. For various reasons, the country fortunately avoided a severe economic downfall; consequently, JPM recorded a minimal provision in Q3-2020 and then recorded a PCL reversal in Q4-2020, which seems reasonable. The GDP and unemployment input assumptions used for the Q4-2020 ACL determination and PCL reversal were more optimistic than those used at Q3-2020 which is consistent with recording a reversal. Yet, in perspective, overall NCOs in 2019 were $5.629B and remained stable at $5.529B in 2020 in spite of the pandemic, while it reported a PCL of $5.585B for the year 2019 under the "incurred loss" model and $17.480B for the year 2020 under CECL, inclusive of the Q4-2020 reversal.

As 2021 unfolded, JPM reported a PCL reversal each quarter, resulting in a total reversal of $9.256B for the year. This trend seems reasonable as the economic environment improved, forecasting prognostications were more comparable, and its NCO decreased significantly to $2.865B. However, as already noted, its NCO had not really increased dramatically in 2020. In combination, 2019 was a "normal" economic environment while 2020 was "chaotic" because of the pandemic; nonetheless, JPM's NCO remained stable across the two years. When the economic environment improved somewhat in 2021, its NCO decreased significantly. Perhaps the 2021 PCL reversals could have been more aggressive sooner, but Q1-2021 was the largest of the four quarters of reversal, consistent with management taking a decisive PCL action as the outlook for 2021 began to appear more optimistic. Overall, actions taken by JPM seem consistent with the disclosures of its forward-looking input assumptions. Input assumptions for forward-looking unemployment showed improving conditions with decreases at each quarterly assessment date. While the input assumptions for GDP at December 31, 2020 reflected a modest recovery developing, and then the following quarterly disclosures showed increasing optimism. For 2021, JPM reported $9.256B of PCL reversals compared to $2.865B of NCO, thereby drawing down its ACL substantially.

Interestingly, for the two-year period ending 2021overall, JPM's PCLs totaled $8.224B compared to $8.124B of NCO. As a result, it had essentially reverted back to the ACL level determined when adopting CECL: $18.584B at January 1, 2020, compared to $18.689B at December 31, 2021. The experience gained through working with CECL from adoption through the following eight quarters (including through the pandemic) had resulted in the same ACL level, but was determined with much different economic outlook assumptions. In particular, upon adoption at January 1, 2020, the unemployment rate outlook for Q2-2020 was 3.7%, for Q4-2020 was 3.8%, and for Q2-2021 was 4.0%, while the GDP growth rate outlook for Q2-2020 was 0.9%, for Q4-2020 was 1.7%, and for Q2-2021 was 2.4%. On the other hand, at December 31, 2021, there was a comparable unemployment rate outlook for Q2-2022 of 4.2%, for Q4-2022 of 4.0%, and for Q2-2023 of 3.9%, while there was a more optimistic GDP growth rate outlook for Q2-2022 of 3.1%, for Q4-2022 of 2.8%, and for Q2-2023 of 2.1%.

In summary, the overall economic outlook inputs used appear more optimistic at December 31, 2021 than when CECL was adopted and NCO experience has been declining over the two-year period, yet JPM management deemed the same level of ACL as appropriate. One would not expect such a result, and such begins to raise a concern as to whether the CECL/ACL represents a "best estimate" of loss expectations or a "contingency view" of what might happen. In Q1-2022 and Q2-2022, JPM's NCO aggregated $1.239B (a decrease compared to $1.791B in 2021's first two quarters) which annualized is $2.478B and somewhat less than 2021's $2.865B, which in itself was an improvement from 2020. Yet, JPM recorded a surprisingly large Q1-2022 provision of $1.328B and continued at a high level with a $1.230B provision in Q2-2022, totaling $2.558B for the six months compared to $1.239B of NCO over the same period, thus building up the ACL. However, the input assumptions disclosed by JPM as used in Q1-2022 were more upbeat than those used at year-end 2021, yet it recorded a significant and unexpectedly high provision of $1.238B after recording a Q4-2021 reversal provision of $1.288B. That reversal was done in spite of an increase in the negativity of the underlying input assumptions compared to those used at Q3-2021. That is, even as its input assumptions worsened for establishing the Q4-2021 ACL from those used in Q3-2021, JPM reported a reversal, then disclosed even more optimistic input assumptions for Q1-2022 only to record what appears to be an inconsistently large PCL.

To review, JPM's Q4-2021 input assumptions, while still upbeat, significantly softened from those used for Q3-2021; nevertheless, it still recorded a significant $1.288B reversal provision comparable to that in Q3-2021. Then in Q1-2022, its input assumptions were more optimistic than those at Q4-2021, yet it recorded a high provision of $1.238B. Such a PCL and input sequence is inherently illogical unless management is judgmentally overriding the CECL modeling results. In fact, in its Form 10-Q, management explains Q1-2022's unexpected PCL increase stating that *"greater weight given to adverse scenarios."* One would

expect the selection of input assumptions to already represent a consideration of appropriate forecast scenarios with inputs considered most probable being the ones used and disclosed. Further, on April 13, 2022, the day of the earnings press release, the Wall Street Journal reported that *"…[JPM] surprised Wall Street by setting aside $900 million in new funds to prepare for economic turmoil…"* arising from uncertainties concerning rising inflation and the Ukrainian war, and that the CEO had commented, *"No one knows what's going to turn out"* and that while commenting that a recession is far from a sure thing, said "Is it possible? Absolutely" (Benoit, 2022a). Again, one can muse that the ACL/PCL activity possibly moved toward a "contingency" instead of "best estimate" perspective.

In Q2-2022 and Q3-2022, JPM recorded PCLs significantly in excess of NCOs, thereby continuing to build its ACL. However, for those quarters, the underlying disclosures of input assumptions displayed increasing management pessimism regarding the economic outlook, and therefore were consistent with comments by the CEO, per the Wall Street Journal on October 10, 2022 reporting on a CNBC interview that same day, that actions by the Federal Reserve and consequences of the war in Ukraine are "…likely (emphasis added) to put the U.S. in some kind of a recession in six to nine months from now" (Benoit, 2022b). As a result, it is not surprising that JPM again recorded a larger PCL in Q4-2022 of $2.288B compared to NCO of $887M for the quarter, while noting in its January 13, 2023, earning press release that doing so was "…driven by modest deterioration in the Firm's macroeconomic outlook, now reflecting a mild recession in the central case…" And the disclosed base input variables for GDP and unemployment in its Form 10-K depicted greater pessimism compared to those disclosed for the Q3-2022 PCL determination with GDP growth for 4Q-2023 dropping to only up 0.4% from up 1.2% and presenting a first estimate for Q2-2024 of zero GDP growth, with related estimates for unemployment showing increases to 5.0% by Q4-2024.

However, JPM's additional Form 10-K disclosures about those input assumptions indicate the influence of other management judgments: "The firm's [ACL] is estimated using a weighted average of five internally developed macroeconomic scenarios. The adverse scenarios incorporate more punitive macroeconomic factors than the central case assumptions provided in the table below, resulting in a weighted average U.S. unemployment rate peaking at 5.6% in the second quarter of 2024, and a 1.2% lower U.S. real GDP exiting the second quarter of 2024." This disclosure evidences the significance of management judgment influencing CECL modeling and determining what actual prognosis is being used to forecast the ACL need, and, while a very helpful disclosure, it also masks the overtness encountered during the pandemic when some banks explicitly disclosed the increment to the PCL that was management judgment (Pinello & Puschaver 2020, 2022). Overall, for 2022, JPM reported PCLs aggregating $6.839B compared to NCOs of $2.853B, thereby building up its ACL by nearly 19%. We next turn our attention to Bank of America (BAC) which is the second largest bank in the country and also has a wide-ranging array of lending activities. It has been providing narrative discussions of its CECL input assumptions in its Form 10-Q's generally with less detail than provided by JPM. It had also been reporting that it was maintaining a reserve for unfunded lending commitments. Similar to JPM, upon adopting CECL, BAC increased its ACL by 32% up to $13.481B, noting that a portion related to unfunded commitments. Figure 4 displays BAC's reporting trend for quarterly PCLs compared to NCO.

Once again it is evident that there was stability in the relationship between quarterly PCLs and NCOs prior to CECL adoption. For those three years combined, BAC had PCLs of $10.268B which is about 10% less than its NCO of $11.390B and, as a result, its ACL had declined slightly, but the trend was similar to JPM's. BAC's 2020 quarterly PCLs, while generally consistent with JPM's, showed a slightly different pattern. In Q1-2020, BAC recorded a PCL of $4.761B then increased that slightly in Q2-2020 to $5.117B, just as JPM had done a slight increase in Q2-2020 from Q1-2020. However, BAC recorded a PCL of $1.389B in Q3-2020 while JPM was dropping its provision to a more minimal $611M. Further, in Q4-2020 BAC recorded a nominal $53M PCL while JPM recorded a meaningful first of five straight quarters of reversals.

Figure 4: Bank of America's Quarterly Provision for Credit Losses and Net Charge-Offs for 2017-2022
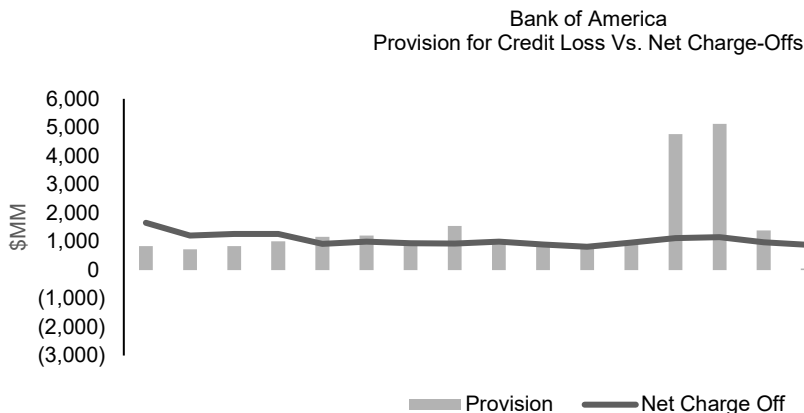
This figure depicts Bank of America's quarterly PCLs and NCOs for the first quarter of 2017 through the fourth quarter of 2022.

Similar to JPM, for the two-year period after adopting CECL, BAC reported total PCLs of $6.726B compared to NCOs of $6.364B, so its ACL only increased modestly to $13.843B from its CECL adoption level of $13.481B. BAC did not disclose details of its input assumptions upon adoption of CECL so one cannot make a direct comparison to the 2021 year-end input assumptions regarding economic outlook. However, it did disclose: "As of January 1, 2020, the Corporation's economic outlook was weighted to include a moderate potential of a recession with some expectation of tail risk similar to the severely adverse scenario used in stress testing." Even though its ACL level remained fairly constant over the two-year period with only a slight increase, as detailed below, its assumptions at December 31, 2021 would appear more optimistic. Therefore, similar to JPM, the overall input outlooks used appear more optimistic at December 31, 2021 than when CECL was adopted and NCO experience was declining over the two-year period, yet management deemed as appropriate a similar level of ACL. This pattern again brings into question whether the CECL/ACL represents a "best estimate" of loss expectations or a "contingency view" of what might happen. In reviewing BAC's disclosures, it is evident that there was not much change in the key input assumptions for unemployment from those at Q4-2020 versus those at Q4-2021 and a modest decline in outlook for GDP. Per BAC's 2021 Form 10-K, the input assumptions used at December 31, 2020 were an unemployment rate outlook of 6.6% at Q4-2021, 5.5% at Q4-2022, and 5.0% at Q4-2023 combined with a GDP growth rate outlook of 2.5% at Q4-2021, 2.4% at Q4-2022, and 2.1% at Q4-2023. In contrast, the year-end 2021 ACL input assumptions were disclosed as "average unemployment rate will be just above 5 percent by the fourth quarter of 2022 and slowly declines to just under 5 percent by the fourth quarter of 2023" and "...[GDP] is forecasted to grow at 2.1 percent and 1.9 percent year-over-year in the fourth quarters of 2022 and 2023." Note that the forecasting disclosure at this point was forward-looking for only two years instead of the three-year forecasting window previously used. This change represents a noticeable reduction in the precision and detail of BAC's disclosures regarding forecasts.

BAC's Q4-2022 report showed a PCL of $1.092B exceeding all of the earlier quarters, and combined with NCO of $689M, it means it was building its ACL. BAC commented in its January 13, 2023 press release that such was due to "loan growth and a dampened macroeconomic outlook." During the earnings conference call that same day, Brian Moynihan CEO commented: "Our baseline scenario contemplates a mild recession...But we also add to that a downside scenario. And what this results in is 95% of our reserve methodology is weighted toward a recessionary environment in 2023...This scenario is more conservative than last quarter's scenario. Now to be clear...it contemplates a rapid rise in unemployment to peak at 5.5% early this year in 2023 and remain at 5% or above all the way through the end of [2024], obviously, much more conservative than the economic estimates that are out there." Comments in its 2022 Form 10-K were consistent with the above and added that "U.S. [GDP] was forecasted at 2.1 percent and 1.9 percent year-

over-year in the fourth quarters of 2022 and 2023." Overall, for 2022 BAC reported PCLs aggregating $2.543B while experiencing $2.172B of NCOs so it built its ACL slightly less than 3%.

Turning our attention to Wells Fargo Corporation (WFC), the fourth largest bank in the country that also has a wide-ranging array of lending activities, we note that WFC also had been disclosing that it was maintaining an allowance for unfunded credit commitments prior to CECL. However, in contrast to JPM and BAC, upon adopting CECL, WFC decreased its ACL by 13% down to $9.127B, commenting that a decrease was needed for commercial loans and an increase was needed for credit card operations and unfunded commitments. Its various commentaries indicated that unemployment and GDP forecasts were key components used in determining ACL levels, but we could not find any disclosures of the actual assumptions being used.

Figure 5: Wells Fargo Corporation's Quarterly Provision for Credit Losses and Net Charge-Offs for 2017-2022
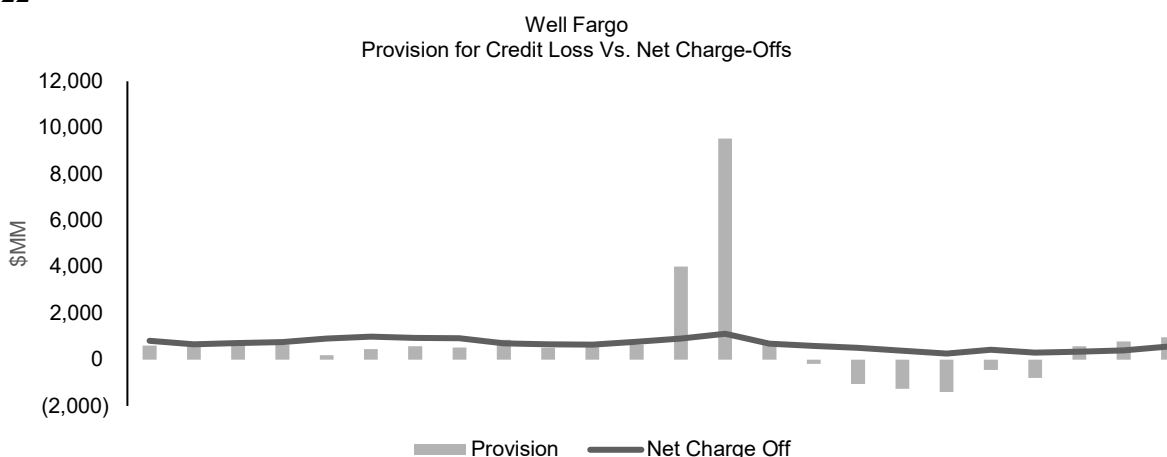
This figure depicts Wells Fargo Corporation's quarterly PCLs and NCOs for the first quarter of 2017 through the fourth quarter of 2022.

As can be seen in Figure 5, once again it is evident that there was stability prior to CECL's adoption in the relationship between quarterly PCLs and NCOs. However, for 2017-2019 combined, WFC had PCLs of $6.959B which is about 17% less than its NCO of $8.434B. As a result, it was drawing down its ACL even before the further decrease at the time of adopting CECL and to a greater degree than either JPM or BAC. Moreover, it had also been drawing down the ACL in the period 2013 through 2017. This pattern is consistent with WFC's management apparently viewing the ACL as having been too great under both the incurred loss accounting model and the new CECL model.

Once the pandemic evidenced itself and economic turmoil and uncertainty became a universal concern, WFC increased its ACL with a large PCL of $4.005B in Q1-2020 which seemed comparable to the PCLs being reported by JPM and BAC in light of its smaller size and accordingly lower ACL level. However, thereafter in Q2-2020, WFC reported a stunning PCL of $9.534B, but without disclosing any input assumptions. The disclosure it made for the Q2-2020 PCL was that they did "*apply some weighting on a downside scenario to reflect the uncertainty in the economic forecast*" but it did not disclose an amount. Its Form 10-Q included several paragraphs discussing the sensitivity of the CECL analysis and the almost poignant observation: "*Management believes that the estimate for the ACL for loans was appropriate at the balance sheet date. Because significant judgment is used, it is possible that others performing similar analyses could reach different conclusions.*" In its disclosures, WFC also commented that under certain scenarios the PCL might have even been $5B greater than reported. Such a statement reflects how dramatically different ACL/PCLs can be depending on input assumptions.

In Q3-2020, WFC recorded a PCL of $769M which is comparable to the $683M of NCO it experienced. It went on to record a modest PCL reversal of $179M in Q4-2020 compared to NCO of $584M, although together the two quarters evidence a drawing down of the ACL. The explanation for the Q4-2020 reversal was disclosed as being "… *predominantly due to a $757 million reserve release due to the announced sale of our student loan portfolio, as well as lower net charge-offs*." Thereafter in 2021, WFC recorded PCL reversals every quarter aggregating $4.155B compared to NCO of $1.574B, further drawing down the reserve.   Viewing 2020 and 2021 in total, WFC recorded PCLs of $9.974B compared to NCO of $4.863B, maintaining an ACL of $13.788B well in excess of the $9.127B established upon CECL adoption at January 1, 2020. This pattern is dramatically different than that of JPM and BAC. Of further note, WFC has been enduring severe regulatory pressure for many of its practices and it cannot be known what effect, if any, that pressure has had on the CECL/ACL determinations. In 2022, WFC's PCLs were fluctuating: a reversal of $787M in Q1-2022, $580M for Q2-2022, $784M for Q3-2022, and $957M for Q4-2022. For 2022 overall, its PCL of $1.534B was slightly less than the $1.608B of NCO experienced so its ACL was drawn down slightly, in contrast to JPM and BAC who built up their ACLs during the year. As noted in WFC's Form 10-K footnote to the financial statements, "*The ACL for loans decreased $179 million from December 31, 2021, reflecting reduced uncertainty around the impact of the COVID-19 pandemic on our loan portfolio. The decrease was partially offset by loan growth and a less favorable economic environment.*"

The above asserts a view of less uncertainty but within the context a less favorable economic environment at the end of 2022 compared to the end of 2021. Above we noted that at Q2-2020, WFC had introduced in the Form 10-Q a broad discussion about the sensitivity of the CECL/ACL determination, noting that others using the same data might discern a need for a $5.0 billion greater PCL. While commenting on a less favorable economic environment at the end of 2022 compared to the end of 2021, the economic environment at the end of 2022 was still much better than that which was apparent at Q2-2020. However, WFC continued to have an expansive discussion about the sensitivities involved in the CECL/ACL determinations:

"*Our sensitivity analysis does not represent management's view of expected credit losses…we applied a 100% weight to a more severe downside scenario…the sensitivity analysis resulted in a hypothetical increase in the ACL for loans of approximately $7.0 billion at December 31, 2022. The hypothetical increase in our ACL for loans does not incorporate the impact of management judgment for qualitative factors applied in the current ACL for loans, which may have a positive or negative effect on the results. It is possible that others performing similar sensitivity analyses could reach different conclusions or results.*"

It appears that CECL has brought into play additional concerns about conservatism – the above yearend comment by WFC regarding the $7.0B uses the same language framing as in Q2-2020 when it recorded a very large PCL and expressed that others might feel that an additional $5.0B could be warranted, although, without a doubt the forward-looking economic outlook and uncertainty was much, much greater and downcast at Q2-2020 amid the pandemic than it was at the end of 2022. Such appears to represent an inconsistent base of analysis being applied.

2022 Year-End CECL/ACL Positioning

All three banks reported earnings on January 13, 2023, and all three increased their PCL in Q4-2022 compared to Q3-2022 and above their NCO for the quarter, thereby building their ACLs. All three had Q4-2022 NCO greater than they experienced in Q3-2022. There is a required disclosure in Form 10-Ks that management present an allocation of the ACL to the various segments of the lending portfolio. At December 31, 2022, the three banks, each of which had experienced a favorable trend of reducing NCO over the three years since CECL's adoption, and each of which had somewhat similar loan portfolios, were in the following postures regarding their CECL/ACL: JPM had an ACL of $22.204B representing 7.8x its NCO during 2022. The ACL for unfunded commitments was 10.1% of the total ACL. Its consumer-related

lending portfolio was 43.7% of its total lending portfolio, yet was allocated 59.6% of the ACL. However, it also disclosed that its total credit exposure, including unfunded commitments and the consumer-related exposure, was 52.3%, which leads one to infer that higher ACL allocation to consumer reflects that additional unfunded exposure. BAC had an ACL of $14.222B representing 6.6x its NCO during 2022. The ACL for unfunded commitments was 10.8% of the total ACL. Its consumer-related lending portfolio was 43.6% of its total lending portfolio and was allocated 50.9% of the ACL.

WFC had an ACL of $13.609B representing 8.5x its NCO during 2022 -- the greatest coverage out of the three banks. The ACL for unfunded commitments was only 4.6% of the total ACL compared to the ten percent levels for JPM and BAC. Its consumer-related lending portfolio was 41.7% of its total lending portfolio and was allocated 48.9% of the ACL, but it also disclosed that 54.3% was allocated to the consumer banking and lending segment, although it did not explain the distinction between the two allocations. Additionally, regarding the allocation to residential mortgage activity, there was a footnote disclosing that the amount "*includes negative allowance for expected recoveries of amounts previously charged off*" – a similar commentary was also made by BAC. In summary, all three banks display similar and yet diverse positioning reflective of their own experience and perceptions of what is likely to evolve. Yet, from past hindsight, the various forecasts used by all three will most likely not be what actually unfolds for the economy. During 2022, JPM built its ACL by almost 19%, BAC built its ACL by nearly 3%, and WFC drew down its ACL by a modest amount. Their year-end ACLs represent a range of coverage compared to their 2022 NCO experience with WFC appearing to have the most conservative posture.

As reported by the Federal Deposit Insurance Corporation's (FDIC, 2023) Quarterly Banking Profile released on February 28, 2023, in pandemic-stressed 2020, the banking system recorded $132B of PCLs up significantly from $55B in 2019, followed in 2021 by $31B of PCL reversals, only to then be followed by $52B of PCLs in 2022. The posturing by the three large banks in our sample, which have a significant representation within the banking system, has been generally consistent with that of the banking system as a whole. In 2020, these three large banks recorded $43.0B of PCLs (about 32% of the system total), then in 2021 recorded $18.0B of net PCL reversals (about 58% of the system total), and then followed in 2022 with $10.6B of PCLs (representing about 20% of the system total). At yearend 2022, there was an evolving consensus regarding the macroeconomic outlook as reported by CNBC on December 28, 2022, noting that its latest quarterly CFO Survey revealed an 80% sentiment that there will be a recession in 2023 with views evenly split as to whether it will be in the first or second half of the year (Rosenbaum, 2022). Furthermore, prior to earnings reports, on January 3, 2023, the Wall Street Journal reported that "*More than two-thirds of the economists at … 23 large financial institutions … are betting the U.S. will have a recession in 2023. Two others are predicting a recession in 2024*" (Rabouin, 2023, p. B1).

CECL Evolution Post-Pandemic

Before the adoption of CECL, PCLs were fairly steady as one would expect under the previous "incurred loss" accounting model being applied within an environment when NCOs were steady. In contrast, beginning with the adoption of CECL amid the great economic uncertainties generated by the pandemic at January 1, 2020, PCLs reported each quarter began to have great variability. Such variability is readily attributable to the macroeconomic forecasting required by CECL when management is developing ACL estimates in such an uncertain environment. But one must keep in mind that major characteristics of the macroeconomic models are the various inputs used by management concerning GDP and unemployment, which can vary greatly from one management team to another as documented by Pinello and Puschaver (2020, 2022). Experts discuss to no agreed conclusion what would be an appropriate point to consider as "post-pandemic." The pandemic caused many disruptions such as changes in workforce behavior and supply-chain bottlenecks and shortages, etc. It is therefore a fundamental historical event that will have consequences for years. But, as noted earlier, now management is contending with those lingering issues

and uncertainties within a more typical business cycle framework, such as the Federal Reserve increasing interest rates to stem inflation and concerns over GDP growth or possibly a recession.

Implementing CECL in Q1-20 and through the pandemic evidenced many discontinuities as management teams struggled to form reliable and responsible macroeconomic forecasts and establish ACL targets that they considered the most appropriate in the circumstances. However, one would expect that by the end of 2020, as it became clear that the economy was stabilizing and after having performed five quarters of CECL analysis (at adoption plus the four quarters of 2020) and also having devoted three years to developing the CECL modeling process, that management had achieved sufficient experience and familiarity with the issues. However, for early 2020, we observed an obvious and expected pattern of significant PCLs being reported, which built related ACLs only to then taper off and even approach some reversals as the year concluded. For the following year, 2021, we observed a pattern of near universal PCL reversals. Yet, thereafter we observed more differing behaviors in 2022, some of which seem inconsistent with the underlying disclosures of macroeconomic assumptions being used. Further, bank management teams have regularly used "what if" scenario planning for asset-liability management of bank balance sheets or securities trading activities, since interest rates change daily as do deposit inflows and outflows and management must seek to maintain adequate liquidity. As CECL modeling has evolved, management has also been implementing such scenario planning analytics. As noted in the discussion above, the use of this approach has morphed the concept of management forming a "best estimate" of CECL/ACL needs into a more mathematical "probability" analysis which covers a wide array of possibilities including those that might be very unlikely. As disclosed by JPM in its 2022 Form 10-K, the result is that the assumptions melded into its scenario analytics are different than the ones management might consider as its "best estimate."

CONCLUDING COMMENTS

The current expected credit loss (CECL) framework is an improved, more forward-looking accounting model in that it has met social policy needs for banks to provide timelier provisions for credit losses (PCLs). Notably, social policy has a bias toward conservatism for the financial industry. However, there no longer appears to be as meaningful a correlation between credit loss provisioning and subsequent actual net charge-offs (NCOs) experienced or even necessarily to management's base modeling assumptions about the evolving economy. While reporting NCOs is anticlimactic to the establishment of an allowance for credit losses (ACL), their relative constancy over the last six years compared to ACL/PCL fluctuations displays that CECL may have actually harmed the utility of credit loss provisioning for consistency and comparability while meeting the social policy need for conservative reserving. Jamie Dimon, JPMorgan (JPM) CEO, has been an outspoken critic regarding CECL: during the Q4-2020 earnings conference call on January 15, 2021, with analysts when JPM reported a PCL reversal, he commented: "*...It's ink on paper...*" consistent with views he has expressed at other times; and during the Q1-2022 earnings conference call on April 13, 2022, *"... and it's a guess. It's probability weighted, hypothetical, multiyear scenarios that we do the best we can, but to spend a lot of time on earnings calls about CECL swings is a waste of time. It's got nothing to do with the underlying business;"* and echoing again during the Q3-2022 earnings conference call with analysts on October 14, 2022, he added: "*... CECL is an enormously bad accounting policy... because it's not a real number. It's a hypothetical probability-based number....*" While the adoption of the CECL/ACL accounting model was a significant event, as outlined above, it has evolved into important information being presented in a manner that is at odds with the precepts outlined in the Financial Accounting Standards Board's (FASB) Statement of Financial Accounting Concepts (SFAC) No. 8 – Conceptual Framework for Financial Reporting (2010) which prioritizes the usefulness of information for decision-making as most important and in particular comparability and consistency, noting:

"...information about a reporting entity is more useful if it can be compared with similar information about other entities and with similar information about the same entity for another period or another date.

Comparability is the qualitative characteristic that enables users to identify and understand similarities in, and differences among, items. Unlike the other qualitative characteristics, comparability does not relate to a single item. A comparison requires at least two items. Consistency, although related to comparability, is not the same. Consistency refers to the use of the same methods for the same items, either from period to period within a reporting entity or in a single period across entities. Comparability is the goal; consistency helps to achieve that goal. Comparability is not uniformity. For information to be comparable, like things must look alike and different things must look different. Comparability of financial information is not enhanced by making unlike things look alike any more than it is enhanced by making like things look different…. Although a single economic phenomenon can be faithfully represented in multiple ways, permitting alternative accounting methods for the same economic phenomenon diminishes comparability." (FASB, 2010, p. 4-5).

The three banks studied disclosed that they had used scenario analytics which by its nature implies a range of underlying CECL/ACL calculations, but the degree of detail and insight disclosed was very different and not comparable, thereby reducing its utility for investors:JPM discussed that the central case input assumptions disclosed for gross domestic product (GDP) and unemployment were essentially morphed into different and more pessimistic input derivations as management placed greater weighting on more conservative scenarios, and it also disclosed that second set of resulting assumptions. Good information, but then one is left to wonder: What exactly are the firm's assumptions? Because a blend of scenarios and management's judgmental weighting thereof that can change quarter-to-quarter is not a real input at all (which is consistent with Jamie Dimon CEO's observations discussed earlier). Bank of America (BAC) disclosed that its baseline scenario contemplates a mild recession and that it then adds in a more downside scenario such that overall the reserve is weighted 95% toward a recessionary environment in 2023, and acknowledged such a view was much more conservative than the economic estimates being publicized by others. While it discloses inputs for GDP and unemployment, one does not know how to compare that information to JPM which actually disclosed two versions of the GDP input data points

Wells Fargo Corporation (WFC) discussed that it had done a "sensitivity analysis" that applied a 100% weight to a severe downside scenario and commented that such might lead to a further increase to the ACL of $7.0B, which would be very significant compared to its yearend 2022 ACL of $13.6B. The disclosure difference is so great as to leave one confused and possibly alarmed as to the intended messaging. Without some insight as to the various input assumptions for the severe scenario, one cannot make a comparison to the inputs used for the CECL/ACL that was reported, especially as those were not disclosed. Thus, the reader only knows the impact that management feels could arise in a severe scenario, but cannot make an insightful comparison to what was actually reported without also knowing management's views regarding ACL levels under an optimistic scenario, or be able to compare WFC's views to those at other banks.

Overall, these three examples display obvious stresses in meeting SFAC No. 8's objectives for comparability and hence usefulness. Furthermore, although highly quantitative, it is not possible to consistently relate the CECL/ACL assessments to any external benchmarks. Amid the grappling with CECL reporting requirements, there has been a renewed emphasis on auditing estimates with the Public Company Accounting Oversight Board's (PCAOB) issuance of Auditing Standard (AS) 2501, *Auditing Accounting Estimates, Including Fair Value Measurements* (PCAOB, 2018), and by the American Institute of Certified Public Accountants' (AICPA) issuance of Statement on Auditing Standards (SAS) 143, *Auditing Accounting Estimates and Related Disclosures* (AICPA, 2020). However, the estimates being recorded inherently have tremendous flexibility: as noted by Brian Moynihan, BAC CEO, during the Q4-2022 earnings conference call on January 13, 2023, commenting that BAC's forecasts for the economy were "*…obviously, much more conservative than the economic estimates that are out there*"; as well as by WFC in its 2022 Form 10-K commenting that its sensitivity analysis could lead to a projected need for an ACL of $7.0 billion greater than that reported by management; and, as noted earlier, JPM's disclosure in its 2022

Form 10-K concerning the degree to which use of scenario weighting had generated more conservative results than the core input assumptions for GDP and unemployment.

Moreover, all CECL-related numbers are adjusted via management judgment for qualitative factors. Overall, the resulting CECL/ACLs may not necessarily reflect management's best estimate of what will happen; rather, they may be reflective of a "contingency aspect" beyond seeking a "most probable estimate" but such would not be consistent with generally accepted accounting principles (GAAP). In addition, the tone we observed of discussions regarding the weighting of scenarios in the CECL calculations appears to drift toward worst case situations and one wonders if there could arise a situation in which say JPM discloses that the result of its scenario weighting is GDP and unemployment inputs more optimistic than its central case, or that WFC might disclose that others could arrive at an ACL determination less than the one recorded? Our findings lead us to suggest that to overcome these issues, additional guidance should be issued to require that various aspects of the CECL/ACL determinations are more comprehensively disclosed and discussed by management in a manner consistent across all banks, specifically the input assumptions driving the CECL macroeconomic modeling and the nature and weighting of scenarios with a discussion of sensitivity. Furthermore, additional research is necessary. As noted, our research was limited to three of the country's largest banks and, while we believe our observations would be pertinent to other banks, additional research could confirm such. Further research could be insightful regarding a longer timeframe prospectively to see if CECL volatility reduces as its use becomes more familiar and it weathers several business cycles. In addition, research as to the degree of evolving disclosure being presented in other banks might be insightful. Lastly, the entire issue of "best estimate" would benefit from additional research to address the fundamental question of whether "best" should mean "most probable" as derived from an amalgamation of weighted probabilities for what "could" happen; e.g., while regulators subject banks to annual "stress tests" to gain insight as to how the banking system might endure a severe economic downturn, they do not require banks to have ACLs that reflect such a scenario.

REFERENCES

American Institute of Certified Public Accountants (2020, July). Auditing Accounting Estimates and Related Disclosures. Statement on Auditing Standards (SAS) 143. New York, AICPA.

Benoit, D. (2022a) "JP Morgan CEO Jamie Dimon Says 'Powerful Forces' Threaten U.S. Economy." *The Wall Street Journal*, April 13, 2022.

Benoit, D. (2022b) "Jamie Dimon Sees U.S. Recession in 6 to 9 Months." *The Wall Street Journal*, October 10, 2022.

Bonsall, S. B., Schmidt, B., and Xie, B. (2022) "Current Expected Credit Loss (CECL) Model and Analyst Forecasts." Working Paper, Pennsylvania State University.

Cox, J. (2023) "U.S. GDP Rose 2.9% in the Fourth Quarter, More than Expected Even as Recession Fears Loom." *CNBC.com*, January 26, 2023.

Federal Deposit Insurance Corporation (FDIC, 2023) *Quarterly Banking Profile*, *Time Series Spreadsheets, Annual Income*, vol.16(4) released on February 28, 2023, Washington, D.C.

Federal Reserve Bank of Atlanta (2022) Center for Quantitative Research, *GDPNow*, December 23, 2022.

Financial Accounting Standards Board (2010, September) *Conceptual Framework for Financial Reporting*. Statement of Financial Accounting Concepts (SFAC) No. 8, FASB, Norwalk, Connecticut.

Financial Accounting Standards Board (2016, June) *Measurement of Credit Losses on Financial Instruments.* FASB Accounting Standards Update (ASU) No. 2016-13, Topic 326 Financial Instruments--Credit Losses, FASB, Norwalk, Connecticut.

Gee, K. H., Neilson, J., Schmidt, B., and Xie, B. (2023) "Are Recognized Expected Credit Losses Decision-Useful and New to Investors?" Working Paper, Pennsylvania State University.

Jacobs, M. (2019) "An Analysis of the Impact of Modeling Assumptions in the Current Expected Credit Loss (CECL) framework on the Provisioning for Credit Loss." *Journal of Risk & Control*, vol. 6(1), 65-112.

Lopez-Espinosa, G., Ormazabal, G., and Sakasai, Y. (2021) "Switching from Incurred to Expected Loan Loss Provisioning: Early Evidence." *Journal of Accounting Research*, vol. 59(3), 757-804.

Pinello, A., and Puschaver, L. (2018) "Accounting for Credit Losses Under ASU 2016-13: Anticipating the Impact on Reporting and Disclosure." *The CPA Journal*, vol. 88(2), 54-59.

Pinello, A., and Puschaver, L. (2020) "CECL Encounters a 'Perfect Storm:' Complexity, Crisis, and Uncertainty." *The CPA Journal*, vol. 90(7/8), 20-28.

Pinello, A., and Puschaver, L. (2022) "Implementing CECL During the Pandemic: Second Quarter Reveals Unexpected Consequences." *The CPA Journal*, vol. 92(1/2), 20-27.

Pinello A., Puschaver, L., and Volkan, A. (2020) "The Relationship Between Critical Accounting Estimates and Critical Audit Matters." *Accounting & Taxation,* vol. 12(1), 23-33.

Public Company Accounting Oversight Board (2017) *The Auditor's Report on an Audit of Financial Statements When the Auditor Expresses an Unqualified Opinion.* Auditing Standard (AS) 3101, PCAOB Release No. 2017-001, PCAOB, Washington, D.C.

Public Company Accounting Oversight Board (2018) *Auditing Accounting Estimates, Including Fair Value Measurements.* Auditing Standard (AS) 2501, PCAOB Release No. 2018-005, PCAOB, Washington D.C.

Public Company Accounting Oversight Board (2022) "Staff Update and Preview of 2021 Inspection Observations." *PCAOB Spotlight*, December 2022, PCAOB, Washington D.C.

Rabouin, D. (2023) "Big Banks Expect Recession and Fed Pivot." *The Wall Street Journal,* January 3, 2023.

Rosenbaum, E. (2022) "Dow Headed Back Below 30,000, Slim Chance of a Soft Landing for Economy in 2023: CNBC CFO Survey." *CNBC.com The Bottom Line,* December 28, 2022.

Schroeder, R. H. (2023) "Research Opportunities to Confirm or Dispel the Myths of CECL: Looking Past the Headlines to Actual Results." *Journal of Accounting, Auditing & Finance*, vol. 38(2), 233-270.

The Conference Board Economic Forecast for the US Economy, December 14, 2022. New York, N.Y.

BIOGRAPHY

Arianna Spina Pinello, Ph.D., CPA, CIA is an Associate Professor of Accounting in the Lutgert College of Business at Florida Gulf Coast University. She is a Certified Public Accountant, a Certified Internal Auditor, and a member of the American Accounting Association, the Institute of Internal Auditors, and the Florida Institute of Certified Public Accountants. Dr. Pinello earned her Ph.D. in Accounting from The Florida State University in 2004, and her research has been published in a variety of academic and professional accounting journals.

Ernest Lee Puschaver, MBA, CPA specialized in audits of large banks during a 28-year career with PwC, and subsequently held executive finance positions with FleetBoston (acquired by Bank of America) and the Federal Home Loan Bank of Atlanta for over five years.

THE INCIDENCE OF EXPECTATIONS MANAGEMENT IN THE POST-REGULATION FAIR DISCLOSURE PERIOD

Sherry Fang Li, Rider University

ABSTRACT

This paper investigates the incidence of expectations management in the post-Regulation Fair Disclosure period. Using uniquely hand-collected data, I present direct evidence that the expectations management game is still played in the new regulatory environment. Management has switched to issuing pessimistic public guidance (instead of relying on private communications as in the pre-Regulation Fair Disclosure period) to dampen analysts' expectations to a beatable level. In addition, they use both quantitative and qualitative, both earnings-related and nonearnings-related disclosures to influence analysts' forecasts. However, I find that expectations management is decreasing during my sample period (2001-2004).

INTRODUCTION

The phenomenon that managers guide analysts' earnings expectations to avoid negative earnings surprises has received considerable attention from both the popular press and accounting regulators over the past number of years. For example, a May 6th, 1991 Wall Street Journal article states, "these days, many companies are encouraging analysts to deflate earnings projections to artificially low levels, …If the game is played right, a company's stock will rise sharply on the day it announces its earnings -- and beats the analysts' too-conservative estimates..." (Cohen, 1991). In a widely cited speech made on September 28, 1998, Arthur Levitt, Chairman of the Securities and Exchange Commission at that time, expressed concern about the "expectations management game." He noted, " Increasingly, I have become concerned that the motivation to meet Wall Street earnings expectations may be overriding common sense business practices. Too many corporate managers, auditors, and analysts are participants in a game of nods and winks. In the zeal to satisfy consensus earnings estimates and project a smooth earnings path, wishful thinking may be winning the day over faithful representation. As a result, I fear that we are witnessing an erosion in the quality of earnings, and therefore, the quality of financial reporting. …" (Levitt, 1998).

Accounting researchers have also shown evidence consistent with firms engaging in expectations management to meet or beat financial analysts' forecasts. Several studies find that firms deliberately guide analysts' forecasts downward to avoid a "disappointment" at the official earnings announcement date (e.g. Matsumoto, 2002, Bartov et al., 2002, Richardson et al., 2004, Li et al., 2014, Li, 2019). Furthermore, Bartov et al. (2002) and Brown and Caylor (2005) report that expectations management has increased substantially in recent years.

Motivated by the concerns expressed by the popular press, accounting regulators and accounting researchers, this paper examines the incidence of expectations management in the post-Regulation Fair Disclosure (FD, hereafter) period. Regulation FD was implemented by the U.S. Securities and Exchange Commission in 2000 to address concerns regarding selective disclosure of material information by publicly traded companies. Prior to the introduction of Regulation FD, companies could share important information with a select group of analysts and investors, giving them an unfair advantage over the public. A survey conducted by the National Investor Relations Institute (NIRI) in 2001 on the effects of Regulation FD shows that many companies worked closely with analysts in developing their earnings forecasts prior to Regulation FD. 81% of the firms claimed that the managers or someone from the firm reviewed the analysts' earnings models in the pre-Regulation FD period. Regulation FD aimed to level the playing field by mandating that companies disclose material information to all market participants simultaneously.

Most of the current expectations management literature focuses on the pre-Regulation FD period (e.g. Matsumoto, 2002, Bartov et al., 2002, Richardson et al., 2004, Brown and Caylor, 2005), and mainly used the downward forecast revision as the proxy for expectation management. However, in the post-Regulation FD period, management's private earnings guidance was prohibited. If they still intend to influence analysts' forecasts, they must switch to public guidance, making it possible to directly observe and measure expectations management activities.

I begin my analysis by selecting a group of firms that are *suspected* to have successfully beaten analysts' forecasts through expectations management. Prior research has shown that on average, analysts' forecasts are systematically optimistic at the beginning of the fiscal period, and then become systematically pessimistic at the end of the fiscal period (Bartov et al., 2002, Richardson et al., 2004, etc.). In these studies, a downward analyst forecast revision is interpreted as evidence of management's intervention to bring analysts' forecasts down to a meetable/beatable level. Following the methodology of prior research, I obtain a sample of 1,073 firm-quarters between 2001 and 2004 where analysts' downward revisions turn a negative forecast error into a positive earnings surprise, and then I investigate all the public managerial disclosures (both quantitative and qualitative, both earnings-related and nonearnings-related) made by these firms in a short period before the actual earnings announcement to ascertain whether indeed management issued guidance that could have influenced analysts' forecasts.

I find that 58.4 percent of such firm-quarters issued pessimistic public guidance while 40.4 percent of the firm-quarters didn't issue any public disclosures during the window examined. The remaining 1.2 percent issued either optimistic or neutral public guidance. The implications of the evidence are twofold. First, this result shows that the expectations management game is still played, and is played in a public way after the enactment of Regulation FD. Second, this result suggests that the use of the downward analyst forecast revision as a proxy for expectations management might misclassify a significant portion of firms that do not guide (silent firms) as firms that guide in the post-Regulation FD period. Moreover, I find that expectations management is decreasing during my sample period. This is somewhat contrary to previous studies (mainly focused on the pre-Regulation FD era) which find expectations management is becoming more common over time (Matsumoto, 2002, Brown and Caylor, 2005). This result is supported by a recent study, Koh et al. (2008), which examines meeting or beating analyst expectations in the post-scandals/Sarbanes-Oxley Act period. Although Regulation FD is not their primary variable of interest, their Table 5 Panel B presents evidence consistent with firms relying on expectations management to meet or beat analyst forecast have decreased after Regulation FD. A possible explanation is that firms that relied on the private earnings guidance in the pre-Regulation FD period found it difficult to switch to public guidance in the post-Regulation FD period, and therefore, reduced their earnings guidance activities.

This study contributes to the literature in that it provides *direct* evidence of expectations management in the post-Regulation FD era by directly investigating the public communications between the management and the analysts, extending the prior research based on downward revisions of analyst forecast (Bartov et

al., 2002, Richardson et al., 2004, etc.). In this regard, this paper is related to Cotter et al. (2006) and Baik and Jiang (2005), which have documented that management forecasts play an important role in leading analysts toward beatable earnings targets. However, both papers focus only on quantitative management earnings forecasts issued for quarterly earnings per share. Prior research finds that fewer than 25 percent of management disclosures are point or range estimates (Pownall et al., 1993, Baginski et al., 1990). Focusing on only quantitative earnings guidance may overlook useful information contained in qualitative guidance and in non-earnings related guidance. This study examines a much broader definition of public guidance, and the results show that a significant portion of firm-quarters issued qualitative earnings disclosures and non-earnings related (sales, operating expenses, etc.) disclosures to guide analysts' expectations.

The remainder of the paper is organized as follows: I review the related literature in the next section, followed by the sample selection and data collection procedures. In the results section, I conduct empirical analyses and present the results. In the last section, I conclude and discuss possible future research questions.

LITERATURE REVIEW

There is abundant academic evidence in the accounting literature suggesting that firms use both accrual-based earnings management and expectations management to meet or beat financial analysts' expectations (MBE, hereafter). For example, Burgstahler and Eames (2003) find that the time-series behavior of earnings is consistent with companies managing their earnings to MBE. Payne and Robb (2000) find that firms with pre-managed earnings below analysts' expectations have greater positive abnormal accruals. Kaznik and McNichols (2002) also provide evidence consistent with earnings management to meet or beat forecasts. In addition to earnings management, Matsumoto (2002) and Bartov et al. (2002) provide evidence consistent with expectations management as a means to MBE.

This paper focuses on expectations management. Managing earnings is risky because auditors scrutinize questionable accounting practices, and managers cannot manage earnings continually due to the reversal property of accruals. By contrast, expectations management is not subject to audit and has no direct impact on reported earnings. Therefore, expectations management appears to be a "safer" venue to help firms MBE.

The current academic evidence on expectations management is largely indirect. Bartov et al. (2002) document that the proportion of cases where analyst downward revision turns a negative forecast error into a positive or zero earnings surprise is significantly greater than the proportion where analyst upward revision turns a positive or zero forecast error into a negative earnings surprise. Brown and Caylor (2005) find a significant temporal trend in the pattern documented in Bartov et al. (2002), consistent with expectations management being more popular over their sample period. Richardson et al. (2004) show that analysts systematically revise their initially optimistic forecasts down to beatable level just prior to the actual earnings announcement. Matsumoto (2002) uses a different approach. She develops a model to measure the unexpected portion of the analyst forecast (UEF) and finds that the mean of UEF is negative, indicating that on average, analyst forecast is lower than what it should be (as predicted by her model). These findings have been interpreted at the *prima facie* evidence on expectations management.

However, without direct examination of management's actual communication with analysts, it is not clear whether the downward revision or the unexpected analyst forecast is driven by management's intervention. For example, other factors may explain why analysts revise their forecasts downward. As the earnings announcement date approaches, more information becomes available to analysts. Analysts become more efficient and the overly optimistic forecasts at the beginning of the period get corrected gradually (Elton et al., 1984).

This paper extends the extant expectations management literature by investigating management's public discretionary disclosure as a mechanism to guide analysts' estimates downward to a beatable level in the post-Regulation FD period. Both academic and anecdotal evidence suggest that managers have the ability to influence analysts' forecasts through discretionary disclosure. "…as a key provider of information to analysts, managers can affect analysts' earnings expectations by controlling the content and timing of discretionary information releases" (Richardson et al., 2004). The passage of Regulation FD prevents firms from disclosing information to selected parties, and therefore prohibits private conversations between the management and the analysts. This makes public discretionary disclosure an appealing tool to dampen analysts' expectations in the new regulatory environment. In this paper, I provide evidence on the actual use of public managerial disclosure to lower analysts' expectations in the post-regulation FD era.

SAMPLE SELECTION AND DATA SOURCE

I begin by selecting a sample of firms that are more likely to have beaten analysts' forecasts through expectations management. The analyst forecasts-related data were retrieved from the 2005 Institutional Brokers' Estimate System (I/B/E/S) Summary History File. I/B/E/S is a database maintained by Thomson Reuters which provides analyst earnings estimates and firm guidance for most publicly traded companies. It is widely used by brokers, investors, and business researchers for accessing analysts-related data. Firm-quarters that meet the following criteria are selected: (1) the last available I/B/E/S analysts' median consensus forecast (denoted as F_L) before the actual earnings announcement is lower than the actual earnings; (2) the last available I/B/E/S analysts' median consensus forecast (denoted as F_P) prior to F_L is higher than the actual earnings).

I choose consensus forecast instead of individual forecast (e.g. Bartov et al., 2002) because managers are more likely concerned with whether the actual earnings can meet or beat the consensus forecast (as reported in company press releases), rather than any individual forecast. This should be especially true in the post-Regulation FD period, as managers can no longer privately communicate to selected individual analysts to influence their forecasts and any public disclosures should be targeted to influence all the analysts (the consensus forecast). I choose the median consensus forecast instead of mean consensus forecast to mitigate the influence of extreme individual forecasts. Stale forecasts that have not been updated since the previous quarter's earnings announcement are excluded from the consensus forecast computation. I denote this sample as the *Down-Beat* sample.

Figure 1 presents the timeline of events. F_L is about 30 days after F_P because I/B/E/S publishes consensus forecasts on the third Thursday every month. The median number of days between F_L date and the subsequent earnings announcement is 11 days.

Figure 1: Timeline of Events

Figure 1 shows the timeline of events. F_L is the last available analysts' consensus earnings forecast before the actual earnings announcement; F_P is the last available analysts' consensus earnings forecast prior to F_L; Q_t denotes the previous quarter end and Q_{t+1} denotes the current quarter end. F_L is about 30 days after F_P.

I then select another sample of firms that are *less likely* affected by expectations management as a control group. Specifically, I select firm-quarters where (1) F_L is optimistic (relative to the actual earnings), and (2) F_P is pessimistic (relative to the actual earnings). I denote this sample as the *Up-Miss* sample.

Figure 2 shows the sample selection criteria for the *Down-Beat* sample and the *Up-Miss* sample. The *Down-Beat* sample includes firm-quarters where analysts revised their optimistic initial forecast (F_P) downward, and this downward revision successfully turned a negative forecast error (measured as the actual earnings minus F_P) into a positive earnings surprise (measured as the actual earnings minus F_L) prior to the earnings announcement. The *Up-Miss* sample consists of firm-quarters where analysts revised their pessimistic initial forecast (F_P) upward, and this upward revision led to missing the analysts' expectations at the earnings announcement date.

Figure 2: Sample Selection Criteria: Down-Beat Sample Vs. Up-Miss Sample

Down-Beat Sample: firm-quarters that are *more likely* affected by expectations management (the analysts revised the initially optimistic forecast downward to a beatable level)
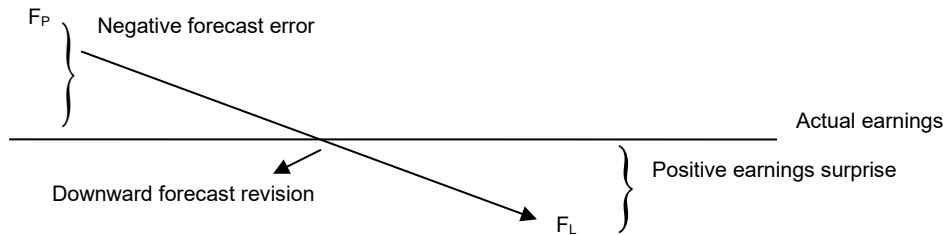
Up-Miss Sample: firm-quarters that are *less likely* affected by expectations management (the analysts revised the initially pessimistic forecast upward, and the firm-quarters missed the analysts' expectations at the earnings announcement)
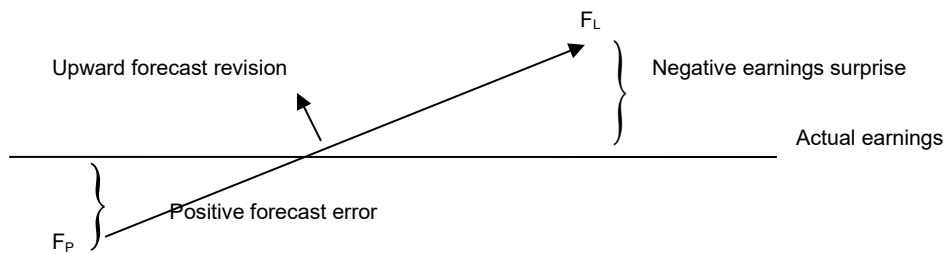
Figure 2 presents the sample selection criteria for the Down-Beat sample and the Up-Miss sample. F_L is the last available analyst consensus earnings forecast before the actual earnings announcement; F_P is the last available analyst consensus earnings forecast prior to F_L; Forecast error is measured as the actual earnings minus F_P; Earnings surprise is measured as the actual earnings minus F_L.

I hand-collected all the public disclosures (both quantitative and qualitative) with implications for quarterly earnings issued between F_P and F_L by the management of the firm-quarters in the two samples. In the expectations management game, timing is a crucial factor. Accordingly, I exclude statements made by management at the beginning of the quarter, because at that time management has a high level of uncertainty about what the actual earnings would be. Therefore, such disclosures are more likely to be issued to correct the analysts' optimism and less likely for expectations management purpose. Many prior studies on the use of managerial disclosures to influence the analysts' and investors' perceptions of earnings also focus on a short disclosure window. For example, Kasznik and Lev (1995) examine disclosures made within 60 days

before the actual earnings announcements for firms with large earnings surprises. Soffer et al. (2000) investigate earnings preannouncements made from two weeks before the end of the quarter until the day before the earnings announcement date. In addition, Tse and Tucker (2010) point out that negative earnings disclosures come in two waves. The beginning-of-quarter ones tend to be genuine management forecast while the end-of-quarter ones tend to be earnings warnings/guidance.

The public disclosures (company press releases, verbal transcripts of conference calls, analyst meetings, etc.) are obtained from the Lexis/Nexis News Wires File, the StreetEvents database, company website and other sources. The StreetEvents is a database maintained by Thomson Financial, which provides corporate disclosure and brokerage event information for more than 6,500 public companies. I used multiple channels to collect managerial disclosures to ensure the completeness of my dataset.

I then classify each firm's disclosures into seven disclosure types: (1) Point forecasts of earnings, (2) Range forecasts of earnings, (3) Qualitative disclosures about earnings, (4) Point forecasts of sales, (5) Range forecasts of sales, (6) Qualitative disclosures about sales, and (7) Other operating information, such as announcements of components of earnings, changes in operating expenses, etc. The first three are all earnings-related disclosures and the last four are nonearnings-related disclosures.

I consider sales-related information and other operating information because nonearnings-related disclosures provide indirect or partial information about earnings (Kasznik and Lev, 1995). I investigate qualitative statements such as "earnings will fall below expectations" because they also convey earnings information to analysts and investors (Skinner, 1994).

I excluded firms in regulated industries as they are likely to have different incentives to MBE than those in non-regulated industries (Matsumoto, 2002). Specifically, I exclude financial institutions (SIC codes 6000-6999), utilities (SIC codes 4800-4999), and other quasi-regulated industries (SIC codes 4000-4499, and 8000 and higher).

The sample period is restricted to years after Regulation FD was formally enacted, specifically, from January 2001 to December 2004. The *Down-Beat* sample is composed of 955 firms with 1,073 firm-quarter observations with required data available, while the *Up-Miss* sample is composed of 98 firms with 107 firm-quarter observations with required data available.

RESULTS

To provide direct evidence of management's involvement in the expectations guidance game in the post-Regulation FD period, I read all the disclosures made between F_P and F_L by the *Down-Beat* and the *Up-Miss* sample firm-quarters. I classify disclosures as pessimistic/neutral/optimistic guidance if they indicate that earnings will be worse/the same/better. Specifically, for quantitative earnings disclosure, I compare the exact value of the point forecast and the mid-point of the range forecast to the initial analyst consensus forecast (F_P). Additional analysis shows that approximately 92% of the pessimistic quantitative earnings forecasts are not only lower than the initial analyst consensus forecast, but also lower than the actual earnings reported.

Forecasts that fall below/equal/exceed the initial analyst consensus forecast are classified as pessimistic/neutral/optimistic guidance. Nine *Down-Beat* firm-quarters made open-ended ("more than" or "less than") earnings forecasts. I compare the end value of the forecast with the initial analyst consensus forecast for guidance classification. None of the *Up-Beat* firm-quarters made open-ended earnings disclosures. For quantitative sales disclosures, I use management's or analysts' previous sales forecast, whichever is available, as the benchmark for the classification. For qualitative disclosures, statements such as "earnings will not meet (will beat) the existing analyst consensus forecast" are classified as pessimistic (optimistic) guidance and statements such as "earnings will be consistent with the existing analyst consensus

forecast " are classified as neutral guidance. Another researcher independently classified a select number of my sample observations. The Cronbach's alpha test (α>0.95) indicates that the coding of the disclosures is reliable.

The majority of the *Down-Beat* sample firms made only one disclosure during the interval examined for a specific quarter. Managers may issue last-minute guidance right before the actual earnings announcement date. Therefore, I also investigated all the managerial disclosures made in the period between F_L and the actual earnings announcement. I find that 11 *Down-Beat* sample firm-quarters made disclosures during this period, and all the 11 disclosures confirmed the previous disclosures made between F_P and F_L. No *Up-Miss* sample firm-quarters made disclosures between F_L and the actual earnings announcement. It seems that the F_P-to- F_L window successfully captures the majority of the earnings guidance activities.

Less than three percent of the firms provided multiple disclosures. For these firms, I consider the most current disclosure for guidance classification. I only consider the most current disclosure because half of the multiple disclosure firms issued subsequent disclosure to correct the information contained in the previous disclosure, while the other half made subsequent disclosure to confirm or reinforce the information contained in the previous disclosure. The latest disclosure tends to represent the final message that managers want to convey to the market participants. None of the *Up-Miss* sample firms issued more than one disclosure during the window examined.

If management simply issues pessimistic guidance when the initial analyst consensus forecast is too high and issues optimistic guidance when the initial analyst consensus forecast is too low, the proportion of pessimistic guidance made by the *Down-Beat* sample firm-quarters should be the same as the proportion of optimistic guidance made by the *Up-Miss* sample firm-quarters. However, if managers deliberately issue pessimistic guidance to bring an optimistic analyst forecast down to a beatable level, the proportion of pessimistic guidance made by the *Down-Beat* sample firm-quarters should be greater than the proportion of optimistic guidance made by the *Up-Miss* sample firm-quarters.

Table 1 shows that management's disclosure policy is asymmetric in the two samples. 58.4 percent (627 firm-quarters) of the *Down-Beat* sample issued pessimistic guidance, while only 17.8 percent (19 firm-quarters) of the *Up-Miss* sample issued optimistic guidance. The difference in the percentages (58.4 percent-17.8 percent = 40.6 percent) is highly significant (p<.0001) (not reported in Table 1). The results are consistent with management's use of pessimistic public guidance to dampen analysts' forecasts in order to achieve a positive earnings surprise, and provide direct evidence of expectations management in the post-Regulation FD period.

Table 1 also shows that a large portion of firm-quarters did not issue any disclosures during the window examined. In the *Down-Beat* sample, 40.4 percent of the firm-quarters kept silent, while in the *Up-Miss* sample, 76.6 percent of the firm-quarters kept silent. Analysts revised forecasts downward or upward right before the earnings announcement date due to factors other than management's intervention. Therefore, the use of downward forecast revision as a proxy for expectations management may misclassify silent firms as guidance firms, and may lead to over-estimating the prevalence of expectations management in the post-Regulation FD environment.

Table 1: Type of Management's Public Guidance

	Down-Beat Sample (Firm-Quarters *Likely* to Be Affected by Expectations Management)		Up-Miss sample (Firm-Quarters *Less Likely* to Be Affected by Expectations Management)	
	N	Percent	N	Percent
Optimistic guidance	7	0.7	19	17.8
Neutral guidance	5	0.5	0	0
Pessimistic guidance	627	58.4	6	5.6
No disclosures	434	40.4	82	76.6
Total	1073	100	107	100

Table 1 reports the type of management's public guidance for the Down-Beat and the Up-Miss samples. The Down-Beat sample includes 1,073 firm-quarters where analyst downward revision turns a negative forecast error into a positive earnings surprise. The Up-Miss sample includes 107 firm-quarters where analyst upward revision turns a positive forecast error into a negative earnings surprise.

Table 2 presents the relative frequency of types of guidance for *Down-Beat* firm-quarters with pessimistic guidance (627 firm-quarters) and *Up-Miss* firm-quarters with optimistic guidance (19 firm-quarters). It is evident that the *Down-Beat* cases used both earnings and nonearnings-related disclosures, and both quantitative and qualitative disclosures to influence the analysts' expectations. In addition, a large portion of the *Down-Beat* cases tend to use more than one guidance type at the same time.

Table 2: Relative Frequency of the Guidance Type

Type of Guidance	*Down-Beat* Cases with Pessimistic Guidance		*Up-Miss* Cases with Optimistic Guidance	
	N	Percent	N	Percent
Range forecasts of earnings, together with point or range estimates of sales	244	38.9	0	0
Qualitative disclosures about earnings and/or sales	70	11.2	2	10.5
Range forecasts of earnings, together with qualitative disclosures about sales	69	11.0	0	0
Range forecasts of earnings only	68	10.8	10	52.6
Range forecasts of earnings, together with disclosures about other operating information	37	5.9	0	0
Point or range estimates of sales only	37	5.9	1	5.3
Point forecasts of earnings, together with point or range estimates of sales	31	4.9	0	0
Point forecasts of earnings only	19	3.0	5	26.3
Other	52	8.4	1	5.3
Total	627	100	19	100

Table 2 documents the relative frequency of types of guidance for Down-Beat cases with pessimistic guidance and Up-Miss cases with optimistic guidance. Down-Beat cases with pessimistic guidance refers to the 627 firm-quarters with downward analyst forecast revision and pessimistic guidance during the window examined. Up-Miss cases with optimistic guidance refers to the 19 firm-quarters with upward analyst forecast revision and optimistic guidance during the window examined.

The largest single group is the range forecasts of earnings, together with point or range estimates of sales (244 firm-quarters or 38.9 percent), followed by qualitative disclosures about earnings and/or sales (70 firm-quarters or 11.2 percent). The third largest single group is the range forecasts of earnings, together with the qualitative disclosures about sales (69 firm-quarters or 11.0 percent). 68 firm-quarters (10.8 percent) issued range forecasts of earnings only. 37 firm-quarters (5.9 percent) issued range forecasts of earnings and disclosures about other operating information, while another 37 (5.9 percent) firm-quarters issued point or range estimates of sales only. In addition, 31 firm-quarters (4.9 percent) issued point forecasts of earnings, together with point or range estimates of sales. 19 firm-quarters (3.0 percent) issued point forecasts of earnings only. 52 firm-quarters (8.4 percent) used other guidance strategies, such as point forecasts of earnings and qualitative disclosures about other operating information.

The majority of the *Up-Miss* cases issued only a single type of disclosure, instead of a combination of multiple disclosure types. For example, ten out of a total of 19 firm-quarters (52.6 percent) issued range forecasts of earnings only, while five out of 19 firm-quarters (26.3 percent) issued point forecasts of earnings only.

From this section on, I denote the 627 *Down-Beat* cases with pessimistic guidance as the *Guidance-Beat* sample, which represents firm-quarters that beat the analysts' forecasts through management's public guidance.

Table 3 presents the descriptive information on the *Guidance-Beat* sample. Panel A reports the year and quarter distribution. There were 230 firm-quarters (36.7%) providing pessimistic guidance to avoid negative earnings surprises in 2001, 154 firm-quarters (24.6%) in 2002, 129 firm-quarters (20.6%) in 2003 and 114 firm-quarters (18.2%) in 2004. The results indicate that expectations management seems to have decreased over my sample period.

Table 3: Descriptive Information on the Guidance-Beat Sample

	Number of Firm-Quarters	Percentage
Panel A: Quarter Distribution	**N=627 (All years)**	**100%**
2001 Q1	54	8.6%
Q2	82	13.1%
Q3	71	11.3%
Q4	23	3.7%
2001 Total	230	36.7%
2002 Q1	30	4.8%
Q2	41	6.5%
Q3	46	7.3%
Q4	37	5.9%
2002 Total	154	24.6%
2003 Q1	46	7.3%
Q2	39	6.2%
Q3	28	4.5%
Q4	16	2.6%
2003 Total	129	20.6%
2004 Q1	15	2.4%
Q2	29	4.6%
Q3	44	7.0%
Q4	26	4.1%
2004 Total	114	18.2%
Panel B: Temporal Analysis of Frequency of Guidance		
Model 1: $Freq_t = \gamma_0 + \gamma_1 TimeTrend_t + \varepsilon_t$		

	Coefficient Estimate	*p-value*
Intercept	59.475	**<.0001***
TimeTrend	-2.387	**0.011**
Adj. R^2	33.87%	

Panel C: Timing of the Guidance					
Variable	**Mean**	**Standard Deviation**	**1st Quartile**	**Median**	**3rd Quartile**
Days_Guidance_Qend	-1	10.80	-9	1	7
Days_Guidance_EA	28	9.38	14	25	35

*Table 3 is based on the 627 Down-Beat firm-quarters (denoted as the Guidance-Beat sample) that issued pessimistic guidance during the window examined. Panel A shows the year and quarter distribution. Panel B reports the regression results of the temporal analysis of guidance frequency. Panel C presents the timing of the guidance. Days_Guidance_Qend denotes the number of days between the guidance date and the current quarter end. Days_Guidance_EA denotes the number of days between the guidance date and the actual earnings announcement date. *** and ** denote significance at 1% and 5% levels, respectively.*

This is somewhat contrary to the previous studies that find expectations management is increasing over time (e.g., Brown and Caylor, 2005). This may be due to the different sample periods considered. I focus on the post-Regulation FD period while previous studies mainly focus on the pre-Regulation FD period. Regulation FD prevents informal, private conversations between management and analysts. Firms that relied on private guidance to achieve positive earnings surprises may find it difficult to do so in the new regulatory environment, and therefore reduced their expectations management activities.

To statistically test the decreasing trend of expectations management, I performed the following regression:

$$Freq_t = \gamma_0 + \gamma_1 TimeTrend_t + \varepsilon_t \tag{1}$$

where *Freq* is the number of firm-quarters providing pessimistic guidance. *TimeTrend* equals 1 if the quarter is 2001Q1, 2 if the quarter is 2001Q2, etc. Regression results are summarized in Table 3 Panel B. γ_1 is significantly negative with a p-value of 0.011, suggesting that firms relying on expectations guidance game have decreased over time in the post-Regulation FD period.

Table 3 Panel C shows the timing of the guidance. *Days_Guidance_Qend* denotes the number of days between the guidance date and the current quarter end. *Days_Guidance_EA* denotes the number of days between the guidance date and the official earnings announcement date. On average, management provides pessimistic guidance one day before the current quarter end and 28 days before the actual earnings announcement date.

In addition, I find (results unreported) that 413 (81.94 percent) firms issued pessimistic guidance in only one quarter during the sample period, 67 (13.29 percent) firms issued pessimistic guidance in two quarters, and 24 (4.77 percent) firms provided guidance in more than two quarters. This evidence suggests that the majority of the firms are "sporadic guiders" and do not engage in expectation guidance activities consistently. I also find (results unreported) that 527 (84.05%) firm-quarters offered an explanation for the pessimistic guidance, such as "order rates did not improve in the quarter as we had expected," or "the severe weather affects our sales adversely." 100 (15.95%) firm-quarters didn't offer any explanation for their guidance.

CONCLUSIONS

This study is one of the first to investigate public managerial discretionary disclosure as a mechanism to manage financial analysts' expectations in the post-Regulation FD period. Through the examination of all public disclosures made in a short period before the actual earnings announcement by 1,073 firm-quarters that successfully switched initial negative earnings errors into positive earnings surprises, I find that 58.4 percent of such firm-quarters issued pessimistic public guidance during the analysis window. This presents direct evidence of expectations guidance activities in the post-Regulation FD era. However, I also find that 40.4 percent of the firm-quarters kept silent. This result suggests that downward forecast revision-based proxies for expectations guidance activities may lead to over-estimating the prevalence of expectations management in the new regulatory environment. In addition, I find that expectations management is decreasing in my sample period.

My analysis regarding the types of pessimistic guidance shows that firms are more likely to use a combination of multiple disclosure forms, both earning-related (e.g. quantitative estimates of earnings and qualitative statements regarding the actual earnings level) and nonearnings-related (e.g. quantitative sales forecasts and qualitative disclosures of other operating information), rather than a single, specific form to guide analysts' estimates.

One limitation of this paper is that it does not address how the passage of Regulation FD changes the expectations management strategy. Firms that relied on informal and private guidance to achieve positive earnings surprises in the pre-Regulation FD period are unable to do so in the post-Regulation FD period.

This study does not address questions like: what types of firms switched from private guidance to public guidance? What types of firms stopped giving guidance due to the new regulation? I leave these questions to future research.

REFERENCES

Baginski, S. and J. Hassell (1990) "The Market Interpretation of Management Earnings Forecasts as a Predictor of Subsequent Financial Analysts Forecast Revision," *The Accounting Review* 65(1), p. 175-190.

Baik, B. and G. Jiang (2005) "The Use of Management Forecasts to Dampen Analysts' Expectations," *Journal of Accounting and Public Policy* 25(5), p. 531-553.

Bartov, E., D. Givoly and C. Hayn (2002) "The Rewards to Meeting or Beating Earnings Expectations," *Journal of Accounting and Economics* 33(2), p. 173-204.

Brown, L. and M. L. Caylor (2005) "A Temporal Analysis of Quarterly Earnings Thresholds: Propensities and Valuation Consequences," *The Accounting Review* 80(2), p. 501-539.

Burgstahler, D. and M. Eames (2003) "Earnings Management to Avoid Losses and Earnings Decreases: Are Analysts Fooled?" *Contemporary Accounting Research* 20(2), p. 253-294.

Cohen, L. (1991) "Low-balling: How Some Companies Send Stocks Aloft?" *Wall Street Journal, May 06, 1991.*

Cotter, J., I. Tuna and P. Wysocki (2006) "Expectations Management and Beatable Targets: How Do Analysts React to Explicit Earnings Guidance?" *Contemporary Accounting Research* 23(3), p. 593- 628.

Elton, E J., M. J. Gruber and M. N. Gultekin (1984) "Professional Expectations: Accuracy And Diagnosis of Errors," *Journal of Financial and Quantitative Analysis* 19(4), p. 351-363.

Kasznik, R. and B. Lev (1995) "To Warn or Not to Warn: Management Disclosure in the Face of An Earnings Surprises," *The Accounting Review* 70(1), p. 113-134.

Kasznik, R. and M. McNichols (2002) "Does Meeting Expectations Matter? Evidence from Analyst Forecast Revisions and Share Price," *Journal of Accounting Research* 40(3), p. 727-759.

Koh, K., D. A. Matsumoto and S. Rajgopal (2008) "Meeting or Beating Analyst Expectations In The Post-Scandals World: Changes In Stock Market Rewards And Managerial Actions," *Contemporary Accounting Research* 25 (4), p. 1068-1098.

Levitt, A. (1998) "The Numbers Game." September 28, 1998. Available at: https://www.sec.gov/news/speech/speecharchive/1998/spch220.txt

Li, S.F. (2019) "Capital Market Consequences of Expectations Management In The Post-Regulation Fair Disclosure Period," *Accounting & Taxation* 11(1), p. 11-20.

Li, S.F., F. Sun and F. Wu (2014) "Analyst Reactions to Expectations Management In The Post-Regulation Fair Disclosure Period," *International Journal of Business and Finance Research* (8), p. 47-58.

Matsumoto, D. (2002) "Management's Incentives to Avoid Negative Earnings Surprises," *The Accounting Review* 77(3), p. 483-514.

Payne, J. L. and S. W. G. Robb (2000) "Earnings Management: The Effect of Ex Ante Earnings Expectations," *Journal of Accounting, Auditing and Finance* 15(4), p. 371-392.

Pownall, G., C. Wasley and G. Waymire (1993) "The Stock Price Effects of Alternative Types of Management Earnings Forecasts," *The Accounting Review* 68(4), p. 896-912.

Richardson, S., S. H. Teoh and P. Wysocki (2004) "The Walkdown to Beatable Analyst Forecasts: The Role of Equity Issuance and Insider Trading Incentives," *Contemporary Accounting Research* 21(4), p. 885-924.

Skinner, D. J. (1994) "Why Firms Voluntarily Disclose Bad News," *Journal of Accounting Research* 32(1), p. 38-60.

Soffer, L.C., S.R. Thigarajan and B. Walther (2000) "Earnings Preannoucement Strategies," *Review of Accounting Studies* 5, p. 5-26.

Tse, S. and J. W. Tucker (2010) "Within-industry Timing of Earnings Warnings: Do Managers Herd?" *Review of Accounting Studies* 15, p. 879-914.

BIOGRAPHY

Dr. Sherry F. Li is an Associate Professor of Accounting at Rider University. Her research appears in journals such as *Accounting & Taxation*, *International Journal of Auditing*, *Research in Accounting Regulation, International Journal of Business and Finance Research,* and *Review of Accounting and Finance.*

WE'VE BEEN CYBER-ATTACKED: A CASE STUDY ON CYBER-SECURITY

Margaret O'Reilly-Allen, Rider University, U.S.A.
Maria H. Sanchez, Rider University, U.S.A.

CASE DESCRIPTION

Cyber-security has grown exponentially in importance in the past twenty years. This paper documents a case study designed to teach business and accounting students the importance of having an effective cybersecurity plan as well as the roles of the internal and external auditors in cybersecurity. The case describes a real world cyberattack and how the company responded. The case is appropriate for undergraduate as well as graduate classes.

JEL: M40, M42

KEYWORDS: Cyber-Security, Cyber-Attack, Internal Controls, Internal Auditors, External Auditors

CASE INFORMATION

Introduction

Previous research has shown cyber-security is a tremendous concern for most companies (Godwin and Sule, 2023; Kozial et al., 2022; Mazzoccoli, 2023; Melaku, 2023). Devices, data and networks must be protected from unauthorized access. Companies must vigorously and continually monitor their risks due to cyber threats, including data breaches, loss of business and revenue, ransomware, malware, credential stuffing, email compromise, phishing, social engineering and numerous other threats. The average cost of a data breach in the U.S. is currently estimated to be $9.48 million (Petrosyan, 2023). There have been numerous high profile cyber-attacks on U.S. companies in the past year. Accordingly, it is imperative that the accounting and business students of today are well educated on cyber security.

Recently, the Clorox Company (Clorox) disclosed in their Form 8-K that they had "identified unauthorized activity on some of its Information Technology (IT) systems." (SEC, 2023a) Because of a new SEC rule passed in July, Clorox was required to notify the public of the incident within four days through filing of form 8-K. The disclosure notes that the incident has caused "disruption" to business operations and will likely continue to cause disruptions. The form 8-K goes on to say, "Clorox has engaged leading third-party cybersecurity experts to support its investigation and recovery efforts. The investigation to assess the nature and scope of the incident remains ongoing and is in its early stages." This cyber incident was highly publicized in the press. As a result of the cyber-attack, there have been outages and shortages of Clorox products for consumers (Jay, 2023). Clorox has indicated that, as a result of the incident, they will lose revenue.

In September, there was a colossal cyber-attack in Las Vegas, crippling two massive entertainment companies: MGM Resorts and Caesars Entertainment. MGM filed form 8-K with the SEC, indicating that they had issued a press release that same day "regarding a cybersecurity issue involving the Company." (SEC, 2023b).

In their form 8-K filing, Caesars notes that they "recently identified suspicious activity in its information technology network resulting from a social engineering attack on an outsourced IT support vendor used by the Company." (SEC, 2023c) The filing notes that the full costs of the incident have not yet been determined. It is interesting to note that the filing indicates that Caesars has cybersecurity insurance, though they have not yet determined what costs will be covered by that insurance. Caesars notes that customer information, including driver's license information and social security numbers were obtained by the hackers.

The Securities and Exchange Commission (SEC) recently passed new regulations for public companies related to cybersecurity disclosures. Material cybersecurity incidents are required to be disclosed timely and annual disclosures are required about cybersecurity risk management, strategy and governance. The new rule became effective in September 2023, and students entering the workforce will need to be familiar with the requirements.

The following case is based on a real world company who suffered a cyber-attack. The name of the company and the individuals have been changed to protect their privacy. The case has been used in undergraduate internal audit as well as graduate level auditing courses. The remainder of the paper presents the case and is organized as follows. Company background and top management are discussed. This is followed by a description of the IT Systems, then a Situation Overview and Implications for Managers. Then case questions are presented. Teaching notes follow with suggested solutions and evidence of case efficacy.

Company Background and Top Management

ABC Company is a privately held craft-supplies distribution company with annual revenues of $275 million that operates out of San Francisco, CA with warehouses in Salt Lake City, UT and Columbus, OH. ABC sells through a wide array of business channels, including independent stores, chains, mass market, direct-to-consumer and e-commerce marketplaces. The company is 100% employee-owned with over four decades of experience and is the craft industry's leading provider of supplies and materials.

ABC's management team consists of Joe Smith (CEO who has been with the company for 5 years), Mike Jones (CFO who recently joined the company), and Neil Armstrong (the Chief Revenue Officer who has been with the company for 10 years). In addition to his finance responsibilities, Mike Jones also has responsibility for the IT team which has been led by Jim Wright for the past 10 years. Due to competing priorities and a general lack of subject matter experience by Mike and the prior CFO, Jim has functioned completely autonomously his entire time in the role.

All ABC corporate employees worked out of their San Francisco offices prior to the COVID pandemic. During the COVID lockdown, the CEO provided an option for employees to work from home (WFH) or to continue to come into the office. Employees working remotely were given the option of using their work-issued or personal laptops. For convenience sake many of the remote employees were permitted to work with laptops not supported by ABC's IT team. Laptops and software programs were not required to use a VPN.

IT Systems

The company used an internally-developed and highly-customized IT system that consisted of 50 physical-servers located across their business locations (i.e. headquarters and 2 warehouse locations). This network processed all financial reporting, sales, inventory and warehouse management activities. Due to the heavy workload on the resource-challenged team, Jim prioritized 'getting stuff done' over documentation and network security. Also, in an effort to save money, Jim would continue to use servers as long as they

worked. This saved the company money but resulted in several servers not eligible for technical support from the manufacturer.

Jim's IT approach resulted in several other compromises being made including: lack of documentation of the servers, failure to ensure system-backups were scheduled and tested, lack of development of a recovery plan in the event of a cyber-attack and no training or proactive steps in place to prevent a cyber-attack. Additionally, the company had not updated virus protection software because, according to Jim, he was working on other projects and it was not a priority. The company did carry a $1 million cybersecurity insurance policy, and had regularly reviewed this coverage with the carrier and stayed current on trends affecting cyber-crime.

Situation Overview

During Mike's first week as CFO, ABC had become the victim of a successful cyber-attack that encrypted their systems and prevented the company from processing sales, managing inventory or performing any accounting functions. ABC was subsequently contacted by the cyber-criminals with a demand to pay $1.5M in bitcoin to de-encrypt their systems.

Upon becoming aware of the cyber-attack, ABC immediately reached out to their insurance partners to report the incident and request assistance in managing the process. The insurance company immediately responded by bringing in their cyber-security experts (company CDE). As part of the investigation launched by CDE, they learned that the virus was triggered by an employee clicking on an email that introduced a sleeper virus into the system. The nature of the virus allowed it to go undetected in ABC's systems while it collected information before eventually encrypting their system and locking it down.

In the process of conducting their work, CDE also identified: how the virus infected ABC's systems, the type of virus they were fighting and the profile of the bad actors (BAs). This information helped CDE assess the likelihood the BAs could effectively de-encrypt their systems if payment was made. They also used these negotiations as a stalling tactic to provide time for ABC to begin the restoration and rebuilding of its systems which was required to understand their ability to be successful in this effort.

CDE's investigation also revealed that the attack was launched out of Russia by BAs with a spotty record of providing effective de-encryption solutions. It also revealed actions taken to contain the virus by ABC prevented the BAs from exfiltrating customer data that could have been sold on the dark web.

The BAs demanded $1.5M in bitcoin currency to be deposited into an international account in return for a de-encryption solution. With the assistance of CDE, the company was able to negotiate enough time with BAs' to bring their systems back online and not pay the ransom.

Implications for Managers

Cybersecurity had to become a priority for management at ABC. Management realized the need to have a strong cybersecurity defense plan as well as a plan to backup and recover data if needed. Management needs to ensure that employees have regular training on cyber issues and that cyber insurance is adequate. Management at ABC learned the hard way that they were at risk for not only financial damage due to the ransom, but also faced a risk of disruptions to operations and reputational damage.

QUESTIONS

Directions: Use class materials and any additional research necessary to answer the following questions. Be sure to cite references.

1. Identify at least five general control weaknesses at ABC that contributed to the cyberattack. Briefly discuss the type of control and the issues associated with each of these weaknesses.

2. Identify at least 2 actions ABC took that helped effectively address the cyberattack and/or prevent future attacks.

3. Briefly describe how a phishing email allowed the virus to enter ABC's system.

4. What should a company that has been cyberattacked do as soon as the attack is discovered (be specific)?

5. Why did the BAs want the ransom payment in bitcoin? Is this standard practice in cyberattacks?

6. What factors should be considered as ABC decides whether to pay the ransom?

7. Based on your responses to question 1, how can ABC prevent cyber-attacks in the future?

8. What is the role of internal audit in cyber-security?

9. What is the role of the external (independent) auditor in cyber-security?

10. What is the role of management in cyber-security?

11. Summarize the recently passed SEC Standard Cybersecurity Risk Management, Strategy, Governance and Incident Disclosure. Why is the SEC concerned with cybersecurity?

12. Do you see any additional SEC or other rules that might help control cyber security problems and minimize impact to customers and firms?

WE'VE BEEN CYBER-ATTACKED: A CASE STUDY ON CYBER-SECURITY
TEACHING NOTES

Margaret O'Reilly-Allen, Rider University, U.S.A.
Maria H. Sanchez, Rider University, U.S.A.

CASE DESCRIPTION

Cyber-security has grown exponentially in importance in the past twenty years. This paper documents a case study designed to teach business and accounting students the importance of having an effective cybersecurity plan as well as the roles of the internal and external auditors in cybersecurity. The case describes a real world cyberattack and how the company responded. The case is appropriate for undergraduate as well as graduate classes.

GENERAL COMMENTS

This case describes a real-world case of an actual company who suffered a cyberattack. The name of the company and the employees has been changed to preserve anonymity. The primary objective of the case is to provide a platform for examining and discussing a real-world cybersecurity case and the implications for the company, as well as the responsibilities of both the internal and external auditors.

This case has been used in an undergraduate level internal audit class as well as a graduate level auditing course. It could also be used in an undergraduate auditing or a capstone course, as it covers an important topic that accountants face today, no matter if they work in corporate, internal audit or external audit. The authors' experience indicates that the case should be assigned to students after cybersecurity has been discussed in class. Students likely have heard recent cyber-attacks in the news, and may have even fallen victim to a phishing attempt themselves on their personal information.

The instructor should allow approximately 10-15 minutes to introduce the case. Students should have at least one week to complete the case outside of class. The case discussion questions are designed so that the instructor may choose to assign all questions at one time, or to pick and choose the sections relevant to the current class discussion topic. Case questions and suggested solutions are below. Following that is a section on case efficacy.

The authors have had very positive student feedback on the case. Students found the topic of Cybersecurity to be quite interesting. Students were surprised to learn how prevalent cyberattacks are in the real world. During our class discussions, students noted that they now better understood why cybersecurity is so important, why we stress it so heavily in the classroom, and why it has been a recent focus by the SEC.

We administered a survey to two sections of a graduate level auditing class. An Appendix to this section (Appendix: Evidence of Case Effectiveness) includes the survey questions and results. A majority of the students have indicated that they "agree" or "strongly agree" with the following statements:

My understanding of cyber-security in general increased as a result of this case.

My understanding of the role of the internal auditor increased as a result of this case.

My understanding of the role of the external (independent) auditor increased as a result of this case.

Through this case, my understanding of evaluating cyber-security risks increased.

I understand the role of the SEC better after completing this case.

I found this case interesting.

QUESTIONS

Question 1: Identify at least five general control weaknesses at ABC that contributed to the cyberattack. Briefly discuss the type of control and the issues associated with each of these weaknesses.

Solution 1:

Undocumented infrastructure. The issue is that without proper documentation, it is impossible to know if the system is working properly and to fix it when there is a problem. It is necessary to have proper documentation to understand network vulnerabilities. This delayed the company's response to the cyber-attack.

Having servers without manufacturer support. In an effort to save money, servers were used for as long as they worked. The issue is that without manufacturer support, servers can become outdated and do not have proper security updates. This leaves the servers vulnerable to exploits.

Lack of cyber-security plan. The company had no plan in place to prevent a cyber-attack and no plan in place to recover in the event of a cyber-attack. The issue is that a lack of a plan will leave them vulnerable to an attack and then make recovering from an attack more time consuming.

Lack of training for staff in cyber-security defense. Employees were not properly trained, leaving them vulnerable to social engineering attacks. The issue is that employees were then more likely to fall for phishing attempts. This could be easily prevented with proper employee training.

Laptops and software programs were not required to use a VPN for remote work. The issue is that BAs could exploit the unsecured connection.

No testing of backup and recovery plans. The issue is the potential for loss of data in the event of an attack. There should be procedures in place to restore systems and data after an attack.

lack of oversight of the IT department. This lack of oversight and lack of tone at the top can contribute to lackadaisical attitudes towards data and network protection. The issue is that Jim did not report to anyone and allowed the company to be vulnerable.

Outdated virus protection. The issue is that without up to date virus protection, the company is extremely vulnerable to unknown threats.

Allowing employees to work with personal equipment not supported by IT. Because of the COVID pandemic, employees began to work from home and were using personal equipment. The issue is that there were no access controls.

Question 2: Identify at least 2 actions ABC took that helped effectively address the cyberattack and/or prevent future attacks.

Solution 2:

Carrying cyber-security insurance. This helped protect the company against large losses.

Immediately reporting the attack to the insurance company. This helps contain the attack and mitigate damages

Taking containment measures. The insurance company was able to bring in experts to contain manage the recovery process and prevent the BAs from exfiltrating customer data that could have been sold on the dark web.

Assessed options prior to making a decision on paying the ransom. With the help of the insurance company, they were able to use the negotiations to buy time and avoid paying the ransom.

Question 3: Briefly describe how a phishing email allowed the virus to enter ABC's system.

Solution 3: Phishing is a type of Business Email Compromise (BEC). According to the FBI, "Business email compromise (BEC)—also known as email account compromise (EAC)—is one of the most financially damaging online crimes. It exploits the fact that so many of us rely on email to conduct business—both personal and professional." (FBI, 2023) In this case, an employee of ABC clicked on an email that introduced a sleeper virus into the system. Students should note the importance of never clicking on anything in an unsolicited email and never opening an email attachment from someone you don't know. If you think you may have clicked on a phishing email, it is important to notify your IT department immediately.

Question 4: What should a company that has been cyberattacked do as soon as the attack is discovered (be specific)?

Solution 4: If you or your company is cyber-attacked, immediately contact your IT department and your insurance company and take all possible efforts to contain the virus. Cyber-security experts should come in to evaluate and contain the attack. It is important to document and keep records of the attack for both insurance and litigation purposes. If customer data has been exposed or stolen, customers may need to be notified. In the case of a publicly traded company, disclosures will need to be made according to the recently passed SEC Standard Cybersecurity Risk Management, Strategy, Governance and Incident Disclosure. Law enforcement may be notified as well. A post-incident analysis should be conducted to determine what steps to take to prevent a successful attack in the future.

Question 5: Why did the BAs want the ransom payment in bitcoin? Is this standard practice in cyberattacks?

Solution 5: Faculty may want to have students watch a short video about Bitcoin, available at https://bitcoin.org/en/ . Bitcoin is a decentralized, digital currency. It is open source, and its design is public. Blockchain is used to secure and verify transactions and it uses a peer-to-peer network. Though bitcoin is an exciting form of fintech and offers many advantages, because of the anonymous nature of payments, it is often used in ransom payments. Bitcoin can easily be sent across the world as a form of payment while assuring anonymity, making it a payment method of choice for criminals.

Question 6: What factors should be considered as ABC decides whether to pay the ransom?

Solution 6: ABC will want to assess whether they can restore their systems without paying the ransom. ABC will want to have confirmation they are dealing with the actual BAs, they will want to assess

likelihood the BA will actually provide the de-encryption information if a ransom is paid, they will want to consider the effectiveness of the de-encryption solution provided by the BAs, and to assess the ability of ABC to restore their environment to a fully-functioning state in a timely manner. They will also want to review the terms of their insurance policy – are ransom payments covered? Finally, ABC will need to consider the impact on their reputation and customer trust.

Question 7: Based on your responses to question 1, how can ABC prevent cyber-attacks in the future?

Solution 7: Student responses will vary; however, ABC should do the following:

Update and Protect IT Infrastructure.

Server documentation and maintenance.

Secure the network and ensure that all remote connections use a VPN.

Regular software update and patches.

Ensure that only company approved devices are used for remote work.

Train and educate employees on cyber-security and phishing.

Regular security audits.

Have a cyber-attack plan in place in the event of a future attack.

Develop an incident response plan.

Review insurance policies for cyber-incident coverage.

Question 8: What is the role of internal audit in cyber-security?

Solution 8: In an increasingly complex cyber environment, internal audit plays an important role in an organization's overall strategy for dealing with cyber threats. Specific areas include:

Identify and assess potential vulnerabilities, threats, and risks to the organization's information systems and data.

Evaluate the effectiveness of internal controls related to cybersecurity, including reviewing policies, procedures, and technical controls to ensure they are adequate for protecting the organization's assets and data.

Assess the organization's cybersecurity policies and procedures, incident response plan, cybersecurity incident insurance, and compliance with insurance policy requirements.

Ensure that the organization is compliant with applicable cybersecurity regulations and standards.
Assess the level of security awareness and training within the organization. Evaluate and test the indicator response plan.

Question 9: What is the role of the external (independent) auditor in cyber-security?

Solution 9: To the extent that financial statement disclosures are required under the new SEC cybersecurity rule (see Question 11), the external auditors will need to consider whether the disclosures are adequate as part of determining whether the financial statements, including disclosures, are presented fairly in all material effects. The auditors must understand the client's automated controls as they relate to financial reporting. If a material breach is identified at the client, the auditor must consider the impact of the audit, including both the audit of the financial statements and the audit of internal controls over financial reporting (for accelerated filers). The external auditors will also consider cybersecurity as part of their overall risk assessment of the company.

Question 10: What is the role of management in cyber-security?

Solution 10: The role of management is to oversee operations of the company. That involves numerous responsibilities, including evaluating and responding to cyber-security risks. Management must be diligent in making sure that the company's cyber-security plan is up to date and regularly reviewed, that their insurance coverage is adequate, and that there are appropriate backup and recovery procedures in place. Management should be proactive, rather than reactive, when it comes to cybersecurity. Management must consider not only financial risks related to cyber issues, but also risk of reputational damage.

Question 11: Summarize the recently passed SEC Standard Cybersecurity Risk Management, Strategy, Governance and Incident Disclosure. Why is the SEC concerned with cybersecurity?

Solution 11: On July 6, 2023, the SEC issued their final rule, Cybersecurity Risk Management, Strategy, Governance and Incident Disclosure, which became effective on September 5, 2023. The rule is meant to "enhance and standardize" disclosures, requiring disclosures about material cyber-security events. The rules also require "periodic disclosures about a registrant's processes to assess, identify, and manage material cybersecurity risks, management's role in assessing and managing material cybersecurity risks, and the board of directors' oversight of cybersecurity risks."

The role of the SEC is to inform and protect investors. Investors demand timely, relevant information for decision making. Information should be comparable and consistent, and the goal of this new cybersecurity standard is to better inform investors and other financial statement users.

Question 12: Do you see any additional SEC or other rules that might help control cyber security problems and minimize impact to customers and firms?

Solution 12: On March 15, 2023, the SEC issued a proposed rule, "Cybersecurity Risk Management Rule for Broker-Dealers, Clearing Agencies, Major Security-Based Swap Participants, the Municipal Securities Rulemaking Board, National Securities Associations, National Securities Exchanges, Security-Based Swap Data Repositories, Security-Based Swap Dealers, and Transfer Agents." If and when passed, the rule would set standards for Market Entities' cybersecurity practices. Cybersecurity is clearly a concern for the SEC, given the role of the SEC to protect investors. Students may note that they expect to see more proposed rules regarding cybersecurity as technology advances.

Appendix: Evidence of Case Effectiveness

	Survey Question	Response*	1	2	3	4	5
1.	My understanding of cyber-security in general increased as a result of this case.	Response Frequency	-	-	1	2	9
		% Frequency			8%	17%	75%
2.	My understanding of the role of the internal auditor increased as a result of this case.	Response Frequency	-	-	1	3	8
		% Frequency			8%	25%	67%
3.	My understanding of the role of the external (independent) auditor increased as a result of this case.	Response Frequency	-	-	-	3	9
		% Frequency				25%	75%
4.	Through this case, my understanding of evaluating cyber-security risks increased.	Response Frequency	-	-	1	4	7
		% Frequency			8%	33%	58%
5.	I understand the role of the SEC better after completing this case.	Response Frequency	-	-	1	3	8
		% Frequency			8%	25%	67%
6.	I found this case interesting.	Response Frequency	-	-	1	2	9
		% Frequency			8%	17%	75%

*Students were required to respond to a questionnaire designed using the following scale:
1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree:*

REFERENCES

FBI (2023) "Business Email Compromise," https://www.fbi.gov/how-we-can-help-you/safety-resources/scams-and-safety/common-scams-and-crimes/business-email-compromise

Godwin, T., and Sule, M. (2023) "A Service Lens on Cybersecurity Continuity and Management for organizations' Subsistence and Growth." Organizational Cybersecurity Journal: Practice, Process and People 3.1: 18-40.

Jay, M. (2023), October 10. "Clorox Warns Cyberattack and Product Shortages Will Drag Sales Downward," NBC News, available at: https://www.nbcnews.com/business/business-news/clorox-warns-cyberattack-product-shortages-will-hurt-sales-rcna119507

Koziol, J., Watts, R. and Bottorff, C. (2022), August 12. "Most Common Cyber Security Threats in 2023," Forbes, https://www.forbes.com/advisor/business/common-cyber-security-threats/

Mazzoccoli, A. (2023), October 15. "Optimal Cyber Security Investment in a Mixed Risk Management Framework: Examining the Role of Cyber Insurance and Expenditure Analysis." Risks 11.9, 154.

Melaku, H. (2023) "A Dynamic and Adaptive Cybersecurity Governance Framework." Journal of Cybersecurity and Privacy 3.3: 327.

Petrosyan, A. (2023), "Average Cost Per Data Breach in the United States 2006-2023," Statista, https://www.statista.com/statistics/273575/us-average-cost-incurred-by-a-data-breach/

SEC (2023a), August 14, United States Securities and Exchange Company, Form 8-K, The Clorox Company,
https://www.sec.gov/ix?doc=/Archives/edgar/data/0000021076/000120677423000969/clx4231381-8k.htm

SEC (2023b), September 12, United States Securities and Exchange Company, Form 8-K, MGM Resorts International,
https://www.sec.gov/ix?doc=/Archives/edgar/data/0000789570/000119312523233855/d502352d8k.htm

SEC (2023c), September 7, United States Securities and Exchange Company, Form 8-K, Caesars Entertainment Inc.,
https://www.sec.gov/ix?doc=/Archives/edgar/data/1590895/000119312523235015/d537840d8k.htm

BIOGRAPHIES

Margaret O'Reilly-Allen is an Associate Professor of Accounting at Rider University. She received her Ph.D. in Accounting and her MBA from Drexel University and her Bachelor of Science in Accountancy from Temple University. Her research is primarily in the areas of enterprise risk management, the information content of auditor reports, and teaching effectiveness. She can be contacted at Rider University, 2083 Lawrenceville Rd., Lawrenceville, New Jersey 08648, USA.

Maria H. Sanchez is a Professor of Accounting at Rider University. She received her Ph.D. in Accounting and her MBA from Drexel University and her Bachelor of Science in Accountancy from Villanova University. Her research primarily focuses on fraud detection and deterrence as well as decision maker behavior in accounting and auditing contexts. She can be contacted at Rider University, 2083 Lawrenceville Rd., Lawrenceville, New Jersey 08648, USA.

REVIEWERS

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

REVIEWERS

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

REVIEWERS

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

REVIEWERS

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

HOW TO PUBLISH

Submission Instructions

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

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

Subscriptions

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

Contact Information

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

Website

www.theIBFR.com

PUBLICATION OPPORTUNITIES

REVIEW of BUSINESS & FINANCE STUDIES

Review of Business & Finance Studies

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

All papers submitted to the Journal are blind reviewed. Visit our website www.theibfr.com/our-journals/ for distribution, listings and ranking information.

EBA Business Education & Accreditation

Business Education and Acreditation (BEA)

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

All papers submitted to the Journal are blind reviewed. Visit our website www.theibfr.com/our-journals/ for distribution, listings and ranking information.

A Accounting & Taxation

Accounting and Taxation (AT)

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

All papers submitted to the Journal are blind reviewed. Visit our website www.theibfr.com/our-journals/ for distribution, listings and ranking information.

REVISTA GLOBAL de NEGOCIOS

Revista Global de Negocios

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

AAll papers submitted to the Journal are blind reviewed. Visit our website www.theibfr.com/our-journals/ for distribution, listings and ranking information.