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OIL RESERVES AND FINANCIAL INFORMATION DURING 2011 - 2015

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ABSTRACT

The price of oil fluctuated wildly from 2011–2015 and fell to about half the price it was at its peak. This paper investigates whether proven oil reserves of companies provide information for the market value of the firm. In doing so, we also examine if proven oil reserves help in predicting future earnings of companies incremental to other measures such as current earning and book value. The study uses financial models from the accounting literature that are influential and have been used in other studies for different purposes and in different industries. The sample consisted of Oil Exploration and Production firms (GICS subindustry 10102020) plus Integrated Oil firms (GICS subindustry 10102010) as included in the COMPUSTAT database. The sample included 120 firms. Data points were generated for a 5 year-period from 2011 to 2015. The results of the data analysis indicate that proven reserve information does not seem to provide any additional explanatory power for the market value of equity of firms incremental to the information provided in financial variable such as earnings, book value, accruals and cash flows. Also, proven reserve information does not seem to aid in predicting future earnings over and above the information found in financial variables such as current year earnings, book value and cash flow and accruals.

Key Words: Oil reserves, information content, market value of firm, future earnings.

INTRODUCTION

Accounting for Oil and Gas companies has had a tumultuous history. There are two methods that are generally accepted for accounting for exploration costs for oil. These are the successful efforts method and the full-cost method. The successful efforts method requires that costs of exploration for oil that do not result in discovering oil and gas should be expensed in the same period as the incurrence of the expense. The other method is the full-cost method which requires that exploration costs for all wells, whether they are successful or not should be capitalized as assets and expensed when oil is extracted from successful wells. Both of these methods are used by different companies in the oil industry. The depletion base is calculated under both methods based on cost of exploration which includes acquisition cost of the deposit, exploration costs, development costs and restoration costs. However, for successful efforts firms the depletion base only includes these costs for successful wells. For full-cost firms the depletion base includes the costs of both successful wells as well as dry holes.

A recounting of the changes in accounting for oil shows the political nature of standard setting. In 1977 the Financial Accounting Standards Board (FASB) published a standard that required all oil firms to use successful efforts accounting. This standard was met with strong opposition by many oil companies in particular by small companies. These companies felt that being forced to follow the successful efforts method would cause their earnings to fluctuate widely from year to year and thus cause investors and creditors to consider these companies more risky and make it harder and more expensive for them to raise capital. Thus they argued it would cause them to cut back on new exploration. The oil companies lobbied extensively in Congress. The Department of Energy at that time also commented that companies using full-cost at that time would cut back on their exploration activities if they had to switch to successful efforts. Congress was swayed by these arguments that the successful-efforts method would result in a reduction in exploration for oil and increase the dependence of the USA on foreign countries for oil. The Justice Department asked the Securities and Exchange Commission (SEC) to postpone uniform adoption of successful efforts accounting until the SEC could determine if the information reported to investors would be improved and what the effect of the standard would be on exploration activities.

In 1978 in response to all this negative feedback about the FASB standard, the SEC examined the issue and concluded that both successful efforts and full cost accounting had problems. The SEC advocated a different method called reserve recognition accounting (RRA) in which as soon as a company discovers oil, it would report the value of the oil in the primary financial statements and prepare an income statement based on RRA. From 1979 to 1981, because of the SEC criticism, the FASB rescinded their standard that only permitted successful efforts accounting and companies were allowed to use full-cost accounting again. The SEC however encountered major problems in implementing RRA. The estimation of the reserves and the selling price and discount rate proved to be a difficult and unreliable task.

In 1981 the SEC abandoned RRA and the requirement that it be used in the primary financial statements of oil companies because the figures were considered too unreliable.

The SEC however required reserve information to be disclosed as supplementary information in the financial reports of oil companies (Accounting Standards Codification (ASC) 932-235-55-1). One of the most significant items disclosed in the supplementary disclosures is the amount of proven reserves that an oil company possesses. This is still however subjective information because the amount of reserves is hard to estimate and companies are always changing their estimates of the reserves. The determination of “reasonable certainty” (from the SEC guidance) is subject to different interpretation by different companies.

In a volatile industry like the oil industry it is hard to determine if the amount of reserves will have an effect on the market valuation of a company and also in predicting its future earnings. This uncertainty has been compounded in recent years because of dramatic fluctuations in the market price of oil. The current

price of a barrel of oil is approximately half of what it was a few years ago and is subject to wild and unexpected changes.

It is the purpose of this paper to empirically test from 2011-2015 when oil prices were particularly volatile whether proven oil reserves of companies provide some information for the market value of the firm incremental to measures such as earnings and book value of the firm. Also to see if proven oil reserves help in predicting future earnings of companies incremental to other measures such as current earning and book value. The price of oil fluctuated wildly from 2011-2015 and fell to about half the price it was at its peak. Thus proven reserves of oil may or may not provide significant information for the market. The study uses financial models from the accounting literature that are influential and have been used in other studies for different purposes and in different industries.

This study will help in increasing our knowledge about the influence of non-financial variables and also provide input to accounting policy makers.

LITERATURE SEARCH

This study falls generally in the area of non-financial variables and how they influence financial variables of interest such as market value of equity and future earnings.

The Financial Accounting Standards Board has expressed an interest in exploring the value of non-financial information reporting to investors and creditors (Maines et al. 2002). There is some evidence that some firms voluntarily disclose non-financial performance measures and also that financial analysts use non-financial measures in their evaluation of firms (Dempsey et al., 1997).

There has also been interest among accounting researchers about the relevance of non-financial information for investors and creditors. One of the qualities that accounting information is expected to possess is relevance to investors and creditors in making decisions.

The research in the value relevance area indicates that the results depend on the industry studied. Also of course the non-financial variables that are relevant are different for different industries. Thus Hughes (2000) finds measures of air pollution relevant for the electric utility industry while Graham et al. (2002) finds that page views are relevant for e-tailers.

Dempsey et al. (1997) surveyed 420 financial analysts and reported that analysts make use of traditional financial statements but also use non-financial information. The study indicated that financial analysts are interested in these measures as predictors of financial performance.

Previous research in accounting has provided some documentation of the value of non-financial measures. Amir and Lev (1996) found that in the cellular telephone industry, non-financial information such as market penetration was highly value relevant. They found that because of the peculiarities of this particular industry, financial information such as earnings by itself were not value relevant but financial information was relevant when combined with non-financial information. Rautavuori (2005) examined the value-relevance of wireless companies' spectrum licenses and industry specific non-financial information. The study showed that both financial and non-financial variables were value

relevant but the non-financial variables were less significant than financial variables. Thus, there were mixed results in the wireless telecommunication industry about the value relevance of financial versus non-financial variables in impacting a company's stock price. It was also difficult to determine which non-financial information may be relevant.

Rajgopal et al. (2001) found that web traffic was an important non-financial indicator of the market values of Business to Consumer (B2C) Internet firms. Jorion and Talmor (2001) studied the Internet industry and found that web traffic, a non-financial measure was more value relevant than conventional financial measures. However they found that the value relevance of the financial measures increased with time as the industry matured and the relative importance of web traffic diminished though it was still significant. They suggested that value relevance of different variables changed with the stage of life of this industry. Graham et al. (2002) examined the value relevance of non-financial measures of internet usage across four Internet industry sectors. They found that net income had no ability to explain stock prices in this industry. With respect to the non-financial variables, they found that for e-tailers and content/community firms, page views had the greatest explanatory power but for service companies, unique users were the most relevant. However, for infrastructure companies, none of the non-financial variables were significant. In general however non-financial information in this study was more relevant than financial information. Bartov et al. (2001) examined the valuation of internet stocks IPO's and determined that the financial and non-financial variables that were significant in the valuation of internet firms were different from those of non-internet firms. Keating et al. (2003) studied the downturn in the stock prices of internet companies in spring 2000 and concluded that financial statement information contributed more to explaining the fall in stock prices than did non-financial information. Thus, for the internet industry also the evidence of the value relevance of non-financial measures was mixed. The value relevance of non-financial measures seems to change with the maturity of the industry.

Hughes (2000) looked at the stock prices of companies in the Electric Utility industry and examined whether they are affected by their exposure to future environmental liabilities. She measured this exposure with a non-financial measure of pollution namely sulfur dioxide emissions. She found that this non-financial pollution measure was value relevant and its relevance increased when stringent environmental regulations were passed in 1990. She found that the industry's exposure to environmental liabilities decreased firm's stock prices by 16 percent on average. Riley et al. (2003) provided evidence of the value of non-financial measures in the airline industry. They found that non-financial variables showed incremental value relevance when included along with financial variables in explaining stock returns. However, they did not find the reverse to be true. They did not find that financial variables show incremental explanatory power over non-financial variables when included in the same model. Yang (2003) examined whether non-financial patent information is value relevant in market valuation for biotech firms. He found evidence that non-financial patent information captured

biotech firms values not currently formally valued by traditional financial indicators. Shortridge (2004) documented the relationship between a non-financial measure of successful research and development (R&D) efforts and market valuation of firms in the pharmaceutical industry. She found that R&D did not explain stock price in her primary model but did so for firms with successful R&D efforts. Thus, the market appeared to discriminate between successful and unsuccessful R&D efforts. Thus, we see evidence for value relevance of non-financial information in the electricity, airline, biotech, and pharmaceutical industry.

Blazovich et. al. (2013) studied the effect of "being green" on a firms financial performance. They found that being green did not significantly impact financial performance but also did not affect the profitability of the firm.

Lee (2012) found that corporate reputation and non-financial variables are positively associated to corporate financial performance.

The studies reviewed above generally show that non-financial variables are value relevant for stock prices. However the evidence regarding the value relevance of non-financial information is somewhat mixed in some industries. Also the conclusions to be drawn from these studies are highly industry specific because the non-financial variables studied are industry specific. Also other factors such as the maturity of the industry have been shown to be significant in determining the value-relevance of non-financial variables. The studies reviewed above also indicate that non-financial performance measures may be value relevant because they predict future financial performance.

There have also been studies in the oil industry regarding measures other than historical cost accounting to see their effect on market and financial variables. Previous studies with the oil industry have indicated that historical cost accounting by itself may be inadequate in measuring the performance of oil companies. This may be because there is a lot of uncertainty surrounding oil companies performance such as the risk of drilling a dry well and the time that elapses between discovery of oil and sale of oil (Quirin et al. 2000).Also estimates of proven level of oil fluctuate are uncertain and fluctuate dramatically sometimes with improved technology. The price of oil also fluctuates dramatically.

There have been studies relating to effect of non-financial variables on market returns and valuation of oil companies. Cormier and Magnan in a 2002 study found cash flows to be associated with market returns.

Bandyopadhyay (1994) shows that whether a firm uses full cost or successful efforts accounting determines market reaction to the financial information released by the firm. Teall (1992) found using Canadian oil company data that reserve disclosure methods provide incremental information content to the market over historical cost earnings. Doran 1988 goes into incremental information content of RRA over historical cost earnings and finds it does have incremental information content. Alciatore (1993) shows that the value of a firm may be affected by changes in oil price reserves. Spear (1996) shows that stock market returns may be affected by changes in reserves. Berry and Wright (1997)

however find that some measures of reserves are value relevant while others are not.

There is an implicit assumption in the studies on non-financial variables reviewed above. The assumption is that non-financial variables are value relevant because they predict future financial performance which is what is of value to investors. There are studies which indicate that non-financial performance measures can predict future financial performance.

However, the literature reviewed above shows that the conclusions to be drawn from these studies are highly industry specific because the non-financial variables studied are industry specific. Also, other factors such as the maturity of the industry and environmental factors have been shown to be significant in determining the value-relevance of non-financial variables. The value relevance and effect on future performance can also change in different periods depending on external environmental factors such as new laws or penalties or the maturing of the technology used by an industry (Hughes (2000), Jorion and Talmor (2001), Graham (2002), Keating (2003) and others). Value relevance and the ability to enhance and predict future earnings may change with environmental factors affecting the industry. In the case of the oil industry the volatility in oil prices combined with the drop in oil prices may affect the relevance of oil reserves for financial performance.

MODELS USED IN THE STUDY

Several influential models in the accounting literature were used in the study. The reason for using several models was to ensure the results were not biased because of choice of model.

The following valuation model is based on Ohlson (1995, 2001) and Barth et al. (1999). I have extended it with the addition of the Proven Reserves of Oil variable. The idea is to see if the Reserves variable provides any incremental information about the value of the firm above the other financial variables included in the model.

Model 1:

$$MVE_t = \alpha_0 + \beta_1 EARN_t + \beta_2 BVE_t + \beta_3 ACCR_t + \beta_4 PRES_t + \varepsilon$$

Where:

MVE = Market value of Equity at time t.

EARN = Abnormal earnings at time t (This is calculated as earnings before extraordinary items minus beginning book value multiplied by 12%. The 12% figure is assumed to be the long run rate of return on equities (Dechow et al. 1999 and Barth et al. 1999). Thus the assumption is that only earnings greater than the 12% return would be significant for the valuation of MVE).

BVE = Book value of the firm at time t

ACCR = Accruals of the company at time t. This is the difference between income before extraordinary items and operating cash flow. ACCR is included in the model on the basis of Barth et al. (1999) findings that accruals provide explanatory power for MVE above the financial variables of EARN and BVE

PRES = Proven reserves of oil for the company at time t. This is our non-financial variable which is included in order to test for its explanatory power for MVE.

Another model used in this study based on Barth et al. (1999) is shown below.

Model 2

$MVE_t = \alpha_0 + \beta_1 EARN_t + \beta_2 BVE_t + \beta_3 CFO_t + \beta_4 PRES_t + \varepsilon$

Where:

CFO = Operating cash flow from the cash flow statement. Barth et al. (1999) show that cash flow may have more explanatory power for MVE over EARN and BV.

All the other variables used in this model have been defined previously above.

The next valuation model is based on Amir and Lev's [1996] adaptation of the Ohlson (1995) model.

Model 3

$MVE_t = \alpha_0 + \beta_1 INC_t + \beta_2 BVE_t + \beta_3 PRES_t + \varepsilon$

Where:

INC = earnings before extraordinary items

All the other variables used in this model have been defined previously above.

The next model is meant to predict next years earnings. They are based on Barth et al. (1999 and 2001).

Model 4

$EARN_{t+1} = \alpha_0 + \beta_1 EARN_t + \beta_2 BVE_t + \beta_3 ACC_t + \beta_4 PRES_t + \varepsilon_1$

Where:

EARN (t+1) = next years abnormal earnings. We are trying to observe the explanatory power of the independent variables for future earnings.

All the other variables have been defined previously.

The rationale for including the proven reserves of oil in the equation are based on the assumption that reserves, other things being equal, should add to explaining the market value of the firm and its future earnings. However whether they add incremental explanatory power in the presence of the other financial variables of earnings and book value is to be tested. Also in a period of volatility in oil prices and a drop in market prices of oil, proven reserves may not add any value to the company that is not already included in the book value of the company.

DATA AND RESULTS

The sample consists of Oil Exploration and Production firms (GICS subindustry 10102020) plus Integrated Oil firms (GICS subindustry 10102010) as included in the COMPUSTAT database. The sample came to 120 firms. Data was gathered for a 5 year period from 2011 to 2015. There was missing data for some of the firms in some of the years. The total number of data points over the 5 year period came to 459 data points.

Descriptive data for the variables used in the sample are listed in Table 1 below:

Table 1
Descriptive Data for Variables

	Mean	Median	Standard Deviation	Count
Price per share	35.89718519	25.98	33.58081032	459
Earnings per Share	0.102614379	0.68	8.27256132	459
Book value per share	22.6041024	16.681	23.53117843	459
Proven reserves per share	1549.636311	887.9582647	2299.79407	459
Common Shares Outstanding in millions	597.4992832	176.8	1139.966852	459
Market value of equity in millions	26648.135	3546.588	58592.17936	459
Abnormal earnings in millions	-773.4128173	-89.362	4342.950194	459
Book value in millions	20637.43719	2114.26	42747.42435	459
Accruals in millions	-3429.589044	-737	6162.013796	459
Cash from operations in millions	5146.006972	647.099	10197.87371	459
Proved reserves in thousands of barrels	1281152.941	100515	2801788.226	459

The variables have a wide range of values as shown by the standard deviations. This is also indicated by the fact that the median is usually much less than the mean. This means that the mean is being dragged upward by the larger firms. All of this indicates that there are a lot of small Exploration and Production (E&P) firms in the sample. But there is a big standard deviation for the sample with many large firms as well.

The price per share has a mean of $35.89 and Standard Deviation of 33.58. Earnings per share has a mean of $.10 and Standard Deviation of 8.27. Book value per share has a mean of $22.60 and total book value has a mean of $20.6 billion

with a median of $2.1 billion and standard deviation of $42.7 million. Market value of equity has a mean of $26.6 billion, a median of $3.5 billion and standard deviation of $58.5 billion. Cash from operations has a mean of $5.1 million, a median of 647 million and a standard deviation of $10.1 billion. Abnormal earnings have a mean of $773 million but the median is negative $89 million. This means that many firms in the sample are making less than the 12% of book value threshold. The accruals have a mean of $3.4 billion indicating earnings are greater than cash flows for the mean sample but the median is a negative $737 million.

The main information to be gleaned from the descriptive statistics is that there is a mixture of small and large firms in the sample and the variables have a big standard deviation.

Table 2 shows the regression results for the market value of equity using valuation model 1.

Table 2

Market Value of Equity Regressed on Financial Variables and Proven Oil Reserves

Model: $MVE_t = \alpha_0 + \beta_1 EARN_t + \beta_2 BVE_t + \beta_3 ACCR_t + \beta_4 PRES_t + \varepsilon$

Adjusted R Square 0.885779368

	Coefficients	*P-value*	
Intercept	2135.053452	0.04461291	
EARN	5.10225457	2.16088E-42	*
BVE	0.962620126	3.71596E-40	*
ACCR	-2.51563186	1.27086E-09	*
PRES	-3.41458E-05	0.96024303	

* indicates significance at the 5% level

All variables are as defined previously

The results from Table 2 indicate that the financial variables such as EARN and BVE are significant and the sign of the coefficients is positive as expected. The market seems to get information from these financial variables. The sign of ACCR is negative and significant. This is as expected because the market seems to discount accounting accruals (difference between accounting earnings and cash flows). This may be because the market uses cash flow information and discounts the effect of accruals. This negative coefficient for ACCR is also in accord with Barth et al. (1999). The sign of the non-financial variable for proven reserves is negative. However the p-value indicates it is not statistically significant. The coefficient for PRES is miniscule and the p-value indicates that it may be due

just to random fluctuation. The negative coefficient could be interpreted to mean that reserves don't add to the value of the firm in a time of fluctuating and falling oil prices. The statistical insignificance of the variable means that reserves do not provide any incremental information to the market over and above the financial variables.

Table 3 shows the regression results for the market value of equity using valuation model 2.

Table 3

Market Value of Equity Regressed on Financial Variables and Proven Oil Reserves

Model: $MVE_t = \alpha_0 + \beta_1 EARN_t + \beta_2 BVE_t + \beta_3 CFO_t + \beta_4 PRES_t + \varepsilon$

Adjusted R Square 0.88828248

	Coefficients	*P-value*	
Intercept	2113.536856	0.043474641	
EARN	2.830709556	3.80342E-30	*
BVE	0.638711659	2.61891E-10	*
CFO	2.72927847	7.27901E-12	*
PRES	-0.000399329	0.55566451	

* indicates significance at the 5% level

The results from Table 3 indicate that the financial variables of EARN and BVE are positive and significant as before. CFO is also positive and significant indicating that the market gets additional information from cash flows incrementally to EARN and BE and that cash flows add value to the firm. PRES is once again negative and statistically insignificant. Thus the negative value may indicate that reserves are viewed negatively by the market or the result may just be due to random fluctuations because it is not statistically significant.

Table 4 shows the regression results for the market value of equity using valuation model 3.

Table 4

Market Value of Equity Regressed on Financial Variables and Proven Oil Reserves

Model: $MVE_t = \alpha_0 + \beta_1 INC_t + \beta_2 BVE_t + \beta_3 PRES_t + \varepsilon$

Adjusted R Square 0.88659203

	Coefficients	*P-value*	
Intercept	3528.339721	0.000158277	
EARN	4.157299076	4.14534E-58	*
BVE	0.804704463	4.72303E-49	*
PRES	-0.000167475	0.788988792	

* indicates significance at the 5% level

It is reassuring that even with this formulation of the model; the results are quite similar to the results from Tables 2 and 3. The financial variables of EARN and BVE are positive and significant. The PRES variable is once again negative and statistically insignificant.

Table 5 shows the regression results for next years earnings using valuation model 4.

Table 5

Earnings for Next Period Regressed on Financial Variables and Proven Oil Reserves

Model: $EARN_{t+1} = \alpha_0 + \beta_1 EARN_t + \beta_2 BVE_t + \beta_3 ACCR_t + \beta_4 PRES_t + \varepsilon_1$

Adjusted R Square 0.57168288

	Coefficients	*P-value*	
Intercept	-416.9220197	0.013747907	
EARN	0.926602117	7.4314E-42	*
BVE	-0.055465551	5.0841E-06	*
ACCR	-0.035424434	0.61479803	
PRES	0.000179759	0.122693742	

* indicates significance at the 5% level

The results from Table 5 indicate that EARN is positive and significant in predicting next years earnings. BE however is negative and significant. This may be because in the calculation of next years EARN we take earnings before extraordinary items and subtract 12% multiplied by the beginning of year book value. Thus the larger the book value the bigger the number that we subtract from next years EARN. ACCR is negative and insignificant. It appears that accruals may not provide much information in predicting next years earnings. PRES is once again insignificant in predicting next years EARN. It does not provide any incremental explanatory or predictive power in addition to the financial variables already included in the model.

CONCLUSION

The results of the data analysis above indicate that proven reserve information does not seem to provide any additional explanatory power for the market value of equity of firms incremental to the information provided in financial variable such as earnings, book value, accruals and cash flows.

Also proven reserve information does not seem to aid in predicting future earnings over and above the information found in financial variables such as current years earnings, book value and accruals.

The reason for this may because of the subjective nature of estimating reserves and changes to them due to changes in technology and other variables. Also the volatility in the price of oil and its recent dramatic drop may make reserves not relevant for the market value of equity or the future earnings of a company.

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DOES THE UNITED STATES POSTAL SERVICE CHARGE AMAZON TOO LITTLE?

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ABSTRACT: A concern has been raised by the President of the United States about the United States Postal Service (USPS) charging significantly discounted prices on the packages it ships for Amazon.com, Inc. Also, there were other critics of USPS's special package delivery pricing practices for Amazon, United Parcel Service (UPS), and Federal Express Corporation (FedEx). This paper describes how the USPS uses very sophisticated cost accounting, statistical, and other approaches to make sure its competitive products cover all their relevant costs and make an appropriate contribution towards covering institutional common costs. Market conditions are carefully considered in determining the prices of competitive products, including providing volume and other discounts to high volume customers, such as Amazon, UPS, and FedEx. It does seem that the concern expressed over the pricing of USPS competitive products is more appropriately directed towards the declining market for its market-dominant products.

Key Words: United States Postal Service; relevant costs; pricing decisions; customers; competitors.

INTRODUCTION

A concern has been raised by the President of the United States about the United States Postal Service (USPS) charging significantly discounted prices on the packages it ships for Amazon.com, Inc. (Amazon) (e.g., Lombardo & Ziobro, 2017). It was later reported that the President continued his criticism of Amazon using the USPS as its "delivery boy" (e.g., Taylor, 2018a, 2018b). There has been considerable pushback on the validity of the basis for such criticism of the arrangement between USPS and Amazon (e.g., Atkinson, 2018; Save the Post Office, 2018a).

The criticism of the package delivery arrangement between the USPS and Amazon may have been at least partly stimulated by the then 10 and, more recently, "11 consecutive years of net losses" reported by the USPS (United States Postal Service, 2019). For example, net losses of $2,742 and $3,913 million were reported by the USPS for fiscal years ended September 30, 2017, and 2018, respectively (United States Postal Service, 2018c, 16). As Megan Brennan, Postmaster General and CEO stated: "The Postal Service receives no dollars for operating expenses

and relies on the sale of postage, products and services to fund its operations" (Brennan, 2017). As shall be pointed out below, there were other critics of USPS's special package delivery pricing practices for Amazon as well as for its two other big customers, United Parcel Service (UPS) and Federal Express Corporation (FedEx).

Like private organizations, the USPS should consider costs, customers, and competitors in making its product pricing decisions (e.g., Datar & Rajan, 2018, 525-526), as well as pertinent federal government statutes and regulations that restrict its freedom in making these decisions. As an independent agency of the United States Federal Government, pricing by the USPS is regulated by federal legislation and the Postal Regulatory Commission.

The USPS has two types of products, market-dominant and competitive products. The USPS stated the following about these two product categories (United States Postal Service, 2019):

> First-Class Mail, Marketing Mail, and Periodicals are the major categories of Market-Dominant mail. Altogether, Market-Dominant mail accounted for approximately 70 percent of total revenue in 2017. These products are subject to a strict price cap tied to changes in the Consumer Price Index, restricting our ability to generate revenue.
>
> Our Package business accounts for the remainder of our revenue, and we compete for customers with other package delivery providers in the open market. Package products must cover their costs and are therefore subject to a price floor. In addition, by law, the competitive portion of these products as a whole must contribute at least 5.5 percent toward institutional costs to help fund our universal service obligation. In fact, they contribute far more than 5.5 percent and this level of contribution is currently under review by the Postal Regulatory Commission.

It is the package/parcel business services provided by the USPS for Amazon in the competitive category that has been heavily criticized and is the focus of this paper. Unusually, two of the USPS's major competitors for parcel delivery, UPS and FedEx, are also major customers of the USPS by relying on it "for the back-end of their two-to-seven-day delivery options" (Stevens, 2014). The USPS has a competitive advantage over UPS and FedEx as it "is the only organization in the country that has the resources, network infrastructure and logistical capability to regularly deliver to every residential and business address in the nation" (United States Postal Service, 2018b, #3).

In another strange twist, the USPS is also a customer of UPS and FedEx where they have a competitive advantage. The USPS describes its complex relationship with FedEx and UPS in the following way (United States Postal Service, 2018b, #5):

> The Postal Service both competes and collaborates with the private sector. UPS and FedEx pay the Postal Service to deliver hundreds of millions of their ground packages, and USPS pays UPS and FedEx for air transportation.

Next, the three elements of pricing decisions, costs, customers, and competitors, will be examined in turn.

COSTS

The USPS costs listed in its published operating results appear to be mainly fixed. For example, Exhibit 1 reproduces the operating results reported by the USPS for fiscal years ended September 30, 2017, 2016, and 2015 (United States Postal Service, 2017, 6). The operating expenses are mostly associated with USPS's employees. Employee related compensation and benefits are subject to the USPS's "collective bargaining obligations and our obligation to participate in federal benefits programs" (United States Postal Service, 2017, 22) that would severely restrict the ability of the USPS to reduce such costs in the short run. It appears from United States Postal Service (2017, 21), that "All other operating expenses" shown in Exhibit 1 include depreciation, supplies and services, and rent and utilities, which are likely to be largely fixed costs.

Exhibit 1: United States Postal Service Operating Results for Fiscal Years Ended September 30, 2017, 2016, and 2015 (Dollars in Millions)[1]

	FY2017	FY2016	FY2015
Operating results			
Total revenue	$69,636	$71,498	$68,928
Operating expenses			
Compensation and benefits[2]	49,108	48,441	47,278
Unfunded retirement benefits	2,658	248	241
Retiree health benefits	4,260	9,105	8,811
Workers' compensation	(797)	2,682	1,760
Transportation	7238	6,992	6,579
All other operating expenses	9,743	9,431	9,157
Total operating expenses[3]	72,210	76,899	73,826
Loss from operations	(2,574)	(5,401)	(4,898)
Investment & interest income-net	(168)	(190)	(162)
Net Loss	**(2,742)**	**(5,591)**	**(5,060)**

1. Source: United States Postal Service (2017, 6).
2. "Excludes amortization of unfunded retirement benefits, retiree health benefits and workers' compensation" (United States Postal Service, 2017, 6, footnote 1).
3. Total operating expenses were added by the authors and were not in the original.

Taking a long enough time horizon, fixed costs can be reduced. For example, the USPS reported in January 2019 that it had undertaken aggressive network and infrastructure rightsizing actions that had led to "cost cutting, efficiency improvements, and targeted innovation that resulted in approximately $13.4 billion in annual savings through 2017 […] by consolidating 363 mail processing facilities and 29,000 delivery routes; modifying retail hours at more than 13,000 Post Offices; reducing our total workforce size by more than 152,000 through attrition; negotiating contracts that control wages and benefits and increased workforce flexibility; and through reductions in administrative overhead" (United States Postal Service, 2019). The achievement of workforce reduction through its rightsizing efforts illustrates the ability of the USPS to significantly reduce its number of employees and its employee related compensation and benefits over the longer-term through attrition and other ways. Because all costs are variable given a sufficient time horizon, the term *long-term variable costs* is sometimes used instead of the more commonly used term of *fixed costs*.

In its "FY2018 Performance Plan" section, the United States Postal Service (2017, 23) stated the following about "compensation and benefits" under the subheading of *Controllable expenses*:

> Compensation and benefits expenses are planned to increase by $0.2 billion, primarily due to contractually required wage increases. The impact of these wage increases will be mitigated by a larger portion of new, less expensive employees. We also plan to reduce the number of work hours through increased efficiency.

Presumably, the "new, less expensive employees" that were planned to be hired by the USPS would include replacements for USPS employees who were expected to retire or leave the USPS for other reasons during FY2018.

Given the USPS has mainly fixed costs, it might be expected that its incremental costs of delivering Amazon's and other companies' pre-sorted packages along with mail is likely to be relatively small. This USPS 'last-mile' service used by Amazon and other companies is called 'Parcel Select' (Lombardo and Ziobro, 2017). In response to critics who several years before the President had questioned the sufficiency and transparency of the USPS parcel delivery prices for its three big customers, UPS, FedEx, and Amazon, a former Postmaster General, Patrick R. Donahoe, was reported to have stated: "[…] the criticism is unwarranted. 'We make money on it. We wouldn't do it if we didn't make money on it […]. Postal carriers are already delivering to every mailbox, so transporting the presorted packages doesn't add significantly to costs […]'" (Stevens, 2014). Also, in response to a later critical article, Joseph Corbett, the USPS's CFO stated: "By law our competitive package products, including those we deliver for Amazon, must cover their costs" (Corbett, 2017). However, as the author of the critical article stated: "But with a networked business using shared buildings and employees, calculating cost can be devilishly subjective" (Sandbulte, 2017). Therefore, it is no

surprise that the USPS uses complex procedures, including activity-based costing (ABC), to ensure that the prices of its competitive and market-dominant products are in compliance with the extant regulations (Office of Inspector General United States Postal Service, 2013).

USPS uses Activity-Based Costing

The Code of Federal Regulations (CFR), Title 39, section 3633(a) (1) forbids the cross subsidization of competitive postal products by market-dominant postal products that means the revenues of competitive products must cover their costs (Postal Regulatory Commission, 2016a, 17). The USPS adopted an ABC system that was developed by private-sector companies such as Deere & Company (that "coined the name 'activity-based costing'") to more accurately assign overhead costs to products for competitive bidding and other purposes (MacArthur, 1992, 37). As discussed in cost/management accounting textbooks, a major benefit from implementing ABC systems is the correction of product-cost cross-subsidization that results from some products being overcosted and other products being undercosted--often caused by overcosted high-volume products subsidizing undercosted low-volume products--using traditional costing systems (e.g., see Datar and Rajan, 2018, 152-196). The USPS conducted an ABC pilot-study during 2002-2003 (United States Postal Service, 2002) and Coopers and Lybrand used ABC in a credit and debit card payment program feasibility study that USPS hired them to conduct during the mid-1990s (Carter, et. al., 1998). Incidentally, UPS also uses an ABC system (Activity Based Costing at UPS, No Date).

The USPS uses four steps to determine the costs attributable to its products that are described in the following way by the Postal Regulatory Commission (2016a):

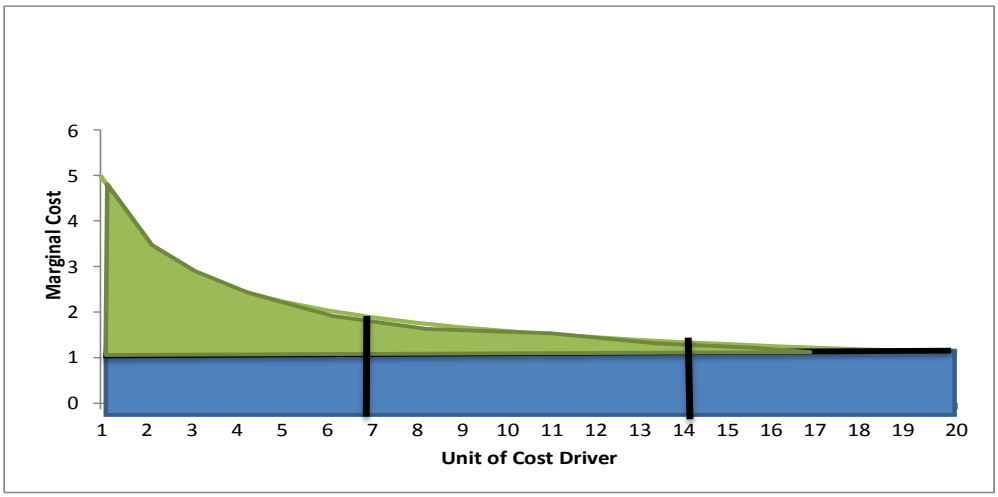
1. <u>Divide Costs Among Segments and Components</u>
   Costs are divided up into components for analysis. Accounting costs are first divided among 18 cost segments. The segments are then further divided into identifiable cost components and then into elements representing a discrete activity; there are over a hundred components and many more elements.
2. <u>Identify a Cost Driver and Find Volume-Variable Costs</u>
   For each cost element, a cost driver is identified that reflects the essential activity of that element. For example, the cost driver for Inter-NDC highway transportation is cubic-foot-miles. The volume-variable cost pool is then found by using the relationship between the element's cost and its cost driver. The relationship is first used to create volume-variable costs according to methods described below.
3. <u>Distribute Costs to Products</u>
   After the pool of volume-variable cost for each product is determined, it is distributed to the various products. These methods of distribution are also discussed below.

4. Calculate Unit Volume-Variable Cost
   Total volume-variable cost for each product is determined by summing the volume-variable costs for that product across components. Unit volume-variable costs are then found by dividing a product's total volume-variable costs by its originating volume.

The Code of Federal Regulations, Title 39, section 3622(c)(2) mandates that the attribution of costs to Postal Service products must be through "reliably identified causal relationships" (Postal Regulatory Commission, 2016a, 14). Order No. 3506 makes it clear that the determination of short-run variability of costs "is determined in a variety of ways: econometric modelling, expert judgment, costing systems, etc. […] If a component has no variability, it has no relationship with volume and is considered institutional" (Postal Regulatory Commission, 2016a, Appendix A, 15). Because of economies of scale and economies of scope (the variety of postal products delivered together), the marginal cost per unit of postal products declines with increasing unit quantities and varieties of postal products that are delivered together (Postal Regulatory Commission, 2016a, 35).

For example, Exhibit 2 reproduces Figure A-10 in Order No. 3506 with three illustrative postal products (Postal Regulatory Commission, 2016a, Appendix A, 20). The variable costs per unit for all three hypothetical products is $1 (the marginal cost of the last unit) and the total variable costs are represented by the rectangle area immediately above the horizontal axis from 1 to 20 units that is shaded blue when color is shown. The area immediately above the rectangle area bounded on the top by a downward sloping marginal cost curve that is shaded green when color is shown, represents the inframarginal costs that decline from $5 to $1 with increasing units due to economies of scale and economies of scope of these products. As the number of postal products increase, the marginal cost per unit should become a stable number at higher volumes ($1 in the hypothetical example) (e.g., see Save the Post Office, 2018b). Before Order No. 3506, inframarginal costs were not included in incremental product costs but were considered to be 100 percent institutional costs. In Order No. 3506, the Postal Regulatory Commission (2016a) discussed three proposals made by the UPS that included a reasoned argument for all inframarginal costs to be classified as variable costs so that they would be included in the costs USPS competitive products prices should collectively have to cover. The Postal Regulatory Commission rejected the reasoning provided by the UPS but in its analysis identified "[…] additional costs that are reliably identified and causally related but not currently attributed, and represent a significant improvement over the current methodology. In this Order, the Commission adopts the incremental cost methodology to determine attributable costs. This results in the attribution of those inframarginal costs that meet the statutory requirements for cost attribution" (Postal Regulatory Commission, 2016a, 3). These attributable inframarginal costs are illustrated next with the aid of Exhibit 2.

Exhibit 2: Marginal Cost Curve with Products Grouped Together[1]



[1] Exhibit 2 is a copy of "Figure A-10: Marginal Cost Curve with Products Grouped Together" from Postal Regulatory Commission (2016a, Appendix A, 20). Earlier Figures A-1 through A-9 show "Cost $" and dollar currency is clearly meant for Figure A-10, too.

The inframarginal costs attributable to the hypothetical third Postal Service product in Exhibit 2 is the small area under the sloping marginal cost curve from unit 14 through unit 20 that is above the black horizontal line that represents the marginal cost of the last unit that is $1. Each of the three hypothetical Postal Service products would take their turn as the third product to determine their attributable inframarginal costs in the same manner (Postal Regulatory Commission, 2016a, Appendix A, 19).

On the same date as Order No. 3506, Order No. 3507 was also published by the United States Postal Regulatory Commission to give "notice of proposed rulemaking on changes concerning attributable costing" that were discussed in Order No. 3506 and illustrated above (Postal Regulatory Commission, 2016b). Order No. 3507 invited written comments from interested parties within a 30-day window on the proposed rule changes to attributable costing. Subsequently, Order No. 3641 reported that comments were received from Amazon Fulfilment Services, Inc., the Public Representative, the Postal Service, UPS, and the Valpak Franchise Association, Inc. (Postal Regulatory Commission, 2016c, 3). Some modifications were made to the final rules in response to the written comments.

Among other changes, the Postal Regulatory Commission revised CFR, Title 39, Section 3015.7b to be as follows (Postal Regulatory Commission, 2016c, 11):

> (b) Each competitive product must recover its attributable costs as defined in 39 U.S.C. 3631(b). Pursuant to 39 U.S.C. 3631(b), the Commission will calculate a competitive product's attributable costs as the sum of its volume-variable costs, product-specific costs, and those inframarginal costs calculated as part of a competitive product's incremental costs.

Product-specific costs include advertising for one particular USPS product only (Postal Regulatory Commission, 2016a, footnote 12, 9).

Order No. 3641 stated that the final rules were adopted by the Postal Regulatory Commission despite a request by UPS in its Comment to postpone implementation because Order No. 3506 was currently being reviewed by the Court (Postal Regulatory Commission, 2016c). The decision by the Commission to not defer implementation of the rule changes was validated as it was later reported that the UPS was unsuccessful in appealing Order No. 3506 in the D.C. Circuit Court of Appeals (Save the Post Office, 2018b, 2018c, 2018d).

Pricing by USPS

In addition to covering the attributable costs discussed above, "Section 3633(a)(3) of Title 39 of the United States Code requires the Commission to 'ensure that all competitive products collectively cover what the Commission determines to be an appropriate share of the institutional costs of the Postal Service'" that historically was determined to be a 5.5 percent markup (Federal Register, 2019). Institutional costs are defined by the USPS as: "Postal costs that cannot be directly or indirectly assigned to any mail class or product. They can be considered common costs or overhead costs needed for overall operations" (United States Postal Service, 2018a). Revised rules for determining the appropriate percentage of institutional costs were published in January 2019 in Order No. 4963 and an increased percentage of 8.8 percent was determined using a new "formula-based approach" for Fiscal Year 2019 (Postal Regulatory Commission, 2019a, 2019b).

Interestingly, in Order No. 3506, the Postal Regulatory Commission (2016a, 61) stated:

> Using incremental costs for attribution need not alter the Postal Service's pricing strategy, nor should it. While each product's attributable cost will be equal to its incremental cost, marginal costs should remain the Postal Service's basis for setting prices, with the application of appropriate markups to ensure each product covers its incremental costs and provides an appropriate share of institutional costs. Effectively, the average price of a product should meet or exceed the product's average incremental cost (the incremental cost divided by the number of pieces). This would result in products having a cost coverage of 100 percent or greater.

This statement is consistent with the recognition that marginal costs, plus any markups required by regulations to, *inter alia*, prevent cross-subsidization of competitive products by market-dominant products, to be consistent with costs setting the floor and not the ceiling on competitive product prices. Higher prices

can be set for competitive products if these can be justified by market conditions that include expected customer and competitor reactions to higher prices. However, it has been pointed out that profit-maximization is not the goal of USPS (Atkinson, 2018, 10). If raising package prices to maximize revenues and profits from competitive products also leads to lower demand, this likely hurts US citizens (customers), particularly those with lower incomes and those living in remote areas, violating USPS's regulations (Atkinson, 2018, 10).

The discussion in Order No. 4963 (Postal Regulatory Commission, 2019a) makes it very clear that the most recent decision to increase the markup of competitive market parcel delivery products from 5.5 percent to 8.8 percent to increase the contribution of competitive products towards institutional costs, was made following very careful consideration of market conditions. For example, Table II-2 (page 7) presented the USPS and its combined competitor's overall parcel delivery market growth by revenue from FY 2007 through FY2017. Additionally, Table II-3 (page 8) showed the increasing parcel delivery market share by revenue gained by the USPS from FY 2007 (9.22 percent) through FY2017 (19.36 percent) versus a decline in parcel delivery market share by revenue for its combined competitors from FY 2007 (90.78 percent) through FY2017 (80.64 percent). Also, Table II-4 (page 11) showed that the average price increased every calendar year for the USPS, UPS, and FedEx from 2008 through 2019, along with the steadily increasing market size.

The growth in revenue from USPS's competitive products contrasts with the continually declining volume and revenue from its market-dominant mail products with increasing competition from growing e-commerce (Atkinson, 2018, 1). For example, the United States Postal Service (2018c, 18) reported the following (italics in the original):

> "[The] combined revenue from *First-Class Mail* and *Marketing Mail* declined by $827 million for the year ended September 30, 2018, compared to the prior year. This decline was attributable to a decline in combined volume of nearly 3.2 billion pieces. These declines in *First-Class Mail* and *Marketing Mail* revenue were more than offset by the increase in Shipping and Packages revenue of nearly $2.0 billion, or 10.1%, as we continued to experience growth in this lower-contribution service category throughout 2018.

The competitive products' combined surplus above cost are reducing the losses caused by the declining market-dominant mail that should be the focus of concern (Atkinson, 2018, 11). More specifically, USPS's customers and competitors for its competitive products are separately considered next in turn.

CUSTOMERS

In addition to published prices for parcel delivery to retail customers, the USPS negotiates special lower-price agreements that are unpublished, called "negotiated

service agreements" (NSAs), for major customers who offer high volume opportunities for parcel delivery using the USPS's competitive advantage "in last-mile business-to-consumer delivery of lightweight parcels" (Postal Regulatory Commission, 2019a, 8-9). Along with the UPS and FedEx, Amazon has an unpublished NSA with the USPS for last-mile deliveries, "with Amazon's own transportation and distribution network performing the upstream work" (Postal Regulatory Commission, 2019a, 10). Rather than hurting the USPS financially, its NSA agreements with its competitors called "'co-opetition' results in lower costs for each of the three competitors, which in turn lowers the overall cost of delivering parcels and improves the productive efficiency of the market" (Postal Regulatory Commission, 2019a, 10). For example, USPS does not have to incur the costs of sorting packages as Amazon "has a network of more than 20 'sort centers' where customer packages are sorted by zip code, stacked on pallets and delivered to post offices for the final leg of delivery" (Sink and Soper, 2017). Interestingly, it was stated in United States Postal Service (2018c, 1) that: "No single customer represented more than 6% of operating revenue for the years ended September 30, 2018, 2017, and 2016." It might be speculated that Amazon is the customer that represents about 6% of USPS's operating revenue.

It was reported that Amazon's 2017 prime member shipments were more than 5 billion items and that Prime members in the United States have increased to 90 million (Perez, 2017). Also, it was reported by Sink and Soper (2017) that "David Vernon, an analyst at Bernstein Research Bernstein […] estimated in 2015 that the USPS handled 40 percent of Amazon's volume in 2015" that is a significant volume of parcels and certainly merits a volume discount. That is a 'lot of eggs in one basket' and losing this dominance to competitors and/or to Amazon insourcing more of its transportation needs would likely lose USPS significant positive contribution margin that probably would not be matched by commensurate savings in institutional overhead costs.

On August 10, 2018, the USPS announced proposed increased prices from January 27, 2019, for both its market-dominant services, such as *First-class Mail*, and its competitive services, including *Parcel Select* that is used by Amazon and other companies for the 'last mile' delivery of products (Ziobro, 2018). These price increases were approved by the Postal Regulatory Commission on November 13, 2018 (Postal Regulatory Commission, 2018). A significant postal increase might indeed lead to Amazon insourcing more deliveries. For example, it was earlier reported that:

> A sudden increase in postal services rates would cost Amazon about $2.6 billion a year, according to an April report by Citigroup. […] Amazon has been setting up its own shipping operations in the U.S. and elsewhere in the world to minimize costs. […] Amazon is experimenting with a new delivery service of its own that is expected to see a broader roll-out in this coming year. Under the program, Amazon would oversee the pickup of

> packages from warehouses of third-party merchants and delivery to home addresses (Sink and Soper, 2017).

A later published article commenting on the proposed 2019 increases in Postal Service shipping and mailing prices, reported an estimate by Credit Suisse that they would cost Amazon greater than $1 billion in 2019 (Frank, 2018).

It may therefore not be surprising that Amazon is increasingly using its own trucks and drivers for package deliveries to its customers because its "shipping costs have exploded, nearly doubling from 2015 to 2017, to $21.7 billion" (Peterson, 2018) that likely will be exacerbated by USPS's most recent price increases that evidently raised the NSA agreement rates charged for the parcel services provided by the USPS for Amazon and other companies (Ziobro, 2018). Herrera and Qian (2019) reported that "Amazon now delivers nearly half of its orders, compared with less than 15% in 2017, according to estimates from research firm Rakuten Intelligence." Also, Amazon announced that it is planning to purchase 100,000 electric vehicles over a ten-year period from 2021 through 2030 for package delivery to customers and to support its goal "to be carbon-neutral by 2040" (Thomas, 2019). This movement towards delivering its own parcels to customers does not support the notion that Amazon management believes it is getting a "real deal" on its delivery costs provided by third parties such as USPS, UPS, FedEx, and other delivery partners.

COMPETITORS

FedEx Corporation, DHL International GmbH, and UPS are identified by D&B Hoovers (2018) as the three leading competitors of the USPS. However, the Postal Regulatory Commission (2019a, 8) states that "the parcel delivery market has three primary competitors that make up the majority of the market: United Parcel Service, Inc. (UPS), Federal Express Corporation (FedEx), and the Postal Service." In some ways the three competitors complement each other with different areas of specialization. The Postal Regulatory Commission (2019a, 8-9) describes this "firm specialization and product differentiation" competition in the following way:

> One of the primary ways these three competitors have competed with one another for customers is through firm specialization and product differentiation. Each of these firms has developed specialties in certain types of delivery: FedEx specializes in international and express delivery; UPS specializes in business-to-business delivery; and the Postal Service specializes in last-mile business-to-consumer delivery of lightweight parcels. As a result, each of these competitors offers products with differences in a range of features, including price, service, reliability, tracking features, and the availability of ancillary services such as insurance and return options.

However, the UPS has been aggressive in trying to get the USPS to raise its competitive product prices, presumably to enable the UPS to be more competitive

in it pricing but this would likely also result in the UPS having to pay the USPS increased rates for postal services provided to the UPS in any renegotiated NSA.

Order No. 3506 was the response by the Postal Regulatory Commission (2016a) to a petition filed by the UPS with its "proposed changes to postal service costing methodologies (UPS proposals one, two, and three)" that would lead to an increase in the costs that competitive products collectively must cover. Because the Postal Regulatory Commission denied the UPS proposals in Order No. 3506, the UPS "petitioned the D.C. Circuit Court of Appeals for review" that was rejected "by a three-member panel of the Court" and the "UPS filed a new petition, this one for a 'rehearing *en banc*,' asking the full Court to reconsider the panel's earlier decision" (Save the Post Office, 2018c). As reported above, this appeal was also unsuccessful (Save the Post Office, 2018d).

The United States Postal Service (2018c, 5) reported increasing competition for 'last-mile' parcel delivery from major existing customers in the following way (hyphen inserted in 'Wal-Mart'):

> The primary competitors of our Shipping and Packages services are FedEx Corporation and United Parcel Service, Inc., as well as other national, regional and local delivery companies and crowdsourced carriers. We see additional competition coming from existing customers who are testing and in some cases implementing "last-mile" services. These companies include Amazon.com, Inc.; Wal-Mart, Inc. and Target Corporation. […] The growth in our Competitive services revenues over the past five years is largely attributable to three major customers. For the years ended September 30, 2018, 2017 and 2016, combined revenue from our three largest customers (excluding mail service providers) represented approximately 8.3%, 7.6% and 5.8% of operating revenue, respectively. The growth in our Competitive service revenues over the past five years is largely attributable to these three customers. Each of these customers is building delivery capability that would enable them to divert volume away from us over time.

Increasing major competition in its traditional area of competitive advantage, 'last-mile' delivery, must be of great concern to USPS management and the Postal Regulatory Commission. In fact, it was reported that the USPS delivered less packages (-3.2 percent), albeit with an increase in revenue (4.8 percent), in the quarter ended June 30, 2019, because Amazon, UPS, FedEx, and other companies delivered an increased number of online ordered packages to homes (Ziobro, 2019). However, FedEx decided to end both its domestic air shipping contract and ground package delivery contract with Amazon during summer 2019, while continuing to ship internationally for Amazon (Ziobro and Mattioli, 2019). This should increase opportunities for the USPS and other shipping organizations to deliver more packages for Amazon.

CONCLUSIONS

The USPS uses very sophisticated cost accounting, statistical, and other approaches to make sure its competitive products cover all their relevant costs and make an appropriate contribution towards institutional common costs. Market conditions are carefully considered in determining the prices of competitive products, including providing volume and other discounts to high volume customers, such as Amazon, UPS, and FedEx, for 'last mile' deliveries. The United States Postal Service (2018c, 25) states that the *Parcel Select* 'last-mile' deliveries of pre-sorted packages are among the lowest-priced services because of competitive pricing but still generate a positive contribution margin, albeit relatively lower than for other package delivery services. It is vitally important that the USPS continues to be competitive in its pricing for 'last mile' parcel services or it will quickly lose significant sales volume that generates a positive contribution margin. It does seem that the concern expressed over the pricing of USPS competitive products is more appropriately directed towards the declining market for its market-dominant products.

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UNDERFUNDED PENSION LIABILITIES' IMPACT ON SECURITY RETURNS: THE U.S. VERSUS THE EUROPEAN UNION

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ABSTRACT

This study assesses the role that underfunded pensions have on security returns. A twelve year analysis (2006-2017) is conducted which includes analyzing 364 U.S. firms and 262 EU firms with underfunded pension plans. Overall results indicate that, with respect to security prices, when firms are known to have underfunded pension plans, European firms appear to be more cash flow sensitive while U.S. firms appear to be more accounting earnings sensitive. These findings may be the result of institutional and structural differences among nations. On the other hand, it is noteworthy to understand that differences in cash flow presentation and recognition exist between the nations and their standard-setters. These differences have the potential of contributing to how investors make stock purchase decisions and therefore must be considered as the transitional phase between IFRS and GAAP continues.

Keywords: Pensions, security returns, IFRS, European Union

INTRODUCTION

In a corporate pension funding study released in 2018, it was found that currently in the United States, publicly traded firms account for approximately $2.0 trillion in unfunded pension liabilities, [Clark, Perry and Wadia (2018)]. The fact that, on average, the funding ratio for these firms is approximately 80% gives one an idea of the amount of pension dollars committed by U.S. firms. European Union (EU) firms face a somewhat similar dilemma. Even though a significant conversion in the EU is on to switch from defined benefit to defined contribution private pension plans, a significant number of defined benefits plans still exist. Eurozone unfunded pension liabilities are projected to exceed those of the U.S. by 2020. What further complicates the picture for these European firms is that the current average funding ratio is only 56% [Financial Times (2017)].

Since publicly traded firms, both in the U.S and the EU operate on the premise of returning a profit to their shareholders, and thus contain a direct correlation to the valuation of firms' wealth through stock prices and the ability to raise capital, this study will focus on the impact of underfunded pension liabilities of publicly traded firms in the U.S. compared to their counterpart firms in the EU.

The underfunded pension obligations of telecommunications giants AT&T and Verizon Communications, Inc. could double within the next five years,

thus dropping the plan below the mandated funded ratio of 80% and requiring even larger cash contributions into the fund. In fact, these two firms have the highest unfunded pension liabilities of any in the Standard and Poor's 500 index [Global Institutional Investors Survey (2015)]. U.S. Steel, also under pressure because of their $2.5 billion unfunded pension liability, has recently begun to drop some retirees from their pension plan. In the Eurozone, British Telecom currently has a 7 billion pound shortfall in its pension fund, while Daimler falls 2.5 billion euros short, and Lufthansa approaches historically high levels of near 7 billion euros of unfunded pension liabilities [Financial Times (2017)]. The direct impact of these scenarios is to put pressure on firms' bottom line through the realization of greater pension expense during the current accounting period. It forces firms to pursue strategies which permit minimizing expenses in other areas of operation in order to compensate for the increase in pension expense. Many firms have had difficulty in achieving this goal. The end result by some is lowered income, reduced stock prices and eventual under capitalization as these firms find it harder to raise capital for the future.

Although this problem seems to have been a long time in coming, very little research has been conducted which fully assesses the impact of underfunded pension plans on stock prices of U.S. firms versus their EU counterparts. This study will attempt to do just that. A comparison analysis will be made of U.S. and EU publicly traded firms that have underfunded pension plans in order to assess any differences and impact on security prices over time.

LITERATURE REVIEW

Bulow, Morck and Summers (1987) utilize pension data from the 1980s and find that market valuation of firms reasonably reflect their pension funding structure. That is, availability and stability of a pension plan influences stock prices upward while termination and instability of a pension plan tend to influence stock prices downward. Other studies hint of stock price impact through the influence of the debt market. Ederington (1992) finds that bond ratings are an informational source to stockholders and thus impact stock prices. Iskandar and Emery (1994) identify underlying influencers which affect bond rating. Pension underfunding is one of those influencers. Carroll and Niehaus (1998) is the first study to focus solely on years after the passage of Statement of Financial Accounting Standard #87 (Accounting for Pensions) and finds that underfunded pension plans reduce debt rating more than any other variable assessed. Thus, a vital link is established from underfunded pension plans to stock prices through the impact on a firm's debt rating.

Chan, Jegadeesh and Lakonishok (2006) assess the quality of earnings and its impact on stock prices. Their study shows that underfunded pension plans have a negative impact on earnings quality and thus may affect stock prices. Fama and French (1993) analyze risk factors in security returns and find that highly underfunded pension liabilities represent a significant risk to the security returns of a firm. Francesco (2009) assesses firms that underfund pension plans versus

those that overfund pension plans. Although the time period is brief and the sample small, their finding is that there is a significant difference in security price reaction.

Many European private pension plans have historically been based on a pay as you go basis. However, with the inception of IAS 19 in 2004, the accounting treatment of pension plans has been similar to what is prescribed in SFAS 87. Mauldin (2017) finds that U.K. firms have the greatest shortfall in pension obligations and this has had a significant impact on their capital formation ability and subsequent stock prices. The Wall Street Journal notes that Spain and Spanish firms were hit the hardest by the last financial crisis but bounced back more vigorously than other countries such as Greece, Germany, Austria and France with firms in these last four countries having the greatest impact in pension funding shortfall. This has lead to an average of a 13% reduction of stock prices across these countries [WSJ (2015)]. Kaier and Muller (2013) find a direct correlation to underfunded pension liabilities and firm stock prices for firms across Europe.

METHODOLOGY

Sample and Data Collection

IASB Regulation Number 1606 (2002) requires companies listed on European securities markets to begin using IFRS in their consolidated financial statements starting in 2005. This includes accounting for employee benefits and pensions. As a result, the sample used in this study will include the years 2006-2017 (first full year subsequent to the year of adoption of IASB Regulation 1606 in the European markets to most current year available). Securities traded on the European Stock Exchange (ESE), the London Stock Exchange (LSE) and the Frankfurt Stock Exchange (FSE) and their associated prices are identified from the AMADEUS database. Earnings and other corporate data related to these firms/securities is found on *Compustat Global*. U.S. firm data is obtained from *Compustat* for earnings information, and the Center for Research on Security Prices (CRSP) for security price information.

Also, analysts' forecast of earnings is obtained from the Investment Brokers Estimate Service (IBES), and consists of quarterly point forecasts of earnings for a given period. In addition, the Electronic Data Gathering and Retrieval System (EDGAR), the *Wall Street Journal*, and the *European Business Register* are used to analyze financial notes and other associated firm information in order to control for such things as change of corporate form, change in ownership, or change in management. If any of these could be documented during the test period, the firm is subsequently eliminated from the study. Table 1 summarizes firms included in the sample.

Table 1
Summary of the Firms, 2006-2017

Item	U.S. Firms	European Firms
Firms initially identified	417	329
Firms eliminated due to lack of CRSP/AMADEUS data	27	31
Firms eliminated due to lack of Compustat Global/ Compustat data	15	24
Firms eliminated due to EDGAR/European Business Register information	11	12
Total firms in study sample	364	262

HYPOTHESIS DEVELOPMENT

Three hypotheses are tested. First, Ball and Brown (1968), Beaver, Lambert and Morse (1980), Basu (1997) and Ball, Kothari and Robin (1998), all incorporate a research design that associates accounting earnings to changes in market values of equity. These studies indicate, (with varying degrees of significance depending on such factors as firm size, firm risk or industry of the firm), that there is an overall significant positive correlation between accounting earnings and a firm's security price. Drawing upon this literature, an in order to establish a baseline upon which to further this line of research, the following hypothesis is stated:

H1: *There is no significant difference in the information content of accounting earnings between U.S. firm firms and European sample firms.*

In their analysis of forecast accuracy of cash flows, Sinha, Brown, and Das (1997) utilize a matched-pair design in which the forecast accuracy of the same analyst is measured over time. Stunda (2016) uses the same methodology to determine forecast accuracy of groups of analysts over a longer time period. Both studies evaluate U.S. firms exclusively.

Although these prior studies assessed the analysts' forecast accuracy of cash flows of U.S. firms, this study will attempt to do the same with comparison between U.S. and European firms. This is an attempt to assess the accuracy of cash flow forecasts in relation to actual earnings, which ultimately provides an indication of how close the earnings forecasts are of underfunded firms in the U.S. versus those in European nations. These forecasts form a basis for future

investment decisions by investors, which ultimately impact security prices. The comparison gives rise to the second hypothesis, stated in null form:

H2: *There is no significant difference in forecast accuracy of cash flows between U.S. sample firms and European sample firms.*

With regard to cash flow forecasts, DeFond and Hung (2003) report that firms which have cash flow forecasts tend to have greater capital intensity. McInnis and Collins (2008) provide evidence indicating that investors place relatively more weight on the cash flows, as opposed to the accrual-based earnings. As a result, a comparison of cash flows between samples is also undertaken. This leads to the third hypothesis stated in the null form:

H3: *There is no significant difference in the information content of cash flows between U.S. sample firms and European sample firms.*

TEST OF HYPOTHESES AND RESULTS

Test of Hypothesis 1

H1: Test of information content of accounting earnings

Hypothesis 1 proposed that "There is no significant difference in the information content of accounting earnings between U.S. firm firms and European sample." Using the Ball and Brown (1968) model to determine the earnings response coefficient (ERC), the following model is established for determining information content:

$$CARit = a + b1UEUSit + b2UEEit + b3MBit + b4Bit + b5MVit + eit$$
(1)

Where: CARit = Cumulative abnormal return firm i, time t
a = Intercept term
UEUSit = Unexpected earnings for U.S. firms in the sample
UEEit = Unexpected earnings for European firms in the sample
MBit = Market to book value of equity as proxy for growth and persistence
Bit = Market model slope coefficient as proxy for systematic risk
MVit = Market value of equity as proxy for firm size
eit = Error term for firm i, time t

The coefficient "a" measures the intercept. The coefficient b1 represents U.S. firms and is the traditional earnings response coefficient (ERC), found to have correlation with security prices in market-based studies (Ball and Brown, 1968). The coefficient b2 is the ERC associated with European firms. Unexpected

earnings (UEi) is measured as the difference between the management earnings forecast (MFi) and security market participants' expectations for earnings as a proxy for consensus analyst following as per Investment Brokers Estimate Service (IBES) (EXi). The unexpected earnings are scaled by the firm's stock price (Pi) 180 days prior to the forecast:

$$UEi = [(MFi) - (EXi)]/Pi \quad (2)$$

Unexpected earnings are measured for each of the sample firms during the test period. The coefficients b3, b4, and b5, are contributions to the ERC for all firms in the sample. To investigate the effects of the information content of earnings on security returns, there must be some control for variables shown by prior studies to be determinants of ERC. For this reason, the variables represented by coefficients b3 through b5 are included in the study.

For each firm sample, an abnormal return (ARit) is generated around the event dates of -1, 0, +1 (day 0 representing the day that the firm's financials were available per DJNRS or *Worldscope*). The market model is utilized along with the CRSP equally-weighted market index and regression parameters are established between -290 and -91. Abnormal returns are then summed to calculate a cross-sectional cumulative abnormal return (CARit).

Results H1

Results of correlating the ERC to security returns are presented in Table 2. Results show that coefficient b1, representing the ERC of U.S. firms, is 1.96 and significant at the .01 level. These results provide a fairly strong relationship between accounting earnings and security prices, indicating that investors perceive that accounting earnings possess information content and therefore have predictive value when correlated with security returns. Coefficient b2, representing the ERC of European firms, is 0.22 and significant at the .10 level. Although, for European firms, the relationship between accounting earnings and security prices is positive, it is not very strong. This indicates that accounting earnings carry a lesser extent of information content among European investors, and therefore they are perceived to have less predictive value. Ali and Hwang (2000) find that the European model emphasizes tax rules and accounting standards and as such, more emphasis is spent adhering to rules and standards and less emphasis to earnings disclosures. This could account for some of the difference seen in this test.

Performing the Welch's test, and as indicated in Table 2, a t-statistic of 1.619 was computed with a p-value of less than .010. This indicates that the means of the sample groups are significantly different, and thus the null of similarity between the groups is rejected.

Table 2
Information Content of Accounting Earnings 2006-2017

U.S. Firms versus European Firms						
Model: $CARit = a + b1UEUSit + b2UEEit + b3MBit + b4Bit + b5MVit + eit$						
a	b1	b2	b3	b4	b5	Adj. R^2
0.20	1.96	0.22	0.42	0.38	0.12	0.241
(.87)	1.66[a]	2.21[b]	0.30	0.51	0.62	
a = significant at the .01 level *b = significant at the .10 level*						
	t-stat	df	p-value			
Welch's t-test	1.619	1	<.010			

In addition, whenever regression variables are employed, there is a probability of the presence of multicollinearity within the set of independent variables which may be problematic from an interpretive perspective. To assess the presence of multicollinearity, the *Variance Inflation Factor* (VIF) was utilized. Values of VIF exceeding 10 are often regarded as indicating multicollinearity. In the test of hypothesis 2, a VIF of 2.8 was observed, thus indicating a non-presence of significant multicollinearity

Test of Hypothesis 2

H2: Test of forecast accuracy of cash flows

Hypothesis 2 proposed that "There is no significant difference in forecast accuracy of cash flows between U.S. sample firms and European sample firms." Consistent with the methodology of Sinha, Brown, and Das (1997), the following model is used to assess forecast accuracy among analysts:

$$rapfe_{ijt} = |R_{jt} - F_{mjt})/R_{jt}|*100 - |R_{jt} - F_{ijt})/R_{jt}|*100 \quad (3)$$

Where: subscripts i, j, t denote analyst, firm and year, respectively
R_{jt} is the j firm's cash flows in year t
F_{ijt} is the forecast of cash flow by analyst i for firm j in year t
F_{mjt} is forecast of average analyst for the firm
$rapfe_{ijt}$ is each analyst's relative absolute percentage forecast error, calculated as the absolute percentage forecast error of the average analyst minus that of the above average analyst. For below average

analysts, the order of the two terms on the right hand side are reversed (i.e. in the later case the individual analyst's projection is below the average analyst's projection).

Results H2

A pooled, cross-sectional analysis is performed over the study period 2016-2017 and incorporating all analyst forecasts. Data analysis in Table 3 indicates the results of the analysis. Results indicate that U.S. analysts have a larger average forecast error (3.05) which is significant at the 0.01 level. European analysts have a smaller average forecast error (1.10) which is significant at the 0.01 level.

Because the variances of the groups are not equal, there exists violation of the assumption of homogeneity across the sample. In order to account for this, the Welch's test was performed. This test assesses the significance between groups when variances do not equal. Based on the Welch's test, and as indicated in Table 3, a t-statistic of 1.682 was computed with a p-value of less than .010. This indicates that the means of the sample groups are significantly different, and thus the null of similarity between the groups is rejected.

Muller and Verschoor (2005) find that European firms have a history of placing importance on cash flows along with their associated forecast. Obrien (1990) surmises that the relatively more experienced analysts have greater forecast accuracy. The above results could be a combination of European firms placing greater emphasis on cash flow forecasts, while possessing analysts who are more experienced in these forecasts.

Table 3
Analysis Accuracy of Cash Flows 2006-2017

U.S. Firms versus European Firms				
Model: $rapfe_{ijt}= \|R_{jt} – F_{mjt})/R_{jt}\|*100 - \|R_{jt} – F_{ijt})/R_{jt}\|*100$				
Entity	Number	Average Mean	t-test	Probability
U.S. Firms	364	3.05	1.70	0.01
European Firms	262	1.10	1.67	0.01
	t-stat	df	p-value	
Welch's t-test	1.682	1	<.010	

Test of Hypothesis 3

H3: Test of information content of cash flows

Hypothesis 3 proposed that "There is no significant difference in the information content of cash flows between U.S. sample firms and European sample

firms". Using a similar approach as hypothesis one**,** a regression model is constructed to assess the information content of cash flows. This model is consistent with that used by Clement (1999), Jacob et al. (1999), Chen and Matsumoto (2006), and Call, Chen and Tong (2009). The model is:

$$CARit = a + b1UEUSit + b2UEEit + b3MBit + b4Bit + b5MVit + eit$$
(4)

Where: CARit = Cumulative abnormal return firm i, time t
a = Intercept term
UEUSit = Cash for U.S. firms in the sample
UEEit = Cash for European firms in the sample
MBit = Market to book value of equity as proxy for growth and persistence
Bit = Market model slope coefficient as proxy for systematic risk
MVit = Market value of equity as proxy for firm size
eit = Error term for firm i, time t

The coefficient "a" measures the intercept. The coefficient b1 represents U.S. firms and is the response coefficient correlating cash flows with security prices. The coefficient b2 is the similar response coefficient associated with European firms. Once again, variables b3, b4, and b5 are inserted for assessment of other determinants which may influence results.

Similarly, for each firm sample, an abnormal return (ARit) is generated around the event dates of -1, 0, +1 (day 0 representing the day that the firm's financials were available per DJNRS or *Worldscope*). The market model is utilized along with the CRSP equally-weighted market index and regression parameters are established between -290 and -91. Abnormal returns are then summed to calculate a cross-sectional cumulative abnormal return (CARit).

Results H3

Results of the test for hypothesis 3 are found in Table 4. Results show that coefficient b1, representing the response coefficient of U.S. firms, is 0.62 and significant at the .10 level. These results indicate that a positive relationship exists between cash flows and security prices for U.S. firms. Coefficient b2, representing the response coefficient of European firms, is 3.23 and significant at the .01 level. This indicates a stronger relationship between the information content contained in reported cash flows and security prices for European firms.

Performing the Welch's test, and as indicated in Table 4, a t-statistic of 1.642 was computed with a p-value of less than .010. This shows that the means of the sample groups are significantly different, and thus the null of similarity between the groups is rejected. This reinforces the finding of Marshall (2000) which indicates that European Union firms tends to place significant reliance on cash flows.

Table 4
Information Content of Cash Flow 2006-2016

U.S. Firms versus European Firms						
Model: $CARit = a + b1UEUSit + b2UEEit + b3MBit + b4Bit + b5MVit + eit$						
a	b1	b2	b3	b4	b5	Adj. R^2
0.40	0.62	3.23	0.55	0.42	0.46	0.238
(.38)	2.19[b]	1.60[a]	0.88	0.39	0.70	
a = significant at the .01 level *b = significant at the .10 level*						
	t-stat	df	p-value			
Welch's t-test	1.642	1	<.010			

Again, regression variables are assessed for multicollinearity using the *Variance Inflation Factor* (VIF). Values of VIF exceeding 10 are often regarded as indicating multicollinearity. In the test of hypothesis 3, a VIF of 2.4 was observed, thus indicating a non-presence of significant multicollinearity

CONCLUSIONS

The purpose of this study was to compare U.S. versus European firms that have underfunded pension plans, and assess differences that they may display in relationship to security prices. The study compared firms with underfunded pension plans during the study periods 2006-2017. A sample of 364 U.S. firms and 262 European firms were contained in the study. In evaluating pension plans, this study is one of the first to use a study period greater than 5 years (i.e., 12), and it is also one of the first to analyze a significant number of firms in both the U.S. and Europe. Previous studies include 50 or fewer firms. The results, therefore, should be robust and indicative of publicly traded companies with underfunded pension plans on both continents. The results indicate that there is indeed a significant difference between firms with underfunded pension plans in the U.S. versus Europe.

First, the information content of accounting earnings is assessed for the two sample groups. The analysis finds that a higher degree of correlation between accounting earnings and stock price exists for U.S. firms than for European firms. This may be due in part to prior studies which show that the European model emphasizes tax rules and accounting standards and as such, more emphasis is spent adhering to rules and standards and less emphasis to earnings disclosures.

Next, forecast accuracy of cash flows between the two groups is assessed. Findings indicate that there is a higher degree of forecast accuracy of cash flows among European firms. This may be due to findings of prior studies that show

European firms have a history of placing importance on cash flows along with their associated forecast.

Finally, the information content of cash flows is assessed for the two sample groups. Findings show that a higher degree of correlation between cash flow and security returns exists for European firms than for U.S. firms. This may be again related to prior studies which indicate that European Union firms tends to place significant reliance on cash flows.

Overall results indicate that, with respect to security prices, when firms are known to have underfunded pension plans, European firms appear to be more cash flow sensitive while U.S. firms appear to be more accounting earnings sensitive. These findings may be the result of institutional and structural differences among nations. On the other hand, it is noteworthy to understand that differences in cash flow presentation and recognition exist between the nations and their standard-setters. These differences have the potential of contributing to how investors make stock purchase decisions and therefore must be considered as the transitional phase between IFRS and GAAP continues.

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TECHNOSTRESS: AN ANTECEDENT OF JOB TURNOVER INTENTION IN THE ACCOUNTING PROFESSION

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ABSTRACT: Transformative technologies are rapidly changing the accounting profession. The technological demand placed upon accounting professionals is unprecedented. Moreover, the United States accounting profession is plagued with significantly higher than average job turnover as compared to other industries. A modern form of stress has emerged in the workplace. Known as technostress, this type of stress originates from the interaction with information and communication technologies. The adverse physiological and psychosomatic consequences that result from technostress are argued to influence job turnover intention similarly to other role stressors. The purpose of this study is to examine the effect that technology stress, along with organizational commitment, job satisfaction, and satisfaction with life, have on the job turnover intention in the accounting profession. This paper broadens the literature with respect to job turnover by evaluating the potential of technostress as an antecedent.

Key Words: Job turnover, Turnover intention, Technostress, Organizational commitment, Job satisfaction, Satisfaction with life, Accounting

INTRODUCTION

The professional business services industry, which includes accounting, auditing, attestation, tax preparation, bookkeeping, consulting, and payroll processing services, continues to be plagued with significantly higher than average job turnover rates in the United States. The job turnover rate for the professional services industry is nearly 2.3 times greater than the national average (U.S. Bureau of Labor Statistics, 2018). Linkedin recently conducted a global job turnover study of 500 million professionals across all industries. Worldwide data indicated job turnover rates for the professional services sector were 1.1 times greater than the combined average for all industries (Linkedin, 2018).

The cost of turnover per employee can equal or exceed their annual compensation (Mitrovska & Eftimov, 2016). However, for management and highly skilled positions like those in the accounting field, this amount can reach in upwards of 250% of yearly earnings (SHRM, 2014). The typical price tag of turnover includes separation, recruitment, and selection costs, training and employee development, and reduced efficiency. From the perspective of productivity, until a new employee is fully functional, the operation of an entire organization can be impaired (Huselid, 1995).

The hidden costs of employee separation are even more costly. Lost expertise can be disruptive to a company, affecting workflow and customer service quality. Turnover can degrade employee morale, giving rise to increased workplace stress and absenteeism (Mitra, Jenkins, & Gupta, 1992). Moreover, the risk of additional turnover magnifies (Felps et al., 2009).

Due to the disproportionate level of turnover in the accounting profession and the costs associated with it, an extensive amount of research has been amassed to study the antecedents of job turnover intentions (Bao, Bao, & Vasarhelyi, 1986; Chong & Monroe, 2015; Doll, 1983; Harrell, 1990; Nouri, 2017; Parker & Kohlmeyer, 2005; Pitman, Gaertner, & Hemmeter, 2011). Prior studies have concluded that organizational commitment and job satisfaction are adversely related to job turnover intention (Gregson, 1992; Lee & Jeong, 2017; Pasewark & Strawser, 1996; Viator, 2001). Work-life balance and life satisfaction have also been linked to job turnover (Schieman, Milkie, & Glavin, 2009). Role stressors, including role ambiguity, role conflict, and role overload, operate as facilitators of job turnover (Bedeian & Armenakis, 1981; Fogarty, Singh, Rhoads, & Moore, 2000; Kim, Im, & Hwang, 2015; Senatra, 1980).

A modern form of stress has emerged in the workplace. Known as technostress, this type of stress originates from the interaction with information and communication technologies (ICTs) (Agervold, 1987; Brod, 1984). The adverse physiological and psychosomatic consequences that result from technostress are argued to influence job turnover intention similarly to other role stressors (Brillhart, 2004; Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2007). The purpose of this study is to examine the effect that technology stress has on the job turnover intention in the accounting profession. This paper broadens the literature with respect to job turnover by evaluating the potential of technostress as an antecedent.

LITERATURE REVIEW

Transformative technologies are rapidly changing the accounting profession. Repetitive tasks are being automated by artificial intelligence, machine learning, blockchain, and robotics. Internet-based cloud computing and mobile applications provide instant access to business or client information. Advances in software enable efficient analysis of big data, triple-entry bookkeeping, and more streamlined tax preparation. Cybersecurity threats and unauthorized data hacks are common realities. The technological demand placed upon accounting professionals is unprecedented (Drew, 2018).

Accountants must be retrained with a new set of skills to navigate the automation revolution or face replacement (Pew Research Center, 2016). Uncertainty can arise from adapting to new workplace technologies as can insecurity from the threat of job loss. Having to work faster and longer to keep up with current job responsibilities while simultaneously retraining for those expected in the future can be an overwhelming process. The physical and emotional responses elicited by the use of ICTs is a phenomenon categorized as technostress.

Technostress

Technostress, also known as technophobia, technology stress, computer anxiety, computerphobia, digital depression, and computer stress, is an anxiety disorder that results from an inability to adapt to or cope with technology (Brod, 1984; Chua, Chen, & Wong, 2009; Durndell & Haag, 2002). Those afflicted with technostress may be impatient, moody, irritable, anxious, fatigued, exhausted, confused, unable to concentrate, impulsive, pessimistic, or even depressed (Riedl, Kingermann, Auinger, & Javor, 2012). Other health outcomes associated with technostress include headaches, indigestion, hypertension, and cardiac arrest (Pucci, Cristina, Antonaci, Costa, Imbriani, & Taino, 2015).

Tarafdar et al. (2007) constructed a framework of five technostress creators, triggered by interfacing with ICTs. Users feel compelled to: (a) increase work pace and job load (techno-overload), (b) stay connected, upsetting the work-life balance (techno-invasion), (c) spend more time learning about complex technologies due to feelings of inadequacy (techno-complexity), (d) regard their jobs are in jeopardy (techno-insecurity), and (e) are uncomfortable with continuous change (techno-uncertainty). These techno-stressors can lead to role overload, the perception that a job is too difficult or demanding (Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2011). Technostress can also produce role conflict, whereby the pressures imposed by ICTs at work interrupt time spent at home (Kahn et al., 1964; Tarafdar et al., 2011). Finally, technostress may impose role ambiguity as job expectations may become blurred when new technologies are adopted (Kahn et al., 1964; Lee, Shin, & Baek, 2017).

If role stressors induce job turnover intention and technostress creates role stress, then technostress may also prompt job turnover intention (Bedeian & Armenakis, 1981; Fogarty, Singh, Rhoads, & Moore, 2000; Kim, Im, & Hwang, 2015; Senatra, 1980; Tarafdar et al., 2007, 2011).

Hypothesis 1 (H_1): Technostress is positively associated with job turnover intention in the accounting profession.

Organizational Commitment

Organizational commitment has been described as the degree of attachment one has to their workplace (Greenberg, 2005; Mowday, Steers, & Porter, 1979). This emotional connection to an organization can improve productivity, enhance job involvement and loyalty, and reduce work stress (O'Reilly, 1989). Employees who are committed to an organization can more deeply identify with corporate values, goals, and objectives, better equipping them to embrace change (Vakola & Nikolaou, 2005). Research results have been consistent across the globe (Siu, 2003).

Weakened or compromised organizational commitment can increase the incidence of job turnover (Allen & Meyer, 1996; Mathieu & Zajac, 1990). Work stress can exacerbate a degradation of organizational commitment (Boshoff & Mels, 1994; Dale & Fox, 2008; Lee & Jamil, 2003; Tu, Ragu-Nathan, & Ragu-Nathan, 2001). As technology related tensions rise at the workplace, the

organizational commitment of accountants may wane. Therefore, in creating a model to predict job turnover intention in the accounting profession, organizational commitment is considered.

Hypothesis 2 (H_2): Organizational commitment is negatively associated with job turnover intention in the accounting profession.

Job Satisfaction

Job satisfaction has been characterized as the extent of contentedness at the workplace (Locke, 1976; Spector, 1985). Various determinants of job satisfaction include financial and nonfinancial benefits, personal growth, supervisors and coworkers, working conditions, communication, recognition and promotion, and job security (Benz & Frey, 2008). Employees who are highly satisfied at work are less likely to quit their jobs (Chen et al., 2011). In contrast, those workers who display negative feelings and are less satisfied are more prone to separate from the company (Tett & Meyer, 1993).

ICTs will continue to shape not only the role of the accountant but also the profession, as a whole. As much of the data entry work of the profession will be eliminated, accountants must transform themselves into strategic consultants and advisers. This metamorphosis may be disconcerting to many as workers step out of their comfort zones and away from what is familiar. A perception of career instability or fear of job insecurity may emerge, leading to a reduction of job satisfaction.

Hypothesis 3 (H_3): Job satisfaction is negatively associated with job turnover intention in the accounting profession.

Satisfaction with Life

ICTs offer immense benefits to both employers and employees. From an employer perspective, technology can improve workplace efficiency and effectiveness while reducing costs. Employees may be provided with greater workplace flexibility. Many organizations now endorse telecommuting, virtual workplaces, and other flexible work arrangements to manage their workloads and life commitments. A healthy work-life balance can be achieved when time is appropriately allocated to both professional endeavors and personal interests. Work-life balance promotes satisfaction with life, in general, and supports overall well-being (Grzywacz, Butler, & Almeida, 2009).

The evolution of ICTs has clouded the boundaries between work and life (Greenhaus, Collins, & Shaw, 2003). Employees may feel pressured to tether themselves virtually to the workplace after hours. This compulsion to immediately respond to workplace requests can upset the work-life balance. The further that work-life balance moves away from equilibrium, the greater the threat of job turnover (Asiedu-Appiah, Mehmood, & Bamfo, 2015; Wright et al., 2014).

The satisfaction with life scale measures the quality and fulfillment with life as a whole (Diener et al., 1985). People who are satisfied with their lives tend to be more positive and healthier (Toker, 2012). Life satisfaction is inversely related to job turnover intention (Lambert et al., 2009). Based on previous research examining life satisfaction and job turnover intention, the following hypotheses was posed:

Hypothesis 4 (H_4): Satisfaction with life is negatively associated with job turnover intention in the accounting profession.

RESEARCH DESIGN

To facilitate an understanding of how technostress, organizational commitment, job satisfaction, and satisfaction with life influences job turnover intention within the accounting profession, the following research question was answered:

***Research Question* (RQ):** What effects do technostress, organizational commitment, job satisfaction, and life satisfaction have on the job turnover intention of accounting professionals?

Data was collected via a multiple-choice, Likert-scale survey combining questions from the Technostress, Job Satisfaction Survey, Organizational Commitment Questionnaire, Satisfaction with Life Scale, and Job Turnover Intention instruments (Diener et al., 1985; Mowday, Steers, & Porter, 1979; Spector, 1985; Tarafdar et al., 2007; Walsh, Ashford, & Hill, 1985). A survey panel of accounting professionals was used. The survey was electronically distributed to a random sample selected from the panel. Responses were assumed to be and converted to an interval level of measure in order to apply parametric tests during data analysis. A multiple regression model was developed to evaluate the significance of the relationships between the variables.

A minimum sample size of 184 was estimated using G*Power 3.1.9.2, assuming *a priori* power analysis, $\alpha = .05$, $\beta = .95$, and a medium effect size (Faul, Erdfelder, Lang, & Buchner, 2007). An instrument is expected to demonstrate a reliability of $\alpha = .70$ or greater (Babbie, 2010). Table 1 provides the average reliability for the instruments used as part of this study. A statistically large sample was acquired to minimize threats to internal and external validity.

Table 1

Reliability of Survey Instruments

Instrument	Reliability
Technostress Instrument Tarafdar et al. (2007)	.71α to .91α
Organizational Commitment Questionnaire Mowday, Steers, & Porter (1979)	.84α to .89α
Job Satisfaction Survey Spector (1985)	.82α to .93α
Satisfaction with Life Scale Diener et al. (1985)	.74α to .86α
Job Turnover Intention Walsh, Ashford, & Hill (1985)	.70α to .80α

SAMPLE DESCRIPTION

Respondents self-reported as 55.3% female, 44.2% male, and .5% trans-male with a majority aged between 31-35 (23.4%), 36-40 (16.8%), or 41-45 (11.2%) years old. Of those surveyed, 47.7% earned a bachelor's degree, 20.3% a master's degree, and 15.7% an associate degree. Approximately 51% of the sample held a management position at the workplace. Regularly observed job positions held by the survey participants included financial accountants (25.9%), accounting directors (20.8%), staff accountants (14.2%), financial advisors (8.6%), and auditors (4.6%). As per Table 2, frequently reported experience levels ranged between 6 to 10 years (30.1%), 1 to 5 years (29.6%), and 11 to 15 years (15.3%).

Table 2

Professional Experience
Frequencies and Percentages (N = *196*)

Years	Frequency	Percentage
< 1	2	1.0%
1 to 5	58	29.6%
6 to 10	59	30.1%
11 to 15	30	15.3%
16 to 20	14	7.1%
21 to 25	13	6.6%
26 to 30	12	6.1%
31 to 35	6	3.1%
36 to 40	0	0.0%
> 40	2	1.0%

Those accounting and financial professionals surveyed worked in the private and public sectors, 60% and 22%, respectively, with approximately 9% employed by governmental entities and 9% for not-for-profit companies (see Table 3).

Table 3

Company Size and Business Sector
Frequencies and Percentages (N = *196*)

Size	Public	Private	Government	Not for Profit
1 to 50	1	36	1	4
51 to 100	6	21	2	3
101 to 250	3	17	1	1
251 to 500	4	8	2	1
501 to 1,000	5	14	2	1
1,001 to 5,000	10	12	1	3
> 5,000	14	10	8	5

Most of the accounting and financial professional surveyed work either 36 to 40 (33.2%), 41 to 45 (23.0%), or 46 to 50 (19.9%) hours per week (see Table 4).

Table 4

Average Number of Weekly Work Hours
Frequencies and Percentages (N = *196*)

Years	Frequency	Percentage
0 to 10	3	1.5%
11 to 15	2	1.0%
16 to 20	4	2.0%
21 to 25	2	1.0%
26 to 30	6	3.1%
31 to 35	5	2.6%
36 to 40	65	33.2%
41 to 45	45	23.0%
46 to 50	39	19.9%
51 to 55	9	4.6%
56 to 60	10	5.1%
60 to 65	3	1.5%
66 to 70	1	0.5%
> 70	2	1.0%

DATA ANALYSIS

SPSS was the software used for data analytics for this study. To manage missing data abnormalities, a listwise deletion approach was applied. Nominal

variables were coded with dummy variables prior to conducting the analysis. Variables were standardized into normalized *z*-scores to identify univariate outliers. Outliers were analyzed using residuals and Cook's Distance (Howell, 2007). Normality was evaluated with a normal probability plot, linearity was confirmed through visual inspection of a histogram, and homoscedasticity was assessed through the review of a residuals scatterplot (Field, 2013). A Durbin-Watson test statistic for the model of 1.78 indicated uncorrelated adjacent residuals and collinearity statistics were within the acceptable range of .1 and 10 (Tabachnick & Fidell, 2013).

RESULTS

Linear multiple regression was conducted to test the research question and hypotheses. The regression model summary is shown in Table 5. According to the model, 51% of the variance in job turnover intention among accounting professionals was explained by the independent variables (technostress, organizational commitment, satisfaction with life, and job satisfaction), incorporated as part of this study.

Table 5

Model Summary (N = *196*)

R	R^2	Adjusted R^2	Std. Error of the Estimate	F	df1	df2	Sig. F	Durbin-Watson
0.71	0.51	0.50	5.37	48.90	4	191	0.00	1.78

Note. Dependent variable = Job Turnover Intention.

Table 6 indicates that the ANOVA was statistically significant, $F(196) = 48.90$ at $p < .01$, for technostress, organizational commitment, and job satisfaction predicting job turnover intention.

Table 6

Analysis of Variance of the Regression Model (N = *196*)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	5633.70	4	1408.42	48.90	.00
Residual	5501.75	191	28.81		
Total	11135.44	195			

Note. Dependent variable = Job Turnover Intention.

Table 7 reports the coefficient data for the model.

Table 7

Multiple Regression Model Coefficient Data (N = *196*)

Variables	B	SE	β	*t*	Sig.
Constant	23.99	3.42		7.02	0.00
Technostress	0.06	0.02	0.21	3.79	0.00
Organizational Commitment	-0.20	0.04	-0.45	-5.76	0.00
Satisfaction with Life	-0.07	0.06	-0.06	-1.09	0.28
Job Satisfaction	-0.04	0.02	-0.19	-2.17	0.03

Note. Constant (y-intercept). Overall model $R^2 = .71$, $F(4, 191) = 48.90$, $p = .001$.

Technostress (β = .21, $t(196) = p < .00$), organizational commitment (β = -.45, $t(196) = p < .00$), and job satisfaction (β = -.19, $t(196) = p < .03$), were statistically significant in predicting job turnover intention in accounting professionals. However, satisfaction with life was not significant (β = -.06, $t(196) = p < .28$).

Table 8 summarizes the regression results and the overall findings of the study based on the research question and sub-hypotheses.

Table 8

Summary of Hypothesis Testing Results

Hypothesis	Variable	*t* Value	Results
H_1	Technostress	.00	Rejected
H_2	Organizational Commitment	.00	Rejected
H_3	Satisfaction with Life	.28	Not Rejected
H_4	Job Satisfaction	.03	Rejected

DISCUSSION

This study identified that a relationship exists between technostress and job turnover intention in the accounting profession. From a practitioner standpoint, managers now have an awareness that technostress is of considerable concern and can lead to an increased incident of job turnover rates in the accounting profession. Firms are now able to strategize how to minimize the stressors associated with technology.

One way that businesses can potentially curb technology stress is to provide staff training prior to an implementation and system support thereafter. Knowledge acquisition not only can reduce the uncertainty that employees feel about the technology but can moderate the perception of its complexity. Likewise, effective workplace communication is pivotal to lessen insecurities and ambiguities surrounding a technology event. Companies should staff appropriately so that role overload can be eased during the transition.

Employers should beware that policies that promote constant connectivity by their employees may drive up technostress and cause job turnover. Managers should respect employee personal time as much as possible and avoid contact after hours. Furthermore, leaders should set the tone by unplugging themselves.

In addition to the impact of job turnover, the economic blow of technostress can be massive, equating to 225 million lost workdays and $300 billion in lost productivity per year (American Institute of Stress, 2007). Other destructive outcomes include decreased profit and company value, a degradation of services, and an increase in job vacancies (Moses, 2013). Technostress can create a toxic work environment, accelerating workplace conflicts, permanently damaging the corporate culture. This study has reinforced the merit of developing approaches to lessen or eliminate the effects of technostress.

Companies should focus on improving the organizational commitment and job satisfaction of their personnel since both were found to be negatively associated with job turnover intention. Strategies such as building a culture of trust and transparency, offering incentives, providing constructive criticism and professional development opportunities, may be beneficial. Although the satisfaction with life scale was not statistically significant in this study, work-life balance has been identified as a highly critical component to retention rates. Companies must continue to engage in work-life balance initiatives.

From a theoretical perspective, this landmark study established that a statistical relationship exists between technology stress and job turnover in the accounting profession. Future research should seek to determine causality between technostress and job turnover using structural equation modeling. A longitudinal study could be performed to measure the perceived variations in technostress across the accounting profession. A final area of future research that should be piloted is a cross-comparison of technostress among non-related professions.

Limitations of the study include the use of a Likert-scale survey as a data collection tool. Respondents were not provided with the opportunity to expand upon or explain their answers. The study was limited to the accounting profession. Results may differ in other occupations or industries. A survey panel was used to gather data. Accountants not registered as part of the panel may have different experiences than those surveyed for this study.

CONCLUSION

The accounting profession is poised for monumental change, driven by advances in technology. Firms must carefully position themselves to embrace the transformation without further driving up job turnover rates. Through an awareness of and by implementing approaches to reduce technostress, the accounting profession can be successful. The workforce will benefit from a more technostress-conscious workplace.

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THE COMPREHENSIVE TAXATION SYSTEM EXISTING DURING THE ROMAN EMPIRE

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ABSTRACT

This paper reviews the various forms of Roman taxes that existed during the period of the Roman Empire. The first section of this paper reviews the tremendous growth of the Roman Empire over several hundred years. In order to fund the expansion of the empire and fund the armies, Roman rulers utilized a wide variety of taxes. The intent of this paper is to review the extremely large amount of taxes that were extracted from inhabitants of Roman conquered lands. Roman taxes were in addition to religious taxes paid by Jewish inhabitants of all Roman controlled lands. This created a system of double taxation which became very oppressive to those affected.

The first portion of this paper briefly traces the growth of the Roman Empire over the period from 753BC to 476AD. The major portion of this paper, however, reviews the Roman taxation system in existence during the years that the empire existed. Following the brief summary of the growth of the Roman Empire, but prior to an analysis of the Roman taxation system, is a discussion of the occupation of the "tax collector" or "publican." The occupation of tax collector or "tax farmer," during this period, was one of very low social status equal to that of prostitutes and other unsavory vocations. The final portion of this paper reviews the question of whether or not the inability to assess and collect these various taxes may have contributed to the fall of the Roman Empire.

Key words: Roman empire, comprehensive taxation system, Romulus and Remus, Julius Caesar

INTRODUCTION

One of the most impressive civilizations in history is that of the Romans. Most historians trace the Roman Empire over a period of many centuries. Depending of the historian, the Roman Empire began with the founding of Rome by the twin brothers Romulus and Remus (Sidebottom, 2016). As legend has it, Romulus founded the city on the Palatine Hill. This paper focuses on the taxes that the Roman government employed to fund all its expenditures including those

needed to support the armies. Similar to the taxation system of today, taxes took many forms including an income tax, a sales tax, various property taxes, and numerous customs fees and duties.

This paper begins with an overview of the growth and expansion of the Roman Empire from approximately 753 BC (or BCE) to 476 AD (or CE). The authors will use the traditional BC (Before Christ) and AD (Anno Domini - Latin for year of the Lord) in this paper instead of the BCE (Before the Common Era) and CE (Common Era) designations. Depending on the historian, the period of the Roman Empire may differ significantly from the dates mentioned above. However, the authors will adhere to these dates mentioned above. The following paragraphs discuss the growth of the Roman Empire.

ORIGIN AND GROWTH OF THE ROMAN EMPIRE

During very early times, many Roman citizens believed that Rome was founded precisely in 753 BC (Sidebottom, 2016). This is the date of the traditional story when the twins, Romulus and Remus, sons of the god Mars, were placed in a basket on the river Tiber and left to die. The basket landed on the riverbank at the future location of the city of Rome. The babies were nursed by a female wolf and later raised by a local shepherd.

Sidebottom continues the Romulus/Remus myth that disclosed that upon adulthood Romulus founded the city of Rome on Palatine Hill and killed his brother Remus. The story is very similar to the Bible's Old Testament story of Cain and Able where brother also killed brother. Although Sidebottom admits that there is no basis in fact for the Romulus and Remus story, he states that archeologists have found evidence of a city on Palatine Hill as early as 1,000 BC (Sidebottom, 2016). Although an exact date cannot be accurately determined when the city of Rome first appeared, historian agree that it was at approximately this date.

N.S. Gill provides a brief summary of the periods of history in ancient Rome (Gill, 2017). He identifies these periods as Regal Rome, Republican Rome, the Roman Empire, and the Byzantine Empire. The following paragraphs briefly summarize each of these periods which begin in 753 BC and conclude in 476 AD (or as late as 1453 AD according to some historians).

Gill states that the Regal Period lasted from 753 BC to 509 BC. This was a period when kings ruled over Rome with the first being Romulus. Romulus, according to legend, was the son of the god Mars and a Vestal Virgin named Rhea Silvia (Gill, 2017). Gill believes that the brothers, Romulus and Remus, were raised by a prostitute rather than a she-wolf, since the Latin word for brothel is "lupanar." The Latin for both prostitute and she-wolf is "lupa."

Gill also describes a second version of the founding of Rome. The Roman poet Virgil describes, in the Aeneid, the founding of the town of Lavinium by

Aeneas in approximately 1176 BC. Ascanius, son of Aeneas, built the city of Alba Longa in 1152 BC. Both these cities were located where the future city of Rome would be built.

Gill adds that most of what is known about early Rome comes from the Roman historian, Titus Livius (or Livi) (Livius, 1928). He lived from 59 BC to 17 AD and authored the text "History of Rome From Its Foundation." Both six and two volume sets of this work are available online (public domain).

As mentioned above, during the Regal period of 753 BC to 509 BC, Rome was ruled by seven Kings. Gill adds that legend has it that the Seven Hills of Rome are associated with these seven original kings. Romulus was king from 753-715 BC. He was followed by Numa Pompilius (715-673 BC), Tullus Hostilius (673-642 BC), Ancus Martius (642-617 BC), L. Tarquinius Priscus (616-579 BC), Servius Tullius (578-535 BC), and finally Tarquinius Superbus (Tarquin the Proud) (534-510 BC). Legend has it that Superbus came into power following the assassination of Servius Tullius. Superbus and his family were purported to be so evil and vicious that legend states they were forcibly removed from power by Brutus and other members of the Senate (Gill, 2017). During this period, the kings answered to the Senate and did not possess absolute power.

Gill identifies the second period in Roman history as the Roman Republic or Republican Rome which lasted from 509 BC to 27 BC (Gill, 2017). During this period, Rome elected the governor of the various regions. To prevent abuse of power, the Romans allowed the "comitia centuriata" to elect a pair of top officials who were called "consuls." The comitia centuriata was a political assembly comprised of 30 kinship groups into which Roman families were divided. These kinship groups (called curiae) were comprised of three families that existed when Romulus was king. These tribes were the Ramnenses, Titienses, and Luceres (Gill, 2017).

The consuls were elected Roman magistrates during the Roman Republican Period (Gill, 2018). By 181 BC, these men had to be at least 43 years old and of good character. These individuals possessed a limited term of near absolute power. They were, however, less powerful than the king because their term was limited to one year and the power was split between the two consuls. Consuls were very powerful, since they were responsible for decisions on war, justice, and finance. Each consul had the power to negate the other. They were, however, supposed to abide by the senate's advice.

One of the most important figures during the Roman Republic period was Julius Caesar who was born in 100BC and lived until he was assassinated on March 15, 44 BC by Marcus Brutus. According to History.com authors, the assassination conspiracy may have included as many as 60 of his senators who were angry about the prospect of taking orders from Caesar's subordinates. These individuals were

scheduled to replace Caesar while he was off fighting a war scheduled to begin on March 18th (History.com authors, 2009).

The third period of the history of Rome, the Roman Empire or Imperial Rome, according to historiography convention, dates from 27 BC to 284 AD (Encyclopedia Britannica, 2018). During the period, the Roman Empire spread at an astounding rate. According to Joshua Mark, the Roman Empire, at its height in 117 AD was the most extensive political and social structure in western civilization (Mark, 2018). The Roman Empire was so vast in 285 AD that Emperor Diocletian divided it into a Western and Eastern Empire. The Eastern Empire remained strong (after 476 AD) operating out of its capital city of Constantinople created by Emperor Constantine in 330 AD.

This "two headed" empire (Rome and Constantinople) was firmly established by 395 AD. During this period, Rome was extremely powerful controlling the Mediterranean, the Balkans, Turkey, and the modern areas of the Netherlands, southern Germany, France, Switzerland, and England (Gill, 2017). The Western Empire was dissolved in 476 AD when Rome fell to Germanic King Odoacer. Some authors consider this date to be the close of the Roman Empire while others consider the end of the empire to be nearly 1,000 years later.

The fourth period of the history of Rome centered upon the Eastern Empire referred to as the Byzantine Empire (Mark, 2018). As mentioned above, the capital city was Constantinople which is modern-day Istanbul. When King Odoacer seized Rome in 476 AD, he did not destroy the Roman Empire in the east which is known today as the Byzantine Empire (Gill, 2017). Residents of this area spoke either Greek or Latin but were citizens of the Roman Empire. However, the culture in this area was more Greek than Roman.

Although the Western Empire collapsed in 476 AD, the Eastern Empire continued to exist for approximately 1,000 years. It was not until the Ottoman Turks conquered the area in 1453 AD (Gill, 2017) Using this date, most historians identify the timeline for the Roman Empire to begin in 753 BC and end in 1453 AD. This 2,200 year period marked the beginning and end of one of the most recognized and respected civilizations in our history.

The remainder of this paper will review several types of taxes assessed upon residents of the Roman Empire. A comprehensive tax system was essential in order to finance the cost of the Roman armies and provide services for all inhabitants of the vast empire. Prior to the review of the Roman tax system, a description of the duties and responsibilities of a publican or tax farmer (collector) is appropriate.

THE PROFESSION OF PUBLICAN OR TAX COLLECTOR (FARMER)

The word "publican" is an English translation of the Greek word "telones" which means "tax-farmer" (Badian, 1983). Therefore, a publican had the task of collecting taxes for the Roman government. During the period of the expansion of the Roman Empire, these individuals would bid to acquire a "tax franchise" for a particular area that enabled them to collect a variety of taxes from occupants of the area. These tax farmers were responsible for converting taxes collected in-kind (crops/animals) into hard currency. Therefore, publicans collected enough money from taxpayers to cover the taxes due, exchange fees, and provide themselves with a profit. (Bartlett, 1994). In addition to an already extravagant salary, the publicans would collect additional taxes above those required by Rome which would further increase their total income.

During the first century AD, Jerusalem was under Roman control being conquered by Roman general Pompey during his eastern campaign when he established the Roman province of Syria in 64 BC and conquered the city of Jerusalem in 63 BC (Barraclough, 1981). In this region, publicans were typically Jews who worked for the despised Roman government collecting various taxes from Jewish citizens. Publicans were despised in most cultures, since they were automatically assumed to be dishonest, unethical, and without character.

Basically, the invading Roman government employed citizens of conquered lands to perform the undesirable task of collecting taxes. The Roman government accomplished this by promising significant bonuses. This allowed the publicans to extort as much money as possible from the local citizens thereby increasing the publican's total income. It is easy to imagine the significant corruption that existed in this type of tax collection system. It is also understandable that the publicans were despised and deemed to be traitors to their own nation. Given this situation, publicans had few friends and were forced to associate with other publicans or the criminal element of the population. The Bible states, in many of its books, that association with a publican automatically cast suspicion on that person's reputation.

The Bible reports that Jesus was often found in the company of publicans. For example, one of the disciples, Matthew (also called Levi) was a tax collector. "And as Jesus passed forth from thence, he saw a man, named Matthew, sitting at the receipt of custom: and he saith unto him, Follow me. And he arose, and followed him" (Matthew 9:9). This appalled the religious Jewish leaders as verse 11 continues with, "And when the Pharisees saw *it*, they said unto his disciples, Why eateth your Master with publicans and sinners?" The Bible contains many verses where tax collectors are on the same level as prostitutes and other undesirables such as Matthew 21:32 (publicans and prostitutes (harlots)), Luke 5:30 (publicans and sinners), and Mark 2:16 (publicans and sinners).

John MacArthur also comments on the social status of the publican. He discusses the disciple Matthew who possessed the occupation least likely to warrant discipleship. MacArthur states that tax collectors were the most despised people in Israel (MacArthur, 2002). He states the citizens of that period deemed them to be lower and more worthy of scorn that the occupying Roman Army. MacArthur reports that publicans extorted money from the people often using hired thugs. In his words, publicans were considered "despicable, vile, unprincipled scoundrels." MacArthur states that publicans had an unspoken agreement with the Roman Emperor that besides collecting legitimate taxes owed to Rome that they could also assess additional fees and taxes. These additional monies could be retained by the publican in full or shared with Rome on a percentage basis.

MacArthur reports that there were two types of tax collectors known as the "Gabbai" and the "Mokhes" (MacArthur, 2002). The first group (Gabbai) were general tax collectors who collected property, income, and poll taxes. The second type (Mokhes) collected duties on imports and exports, goods for domestic trade, and virtually everything that was moved by road. In addition, they established tolls on roads and bridges, taxes on beasts of burden, and taxes on transport wagons based on the number of axles. Finally, MacArthur added that publicans were allowed to assess taxes on packages/parcels, letters, and any other type of personal property.

There were two types of Mokhes referred to as the Great Mokhes and the Little Mokhes (McArthur, 2002). A Great Mokhes operated behind the scenes and hired others to actually collect the taxes in his place. A Little Mokhes operated a tax office where he would deal with people on a face to face basis. MacArthur believes that the disciple Matthew was a Little Mokhes because he was dealing with people face-to-face at a tax office when Jesus found him (Matthew 9:9). MacArthur stresses how much publicans were hated by the local people. He states that no self-respecting Jew would become a tax collector. This action cut him off from his people and his God, since he was banned from the synagogue and forbidden to sacrifice and worship in the temple. As mentioned earlier, the publicans had few friends other than fellow publicans and the socially undesirable.

George Shillington discusses the "Tale of Two Taxations" (Shillington, 1997). This relates to taxation at the time of Christ during the first century AD. Inhabitants of Jerusalem during this period were required to pay both Roman and Jewish taxes which created a dual tax system. The publicans were especially hated because they extracted money from Jewish residents that was budgeted for one of their three required religious taxes. These included a wave or first fruits offering of typically 3%, a 10% annual tithe (for support of the priests and Levites), and a second 10% tithe for a total of approximately 23%. The second portion of the dual tax system included the Roman taxes collected by the publicans. Shillington references Titus Flavius Josephus who wrote that the primary taxes extracted by the Romans were the poll (head tax) and land taxes. In addition to these two taxes,

the Roman government also collected various land transfer taxes, export and import duties, and a real estate tax on all the houses in Jerusalem (Josephus, 78AD). It is easy to understand the hatred towards the Publicans who extracted numerous taxes to finance a foreign government. This left residents of conquered lands with less funds to pay necessary living expenses and pay required Jewish religious taxes identified in both the books of the old and new testaments of the Bible.

The next portion of this paper identifies the significant number of taxes that were utilized by the Roman government. These included real estate taxes, excise and custom taxes, marriage taxes on unmarried men and women who could not bear children, inheritance taxes, poll taxes, and many more. The final segment of this paper reviews the question of whether massive tax evasion was a major reason for the fall of the Roman Empire.

THE EXTENSIVE ROMAN TAXATION SYSTEM

The Roman Empire extracted a number of direct and indirect taxes or tributes. The two basic types of direct taxes were tributum soli and tributum capitis (Encyclopedia Britannica, 2018). According to Brunt, tributum soli was a tax on the land (Brunt, 1981). It was not a tax on harvests or crops. Nor was it a tax on "movables" such as slaves, animals, and equipment for cultivating and processing crops. Since land was the chief source of wealth during the period of the Roman Empire, the land tax produced the majority of total tax revenues.

Caesar Augustus (or Octavian until 27BC), the first Roman emperor, following the republic, from 30BC to 14AD, established a number of fiscal and monetary reforms. In particular, he introduced three new taxes including a land tax (tributum soli), a general sales tax, and a flat-rate poll tax (tributum capitis) (Davies, 2002). The tributum soli or land tax was established at one percent of the assessed value of the land. The general sales tax of 1% and flat-rate poll tax on adults from the age of 12 or 14 to age 65 will be discussed later in this paper.

Brunt states that in the Roman census process, the imperial government had a model for registration and taxation of all forms of property including both real and tangible personal property. This included land, buildings, cash, debts due from others (accounts receivable), clothing, jewels, and slaves (Brunt, 1981). The worth of all these forms of capital was valued apparently using a set of formulas established by the censors who were government officials who conducted the census. This valuation system required the possessors of the land to specify the acreage that could be cultivated and farmed, the number of grade vines, and the acreage containing olive trees (Brunt, 1981).

Since the land tax was such a vital part of the Roman taxation system, there were significant penalties for false declarations concerning the acreage and value of the property. Slaves implicated in the frauds would often suffer death. The

testimony of slaves was often sufficient to convict the land owner. Septimius Severus, Roman emperor from April 193AD to February 211AD ruled that slaves could be examined against their owners for only the crimes of census fraud and adultery (Brunt, 1981).

A second type of Roman tax was called "Collatio lustralis" or a tax on "traders in the widest sense." It was a tax on anyone who produces a product or provides a service, with the exception of farmers, physicians, and teachers (Oxford Classical Dictionary, 1970). This tax was instituted by Constantine, Roman Emperor who ruled from 306 to 337AD. According to the Byzantine writer Zosimus, Constantine established this tax as early as 325AD (Goffart, 1971).

The tax was originally collected annually in either gold or silver but in the late 4th century it was only payable in gold. In the early 5th century, the tax was required to be paid once every four years. Zosimus reported the extreme hardship caused by this tax, since it was collected in a lump sum every four years (Goffart, 1971). It was devastating to parents who were forced into selling their children into slavery or prostitution in order to pay this tax.

The tax was abolished by Anastasius I in 498AD in the Eastern Roman Empire as part of his monetary and fiscal reforms (Nicks, 1998). Anastasius was known for his administrative efficiency. For example, he changed the payment method for governmental transactions from goods to hard currency (Treadgold, 2001). Upon leaving the imperial government, he was recognized for establishing a significant budget surplus due to internal controls introduced to minimize governmental corruption. The state treasury, at the time of his death, was three hundred and twenty thousand pounds (Nicks, 1998). In addition, Anastasius reformed the tax code of the period and introduced an improved form of currency (Treadgold, 2001).

A third type of Roman tax was called Portoria which was also referred to as a harbor or customs tax. This was a 2½% ad valorem (based upon value) tax collected in virtually every port in the Mediterranean on nearly every type of product (Finley, 1973). The only items exempted from the tax were shipments of imperial annona (corn supplies) for the armies and the citizens of Rome.

The system supplying Rome, the armies, and other valuable cities with grains (mainly corn) and other foodstuffs came to be known as the *annona* (Erdkamp, 2016). The grain distribution system was first introduced in 123BC by C. Sempronius Gracchus (a Roman populist and reformist politician). Given that the harbor tax or customs duty was assessed on virtually all goods moving in and out of Mediterranean ports, this tax produced significant revenue for the Roman government. This system ended in 429AD when Africa was conquered by the Vandals, since most grains at this time were shipped to Rome from African ports.

The Roman tax system also included two taxes assessed on orphans, widows, and single women that was used for the purchase and upkeep of the Roman army's horses. These taxes were termed "aes equestre" and "aes hordearium" (Hill, 1943). The aes equestre was the monetary sum of 10,000 asses. The as (plural asses) was originally introduced in approximately 280BC as a large cast bronze coin (later copper) that was minted during the periods of the Roman Republic and Roman Empire.

The aes equestre was given to a cavalry soldier often called the "equus publicus" (equestrian order) for the purchase of a horse. The equus publicus was a wealthy secondary property-based class of ancient Rome who ranked below the senatorial class. In more modern times, this class would have been known as "knights." Therefore, the cavalry was composed of men from fairly affluent heritage.

The aes equestre was collected from single women (maidens and widows) and orphans provided that they owned a certain amount of property (Smith, 1875). This was based on the argument that women and children should contribute to the military who fight on their behalf. The Roman government deemed this to be a fair tax given the fact that women and children were not included in the census and therefore were exempt from other taxes such as the poll tax which was assessed primarily on adult men (Niebuhr, 1835). Revenue from this tax was deposited and accumulated in the public treasury. Later, these revenues were paid from the public treasury to a cavalry soldier in lots of 10,000 asses in order to purchase a horse (Smith, 1875).

The aes hordearium amounted to the sum of 2,000 asses annually for the care and feeding of a horse (Smith, 1875). Like the aes equestre, the tax was assessed against single women and orphans who owned a certain amount of property. In other words, it was not collected from women and orphans who had little or no assets. The cavalry soldier received this annual 2,000 asses stipend from the public treasury at the rate of 200 asses per month for 10 months (Niebuhr, 1835).

Niebuhr states that in these early times ten months were considered to be one year and 10 months times the 200 asses per month equals the aes hordearium total of 2,000 asses for a year. He continues that the cavalry rate of 200 asses per month was twice the 100 asses received by a foot-soldier or infantryman (Niebuhr, 1835). Niebuhr adds that generals in the Roman Army received 300 asses per month. The general's triple pay (triple the infantryman's salary of 100 asses) was introduced in 354AD by the military tribune Cn. Cornelius Cossus (Niebuhr, 1835).

Another Roman tax was called the "aes uxorium" which was a tax imposed upon women who could not bear children, with the exception of Vestal Virgins,

and unmarried men who had reached adulthood without marrying (Peck, 1898). It was first introduced by the censors M. Furius Camillus and M. Postumius in 403BC (Smith, 1875). This tax did not apply to unmarried men age 60 and older nor to unmarried women age 50 or more. It is uncertain how long this tax remained in existence.

Prior to the reign of Rome's first emperor, Augustus Caesar, from 27BC to 14AD, no inheritance taxes were recorded for the Roman Republic. Augustus introduced the "vicesima hereditatium" or inheritance tax of approximately 5% (Gardner, 2001). This tax applied to inheritances that were received by way of a will and any close relatives were exempt from paying it. Close relatives included the deceased individual's grandparents, parents, children, grandchildren, and siblings. Roman custom from the late Roman Republic and afterwards was that husbands and wives kept their own property separate from that of the spouse. This resulted in Roman women remaining a part of her birth family. She was not considered to be under the legal control of her husband. Therefore, in many cases it was questionable if the wife was exempt from the tax. Many authors feel that Roman social values regarding marital devotion probably exempted the wife from tax in most cases (Gardner, 2001).

Another tax that was introduced by Augustus Caesar was a 1% general sales tax (Davies, 2002). The tax was designed to fund the military and was instituted in approximately 6AD. It was termed the "centesima rerum venalium" which roughly translates to "a hundredth of the value of everything sold." This tax was later reduced to one half percent by Tiberius and finally eliminated by Caligula. Tiberius was emperor from 14AD to 37AD following Augustus. Caligula followed Tiberius as emperor from 37AD to 41AD. This unpopular sales tax existed for less than 40 years.

A Roman tax that was specifically imposed upon Jewish people living in the Roman Empire was called the "fiscus Judaicus" (Gottheil & Krauss, 1906). According to Josephus, the tax was imposed by Roman Emperor Vespasian as a result of the First Roman-Jewish War (first Jewish revolt) of 66-73AD. The tax was imposed following the destruction of the second Temple in 70AD. This two denarii (or one-half shekel) tax was in place of the Temple tax (Exodus 30:vs.11-13) paid in prior years by the Jewish people for the upkeep of the Temple. This tax was a major humiliation for the Jews who had just experienced the destruction of their Temple for the second time. Unlike the Temple tax of previous years that was paid only by adult men between the ages of 20 and 50, the fiscus Judaicus was imposed on all Jewish people including women, children and the elderly (Schäfer, 1998).

The extensive Roman tax system also included a poll or head tax (of two denarii) called the "tributum capitis" (Digest 50, tit.15, 1932). The Roman government imposed this direct tax on all the people living in the controlled

provinces. This tax was assessed primarily on the Roman subjects living in the provinces and not on Roman citizens. For this reason, it was a much hated tax referred to by Tertullian (an early Christian author) as a "badge of slavery." (Audi, (1999). According to Tertullian, this tax provoked numerous civil revolts. The most famous of these being the Zealot revolt in Judea in 66AD following the destruction of the temple in 70AD. These taxes were typically collected by the private tax farmers or publicans discussed earlier. According to Tertullian, these taxes were assessed annually on males over age 14 and females over age 12 until they reached the age of 65.

The final two Roman taxes included in this paper are typically called slave taxes (Bradley, 2016). The “vicesima libertatis” was a tax on slave owners who freed slaves. The tax was 5% of the value of the slave (Dilke, 2016). The tax was either paid by the owner, if he freed the slave, or by the slave, if he redeemed himself with his own money. The second slave related tax was called the “quinta et vicesima venalium mancipiorum.” This was a 4% tax on the owners who sold slaves (Dilke, 2016). Information is very scarce concerning these taxes such as the years they existed and the methods used to value the slaves. No doubt age and sex were important assessment factors but details on this valuation process have been lost over the centuries.

It is obvious that the Romans were forced to utilize a wide range of taxes in order to finance the expansion of the empire and purchase food, supplies, and armaments for the armies. In addition, funds were needed to purchase food for the large population (approximately one million) living in the city of Rome. Davies estimates that Rome needed to import at least 150,000 tons of grain each year to feed the inhabitants (Davies, 2002). Much of this grain was needed to feed the poor of the city. Davies states that as many as 200,000 of the poor in Rome received free distributions of wheat from the Roman government. It is not surprising that the cost of funding the armies and expanding the empire required the emperors to consider all possible forms of additional tax revenues.

A number of Roman emperors revised and modified the monetary and tax system for Rome. One of the most successful in these endeavors was Augustus Caesar emperor from 30BC to 14AD. He instituted a set of three principal taxes to generate the much needed revenues for the period (Davies, 2002). As mentioned earlier, these included a 1% sales tax, a 1% tax on land (tributum soli), and the poll or head tax of two denarii on men aged 14 to 65 and women aged 12 to 65. Many of details of the taxes discussed above have be lost over the centuries such as the exact year introduced and removed. Finally, an interesting fact is that the majority of the Roman taxes (real estate, sales, etc.) discussed in this paper are still common today in many countries around the world.

FINAL THOUGHTS – TAXES AND THE DECLINE OF THE ROMAN EMPIRE

No doubt the decline of the Roman Empire was the result of numerous factors. However, two of the major causes for the decline could have logically been the widespread tendency of the people to evade as many of the multitude of taxes as possible and the inefficient and ineffective tax assessment and tax collection processes of the Roman government.

Pulliam discusses a number of reasons why significantly more taxes were collect than were actually deposited with the Roman government (Pulliam, 1924). In addition to taxpayers evading these taxes, there was also a huge amount of fraud and embezzlement on the part of tax assessment and tax collection personnel. Pulliam argues that that "while the revenue secured was usually adequate for all expenses of the government, the system of taxation had a number of serious defects (Pulliam, 1924).

The primary defect, according to Pulliam, was the method of collecting the taxes. As discussed earlier in this paper, the publicans (tax farmers) were considered cheats and fraudsters. Pulliam states that publicans collected exorbitant amounts of tax well above the required amount. He says that the publican became the "most odious figure in provincial life and perhaps the most galling feature of Roman domination was the tax that Rome collected" (Pulliam, p.548).

The second basic problem of the Roman tax system, according to Pulliam was the range of duty rates charged on goods moved from one province to another. The trade districts were often arbitrarily determined and did not correspond to provincial boundaries (Pulliam, p.548). Pulliam states that the duties on goods going from one province to another were much higher than goods going from a province to Rome. In addition, harbor duties and road and bridge tolls made the cost of transporting products from province to province cost prohibitive. Pulliam argues that free movement of trade throughout the empire would have increased the overall wealth of the empire significantly.

A final problem of the Roman Empire taxation system, according to Pulliam, was the lack of overall general administration (Pulliam, p.549). The Roman government never attempted to appoint an experienced, effective, and efficient manager to the finance and taxation department of the government. The head of finance and expenditures, called a "quaestor," served for only one year thereby never becoming familiar with the details of the financial management area of the government. Pulliam states that the budgeting process was nonexistent and that there was no attempt to balance taxation revenues and government expenditures.

SUMMARY AND CONCLUSIONS

This paper reviewed many of the taxes collected by the Roman government during the period of the Roman Empire. It appears that most every type of tax in existence today is rooted in the history of the Roman Empire which covered many centuries from 753BC to 476AD. The tax system of this period was a major hardship on the people living within the empire. This resulted, in large part, from the fraudulent and dishonest actions of the publicans or tax collectors of the period. It is easy to understand the importance of internal controls in today's business environment. Unfortunately, such controls did not exist during the period of the Roman Empire.

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KEEPING THE OIL AND GAS PIPELINES OPERATING AS ASSETS: SAFETY ISSUES CAN MAKE THEM LIABILITIES

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ABSTRACT

The purpose this research is to examine the pros and cons of oil and gas pipelines. While most people think of these pipelines as "Assets", they can become "Liabilities". Risk assessment and legal liability issues will be examined. The key to upholding safety standards is vigilant behavior on the part of the corporate leaders, operating managers, employees, and even the general public. Observation and "see something, say something" measures can prevent huge losses – human life, environmental damage, and monetary payouts. The research is important for USA energy security concerns, USA jobs, environmentalists, and taxpayers.

Key Words: Risk Assessment, Oil and Gas, Pipelines, Safety

INTRODUCTION

While the typical price of a barrel of oil ranged from about $50-70 in 2018, the estimated cost of a barrel of spilled oil is about $19,800. The oil spill costs at Marshall, Michigan were as high as $60,000 per barrel in 2010! The purpose this research is to examine the pros and cons of oil and gas pipelines. While most people think of these pipelines as "Assets", they can become "Liabilities" with mishaps and negligence. The purpose of this research is to examine some of the incidents in West Texas, the United States, and other parts of the world in order to educate people about the types of risk taken when dealing with oil and gas pipelines. While pipelines continue to be the safest mode of product transportation, it is important to remain vigilant about the risks and ways in which these assets can turn into liabilities.

LITERATURE REVIEW

According to Global Data (2018), the global oil and gas pipeline industry is expected to witness the start of the operation of 504 pipelines during the 2015–2018 period. Of these, 315 will be natural gas pipelines, 105 will be crude oil pipelines. Makholm (2016) describes that the regulatory treatment of oil pipelines in the United States has progressed, as the Federal Energy Regulatory Commission (FERC) attempts to reconcile what it knows about regulating gas pipelines as a highly competitive transport business with its oil pipeline duties. Mogel and Gregg (2004) asserts that natural gas now is more expensive than fuel oil in many parts of the US. This has caused a significant problem for interstate natural gas pipelines which find that their markets are eroding at the same time when they must take or pay for large volumes of natural gas because of contractual obligations incurred in the middle and late 1970s. As a partial solution, some have argued that the existing approximately 269,000 mile natural

gas pipeline transportation system is a barrier to the sale, transportation, and use of natural gas unless that system is converted to one of common, or at least, contract carriage. Klass,& Meinhardt (2015) explores the history and geography of oil and natural gas to help explain why US regulation of the infrastructure for transporting these two similar types of energy resources to markets developed so differently. Notably, while interstate natural gas pipelines are reviewed and permitted at the federal level by the Federal Energy Regulatory Commission (FERC), interstate oil pipelines are reviewed and permitted almost exclusively at the state level. This research considers whether changes in the regulatory agencies for oil or natural gas transportation are now needed to promote more effective cross-country transportation of new sources of shale oil and gas made available by hydraulic fracturing technologies.

Dey, et al (2004) describes how offshore oil and gas pipelines are vulnerable to environment as any leak and burst in pipelines cause oil/gas spill resulting in huge negative impacts on lives. Breakdown maintenance of these pipelines is also cost-intensive and time-consuming resulting in huge tangible and intangible loss to the pipeline operators. This study develops a risk-based maintenance model whereby risk-based inspection and maintenance methodology is particularly important for oil pipelines system, as any failure in the system will not only affect productivity negatively but also has tremendous negative environmental impact. The research proposes a model that helps the pipelines operators to analyze the health of pipelines dynamically, to select specific inspection and maintenance method for specific section in line with its probability and severity of failure. Glukhova & Zubarev (2017) focuses on an economically expedient resolution of the problem of industrial and environmental safety of operation of the existing gas pipelines. It highlights the importance of safety and reliability of pipeline transportation for the economic stability of the industry and energy security of the country and demonstrates economic impacts of accidents on the main gas and oil pipelines. Rigney (2015) Technological advancement in drilling techniques, primarily hydraulic fracturing, has provided access to previously unreachable natural gas reserves. Much of this increase in natural gas production is derived from the Marcellus Shale, a shale formation that spans Ohio, Pennsylvania, West Virginia, and New York. This surge in natural gas production has prompted natural gas pipeline companies to upgrade their pipeline networks. Pipeline companies must apply for certificates of public convenience and necessity from the Federal Energy Regulatory Commission (FERC) and, if approved, perform an environmental evaluation, as required by the National Environmental Policy Act (NEPA). In examining the environmental impacts of the pipeline project, pipeline companies must be careful not to impermissibly segment the project into component parts, thereby failing to consider a proposed project's full range of environmental impacts. This is referred to as the rule against segmentation, developed by courts to ensure that companies consider the full range of environmental consequences of proposed projects. A worldwide approach to the issues can be found in Kolb (2012) as it examines the ongoing natural gas

revolution and assesses its impact on the energy industry and societies of Central Asia. The natural gas revolution consists of three related technological developments - hydraulic fracturing, horizontal drilling, and the increasing build-out of the world liquid natural gas (LNG) infrastructure. The article focuses on Turkmenistan and its rich reserves of natural gas and explores the conditions under which Turkmenistan currently reaches international markets through pipelines to China, Iran, and Russia. It also assesses Turkmenistan's future prospects for reaching additional world markets and for sustaining the markets it presently serves. Finally, the article analyzes the difficulties that Turkmenistan's gas industry are likely to face and the implications these continuing energy industry tribulations will have for social development in Central Asia.

Leitzinger & Collette (2002) identifies lessons learned from the restructuring of the natural gas industry. The replacement of regulated wholesale merchants by new entrants did not occur because of competitive efficiencies. Competition in wholesale gas marketing has produced consumer benefits in the form of innovation, new product development, broader choices and possibly reduced costs. Mbara & Van (2011) describes the rapid growth in the use of pipelines to transport energy products. Due to the strategic nature of energy products that are transported by pipelines, the importance of risk awareness, assessment and management cannot be over-emphasized. With the risk of pipeline disruptions increasing globally, energy pipeline organizations are compelled to incorporate measures that should help to identify and address areas that can lead to energy pipeline disruptions. Given the strategic importance of energy pipelines, the main purpose of this research is to ascertain awareness of the risks associated with the energy pipeline's physical environment, not only from the energy pipeline operators, but also from communities who are exposed to such risks. The findings show that the corporate energy sector in South Africa is aware of risks associated with energy pipeline supply chains while the general public's awareness is very low.

Jamal (2015) asserts that ensuring the availability of basic resources and energy services, in adequate quantities and at reasonable prices, is a vital aspect of national energy policy everywhere. Hence, transnational pipeline projects for the transportation of oil and gas products play a significant role in the global quest for energy security. The construction and operation of cross-border pipeline systems from producing countries to consumer markets entail huge financial commitments for investors. Likewise, such long-term infrastructure projects straddling several jurisdictions have implications for the rights of livelihood-affected people and may adversely impact the environmental sustainability along the project area. The research pays close attention to the Energy Charter Treaty, the only multilateral legal instrument dealing exclusively with the energy sector.

Hellmann (2015) describes how the threat of large-scale cyber attacks on the nation's oil and gas pipeline systems is increasing. With increased

information sharing between the private sector and the government, and specific, numeric objectives to work toward in developing cybersecurity programs for pipeline systems, the voluntary measures currently in place might prove effective in protecting systems nationwide. These voluntary measures could be strengthened through legislation streamlining the information sharing process and providing liability and privacy protection for oil and gas pipeline owners, which would further incentivize industry participation.

In summary, it is important to remember the difference in price between a product that is transported properly and remains an asset as compared the product becoming a “Liability”. Just because the federal government is pro-pipeline, that will not eliminate the risk assessment stage and the legal liability that can result from mishaps.

TEXAS PIPELINES AND MISHAPS

Activity in the Permian Basin area of Texas has reached levels higher than any recorded in history and this region is one of the main reason why the United States is a world oil producer now. There is motivation for the oil pipeline rivals to consolidate some of the West Texas projects because the lack of pipeline transports is the major constraint in the area. While consolidation can take advantage of certain companies’ expertise, there is also risk involved if the companies do not work together properly in their new roles. There has been an increase in natural gas flaring simply because the area has insufficient pipeline infrastructure and flaring causes light pollution for the area. This creates concerns for the McDonald Observatory enthusiasts in the area.

A new natural gas pipeline is being proposed from southeast New Mexico to Corpus Christi. The 650-mile pipeline will transport 220,000 barrels per day of natural gas liquids when completed. Natural gas liquids include propane, butane, and ethane, which is used in plastics production and as a petrochemical feedstock. The pipeline will extend from the Permian basin in southeast New Mexico and West Texas to Corpus Christi, where a fractionation complex will be built to separate the various liquids.

In addition, eight other companies are exploring the Delaware Basin. There is a new finding of oil in the area of Balmorhea Lake in southern Reeves County, about 100 miles from the heart of the Permian Basin oil patch too. Apache, the oil company involved with it, estimates that the area may contain 3 billion barrels of oil. The company named the new field Alpine High. Further south, in Big Bend country, Energy Transfer Partners has built two natural gas pipelines, the Comanche Trail and Trans-Pecos pipelines. "The pipelines are really starting to lay the groundwork of what made it possible for companies to frack in these parts of the Permian Basin. The new pipelines come at the best possible time for Apache, which will need a way to move the oil it produces.

Increased energy production will have an environmental impact on the region. Increases in fracking in the Permian Basin overall have already stressed the environment. The main question is whether the country's natural

resources and wild spaces will be used for development. Water is a key concern in the region and the unique spring-fed pool at Balmorhea State Park is of major concern. It is the west Texas desert oasis that drives tourism in the area, and the economy.

With all of the production and oil activities, the assets can quickly be transformed into liabilities when construction is not properly conducted and when operations go awry. Here are a sample of very recent Texas mishaps that costs both companies and the state money:

- On January 30, 2017: A Texas Department of Transportation crew dug into the 30-inch-diameter Seaway Pipeline, near Blue Ridge, Texas, spraying crude oil across road. About 210,000 gallons of crude were spilled. There were no injuries.
- On February 15, 2017: A 36-inch-diameter Kinder Morgan natural gas pipeline exploded and burned in Refugio County, Texas. There were no injuries. The flames were visible 50 miles away. Refugio County Chief Deputy Sheriff Gary Wright said the explosion occurred at an apparent weak point in the pipeline that must have required maintenance, but KM disputed the issue. Residents as far as 60 miles away thought it was an earthquake, while others described it as "a thunder roll that wouldn't end." According to the PHMSA incident listing, "the incident was most likely caused by some combination of stress factors on the pipeline." The explosion and resulting fire cost $525,197 in property damage. The pipe was installed in 1964.
- On February 27, 2017: A crude oil pipeline ruptured in Falls City, Texas, spilling about 42,630 gallons of crude oil. The cause was from internal corrosion.
- On July 13, 2017: A contractor doing maintenance on Magellan's Longhorn Pipeline hit that pipeline, in Bastrop County, Texas. About 87,000 gallons of crude oil were spilled, resulting in evacuations of nearby residents.
- On December 13, 2017: An Energy Transfer Partners gas pipeline exploded and burned, in Burleson County, Texas. There were no injuries reported.

While pipelines are still the safest model of oil and gas transportation, there are risks. Here are examples of pipeline problems throughout the USA. From 1994 through 2013, the U.S. had 745 serious incidents with gas distribution, causing 278 fatalities and 1059 injuries, with $110,658,083 in property damage. From 1994 through 2013, there were an additional 110 serious incidents with gas transmission, resulting in 41 fatalities, 195 injuries, and $448,900,333 in property damage. From 1994 through 2013, there were an additional 941 serious incidents with gas all system types, resulting in 363 fatalities, 1392 injuries, and $823,970,000 in property damage. It is interesting to

note that most pipeline accidents are discovered by local residents, not the companies that own the pipelines!

PIPELINE MISHAPS IN THE UNITED STATES

Here are a sample of USA mishaps that costs both companies and the USA money as well as lives lost:

- September 9, 2010: A PG&E 30-inch natural gas line exploded in San Bruno, California and killed 8 people. Eyewitnesses reported the initial blast "had a wall of fire more than 1,000 feet high".
- July 25, 2010: Crude oil pipeline ruptures near Marshall, Michigan, spilling over 840,000 gallons of oil into the Kalamazoo River.
- December 12, 2012: A 20-inch transmission line owned by NiSource Inc., parent of Columbia Gas, exploded, leveling 4 houses, between Sissonville and Pocatalico in Kanawha County, West Virginia (WV). When it blew, nobody at pipeline operator, Columbia Gas Transmission knew it. An 800' section of I-77 was completely destroyed. "The fire melted the interstate and it looked like lava, just boiling." Later the West Virginia Public Service Commission released several pages of violations by Columbia Gas. Forty families were "impacted" by the explosion. The investigation cited "external corrosion" as the cause of the blast.
- May 26, 2014: Viking gas pipeline explosion near Warren, Minnesota shot a fireball over 100 feet in the air. Roads within a two-mile radius were blocked off. Authorities suspected natural causes because there was still frost in the ground and the soil was wet.
- November 16, 2017: TransCanada's Keystone Pipeline leaks 210,000 gallons (5,000 barrels) of crude oil in Marshall County (northeastern South Dakota). Officials don't believe the leak affected any surface water bodies or threatened any drinking water systems.

WORLDWIDE MISHAPS

While safety standards are better in the United States, both lives and money has been lost with the pipeline problems. Since most USA oil companies are multinational in nature, it is important to discuss the pipeline safety issues with a global emphasis. Here are some examples of worldwide accidents that cost both the companies and the countries lives and money:

- 1965: An explosion from a gas line destroyed several apartments in the LaSalle Heights Disaster (LaSalle, Quebec), killing 28 people, the worst pipeline disaster in Canadian history.
- 1978: A gas pipeline exploded and burned, killing 52 people in Colonia Benito Juarez, Mexico, and injuring 11 in a town of only 100 people. The failure created a crater 300 feet wide and 20 feet deep.
- 2006: A vandalized oil pipeline exploded in Lagos, Nigeria. Up to 500 people may have been killed.

- 2011: Nairobi pipeline fire kills approximately 100 people and hospitalized 120.
- 2013: A Sinopec Corp. oil pipeline exploded in Huangdao, China. 55 people were killed.
- 2014: A pipeline blast in Southern Indian state of Andhra Pradesh killed 22 people and injured 37. The pipeline was operated by Gas Authority of India Limited (GAIL) and a preliminary investigation revealed faulty operational procedures as a cause of fire.
- 2014: A string of explosions originating in buried gas pipes occurred in the city of Kaohsiung, Taiwan. Leaking gas, suspected to be propylene, filled the storm drains along several major thoroughfares and the resulting explosions turned several kilometers of road surface into deep trenches, sending vehicles, people and debris high into the air and igniting fires over a large area. At least 30 people were killed and over 300 injured.

CONCLUDING REMARKS

Pipelines are still the safest mode of transportation for oil and gas products. People thinking about pipeline safety need to consider about the Exxon Valdez accident and other tanker transport accidents. However, safety is of utmost importance when conducting oil and gas business with the pipelines as the primary mode of transportation. Please remember the differential in prices when the product is an “Asset” and when the product is a “Liability”!

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AN ANALYSIS OF ALTERNATIVE WORK ARRANGEMENTS TO ADDRESS THE GENDER GAP IN PUBLIC ACCOUNTING

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ABSTRACT

Women make up approximately half of the full time staff at U.S. accounting firms and one fourth of the partners and principals. These firms have conducted extensive research to document the need for closing the gender gap worldwide. Accounting firms are currently advocating alternative work arrangements (AWAs) as part of a solution to close this gender gap. The purpose of this study is to review the current advocacy for alternative work arrangements, followed by a review of the academic literature, both theoretical and empirical, to document the historical progress of and lessons learned in use and implementation of AWAs. In this literature review, the paper specifically considers who are the participants of AWAs and the outcomes to the employee and to the employer of utilizing and/or implementing AWAs.

Keywords: Gender gap, public accounting, alternative work arrangements, biases

INTRODUCTION

Current business news articles document the lack of women in executive positions. Fewer Fortune 500 chief executives are women than are named John (Miller, Quealy, and Sanger-Katz, 2018). Women hold almost 52% of professional-level jobs, earn 60% of master's degrees, and represent 49% of the college educated labor force (Herd and Jasik, 2018, p. 45). However, women still appear to be hitting a ceiling at middle management. In 2017, 6.4% of the CEOs at Fortune 500 companies were women (up from 4.8% in 2014), and women held only 18% of board seats at S&P 1500 companies (Herd and Jasik, 2018, p. 45).

In March 2018 PricewaterhouseCoopers (PwC), published the results of their international research report, concluding that the gender gap remains wide and underemployment of women remains a pressing issue (PwC, 2018b, p.5). The women in the survey were aged 28 to 40 and were at the point in their working lives where the gap between men and women's progression begins to widen dramatically. This is also the time in women's lives where the challenges of combining careers and personal priorities increase (PwC, 2018a, p. 5).

According to the PwC report, the evidence suggests that both structural and policy factors help explain the gender pay gap. The quantitative theory of human capital investments suggests that since many women take time off to have children (i.e., maternity leave) or plan to at some point take time off to have

children, women may on average spend less time at work or have less incentive to put in more hours, and therefore build up lower levels of human capital, which could result in lower earnings (Erosa, Fuster, and Restuccia, 2016). Evidence also supporting the quantitative theory of human capital investments was found in analysis of MBA students (Bertrand, Goldin, and Katz, 2010).

The Peterson Institute showed in a 2015 study that companies with more women at the executive and board levels perform better (Herd and Jasik, 2018). Additionally, the academic literature finds that firms with women on boards and in senior management have higher earnings quality and higher earnings management restraint (Krishnan and Parsons, 2008; Srinidhi, Gul, and Tsui, 2011; Arun, Almahrog, and Aribi, 2015; Kyaw, Olugbode, and Ptracci, 2015; Khliff and Achek 2017; Duong and Evans 2016). The literature also finds that firms with women on their boards have lower likelihood of fraud and internal control weaknesses (Capezio and Mavisakalyan, 2016; Chen, Eshleman, and Soileau, 2016; Khliff and Achek, 2017).

To close the gender gap in positions of leadership, current literature from all four of the largest public accounting firms currently advocates the need for alternative work arrangements (AWAs) and a work environment where women can thrive (Deloitte, 2018; Ernst and Young, 2017; KPMG, 2018; PwC, 2018b).

Given this emphasis in current practitioner literature on the need for AWAs and the potential AWAs have to influence positively the gender gap in public accounting, the following academic literature review will focus on AWAs. This review of the academic literature on AWAs starts by examining (1) who participates in the AWAs, followed by a discussion of (2) the outcomes to *employees* who participate in AWAs, and concluding with a discussion of (3) the outcomes to *employers* who offer AWAs.

LITERATURE REVIEW

Who Participates in AWAs: *Non-Accounting Specific Literature*

First, the literature that examines who participates in AWAs in a non-accounting related workplace is discussed, followed by a discussion of literature that examines AWA participation in a specifically accounting related context. In examining who participates in AWAs, Hall (1990) finds that both men and women face struggles in balancing a family and a career. Specifically, he speculates that men and women with children especially face the struggles of balancing family and career thus suggesting that both men and women with children face the necessity of participating in AWAs. Additionally, he finds that some employees, specifically those with children, may be participating in their own form of AWAs even when formal AWAs are not provided. Informal AWAs can manifest through an employee arriving outside the traditional start time, working through lunch, or taking some work home (Hall 1990).

A unique finding in Kossek, Noe, and DeMarr (1999) is that firms that have formal AWAs may not actually be the firms that have employees working in AWAs. They suggest that it takes more for a firm than simply to adopt AWA policies to have employees utilizing AWAs. Subsequent research shows that

organizational culture supportive of AWAs is required for employees to actually participate in and use AWAs (Kossek, Barber, and Winters 1999).

Kossek, et al. (1999a), using a field study design, examine one facet of organizational culture: peers' influence on an employee utilizing an AWA. They find that employees' with peers that previously utilized (or planned to utilize in the future) AWAs were significantly more likely to actually utilize an AWA themselves compared to those without such peers. They also found that women were more likely to utilize AWAs than men were. They specifically examined flexible schedules, part-time work, and leaves of absence. Their results suggest that organizational culture strongly drives whether an individual participates in an AWA. Besides the organizational culture aspect of peer influence, specific job characteristics influence whether an individual participates in an AWA (Powell and Mainiero, 1999).

After an organization adopts policies allowing for formal AWAs, individuals interested in these arrangements must request and obtain approval by someone at the firm for this arrangement (Powell and Mainiero, 1999). Work disruption theory suggests that managers consider how much work the arrangement will disrupt if they approve an arrangement (Powell and Mainiero, 1999). Specifically, AWAs are more likely to get approved for and thus get used by those working on less critical tasks or having fewer special skills, those without supervisory roles, and those that suggest a more temporary arrangement (Powell and Mainiero, 1999). While not everyone may be allowed an AWA, work/family border theory suggests that some sort of work/life integration is occurring whether or not formal programs are used (Clark 2000).

Work/family border theory developed in Clark (2000) suggests that everyone with an outside-the-home job must figure out how to integrate and balance their outside work with their family life. With work family balance/integration as the goal, Clark's border theory predicts as follows: (1) AWAs will benefit those where work and family are more similar, (2) AWAs will benefit individuals that prioritize family over work, (3) individuals with more influence and control both at home and work will benefit more than those with less influence and control in either home or work. AWAs according to this theory are more likely to benefit individuals and situations with certain characteristics. However, this theory also suggests that regardless of whether a formal AWA exists, work life integration may occur with non-ideal balancing of work and life demands.

Guest (2002) discusses why work-life balance is currently an important issue. "[T]he demands of work contribute to a reduced participation in non-work activities resulting in an imbalance." This relates to AWAs as most view AWAs as promoting or increasing work-life balance. Work-life balance has become a bigger issue with women in the workforce, since the intensity of work as well as work hours has been increasing over time, and since Generation X (a group that values a good work life balance) is joining the workforce. Whether work and life are in balance depend on a number of factors including workplace and job characteristics, family culture and family demands, and individual characteristics

such as work orientation, personality, energy, gender, age, career stage, etc. (Guest 2002). While work/life balance depends on certain factors and characteristics, use of family-friendly benefits such as AWAs also relates to certain factors and characteristics, but not in all of the expected ways (Butler, Gasser, and Smart, 2004). Thus, the necessity for AWA use has increased as more women have entered the workforce over the decades.

Butler, et al. (2004) examine individual psychological characteristics as well as demographics that predict participating in and using family-friendly benefits (including AWAs). They find that gender and marital status do not influence, while age of youngest child does influence the likelihood of using family-friendly benefits. They also find that work outcome expectancies, but not family outcome expectancies influence an individual's decision to use the family friendly benefit. While these are interesting and potentially useful findings, the generalizability of the results found in that study may be limited due to the sample used (i.e., the parents and family of college students at a university) (Butler, et al. 2004).

Who Participates in AWAs: *Specific Accounting Literature*

Almer, Cohen, and Single (2003) examine who is interested in and who actually participates in AWAs in the assurance line of public accounting firms. They examine individual and firm characteristics and find that an employee is more likely to express interest in adopting an AWA if he or she perceives the existence of organizational support and support from those who review him or her. Additionally, they find that family considerations, gender, marital status, and position at the firm all impact an employee's likelihood of participating in an AWA (Almer et al., 2003).

Gallhofer, Paisey, Roberts, and Tarbert (2011) examine the work-lifestyle choices of female accountants in Scotland, with special focus on whether women face employer imposed constraints or self-made constraints via choices related to prioritizing family. Using surveys and interviews to gather data, they find that women face some organizational issues in the workplace, but often choose family over work thus leading to lost work opportunities. One way in which they choose family over work is by choosing to use AWAs. Further, they find that women generally prefer to forego their lost opportunities in order to prioritize family. The findings support preference theory that suggests, "women's choices owe less to inequalities in the workplace and more to the preferences of individual, particularly, but not exclusively, women". The findings also support difference feminism, which allows women and men to operate differently due to inherent differences and choices. Preference theory and difference feminism, both supported here, suggest that women are more likely to choose AWAs to allow for more family time (Gallhofer et al., 2011).

Buchheit, Dalton, Harp, and Collingsworth (2016) examine multiple types of organizations including large public accounting firms, smaller public accounting firms, and industry accounting departments. They find that employees

working at Big 4 firms are least likely of all the groups surveyed to feel that they could actually utilize an AWA. Moreover, they find no difference between those working in audit or tax lines of service. In addition, they find that women feel more organizational support for AWA use than men do, which supports the traditional gender role theory found in Johnson, Lowe, and Reckers's (2008) study.

Further, most accounting firms now offer AWAs. The accounting firms specifically design their AWAs to attract female accountants. In addition, these marketing efforts around AWAs have been successful with women being much more likely to actually utilize AWAs than are men (Cohen, Dalton, Holder-Webb, and McMillan, 2018; Almer et al., 2003; Dalton, Cohen, Harp, and McMillan, 2014; Johnson et al. 2008). However, some question whether these AWAs are usable or underutilized (Dambrin and Lambert 2008). In interviews with French Big Four employees, Dambrin and Lambert (2008) find that women are perceived as utilizing AWAs at the time right around when they have their first child. Additionally, those interviewed thought those working in taxation may be more able to utilize AWAs. Lupu (2012) also interviewing French accountants finds that women with or about to have children are the ones seeking AWAs. In addition, senior women who have proven themselves in their jobs prior to seeking an AWA are more likely to be the ones approved to work an AWA. Whiting and Wright (2001) in an examination of the New Zealand accounting profession also find that women around the time they become mothers are the ones seeking out AWAs.

In an analysis of one Big 4 accounting office, Kornberger, Carter, and Ross-Smith (2010) found that in 2009, 245 females and 40 males participated in the firm's AWA program. They also found evidence that women raising a family were the ones most utilizing AWAs, which supports prior literature (e.g., Dambrin and Lambert 2008, Whiting and Wright 2001).

Outcomes to *Employee* from AWAs: *Non-Accounting Specific Literature*

Next, the outcomes to the *employee* from working an AWA are examined, focusing first on research in non-specific accounting literature, followed by a discussion of specifically accounting literature. The literature finds that the main benefits of AWAs to the employee participating in the AWA are reduced stress and burnout as well as increased job satisfaction and commitment (Johnson, et al., 2008; Kossek and Ozeki, 1999; Baltes et al., 1999; Powell and Mainiero, 1999, Rhodes, 2001; Scandura and Lankau, 1997). The main drawbacks of AWAs to the employee participant in the AWA are reduced promotions, raises, and status within the organization and assignment to less challenging work (Johnson et al., 2008; Butler et al., 2004; Judiesch and Lyness, 1999; Nord, Fox, Phoenix, and Viano, 2002; Rogier and Padgett, 2004; Butler et al., 2004; Hall, 1990; Kossek et al., 1999a).

Justice theory suggests that workers believe rewards should be allocated in a certain way, specifically, equity based allocation should be used when productivity is the goal, equality based allocation should be used when team

building and good social relationships are the goals, and need based should be used when social responsibility are the goals. According to justice theory, at for-profit firms, profitability is the goal and thus managers should allocate rewards based on productivity. Providing family friendly policies that benefit only those with children provides rewards based on a need basis, which would be appropriate when social responsibility is the goal, but not when profitability is the goal. Thus, resentment by others may result when an employee utilizes an AWA. (Rothausen, Gonzalez, Clarke, and O'Dell, 1998)

Hill, Miller, Weiner, and Colihan (1998) examine one specific type of AWA, telecommuting, and examine its effects on work-life balance. Interestingly, they find that employees *perceive* telecommuters to have greater productivity, higher morale, more flexibility, longer working hours, and less teamwork than non-telecommuters; however, when they examine actual outcomes, they find that productivity and flexibility only are improved. This paper's most interesting finding is that what is perceived by the employees is not the same as what actually occurs. This finding may explain other mixed findings in the literature when a study relies on perceptions instead of actual effects (Hill et al., 1998).

Judiesch and Lyness (1999), using a field study design, examined the impact of leaves of absence on career promotions and salary increases. In line with what both human capital theory and gendered culture theory predict, they found that employees taking a leave of absence faced fewer subsequent promotions and smaller salary increases. Human capital theory says that leaves of absence prevent at least some human capital from accruing, thus those taking a leave of absence have lower human capital. Additionally, gendered culture theory says that organizational cultures reflect male values and, a leave of absence, as it is often associated with maternity leave, goes against the organizational culture. (Judiesch and Lyness, 1999).

Studies have shown that fewer employees use AWAs than was expected when the firms implemented the AWAs (Schwartz, 1994). As discussed previously, it takes more than just the offering of AWAs for employees to utilize AWAs (Kossek et al., 1999a). Schwartz (1994) has shown that employees avoid fully utilizing these arrangements due to fears of negative career consequences including delayed career advancement and not feeling truly free to take on and adopt available AWAs. This research has also shown that these fears are somewhat true and that those taking on AWAs do experience career penalties related to their work arrangements (Schwartz, 1994).

Clark (2001) examines the flexibility of working hours and the flexibility of work itself as it relates to work/family balance for individuals likely to be facing difficulty balancing work/family. This study focuses on the outcomes to the employee at home and at work. She finds that more flexible work increased satisfaction and well-being with work and family, while flexibility of work time did not have any benefits. In a univariate test, they do find results with flexibility of work time, but after controlling for flexibility of the work itself, the flexibility of work time no longer explains anything (Clark 2001).

In a qualitative study on the implications of a specific type of AWA, reduced workload, Lee et al. (2002) found that the employees participating in the AWA were generally quite happy and satisfied with their arrangement and the potential tradeoffs they were facing. Specifically, the participants seemed to think that their AWA participation affected their short-term career advancement. Further, the researchers found that a combination of an employee's individual characteristics as well as organizational and job specific characteristics influenced the success of the AWA. Specifically, the individual characteristics that led to a successful arrangement included hard working, self-motivated, having unique skills, and organized. The job specific and organizational characteristics that seemed to have a positive effect on AWA were having project-oriented work, supportive coworkers, and an organizational culture that promoted employee-friendly values. The most important characteristic they found was having a supportive boss. This study was unique in that it focused on high-level managers and professionals, which are the types of employees and jobs that most perceive as being less suited to an AWA (Lee et al., 2002).

A study on another type of family friendly policy, specifically leaves of absence, found that men faced a social penalty when taking a leave, whereas women did not (Wayne and Cordeiro, 2003). Specifically, in an experimental setting, participants rated men as less likely to be good organizational citizens at work when choosing to take a leave of absence. Organizational citizenship behaviors are extra behaviors or acts that an employee performs that are beyond the job description (Wayne and Cordeiro, 2003). While organizational citizenship is clearly beneficial to the employer, the employee does not go unrewarded. In fact, research has found that employees perceived to be better organizational citizens receive higher performance ratings and rewards (MacKenzie, Podsakoff, and Fetter 1991; Borman and Motowidlo, 1997; Wayne and Cordeiro, 2003).

Butler and Skattebo (2004) examine the performance rating of employees after experiencing a family-work conflict. They find the performance rating for men declines while the performance rating for women is unaffected. Eagly's (1987) social role theory and Dipboye's (1985) stereotype fit model predict the results the authors find in this study as the behavior is inconsistent with traditional gender roles. Interestingly, the gender of the evaluator does not affect the results – i.e., both genders seem to punish men for deviating from the traditional gender roles (Butler and Skattebo, 2004).

Rogier and Padgett (2004) examine the perceptions of career advancement for women who participate in AWAs in an experimental setting. In their study, they find that participants perceive women as having less career advancement potential, specifically lower job and career dedication and lower motivation for advancement. These results are consistent with other research findings that women participating in AWAs face negative career advancement perceptions.

Smithson and Stokoe (2005) use focus groups to examine the participants' perceived repercussions from participation in AWAs. They find that the participants perceive those participating in AWAs as being less committed and as choosing family more over career. Further, they find that resentment arises against

those that are participating, as the idea exists that someone else will need to pick up the work from the employee participating in the AWA.

Outcomes to *Employee* from AWAs: *Specific Accounting Literature*

Next, the outcomes to the employee from AWA participation in the accounting industry specifically are examined. In one study (Almer and Kaplan, 2002), the authors surveyed a group of CPAs working in public accounting. They compared those that were currently working in an AWA with those that were likely candidates for working in an AWA. The study focused on characteristics relating to the employee's feelings about their job – i.e., job satisfaction, turnover intention, burnout, and stress. They found that employees in an AWA had greater job satisfaction, reduced plans of turnover, less burnout, and less stress as compared to those on a traditional work schedule. Further, the survey found these same results occurred when employees switched from a traditional schedule to an AWA. In the firms studied, the employee generally had to have a conversation with his or her superiors and define their workload, assignments, working arrangement, etc. to begin an AWA. The authors suggest that this conversation may have an impact on the employee's feelings about his or job. The authors surmise that this conversation and role defining may be an unintended benefit of AWA participation (Almer and Kaplan, 2002).

While Almer and Kaplan (2002) find benefits to participation in AWAs, they do not examine potential negative consequences. In a research design where the participants evaluate their "peers" at a public accounting firm, Cohen and Single (2001) find that participants rated those engaged in an AWA as having lower likelihood of professional success, higher anticipated turnover, and less likely to be chosen on a subsequent engagement than those not working in an AWA.

Frank and Lowe (2003) examine participation in AWAs in private accounting. They examine the impact participation in AWAs has on performance evaluations, job commitment, and career progression and whether gender influences any effect. They find that participation in an AWA did not affect short-term current task performance or job commitment and dedication but did negatively influence perceptions of long-term career potential. Specifically, they found that those in an AWA were perceived as more likely to perform poorly in the future, less likely to be chosen for special projects, more likely to be given less challenging work, and less likely to be promoted. In addition, they find that gender of the individual participating in the AWA did not seem to influence the results. Further, they find evidence that those that are currently engaged in an AWA do not have negative perceptions of long-term career prospects (Frank and Lowe 2003). These findings from private accounting contribute to the other papers discussed in this section and suggest that the negative actual and negative perceptions surrounding those who participate in AWAs may extend beyond traditional public accounting work. Additionally, some of these same negative consequences of

AWA participation researchers also found in non-accounting industry jobs as discussed previously (e.g., Rothausen et al., 1998, Schwartz 1994).

Johnson et al. (2008), using manager level employees at Big 4 accounting firms, examine the effect of AWA use on potential career advancement in an experimental setting. Using unique questioning, they are able to disentangle the effects AWA participation has on formal evaluation separate from informal evaluations. Consistent with firms promoting their work-life balance initiatives, they find that AWAs do not impact formal evaluations; however, participation in AWAs does appear to influence informal evaluations. Further, consistent with traditional organizational role views, they find that participants informally rated males participating in AWAs lower than females participating in AWAs (Johnson et al., 2008).

Further, organizational policies and decisions, including providing AWAs at a firm that attempt to help women achieve work-life balance may in fact be harming women's careers (Lyness and Thompson, 1977; Cohen et al., 2018). The mechanism may be that women are assigned lower risk jobs that also have fewer developmental opportunities in order to help women achieve work-life balance (Lyness and Thompson, 1977, Cohen et al., 2018). Findings from interviews done with French Big 4 employees further support this, where they find that employees perceive those that utilize AWAs will face marginalization on the path to partnership. Those interviewed suggested that those utilizing AWAs were likely to be put on a different path not leading to partnership, such as director track (Dambrin and Lambert, 2008). Additionally, those utilizing AWAs may face a "drop in status" and significantly lower salary (Dambrin and Lambert, 2008).

Dalton et al. (2014) find that employees feel lower levels of gender discrimination at firms that are more supportive of AWAs. However, in line with prior research (e.g., Kossek, et al., 1999b), Dalton et al. (2014) find that the benefit of decreased gender discrimination at a firm requires actual organizational support for AWAs and not just the offering of the AWA. Further, they find that the decreased gender discrimination at a firm from support for AWAs also leads to lower levels of turnover intention. This suggests that individuals at firms with support for AWAs experience lower levels of gender discrimination, which leads to them staying at their job and not searching for new work, which may or may not be a positive outcome to the employee. This finding of lower turnover when AWAs and flexibility in work are offered is also in line with what Dambrin and Lambert (2008) find in their interviews of employees at French Big Four firms. Specifically, they find that not offering flexibility is perceived to lead to higher turnover.

In structured interviews with employees at a Big 4 accounting firm office, Kornberger et al. (2010) find evidence that employees participating in AWAs face a questioning of their individual work performance due to less "face time" in the office during normal office hours. Additionally, these AWA participants faced "greater managerial surveillance when they were at work", not being selected for the "large and prestigious engagements", the perception of not being able to appropriately serve clients, and the perception of "not being serious" about work. They further found that this lower perceived visibility due to AWA usage led to

negative perceptions of career progression within the firm. Lupu (2012) finds similar results in a French setting. Specifically, the author finds that those working AWAs face organizational marginalization through exclusion from important client meetings, a path on a non-partner track, the perception of partial disengagement, lack of loyalty, and incompatibility for a management position. Additionally, in a large scale analysis of women in accounting literature, Haynes (2017) comes to the conclusion that women utilizing AWAs face stereotyping, lower pay, gendered hierarchies, and discrimination.

Public accounting firms in the U.S. have adopted AWAs to counteract the gender gap that results from women leaving public accounting before moving up in the firm. However, if participating in these AWAs has negative consequences to career advancement, these AWAs may not be serving their intended purpose.

Outcomes to *Employer* from AWAs: *Non-Accounting Specific Literature*

Next, research that has examined outcomes to the employer from implementing or having AWAs is discussed. First, this literature is examined in the context of any type of business, and then examined by looking solely at what research has found in the accounting industry related to the benefits and drawbacks on employers who offer AWAs.

Prior literature finds that the main benefits to the employer of offering and having their employees participate in an AWA are increased productivity and reduced turnover (Johnson et al., 2008; Hill et al., 1998; Nord, et al., 2002; Connor, Hooks, and McGuire, 1999; Dalton and Mesch, 1990). The main drawbacks to the employer of offering and having their employees participate in an AWA are increased difficulty of work scheduling and job coverage, potential declines in quality or client service, increased supervisor workload, and resentment by non participants (Johnson et al., 2008; Nord et al., 2002; Baltes et al., 1999; Kossek and Ozeki, 1999; Lee et al., 2002; Parker and Allen, 2001).

Flexibility in the workplace can help to create balance between home and work life (Hall 1990). This flexibility does not have to always be a formal AWA. Hall's (1990) work suggests that even firms that do not have formal AWAs in place likely already have informal AWAs in place, and thus formalizing AWAs may have potential benefits – i.e., retaining top employees.

In a naturally occurring field experiment related to the implementation of an AWA, employee absenteeism decreased significantly during the period of flexible work arrangements, but employee turnover was unaffected (Dalton and Mesch, 1990).

Scandura and Lankau (1997) examine how the perceptions of an organization having AWAs affected organizational commitment and job satisfaction of the employees. Research has found job satisfaction is a prerequisite for organizational commitment by the employee (Scandura and Lankau, 1997; Vandenberg and Lance, 1992, Williams and Hazer, 1986). In addition, organizational commitment is associated with and may lead to many positive

benefits to the employer including beneficially affecting: performance, turnover, participation, power, teamwork, and professionalism (Scandura and Lankau, 1997; Aranya, Kushnir, and Valency, 1986; Mathieu and Zajac, 1990; Welsch and LaVan, 1981). Scandura and Lankau (1997) find that employees working at organizations where they perceive AWAs exist (regardless of whether they themselves participate) self-report higher levels of job satisfaction and organizational commitment. Further, these results are stronger for women and those with children.

Since companies are in the business of making a profit, for an employer to set up an AWA there must be some benefit to the employer. Baltes et al. (1999) find that the effects of AWAs to the employer are positive overall with the employees working in an AWA having improved productivity/performance, job satisfaction, absenteeism, and satisfaction with work schedule. These outcomes additionally benefit the employer and are not short lived but rather are long term. However, these findings only apply to lower level employees (Baltes et al., 1999).

Employees often underutilize family friendly policies, including AWAs, provided by the employer (Kossek and Ozeki, 1999; Kossek et al., 1999b). Some researchers also found these policies to be ineffective in achieving the goals thought to be important to the employer (Kossek and Ozeki, 1999). According to Kossek and Ozeki (1999), mixed evidence at best is found regarding AWAs benefit to the employer in the form of lower turnover, lower absenteeism, and increased employee commitment. When measuring turnover intentions, some research finds no effect, but some research finds lower turnover when AWAs are put into place (Dalton and Mesch, 1990; Dunham, Pierce, and Castenada, 1987; Pierce and Newstrom, 1982; Rothausen, 1994). Regarding absenteeism, research found that certain specific types of AWAs worked in some situations and not in others (Dalton and Mesch, 1990; Krausz and Freibach, 1983; McGuire and Liro, 1987; Pierce and Newstrom 1982, 1983; Thomas and Ganster, 1995). Thus, the benefits, if any, accruing to the employer seem to be very specific to the type of AWA and the type of workplace examined.

A major detriment and hurdle to overcome in achieving successful AWAs is feelings of resentment and unfairness towards those participating in AWAs felt by the non-participants (Rothausen et al., 1998). In a study examining individual employee characteristics related to perceptions of unfairness, the authors found that "younger workers, minorities, those who had used flexible work arrangements, and workers in jobs requiring a greater degree of task interdependence had more favorable perceptions concerning work/family benefits than did older workers, Caucasians, individuals who had not used flexible work arrangements, and those working in jobs requiring a lesser degree of task interdependence" (Parker and Allen, 2001). Hegtvedt, Clay-Warner, and Ferrigno (2002) also study potential resentment by those employees that are not able to take advantage of the family friendly benefits, including AWAs. Those that do not utilize AWAs may feel resentful because they are not getting the benefit, and think their employer may expect them to pick up extra work. Using the *National Survey of the Changing Workforce*, Hegtvedt et al., (2002) find that 40 percent of the employees in the

survey would feel resentment if their employer provided family friendly benefits that did not help them personally. They also found that 16 percent of those surveyed would feel resentment if they had to pick up extra work due to the family and personal commitments of others. They find that a supportive workplace reduces resentment. Additionally, they find women feel less resentment than men in regards to picking up extra work due to someone else's family commitments, but both men and women feel the same level of resentment towards family friendly benefits that do not personally benefit them (Hegtvedt et al., 2002).

One of the greatest benefits to the employer of offering AWAs is in recruiting and potentially retaining workers who value this benefit (Nord et al., 2002). Besides recruiting and retaining top employees, most of the benefits of AWAs seem to accrue to the employee participating (Nord et al., 2002). Some of the indirect costs of these programs to the employer includes loss of productivity and feelings of unfairness by non-participants (Nord et al., 2002).

As some studies have found that women more often push for and then utilize AWAs than men (Goodstein, Gautam, and Boeker, 1994; Powell and Mainiero, 1999), and AWAs have been shown in some studies to increase productivity and reduce turnover (Johnson et al., 2008; Hill et al., 1998; Nord et al., 2002; Connor et al., 1999; Dalton and Mesch, 1990), it stands to reason that firms with AWAs find particular value in the skills women bring to their organizations. Parker (2008) examined differences in strategic management and accounting processes caused by gender differences. He finds evidence that both feminine and masculine features are important in the workplace (Parker, 2008). Women tend to use more "interactive, participative leadership styles and to exhibit the transformational leadership style in particular" while men tend to use a "transactional leadership" style (Parker, 2008; Burke and Collins, 2001; Kim and Shim, 2003; Trinidad and Normore, 2005; Wilson, 1995). Further research has found that women make more "ethically based decisions than men" (Glover, 2002; Parker, 2008).

Outcomes to *Employer* from AWAs: *Specific Accounting Literature*

Implementing AWAs at accounting firms and in the accounting industry specifically is extremely important as Cohen and Single (2001) found out while interviewing Human Resources and Auditing personnel at a public accounting firm for a case study, and as is also evidenced through the literature the large accounting firms publish related to their AWA availability (e.g., PwC, 2018b, p. 6). In the Cohen and Single (2001) study, participants thought women were much more likely to be interested in AWAs than men were. Losing a manager and retraining someone to take his or her place costs a firm approximately 150% of the manager's salary (Coolidge and D'Angelo, 1994). This suggests potential benefit from retaining an employee even if an AWA has significant costs. Additional potential consequences to accounting firms of offering AWAs include: (1) the inability of the individual on a flexible work arrangement to stay career focused and generate new business, (2) increased commitment to the firm by the individual, and (3) once

a program is put into place, doing away with it would generate negative publicity (e.g., Yahoo CEO Marissa Mayer's 2013 ban on working remotely).

Additionally, in interviews with French Big 4 employees, interviewers found evidence of resentment and feelings of injustice towards those participating in AWAs, which follows what is found in non-accounting industries (Dambrin and Lambert 2008; Rothausen et al., 1998; Hegtvedt et al., 2002). Also in a French setting, Lupu (2012) finds that managers have more difficulty managing employees who participate in AWAs than employees who follow normal working schedules.

The perception that AWAs may prevent fully servicing a client's need is a negative outcome of AWA participation found in Kornberger et al.'s (2010) study. However, they also found a positive outcome in providing AWAs at a Big 4 accounting firm: AWAs provided benefits to the reputation of the firm in the professional service and general business community. They find that the AWA program actually enhanced gender barriers at the firm as the formal AWA program gave the firm an excuse as to why women were not progressing in the firm.

CONCLUSION

The gender pay gap and lack of women at top levels of management is an ongoing issue in the United States and abroad in large public accounting firms. In the long term, a comprehensive solution involving public policy may be necessary. However, in the short term, accounting firms are trying to utilize AWAs to attempt to narrow this gap. Effectively implementing AWAs, prior literature finds, is possibly even more important than just the offering of AWAs. AWAs may have unintended consequences for both the participant and the offering firm. Careful analysis of the specifics of the AWA program as well as the implementation of the AWA will be necessary to ensure the firms meet the intended goals. However, the unintended costs of AWAs can be quite large. Accounting firms will need to carefully identify their goals and continuously measure their progress to be successful. By examining in this article the literature that studies historical results of implementation and/or use of AWAs, this paper sheds some light on how best to structure and implement AWAs.

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VARIATIONS IN UNFUNDED PENSION LIABILITIES ACROSS U.S. STATES

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ABSTRACT

Unfunded state pension liabilities are a rising concern for states and taxpayers as the bills from previous promises are coming due, and investment returns are at low point. The provenance of these looming obligations can help us understand how to mitigate this issue. This paper demonstrates a lack of association of a state's ability to pay as a driver of unfunded pension liabilities (gross state product or tax revenues). Further, this work provides evidence that service levels (state employees per capita) and promises made to state retirees (total liability per member) are potential drivers of unfunded public pension liabilities. Given these results, we might conclude that state governments are their own worst enemy in the generation of these unfunded pension liabilities, especially since there is evidence suggesting that these deals were crafted for political expedience such as delaying the inevitable facing of fiscal imbalance (debt and deficits correlated with unfunded pension liabilities). Further complicating this issue is the possible flight of the tax base of a given state as the residents (taxpayers) discover the truth about the looming fiscal issues and conclude that a more prudent state government would better serve them.

Key words: Pensions, unfunded pension liabilities, state pensions, pension obligation

INTRODUCTION

In 2013, US states reported a total unfunded pension costs for state employees of $968 billion or 6.9% of aggregate state income (Pew 2017). Pension liabilities arise from state promises to its current and former employees (state workers) to fund their retirement, often including healthcare coverage or other postemployment benefits (OPEB). Unfunded pension liabilities represent the estimated portion of this future cost (liability) that is not set aside (invested) today based on estimated future payouts and investment returns over the relevant time-period. To be clear, the $968B in unfunded pension obligations cited here excludes OPEB. If included, it is estimated to add an additional 28% to this amount at the state level (Munell, Aubry & Crawford 2016). To estimate unfunded pension liabilities, actuaries consider several uncertain aspects of a given pension plan's members; such as their current ages and expected lifespans as well as those of their

spouses, because pension payments often continue until death of both household members. These pension characteristics can vary by plan (across and within states) and are are accounted for by actuaries that deal with statistical predictions from demographic trends.

The generosity of survivor benefits (percent of payment that continues after the death of the primary beneficiary) is where the promises of politicians first start to affect actuarial distributions of these defined benefit programs. A common theme among the politicians that seek election (and re-election) from their constituents is to make the present seem better or improved at a low cost. This can be achieved by a sleight of hand regarding the future since people tend to discount future costs more heavily than future benefits, especially when the cost is borne by society while the benefit accrues to individuals. Further, by shifting costs to future periods, balancing the state budget (required in several states) is made easier.

Survivor benefits are just the tip of the iceberg in state pensions since current negotiations with state employee unions include retirement age, years of service calculations, average wage calculations (e.g. weighting more recent pay higher), cost of living adjustments, and various other "credits" that improve the future payout of pensions, often in return for lower wages today. These future benefit promises are easier to ignore since their cost can be shifted to future periods and further obfuscated by over-estimation of pension plan return on investment. Of course, states must invest in order to expect any return, and this is where unfunded pension liabilities create the trade-off between future benefits and current costs. State governments often make optimistic assumptions about investment returns and actuarial estimations compensate with conservative assumptions in their predictions about the future costs of administering state pension plans. Actuarial reports regarding the "health" of a given pension plan are commissioned by the states on a regular basis, although not required or consistently formed (estimated). A "healthy" plan is often regarded as one that is at least 90% funded. However, the true health of a pension plan can be difficult to judge accurately because of a combination of a lack of consistent standards of measurement and a lack of actuarial independence, both under the auspice of the state government.

The funding status of a state's pension fund is considered fully funded when, based on actuarially estimated returns and payouts, the fund has enough current investments to pay the future anticipated costs (note that current contributions to the fund should be invested and not used to pay current retirees who are paid from the funds returns and principal). Ideally, any pension fund would set aside the anticipated costs when the employee performs the work and thus earns the right to the future cash flow (retirement benefit) but, as with all budgets, current costs appear more significant than distant future payments. Add to this time-horizon issue the overly optimistic estimates of low payouts along with equal or greater optimism for high investment returns and the results are low

perceived current costs (pension investments set aside) with rising future obligations that are unfunded, even in the actuarial (conservative) sense. While this appears to a significant issue for the states, a state by state comparison reveals that the health of state pension plans varies dramatically from fully funded (actuarially) to substantial looming costs (unfunded) to keep up with future (and current) expectations of pension members (Barkley 2012). So, what causes this disparity across the states?

Funding Disparity

As with any budget, an imbalance can be analyzed from the flow of resources available to finance spending, from the flow of resources spent (promised), or both. Since the financial crisis of 2008, states have recovered at different rates impacting their ability to collect tax revenue (Pew 2017). Tax revenue and the source of that revenue (state income or gross state product) are simple enough to measure with Census data. On the spending side, promises made to fund pension plans can arise from the level of state services provided or from the promises made to the state employees (or both). These spending side levels can be approximated with the number of state employees per capita (as a proxy for the level of state services) and total pension liability per member of the pension plan or per capita. Since both low inflows and high outflows could be happening simultaneously, it is natural to begin with the association between state resources and total pension liability.

While correlation does not imply causality, if total pension liability is positively correlated with state resources (ability to pay) then perhaps the "rich" states are over-promising to their employees because they feel rich. If total pension liability is negatively correlated with a state's ability to pay then perhaps the state is making pension promises in lieu of an ability to compensate state employees in the current period and that might lead to greater underfunding of the pension obligation (liability). If there is no correlation, then the question of underfunding may be undetected or unrelated to ability to pay and our focus should turn to promises made. These posited relationships are summarized in Chart 1.

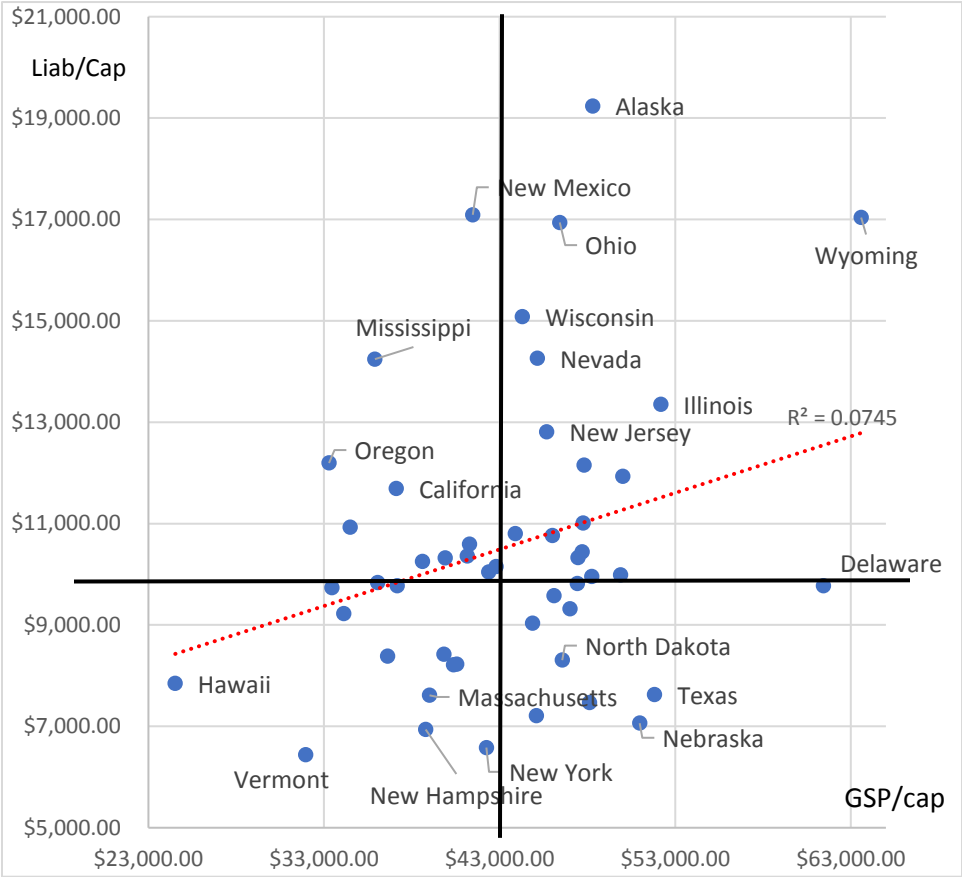
CHART 1: Correlations and possible causes

Positive Correlation: Ability to Pay (GSP) & Total Pension Liability	Rich states remunerating state employees from state largesse
Negative Correlation: Ability to Pay (GSP) & Total Pension Liability	Poor states using pension promises to forestall current budget issues
No Correlation: Ability to Pay (GSP) & Total Pension Liability	Ability to pay not driving pension funding status, check promises made

Using 2013 data adjusted for cost of living differences among the states, there appears to be no correlation (or ever so slight positive correlation) between a state's ability to pay and its total pension liabilities (as discussed next).

Figure 1 shows a scatter plot of a state's total pension liability per capita versus gross state product (income) per capita by state.

FIGURE 1: Total Pension Liability per capita v GSP per capita with median



The graph (Figure 1) shows all states and has a median GSP of about $44,000 and total pension liability per capita of about $10,000 (bold vertical and horizontal lines) dividing states into high and low ability to pay (above or below median GSP) and high and low promises of state services (above or below median pension liability per capita). Adding a trend line to this graph results in a R^2 of about 7.45% or very little correlation between a state's ability to pay and it pension liability per capita.

Removing the outliers of Alaska, Hawaii, Vermont, Delaware, and Wyoming, reduces the R^2 to less than 0.1% (0.06%) and allows a clearer focus on the

remaining states. Again, there appears to be no correlation between pension liabilities and a state's ability to pay for them in a per capita sense. There does appear to be larger UNFUNDED liabilities as the total liability per capita grows, but this should come as no surprise since there are fewer taxpayers to foot the bill.

Investigating the relationship between total liabilities per *pension plan member* and gross state product has similar results (i.e. little correlation). Here the interpretation on ability to pay is the same, but now considering the total pension liability per member of the plan is used as a proxy for the level of promises made to the plan members for future benefits. The full panel of states has an R^2 of 1.4%, with a median total pension liability per member of over $127,000. Removing the outliers of Nevada, Delaware, Hawaii, and Alaska, raises the median promise level to $130,000 and slightly increases the R^2 to 1.7%, confirming what can be seen in both approximations: no correlation between a state's ability to pay and its promises per member of the state work force. Interestingly, some of the largest unfunded pension liabilities are in the high ability to pay, high promises made to state workers quadrant when separating by median ability (GSP per capita) and median promise (pension liability per capita).

These preliminary results leave open the question of how state resources (ability to pay) affect the funding status of the state pensions. It could be that states with lower ability to pay cannot afford to meet similar obligations for pension plans as other states with more resources leading to hypothesis 1:

Hypothesis 1: States with a lower ability to pay will face higher unfunded pension liabilities.

It is also possible that state governments make promises of higher levels of state service for the broader electorate to curry favor at re-election time or to ameliorate some real or perceived social inequity.

Hypothesis 2: States with a higher percentage of state employees will face higher unfunded pension liabilities.

It might be the case that state governments make more significant pension promises to state employees as a form of deferred compensation or to appease a particularly vocal constituency (state employees).

Hypothesis 3: States with higher level of total pension liabilities will face higher unfunded pension liabilities.

This last hypothesis has an obvious mechanical nature to it since higher levels of pensions promises are likely to lead higher unfunded pension liabilities, but controlling for ability to pay and taking a longer-term perspective allows for some additional insight.

As a corollary to Hypothesis 3, states might provide additional pension (deferred) compensation in exchange for lower current period costs if the state is in a fiscal bind, especially if the state budget is required to be balanced by state law.

Hypothesis 4: States with more significant budget issues (deficits and debt) will face higher unfunded pension liabilities.

As preliminary results, the level of state resources (income or tax revenue) reveals no correlation between the source of funding and *unfunded* pension liabilities despite the wide variance in unfunded liabilities across states. The results from level of state services (state employees per capita) shows weak correlation with unfunded pension liabilities; whereas data on promises made to state employees (total pension liability per plan member) reveals stronger correlations despite the confounding issues of the time members are in the state pension plan and the total level of membership. Results on the level of debt per capita and deficits both indicate a strong correlation with unfunded pension liabilities, which should come as no surprise since robbing the future is a common way to pay for the present.

After a brief overview of the literature in this area, this paper will discuss the methodology used to address the potential causes of variation in funding status across the states, offer a summary of the results, and provide some concluding remarks regarding the causes and possible avenues to address these issues. The hope is that states that are in funding trouble might be able to learn from the states that are funded, unless there are significant differences that preclude the application of these results.

LITERATURE REVIEW

The Pew reports (2017, 2014) are good at quantifying and comparing the state pension funding issues, but are only a part of the problem. Lutz & Sheiner (2014) estimate that unfunded OPEB might be as much as an additional half the size of unfunded pensions (despite being about a quarter of the overall cost) and demonstrate a similar variation across the states. OPEB unfunded obligations are often easier to "hide" since there are more estimations and therefore more opacity to the situation as a whole. Just on the pension side, even the actuarial estimates forecast an increase in ARC (annual required contribution) to keep the pension system current (Brainard & Brown 2015). These actuaries are paid by the state running the fund and thus, even their favorable estimations are based on statistical analysis of past trends that do not fully incorporate current financial market expectations as used by the financial professionals that manage the pension funds' investments. In fact, Rauh & Novy-Marx (2010) estimate that even with zero cost of living adjustment and a move to the Social Security retirement age (many pensions allow for early retirement after 20 or 30 years of service) using Treasury

Bill discount rates would put the pension deficit at $1.5 Trillion rather than the actuarially estimated $968 Billion. Liu, Lu & Zheng (2010) perform a similar ranking of pension status with qualitatively similar results to Pew and while actuarial discounting might understate the problem, it does not appear to change the relative ranking of pension funds.

While we can all agree that a problem exists and that it clearly varies by state, there is more of a paucity of research on the choices as well as the causes. Gale & Krupkin (2016) argue that options are limited since these pension (and collective bargaining) agreements are binding as well as being a political hot button. Abrogation of the contracts through bankruptcy is the threat point to engender renegotiation of the contracts but the lack of political will to upset the system that the politicians rely on to deliver services to their constituents as well as the state employee constituency itself does not favor reform. Yet reform such as concessions, increases in taxes, or cuts in state service levels is necessary to meet the obligations in a way that is fair to all. Even as far back as Porterba (1996) we see evidence of short term budgeting at the state fiscal level that favors current constituents by passing the costs on to future generations. Porterba noted that many states have a balanced budget amendment in their state constitutions and a popular way to get around that restriction is through pension promises for tomorrow to get lower wage increases today. Compounding these issues are the downward biased actuarial estimates of the unfunded pension obligation generated by using upwardly biased estimations of long-run returns to the pension assets. Johnson (1997) finds that states are using these mis-estimations to fund current period lower taxes and allow for generous pension promises that are unfunded today. Cheney, et al (2003) provide further empirical evidence of states underfunding and or mis-estimating due to budget constraints in taxes or spending. Those mis-estimations in actuarial assumptions are associated with states that have most fiscal difficulty according to Eaton and Nofsinger (2004) and this extends into private pensions (as would be expected) according to Comprix and Muller (2006).

Missing from this stream of literature is additional research on the fundamental causes of the pension problem. Is it just political expedience that creates this issue, or are more basic economics such as the ability to pay or the level of services at the root of these funding problems? Exposing these issues more clearly provides insight so that we can learn from past mistakes and not fall prey to the same issues as we try to repair the current system. Isolating the economic cause allows those that will face this issue (future generations of citizens) to make wiser choices in the politicians they elect and the places they choose to live.

METHODOLOGY

With so many states facing unfunded pension obligations, it raises the question: whence do these issues arise? We can think of it in two ways: either the state wishes to provide services for its residence on par with other states but cannot

afford it (ability to pay) or states that have the ability to pay are making promises of higher pensions to their state employees. The latter could be either a case of pension promises that are consistent with a higher level of state services to residents (e.g. more state employees per capita). A more nefarious motivation such as to defer current pay (or pay increases) in order to balance a fiscal budget today or even a political side payment for election support, is a possible future area of research. In order to attempt separating and testing these possibilities we can think of states as either high or low ability to pay states (HA, LA) as well as either high or low promise of future pay states (HP, LP). Since these conditions are not mutually exclusive we have a two by two categorization of states, represented in Chart 2 below.

CHART 2: State public pension characteristics (ability to pay and promises made to workers)

High Ability (HA), High Promise (HP)	High Ability (HA), Low Promise (LP)
Low Ability (LA), High Promise (HP)	Low Ability (LA), Low Promise (LP)

To discern a state's ability to pay both Gross State Product (GSP) and Tax Revenues (TR) are considered (Census Bureau data). Gross State Product is, of course, a measure of the total income of a state and should be highly correlated with ability to pay for state worker pensions. The confounding factors include states with porous borders (small states or states with significant portions of the population at a border) especially those with high tax rates relative to the bordering states. To account for this, tax revenues collected by the states is tested for association with unfunded pensions and this results in qualitatively similar results in all cases. Tax revenues are clearly dependent on the tax rate(s) in each state, but tax arbitrage (competition) among the states (especially those with porous borders) limits the amount of variance to some degree; so, the similar results should not be surprising.

The ability to pay results indicate that the level of unfunded pension obligations (Pew Report) in a state is, at best, unrelated to both measures of ability to pay (when adjusting for the cost of living between states). Further, unfunded pension liabilities are actually positively correlated with ability to pay when using unadjusted (CoL) levels (GSP: 0.1 $p=0.011$, TR: 0.6, $p=0.031$) which is counter to the expectation (Pew Report). Thus, it can be concluded that relatively poor states with less ability to pay for state services provided by state employees are not a significant driver of unfunded pension liabilities.

So then, what is driving some states further into an unfunded status while others are able to fully (actuarially speaking) fund future pensions obligations. One possible explanation is that states make "promises" to state employees for either a higher level of state services (i.e. lower pay today, but more generous pensions) or for political expedience such as delaying compensation in order to balance the

current fiscal period's budget. Regardless of the reason, let us consider how to measure these promises made and then attempt to disentangle the potential causes.

In this study, the level of promises made to state employees is proxied by the total pension liability per capita (LpC) and total pension liability per member of the pension plan (LpM), which includes past and present employees. Total pension liability means that this is the total pension cost for future payments based on past employment (as actuarially determined), not just the unfunded portion of that liability. Higher pension liability per capita suggest that state employees are paid and or promised more future pay, which could result from higher state services being provided or a higher cost of living. To compensate for the cost of living differences the Census Bureau regional price deflators by state are used to adjust the data. Higher total liability per capita is also consistent with higher deferred compensation in exchange for pay concessions today (reduce current fiscal pressures) which is more likely to correlate with higher unfunded portions of this liability. The data show that total liabilities per capita (LpC) has significant (p=0.000) correlation with unfunded pension liabilities (point estimates from 0.41 to 0.35) when using both cost of living adjusted data and unadjusted data and whether or not including GSP as a control for ability to pay. This suggests that the level of promises made to state employees is a driver of unfunded pension liabilities regardless of the relative cost of living or state's ability to pay (overall or per capita).

It could also be the case that there are more state pension members (consistent with a higher service level) so total pension liability per plan member is also considered. Pension liability per plan member rises as the level of promises to each member increases, which is a more direct measurement of the promises, but with less connection to state services levels provided to the state's citizens. However, this measure also suffers from diffusion over a longer time frame: it includes as members those just hired all the way out to those who might have been retired for 20 or more years. The level of promises is likely to have varied greatly over that time frame and more recent hires are in the divisor (denominator) despite not contributing much to the dividend (numerator). Despite this bias, the LpM still produces weakly significant point estimates (within the 10% range: p=0.003 for uncontrolled, unadjusted data to p=0.076 for GSP controlled and cost of living adjusted data with point estimates from 0.01 to 0.02) indicating correlation to unfunded pension liabilities. This suggests that these unfunded liabilities are partially correlated with promises made to state employees.

To further explore the relation between these promises made to state employees and their causes, the level of services provided is estimated by the number of current state employees per capita and the total state retirement plan membership per current capita. The number of current (EE/capita) or current and former (Member/capita) state employees per capita is suggestive of the level of services provided but could be confounded with low productivity of employees (to the extent that varies by state) or by excessive hiring as a concession to state unions

for lower current fiscal period pay increases to existing members. Of course, we would expect higher levels of members per capita to be associated with higher total pension cost and higher unfunded pension liabilities as these higher costs are spread among fewer residents, and the results are significant (p=0.000, point=77,713). However, to the extent that prior state employment levels are correlated with current state employees (consistent with the level of service argument for higher pension costs), we would expect higher current employment levels to also be associated with higher pension costs and greater unfunded pension liabilities. This is a reasonable assumption barring any significance difference in longevity or retirement age (an open question relating back to promises made for political expedience). The results indicate a break between current and former plan members since the liability per capita is not correlated with current state employees per capita (p=0.27). This break suggests that the level of service argument is not supported as a reason for a state to have excessive unfunded pension liabilities.

RESULTS

Estimating the link between ability to pay and unfunded liabilities suggests a simple correlation model:

(1) Unfunded level = $\alpha + \beta$(ability to pay) + ε

With the unfunded level and ability to pay measures normalized by population (per capita); additionally, cost of living adjustments by state are made using Census deflators.

RESULTS 1: Unfunded pension liabilities on GSP or Tax Revenue (ability to pay)

Dep.Var. = unfunded pension liabilities per capita	Intercept	β	CoL adjusted β
GSP per capita (p value)	-1162.57 (0.50) 1924.43 (0.257)	**0.098 (0.012)****	0.026 (0.494)
Tax Revenue per capita (p value)	**1720.84 (0.032)**** **2379.08 (0.002)*****	**0.0005 (0.041)****	0.0003 (0.306)

To compare with prior research on political and fiscal motivations for unfunded pension liabilities (Chaney et. al, 2003; Eaton & Nofsinger 2004) the fiscal stress of a state is considered as a driver of unfunded pension liabilities.

When the level of unfunded pension liability per capita is compared with the level of state debt or current year deficits per capita (and controlling for income as well as using cost-adjusted data) higher debt or deficits are significant drivers of unfunded liabilities (p=0.026 and p=0.049, respectively).

Thus, no association between ability to pay (state resources) and *unfunded* pension liabilities appears, similar to the earlier results regarding total pension liabilities and a state's ability to pay measures; Hypothesis 1 fails. That re-opens the question as to what does cause some state's to run into pension funding trouble while others seem to be able to fully fund their state pensions.

Estimating the link between the level of state services to the public and unfunded liabilities is accomplished with state employees per capita and state pensions members per capita (past level of services) while controlling for ability to pay:

(2) Unfunded level $=\alpha + \beta$(level of service to public) $+ \gamma$(ability to pay control) $+\varepsilon$

RESULTS 2: Unfunded pension liabilities on number of state workers or pension plan members

Dep.Var. = unfunded pension liabilities per capita	Intercept	β	γ
State Emp per capita (p value)	-2,480 (0.1498)	**119,939 (0.0128)**	**0.08 (0.0280)**
Plan members per capita (p value)	-2,888 (0.1319)	*22,500 (0.0578)*	**0.09 (0.0133)**
State Emp per capita - CoL adjusted (p value)	115 (0.95417)	*82,368 (0.0641)*	0.04 (0.3480)
Plan members per capita-CoL adjusted(p value)	425 (0.8024)	**27,170 (0.0127)**	0.01 (0.8319)

It appears that there is at least a weak association between the level of state services provided and the unfunded pension liabilities. So, appeasing state voters by providing a higher level of services and then delaying the payment for these services is at least mildly suggested. The level of state services as measured by total pension plan members (retired and active) per capita is more strongly

associated (at the 5% level) with unfunded pension liabilities, suggesting that at least part of the unfunded liability is a result of the state government's provision of services. This provides some support for Hypothesis 2 but using total plan members per capita as a measure of state services suffers from the possibility of changes in the denominator (population) driving the results. For example, as states make increasing high promises to state workers in the future (pension promises) it drives up the expected cost and hence likely future burden on taxpayers. To the extent that these taxpayers are mobile, they might move to states with a lower expected future burden on taxpayers (e.g. migration from the Northeast to the Southeast that has been witnessed over recent decades).

So then, if a state's ability to pay is unrelated to unfunded pension liabilities and the level of services provided is only weakly associated with them, it might be that states are promising their employees too much in the future, possibly to defer that cost. Using the total level of pension liabilities (funded and unfunded) as a measure of these promises (both per capita and per plan member) provides some insight into the relationship between pension promises and unfunded pension liabilities:

(3) Unfunded level = $\alpha + \beta$(pension promises) + γ (ability to pay control) + ε

RESULTS 3: Unfunded pension liabilities on total pension liabilities

Dep.Var. = unfunded pension liabilities per capita	Intercept	β	Γ
Total liability per capita (p value)	-1,986 (0.1644)	**0.3867 (0.0000)**	0.021 (0.5267)
Total liability per plan member (p value)	-1,290 (0.4395)	**0.015 (0.0453)**	0.054 (0.2020)
Total liability per capita - CoL adjusted (p value)	132 (0.9306)	**0.3611 (0.0000)**	-0.014 (0.6814)
Total liability per plan member -CoL adjusted (p value)	260 (0.8902)	*0.015 (0.0764)*	0.019 (0.6141)

The results of the pension promises show strong correlation on a per capita basis, but the natural bias there is towards correlation since higher total liability

per capita is more likely to drive higher unfunded liability per capita, even when controlling for a state's ability to pay. The weaker statistical significance (at the 10% level) with total pension liability per plan member also biased, but away from results since the higher promises are likely to be the more current agreements whereas the older agreements (with current retirees) are the ones that would drive higher unfunded pension liabilities given the longer time horizon of accumulation and the shorter time horizon for investment returns. When taken together, these results suggest that the level of promises made to state workers is weakly associated with higher unfunded pension liabilities under Hypothesis 3.

The question of why state governments would make these pension promises to state employees is still unanswered. One possibility is the deferral of compensation for state employees to make the state budget easier to balance (especially if it is required to balance by law). Some light may be shed on this by considering the association between state debt (or deficit) levels and unfunded pension liabilities.

Estimating the connection between budget shortfalls and unfunded pension liabilities can be done with state debt per capita and state deficits controlling for a state's ability to pay since debt might be substituted for a state's ability to pay:

(4) Unfunded level = $\alpha + \beta$(debt or deficit) + γ (ability to pay control) + ε

RESULTS 4: Unfunded pension liabilities on state debt or deficit

Dep.Var. = unfunded pension liabilities per capita	Intercept	β	Γ
State debt per capita (p value)	162 (0.9252)	**0.365 (0.0184)**	0.037 (0.391)
State deficit (p value)	-2,887,624 (0.1318)	*22,500 (0.0578)*	**94.07 (0.0133)**
State debt per capita CoL adjusted (p value)	488 (0.7782)	**0.370 (0.0260)**	0.0298 (0.4199)
State deficit CoL adjusted (p value)	1,434,401 (0.3871)	**18,970 (0.0492)**	1.13 (0.9769)

From these results there appears to be strong support for the association between state debt (or deficit) and unfunded pension liabilities as hypothesized

(Hypothesis 4). It should be noted that while debt per capita produces significant results, deficit per capita was not even close (p=0.756), yet deficit level versus unfunded pension liability per capita was significant (see tabulated results). This could be the result of high deficit states looking to balance the budget with an extraordinary move like slowing funding payments to pensions whereas low deficit states turn to other measures. That result is obfuscated by dispersing the current deficit over more citizens. Also, the recency of deficits versus debt could be a factor as well: a deficit this year might not change the contribution made to the pension plan very much whereas a series of deficits resulting in higher debt levels (per capita) likely has a higher cumulative effect on unfunded pension liabilities and states with a higher current deficit (in total) are more likely to have higher debt levels (long term deficits). In other words, there are high and low spending states but some of the high spending states have a higher population and so get shifted into the middle on a per capita basis and these high spending states are the one having trouble funding their pensions regardless of population.

Given the results (summarized in Chart 3) from the tests of association between unfunded pension liabilities by state and the possible causes, it seems that funding is within the control of the state governments.

CHART 3 RESULTS SUMMARIZED by hypothesis

Unfunded pension liabilities are associated with:	Measure:	Significance:	Result:
H1: a state's ability to pay	Income (GSP) pC Tax revenue pC	None None	Fail
H2: a state's level of service provided	State employees per capita (pC) Plan members pC	10% level 5% level	Weak pass
H3: a state's promises to its pension plan	Total pension liability per capita Total liability per member	1% level 10% level	Pass
H4: a state's budget balance	State debt per capita State deficit	5% level 5% level	Strong pass

So what does the future hold for these various pension plans with such wide differences in funding status across states?

Obviously, states that are fully funded must keep up with the future retirees but states that are behind in funding today must catch up or face the possible migration of their tax base away from the future funding. These states might catch a break if the number of state employees retired slows or reverses (this would also make funded states have an even brighter future); however, if the upcoming number of retirees is rising then states that are behind in funding will face even more difficulty in funding, exacerbating the demographic migration threat. You can only raise state taxes so much before your tax base moves to another state (tax arbitrage) given the relative ease of moving. In fact, once this trend starts, it builds on itself as the best and brightest seek opportunities and congregate in new areas, bringing tax dollars, productivity, and output with them. This leaves the unfunded and worsening states in a terrible predicament that might necessitate the re-negotiation of state pension agreements or concessions from state workers unions. Even those fully funded states might be subject to these same market (the market for state services are a reasonable cost) forces as their future pension liabilities rise. At least those states have choices in their future, but the states with the issue today must solve the Laffer curve trade-off between tax rates and growth quickly or risk losing their tax-paying base.

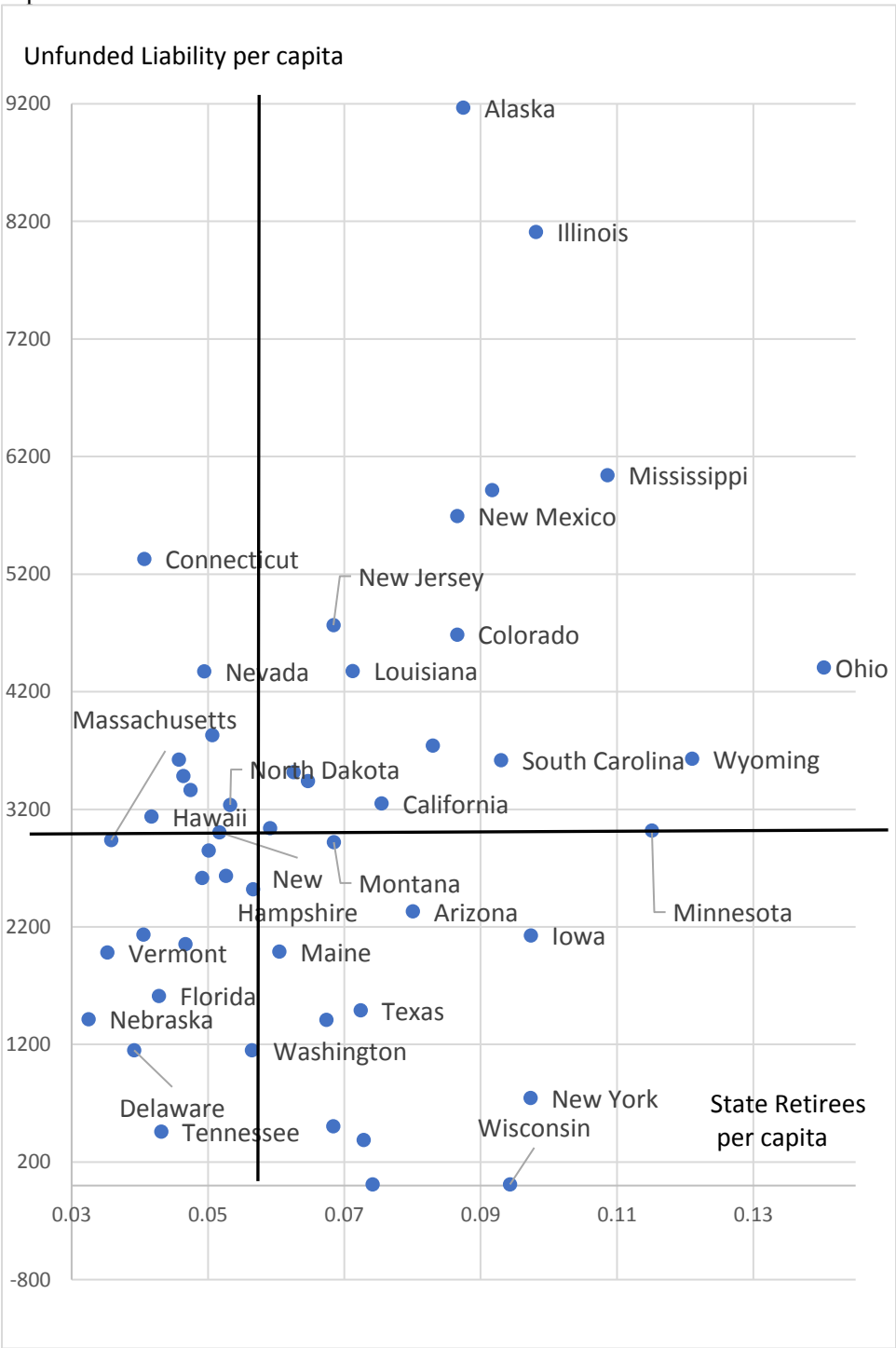
To visualize this issue, consider states along two dimensions: the funding status of the current pension liabilities and the present level of state retirees per capita. This suggests a two by two matrix of possibilities (Chart 4) in to which we can map the various states by their current status.

CHART 4: State pension status by median (funding, current retirees)

Low Funding, Low Retirees	Low Funding, High Retirees
High Funding, Low Retirees	High Funding, High Retirees

Subtracting the current state employees per capita form the total state pension membership per capita, an estimate of the number of retired state workers per capita is found. Observing (see Figure 2) a clustering of states by unfunded liabilities and the estimate of state pensioners per capita we can see four groupings (quadrants), with low unfunded status and many retirees (lower right, e.g. Wisconsin) as being the least risky group since they are paid up for those that are retired now (little uncertainty about the bill). Next, funded states that have few current retires (lower left, e.g. Tennessee) are current and have the flexibility to stay out of trouble by not over-promising today. The upper right quadrant (e.g. Mississippi) have a high number of current retirees and a low funding status, so they are in current trouble but working through it; if they can pay now and avoid

FIGURE 2: Unfunded Liabilities per capita v. retired state employees per capita



making promises for the future they can head in the correct direction. The upper left quadrant (e.g. Connecticut) has a low funded status and few retirees, so their problems lie ahead, especially if they continue to make promises they cannot keep.

The funding status of state pensions is clearly a choice of the state government, but so is the number of current state employees that will become future retirees. Assuming a normal trend across states with reversion to the mean, those states with a high level of current retirees are likely to see lower levels in the future, and those with lower levels are likely to see a rise, unless the state government of the given state is entrenched in its ways which might cause the trend to continue of worsen. Factors such as these are what lead to the tax arbitrage migration discussed in the preceding analysis.

So what drives states to make these promises? Political expedience in balancing the state's budget has been proffered as a reason. The test of this relationship suggests that states that are in fiscal trouble have higher unfunded liabilities. This is not surprising since if the state cannot balance its budget it is likely to have difficulty in setting aside money for long-term obligations. Yet, the compounding of the fiscal problems by under-funding the promises made to state employees is, in part, masking the fiscal problems of the state, especially if the worst days (most retirees) lie ahead.

CONCLUSION

When taken together, the lack of evidence on a state's ability to pay as a driver of unfunded pension liabilities, along with the evidence that service levels and promises made to state retirees are a potential driver, we might conclude that state governments are their own worst enemy in the generation of these unfunded pension liabilities. This is especially true in light of the evidence suggesting that these deals were crafted for political expedience such as delaying the inevitable facing of fiscal imbalance. Further complicating this issue is the possible flight of the tax base of a given state as the residents (taxpayers) discover the truth about the looming fiscal issues and conclude that they would be better served by a more prudent state government. This sleight of fiscal hand is leaving those taxed by the state and its future pensioners potentially holding the bag; unfortunately, that bag might not be as full as promised or envisioned.

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CONSISTENCY OF ETHICAL ANALYSIS AMONG ACCOUNTING STUDENTS

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ABSTRACT

This paper reports student responses to a series of fictitious ethical dilemmas. We found that there was no clear indication that students use consistent ethical frameworks when making decisions with moral content in the administered survey situations. Additionally, we found little to no correlation between what a student judged as important in the scenarios and the corresponding decisions that were made. An important outcome of accounting ethics education is a student who is equipped with the ability to make reasoned, consistent ethical decisions that translate ethical ideals into action in real world situations, ensuring a logical and analytical approach. Based upon our findings, that outcome has not been completely or consistently attained. We concur that a focus on moral development may be inadequate (see, for example, Jeffries & Lu, 2018 and Shawver & Sennetti, 2009) and suggest that ethics instruction incorporate more fully the complexities involved in ethical decision-making. Improvements in moral reasoning may be seen with improved classroom methods (Jones, 2009) and we encourage ethical analysis to be viewed as a multi-faceted process that matures as the student matures, with a corresponding focus on analytical ability that continues to develop as situations become more complex and increasingly challenging.

Key Words: cognitive moral decision-making, ethical awareness, Defining Issues Test II (DIT- 2), ethics instruction

INTRODUCTION

In an effort to determine the ethical thought processes and moral decision-making abilities of our students, we administered the Defining Issues Test II (DIT-2), which is widely used as a measure of cognitive moral decision-making, moral reasoning, and cognitive moral development. The ethical framework used in moral reasoning and decision-making should yield some consistent and correlated responses between the moral statements deemed to be important in a given scenario and the resulting choice of action. Ethical reasoning ability is a key component in all our daily lives and is of particular importance for accounting students that will soon be accounting professionals. As accounting professionals, they will be charged with ensuring accurate and trustworthy financial reporting activities. When asked to come to a decision about the appropriate action for a

given scenario, our findings show that students are not demonstrating an ability to consistently apply such reasoning to diverse, ethically charged situations. The amount and the frequency of exposure as well as the methods of delivery need careful scrutiny to determine future approaches to ethics instruction.

BACKGROUND AND INSTRUMENTATION

Ethical analysis is often studied using the DIT-2 originally developed by Rest (1979) as the Defining Issues Test and subsequently updated. It is grounded in cognitive moral development theory (Kohlberg, 1969) and its three levels of moral reasoning. The first level is labeled as pre-conventional thinking and is characterized by punishment avoidance. The second level is labeled as conventional thinking and focuses on following rules and laws to maintain order for the proper functioning of society. The third level is labeled post- conventional thinking and is characterized by principled thinking that transcends specific societal rules in favor of universally applicable ideals. Rest (1986) expanded cognitive moral development theory into a cognitive moral decision-making model which posits four theoretically (though not necessarily in practice) sequential components: moral issue identification, moral reasoning, moral intent, and moral action.

The DIT-2 measures Rest's (1986) second component, moral reasoning, and characterizes results according to level of moral reasoning (pre-conventional, conventional, post- conventional) as described by Kohlberg (1969). It provides five ethical scenarios and lists several statements of ethical reasoning or justification related to the given scenario. Respondents rank the list of statements according to what is most important in choosing an action, and then respondents choose the appropriate action for the scenario. The rankings provide data to determine the level of moral reasoning, and the action chosen also indicates a respondent's level of moral reasoning.

Studies showing links between moral development scores and ethical behavior provide mixed results. Christensen, et al. (2016) provide a comprehensive review of DIT studies within the accounting field, looking at the relationship between DIT-2 P scores and several variables, such as gender, political affiliation, length of professional service, and effectiveness of types of ethics instruction at the undergraduate level. Abdolmohammadi and Sultan (2002) and Buono, et al. (2012) found that students with higher DIT-2 P scores were less likely to engage in insider trading. West, et al. (2004) found that DIT scores did not correlate consistently with cheating in a natural experiment on observed cheating behavior. The authors suggested an investigation into more results than only DIT P scores and N2 scores. Similarly, Bailey, et al. (2010) encourage a more wholistic application of DIT survey output that investigates how respondents use moral reasoning to make decisions.

Following Bailey, et al.'s (2010) suggestion, we focus on four other measures calculated from the DIT-2 responses in the current study. Two provide an indication of how consistent a respondent's ethical reasoning is when making

value choices regarding relative importance of the statements accompanying the scenario, and two relate to how well and how consistently ethical reasoning is applied to the decision made. The four measures are described in the paragraphs that follow.

The two variables relating to moral reasoning consistency measure whether responses display consistent application of a moral level or whether responses appear to indicate transitional thinking between levels of moral reasoning (Thoma & Rest, 1999; Derryberry & Thoma, 2005). The Type Indicator variable defines seven types, three for consolidated thinking for each of the levels (pre-conventional (Type 1), conventional (Type 4), post-conventional (Type 7)), and four for transitional thinking that leans more toward one level than the other (e.g., Type 2 is transitional between pre-conventional and conventional but uses more pre-conventional than conventional thinking while Type 3 is also transitional between those two levels but uses more conventional than pre-conventional thinking, and so on). Finally, the Type Indicator score is also condensed into a Transitional/Consolidated score that groups respondents into either transitional or consolidated thinking, regardless of level (i.e. 1 for transitional type indicators and 2 for consolidated type indicators).

The two variables that relate to application of ethical reasoning to decisions made are the "Can't Decide" score and the Utilizer score. The DIT-2 provides scores on the number of times respondents choose the option of "Can't Decide" when pondering the appropriate action to take in a scenario. As there are 5 scenarios in the DIT-2, the number of can't decide responses may range from zero to five. This variable indicates how much impact the ranked statements have on the respondent's action choice when deciding what to do in the given scenario. The Utilizer score is an indication of how well the ranking of statements (and the level of moral reasoning indicated thereby) corresponds to the decision choice, assuming the respondent did not reply with a "can't decide" answer. A high Utilizer score would indicate that the action (and the level of reasoning represented by that action choice) corresponds highly to the ranking of important statements in making the judgment (and the level of reasoning represented by the rankings). Since the Utilizer score cannot be computed if the respondent chose "Can't Decide", there is no Utilizer score for any respondent with either four or five can't decide responses for the five scenarios, and the Utilizer score is 0 for any respondent with three can't decide responses out of the five scenarios (Bebeau & Thoma, 2003).

SAMPLE AND FINDINGS

The sample consisted of 63 usable responses from accounting students in an intermediate and an upper level accounting class. The overall level of moral reasoning is provided in the N2 score, with a higher score indicating more post-conventional thinking. In other words, there is an assumption in Kohlberg's (1969) cognitive moral development theory that higher levels of moral reasoning are preferable. Commonly, respondents score at the conventional level of moral

reasoning. In the current sample there were no significant differences in average N2 scores between the intermediate and upper level students.

The frequency of type for the sample is provided in Table 1 below. The shading highlights the three stages of moral development by grouping transitional types with the consolidated type closest to it. A total of 23% of the respondents reasoned predominantly at the pre-conventional stage, a total of 40% of the reasoned predominantly at the conventional stage, and nearly as many (37%) reasoned predominantly at the post-conventional stage of moral reasoning.

Table 1: Grouping of Respondents by Type Indicator Score (Total N = 63)

Type	Description	N	Percent	Cumulative %
1	Consolidated, **Pre-**Conventional	1	1%	1%
2	Transitional, Mainly **Pre-**Conventional	14	22%	23%
3	Transitional, Mainly Conventional	12	19%	42%
4	Consolidated, Conventional	8	13%	55%
5	Transitional, Mainly Conventional	5	8%	63%
6	Transitional, Mainly **Post-**Conventional	15	24%	87%
7	Consolidated, **Post-**Conventional	8	13%	100%

Combining the scores into Consolidated vs. Traditional, a total of 17 respondents showed consolidated thinking and the other 46 respondents demonstrated transitional thinking, thus 27% and 73% as consolidated and transitional, respectively. This indicates that the students in the sample are not consistently using one level of moral reasoning when they rank statements of importance and when they decide upon the appropriate action for the five scenarios.

Information about the number of can't decide choices and the utilizer scores for the sample is provided in Table 2. Since there are five scenarios in the DIT-2 instrument, the number of can't decide responses may range from zero to five. Utilizer scores for the sample for zero, one, and two can't decide responses are shown. The utilizer score for three can't decide options is zero, and there is no ability to calculate a utilizer score for those respondents answering that they can't decide for four or five of the scenarios.

Table 2. Number Can't Decide Answers and Utilizer Scores (Total N = 63)

Number of Can't Decide Responses	Number of Respondents	Utilizer Score	N2 Score	Correlation: Utilizer and N2
0 (5 Decisions Made)	21	.18	29.8	-.353
1 (4 Decisions Made)	15	.14	30.1	-.425
2 (3 Decisions Made)	15	.19	25.5	-.281
3 (2 Decisions Made)	4	0	20.8	---
4 (1 Decision Made)	3	---	30.6	---
5 (0 Decisions Made)	5	---	34.9	---

Several things are noteworthy from the information provided in Table 2. Fifty-one out of 63 respondents (81%) made a decision about what to do in a majority of the scenarios. N2 scores are provided in the table to show the level of moral reasoning by number of decisions made. It is unexpected to find that for the respondents with a utilizer score different from zero, there is a negative correlation between the utilizer score and the N2 score. In other words, respondents who made a decision that more greatly corresponded to their ranking of importance of statements about the scenario had lower N2 scores than respondents who did not utilize their rankings to make a decision about what to do in a given scenario. The ability to evaluate statements for their importance in helping to decide what to do in a scenario and then to make a decision that is consistent with that evaluation (as measured by the Utilizer score) is a desired outcome. To find a negative correlation between N2 score and Utilizer score is and unexpected and undesired outcome of the study.

Also of significant note is that although subsample size is very small, the total of five respondents who made no decisions of an action to be taken in any of the scenarios had the highest average N2 score of any of the other can't decide categories. This is consistent with the finding that higher utilizer scores were associated with lower N2 scores. The group with the highest number of can't decide responses had the highest levels of moral reasoning, and the group that made only one decision out of the five had the second highest mean N2 score.

Table 3 is a combination of the consistency measures presented separately in Tables 1 and 2. It provides the number of can't decide choices by Type Indicator for the 63 respondents. It is a more detailed investigation of consolidated and transitional thinking at each moral reasoning level paired with the ability to make a choice about the most appropriate action to be taken.

The numbers below show a large dispersion of Type Indicator representation for respondents that made three or more choices (0, 1, or 2 can't decide responses). Although much smaller numbers of respondents made less than three choices (3, 4, or 5 can't decide responses), those respondents are also dispersed across Type Indicator categories. These results confirm that there is no

definitive relationship between level of moral reasoning categorized by Type and ability to make a decision of an ethical nature.

Collapsing Type Indicator score into Consolidated vs. Transitional and then grouping by number of can't decide choices provides summarized information regarding consistency of moral reasoning as it pertains to decision-making ability. That information is presented in Table 4.

Table 3: Number of Can't Decide Responses Grouped by Type Indicator

Type/No. of Can't Decide (CD)	CD = 0 out of 5	CD = 1 out of 5	CD = 2 out of 5	CD = 3 out of 5	CD = 4 out of 5	CD = 5 out of 5	**Total by Type**
1: Pre-conv. Consolidated	1	0	0	0	0	0	**1**
2: Pre-conv. Transitional	6	2	3	1	1	1	**14**
3: Conv. Transitional	2	4	4	1	0	1	**12**
4: Conv. Consolidated	2	3	2	1	0	0	**8**
5: Conv. Transitional	4	0	1	0	0	0	**5**
6: Post-conv. Transitional	1	6	4	1	2	1	**15**
7: Post-conv. Consolidated	5	0	1	0	0	2	**8**
Total by No. of CD Choices	**21**	**15**	**15**	**4**	**3**	**5**	**63**

Table 4: Number of Can't Decide Responses by Consolidated vs. Transitional Classification

# of CD Choices	**0**	**1**	**2**	**3**	**4**	**5**	**Total**
Total	21	15	15	4	3	5	63
Consolidated	8 (38%)	3 (20%)	3 (20%)	1 (25%)	0	2 (40%)	17 (27%)
Transitional	13 (62%)	12 (80%)	12 (80%)	3 (75%)	3 (100%)	3 (60%)	46 (73%)

When Type Indicator is collapsed into only consolidated and transitional classifications across all numbers of can't decide choices, respondents are overwhelmingly transitional in their moral reasoning. It is interesting to note that at the extreme ends of both making a decision in all five scenarios and making a decision in none of the five scenarios, the number of respondents in the two classifications of consolidated vs. transitional comes closest to being distributed equally. The four other can't decide categories (from one to four decisions made) range from a low of 75% to a high of 100% of respondents classified as transitional. For one final parsing of the information, of the 51 respondents making a decision a majority of the time (less than three can't decide responses), 37 (73%) were classified as transitional; of the 12 respondents not making a decision a majority of the time, 9 (75%) were classified as transitional. It appears that consolidated moral thinking has no impact on ability to make a decision.

DISCUSSION AND CONCLUSION

The findings presented here indicate that students do not consistently apply ethical frameworks when making decisions with moral content in a survey situation. There was virtually no correlation between the moral statements students had judged to be important in the scenario and the decision that was made, and most students did not exhibit a consolidated, consistent application of moral reasoning level when answering questions of an ethical nature. The study adds to the literature suggesting the need to investigate other components of Rest's model and other aspects of ethical behavior (Buono, et al., 2012; Jeffries & Lu, 2018; Shawver & Sennetti, 2009) and it also investigates other variables provided by DIT-2 results beyond the P score and N2 score (Bailey, et al., 2010).

The generally accepted approach to business ethics instruction has been to provide a structured, multi-step model of analyzing an ethical situation in order to clearly identify issues, options, probable outcomes of the options, and the best choice to procure the best outcome. However, a formalized, academic approach may not equip students with all of the tools needed to properly decipher complex ethical dilemmas fraught with uncertainty and professional pressures. Our findings add to the literature suggesting that students may not be graduating from accounting and business programs with the mature understanding needed to reason about ethical scenarios and then choose a logical action that flows from the reasoning applied. The areas of immediate investigation would be whether there is a breakdown in students' ability to consistently apply ethical frameworks to analyze specific situations; and whether there is a disconnect between consistent reasoning (once achieved) and consistent application of the reasoning used to determine the final action choice. Further research into these areas will hopefully provide greater insight and avenues for improved ethics education.

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FRAUD-DETECTING EFFECTIVENESS OF MANAGEMENT AND EMPLOYEE RED FLAGS AS PERCEIVED BY THREE DIFFERENT GROUPS OF PROFESSIONALS

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ABSTRACT

All organizations are vulnerable to the risk of financial statement fraud. Companies try to mitigate the threat of fraud by establishing preventive measures. These measures include implementing specific policies, procedures, programs, and training to identify potential fraud. These measures comprise the first tier line of defense against financial statement fraud. The second tier line of defense involves the establishment of red flags that could ostensibly identify the threat of fraud occurring. However, not all red flags are equally effective in detecting fraud. The purpose of this study was to explore how effective different types of flags are in detecting fraud as perceived by managers. Research was conducted by questionnaires sent to three distinct groups of professional financial statement users: Chief Executive Officers and Chief Financial Officers; Controllers and Treasurers; and Human Resource Directors. This represents a broad swathe of professional users. These three different groups of professional users were surveyed to obtain a broad range of perceptions regarding the effectiveness of different red flags to detect fraud. Perceptions of surveyed professionals identified most common red flag indicators. The findings of this study are useful in indicating, to all users, which specific red flags are considered the most important by experienced professional users. Generally, red flags represent warnings that something could be wrong or hidden from evaluators. All users of financial statements need to be aware of the most effective red flags in order to monitor a potentially disastrous situation and then take immediate corrective measures, as needed.

Keywords: Fraud Detection, Management/Employee Red Flags, CEOs/CFOs, Controllers/Treasurers, HR Directors

INTRODUCTION

A red flag is a set of circumstances that are unusual in nature or that vary from normative activity. It is a signal that something out of the ordinary needs to be investigated further. Dinapoli (2006) notes that red flags do not indicate guilt or innocence but merely provide possible warning signals of fraud. The American Institute of Certified Public Accountants (AICPA) Statement of Auditing Standards (SAS) No. 99 highlighted the critical importance of fraud investigation. This auditing standard that was adopted by the Private Company Accounting Oversight Board (PCAOB) requires external auditors, assisted by internal auditors, to use 42 specific red flags to detect fraudulent activities in conducting financial statement audits of publicly held corporations. This study focuses on another set of 20 management red flags and 13 employee red flags that were established by the New York State Controller, Thomas P. DiNapoli. This article explores the level of effectiveness of these management and employee red flags in detecting fraud as perceived by 203 respondents, which include the three groups: Chief Executive Officers and Chief Financial Officers, Controllers and Treasurers, and Human Resource Directors. Being able to recognize red flags is necessary not only for auditors and accountants but also for any executive business professional working in the public sector, where the potential for fraud to occur exists.

LITERATURE REVIEW

The effectiveness of red flags to detect fraud may be directly related to the number of years of both external auditing experience and internal auditing experience, based on positional roles of executive and upper-middle corporate management. Bonner and Lewis (1990) confirmed that more auditing experience improves the effectiveness of auditors, since more experienced auditors have a greater ability to apply their auditing knowledge than less experienced auditors, as concluded by Choo and Trotman (1991). Auditing knowledge is acquired from years of auditing experience, according to Wright and Wright (1997) and Prawitt, Smith, and Wood (2008). Similarly, Shamki and Alhajri (2017) verified a positive relationship between internal auditor effectiveness and their number of years of auditing experience. Moreover, Bond and DePaulo (2008) found highly experienced auditors demonstrate 67 percent accuracy in making auditing decisions, and 78 percent accuracy in making auditing decisions not involving fraud.

Many red flag studies focus exclusively on managers. Hackenbrack (1993) discovered that external auditors of large audit clients concentrate more on the fraud-risk attributes concerning opportunities for perpetuators to commit fraud. Apostolou and Hassell (1993) found internal auditors perceived the importance of red flags in identifying the possible occurrence of management fraud. Similarly, Albrecht and Romney (1986) validated the significance of red flags as predictors of management fraud as determined by audit partner respondents. This study indicates

one-third of red flags are considered significant predictors of fraud and most red flags tend to focus on the personal characteristics of management. Also, Apostolou, Hassell, Webber, and Sumners (2001) found external and internal auditors rated higher fraud indicators concerning management characteristics and their influence over corporate control environment. Furthermore, Heiman-Hoffman and Morgan (1996) surveyed external auditors of the then "Big Six" international public accounting firms and they ranked the thirty most important warning signs of possible fraud, of which management attitudes are considered the most important red flags. Church, McMillan, and Scheider (2001) noted internal auditors perceive red flags as more predictive when managers attempt to falsely overstate earnings in order to earn bonuses.

METHODOLOGY

The study was conducted by means of a survey instrument. Red Flag Questionnaires were sent to various types of business professionals to determine the degree of effectiveness of management and employee red flags in detecting fraud. The respondent professionals were Chief Executive Officers and Chief Financial Officers, Controllers and Treasurers, and Human Resource Directors.

The red flag questionnaire used a six-point Likert scale to measure the professionals' perceptions of the level of effectiveness of red flags in detecting fraud. Each professional evaluated the fraud-detecting effectiveness of each red flag by selecting one of the following responses: not effective, slightly effective, moderately effective, mostly effective, effective, or extremely effective. If the professional decided the red flag was extremely effective in detecting fraud, the value of 6 was entered into the database. In contrast, if the professional decided the red flag was not effective in fraud detection, a value of 1 was entered into the database.

The red flag questionnaire was completed and returned by 203 professional respondents. The 203 respondents who completed the questionnaire are classified into the following three groups: (1) Chief Executive Officers and Chief Financial Officers, (2) Controllers and Treasurers, and (3) Human Resource Directors. Breakdown of the respondents are shown in Tables 1 and 2. The red flags used in the questionnaire were derived from an article entitled, "Red Flags for Fraud." This article listed numerous red flags used to detect fraud and was written by Thomas P. Dinapoli, New York State Comptroller (n.d.).

Table 1: THREE DISTINCT CATEGORIES OF PROFESSIONAL RESPONDENTS

Positional Titles of Professional Respondents	Number of Respondents	Percentages of Respondents
Chief Executive Officers (CEOs) and Chief Financial Officers (CFOs)	92	45.3%
Controllers and Treasurers	61	30.1%
Human Resource (HR) Directors	50	24.6%
Totals	203	100%

Table 2 shows various professional certifications of the respondents. The Certified Public Accountants (CPA) certification represented the largest number with 81 (39.9%) respondents, followed by Chartered Financial Analysts (CFA) at 26 (12.8%); Certified Management Accountants at 18 (8.9%); and Certified Internal Auditors (CIA) at 18 (8.9%) respondents. The rest of the respondents, at 60 (29.5%), had non-accounting/non-finance certifications.

Table 2: QUANTITY AND TYPES OF CERTIFICATIONS HELD BY RESPONDENTS

Types of Certifications	Number of Certifications	Percentages of Certifications
Certified Public Accountants (CPAs)	81	39.9%
Chartered Financial Analyst (CFAs)	26	12.8%
Certified Management Accountants (CMAs)	18	8.9%
Certified Internal Auditors (CIAs)	18	8.9%
Non-Accounting/Non-Finance Certifications	60	29.5
Totals	203	100%

The types of fraud detected by the respondents' organizations were classified into 21 categories, according the 203 respondents in Table 3. The types of fraud that occurred the most frequent were embezzlement, credit card fraud, and theft. The next grouping included nine types of fraud that occurred with regular frequency: internet, identity theft, money laundering, tax fraud, falsified documents, computer, billing, payroll, and misappropriation of assets. Finally, a group of seven types of fraud detected at the lowest frequency included: fraudulent transactions, insurance, check forgery, misappropriation of funds, unauthorized purchases and payments, unauthorized signatures, and double payments. This does not indicate that the latter frauds are not significantly occurring; merely that these frauds have not been as frequently identified by the respondents in our study.

Table 3: TYPES OF FRAUD DETECTED BY RESPONDENTS

Types of Fraud Detected by Respondents	Number of Times Each Fraud Type Was Detected	Percentage of Each Fraud Type Detected
Embezzlement	38	20.9%
Credit Card Fraud	27	14.8%
Theft	18	9.9%
Other Fraudulent Activities	17	9.3%
Fraudulent Financial Reporting	16	8.8%
Internet Fraud	10	5.5%
Identity Theft	7	3.9%
Money Laundering	5	2.8%
Tax Fraud	5	2.8%
Fraudulent Documents	5	2.8%
Computer Fraud	5	2.8%
Billing Fraud	5	2.8%
Payroll Fraud	5	2.8%
Misappropriation of Assets	4	2.2%
Fraudulent Transactions	3	1.7%
Insurance Fraud	3	1.7%
Check Forgery	2	1.1%
Misappropriation of Funds	2	1.1%
Unauthorized Purchases and Payments	2	1.1%
Unauthorized Signatures	2	1.1%
Fraudulent Double Payment	1	0.55%
Totals	182	100%

The 203 respondents evaluated the level or degree of the fraud-detecting effectiveness of the following 20 management red flags using a six-point Likert scale. Table 4 shows the perceived level of effectiveness of each of the 20 management red flags in detecting fraud. The level or degree of fraud-detecting effectiveness of each management red flag was determined by computing the mathematical average, or mean, of all the response from the 203 respondents. The 20 management red flags are listed in the descending order of fraud-detecting effectiveness as shown in the right most column of Table 4.

Management red flags represent a higher priority than employee red flags. Since managers have the authority to over-ride internal controls and employees do not, detection of fraud committed by management is considered critically more important to detect than fraud committed by employees. Based on our survey, the most significant indicators of management fraud are missing or unaccounted for documents, financial transactions that are not logical and appear not to make sense, contracts signed without any tangible evidence of output in the form of products,

reluctance to provide information to auditors, management decisions dominated by a single individual or a small group, and high turnover of external auditors. For further detailed analysis, see Table 4

Table 4: FRAUD DETECTING EFFECTIVENESS OF MANAGEMENT RED FLAGS

Management Red Flags	Degree of Effectiveness of Red Flags in Detecting Fraud						
	Not Effective	Slightly Effective	Moderately Effective	Mostly Effective	Effective	Extremely Effective	**Mean**
Missing Documents	17	24	32	35	35	60	**4.12**
Financial Transactions Do Not Make Sense	18	16	45	33	44	47	**4.03**
Contracts Resulting In No Products	17	22	41	40	47	36	**3.92**
Management Reluctance to Provide Information to Auditors	18	26	52	29	41	37	**3.79**
Management Decisions Dominated by Single Individual or Small Group	12	32	40	50	45	24	**3.77**
Frequent Changes in Banking Accounts	20	27	45	35	42	34	**3.76**
Frequent Changes in External Auditors	16	34	48	39	33	33	**3.68**
Unexpected Overdrafts and Declines in Cash Balances	19	33	44	38	37	32	**3.67**
Management Engaged in Frequent Disputes with Auditors	24	33	36	39	48	23	**3.61**
Weak Internal Control Environment	27	24	49	34	39	30	**3.61**
Decentralize Without Adequate Monitoring	22	26	51	41	42	21	**3.58**

Compensation Excessively Too High	24	28	49	41	35	26	**3.56**
Excessive Number of Year End Transactions	20	29	55	44	33	22	**3.53**
Accounting Personnel Are Lax and Inexperienced with Their Duties	25	30	50	34	39	25	**3.53**
Management Refusal to Use Pre-Numbered Documents	24	29	52	43	25	30	**3.52**
Significant Downsizing in Healthy Market	24	31	50	37	37	24	**3.51**
Company Assets Sold Under Market Value	23	38	44	41	27	30	**3.50**
Excessive Number of Checking Accounts	26	32	44	43	33	25	**3.49**
Continuous Rollover of Loans	23	30	54	40	33	23	**3.49**
Management Displays Significant Disrespect for Regulatory Body	28	29	46	44	35	21	**3.45**

Table 5 shows the perceived level of effectiveness of each of 13 employee red flags in detecting fraud. The level or degree of fraud-detecting effectiveness of each management red flag was determined by computing the mathematical average, or mean, of all the responses from the 203 respondents. These 13 employee red flags are listed in the descending order of fraud-detecting effectiveness as shown in the right most column of Table 5. In our survey, the top employee-related red flags are carrying unusually large sums of cash, providing unreasonable responses to questions, evidence of heavy gambling, creditors or collectors appearing in the work place, bragging about significant new purchases, refusing promotions, lack of segregation of duties among others.

Table 5: FRAUD DETECTING EFFECTIVENESS OF EMPLOYEE RED FLAGS

Employee Red Flags	Degree of Effectiveness of Red Flags in Detecting Fraud						
	Not Effective	Slightly Effective	Moderately Effective	Mostly Effective	Effective	Extremely Effective	Mean
Carrying Unusually Large Cash	14	27	40	36	44	42	**3.96**
Providing Unreasonable Responses to Questions	15	29	36	45	44	34	**3.87**
Gambling Beyond Ability to Stand the Loss	23	20	40	41	38	41	**3.86**
Creditors or Collectors Appearing in Workplace	21	23	40	41	46	32	**3.81**
Bragging about Significant New Purchases	22	18	53	31	47	32	**3.78**
Refusing Promotions in Fear of Detection	16	28	46	45	36	32	**3.75**
Lack of Segregation of Duties	17	26	49	42	41	28	**3.73**
Employee Lifestyle Changes	18	29	49	41	30	36	**3.71**
Excessive Drinking or Other Personal Problems	20	29	43	44	37	30	**3.68**
Easily Annoyed at Reasonable Questions	17	31	51	36	42	26	**3.66**
High Employee Turnover	20	34	43	41	38	27	**3.61**
Refusal for Vacation or Sick Leave	28	32	51	45	22	25	**3.37**
Borrowing Money from Co-Workers	24	36	43	38	38	24	**3.50**

Tables 6 and 7 indicate the level or degree of the effectiveness of each red flag in detecting fraud as perceived by each of the three main groups of respondents. In Table 6, the fraud-detecting effectiveness of each of the 20 management red flags are showed by each of the three groups: Chief Executive Officers and Chief Financial Officers, Controllers and Treasurers, and Human Resource Directors. In Table 6, the level or degree of fraud-detecting effectiveness of each management red flag is determined by: (1) Mathematical average, or mean, of the responses from 92 Chief Executive Officers and Chief Financial Officers, (2) Mathematical average, or mean, of the responses from 61 Controllers and Treasurers, and (3) Mathematical average, or mean, of the responses from 50 Human Resource Directors.

In general, the Chief Executive Officers and Chief Financial Officers group evaluates 20 management red flags as slightly more effective in detecting fraud than the Controllers and Treasurers group. Likewise, the Controllers and Treasurers group evaluated the management red flags as slightly more effective than the Human Resource Directors group.

Across the board, management involved red flags include financial transactions not making any sense; missing documents; management decisions dominated by a single individual or small groups; unexpected overdrafts, frequent changes of bank accounts, frequent changes in external auditors, higher compensation to management relative to industry averages; management engaged in frequent disputes with auditors, among others. For more detail, see Table 6.

Table 6: AVERAGE FRAUD DETECTING EFFECTIVENESS OF EACH MANAGEMENT RED FLAG

Management Red Flag Indicators	Chief Executive Management	Controllers and Treasurers	Human Resource Directors
Financial Transactions Do Not Make Sense	4.26	3.90	3.76
Missing Documents	4.20	4.12	3.96
Management Decisions Dominated by Single Individual or Small Group	4.01	3.74	3.33
Unexpected Overdrafts and Declines in Cash Balances	3.99	3.52	3.24
Contracts Resulting in Not Products	3.96	3.91	3.84
Management Reluctance to Provide Information to Auditors	3.93	3.74	3.57
Frequent Changes of Bank Accounts	3.92	3.69	3.53
Frequent Changes in External Auditors	3.84	3.62	3.43
Compensation Excessive Too High	3.75	3.50	3.24

Weak Internal Control Environment	3.74	3.71	3.24
Management Engaged in Frequent Disputes with Auditors	3.73	3.59	3.39
Decentralization without Adequate Monitoring	3.73	3.59	3.29
Excessive Number of Year End Transactions	3.69	3.48	3.27
Management Refusal to Use Pre-Numbered Documents	3.74	3.47	3.16
Accounting Personnel are Lax and Inexperienced with their Duties	3.67	3.52	3.27
Company Assets Sold Under Market Value	3.65	3.40	3.33
Excessive Number of Checking Accounts	3.64	3.45	3.27
Management Display Significant Disrespect for Regulatory Agencies	3.59	3.52	3.10
Continuous Rollover of Loans	3.55	3.55	3.29
Significant Downsizing in Healthy Market	3.55	3.57	3.37

In Table 7, the fraud-detecting effectiveness of each of the 13 employee red flags are showed by each of the three groups: Chief Executive Officers and Chief Financial Officers, Controllers and Treasurers, and Human Resource Directors. In Table 7, the level or degree of fraud-detecting effectiveness of each employee red flag is determined by: (1) Mathematical average, or mean, of the responses from 92 Chief Executive Officers and Chief Financial Officers, (2) Mathematical average, or mean, of the responses from 61 Controllers and Treasurers, and (3) Mathematical average, or mean, of the responses from 50 Human Resource Directors.

In general, the Chief Executive Officers and Chief Financial Officers group evaluates 13 employee red flags as slightly more effective in detecting fraud than the Controllers and Treasurers group. Likewise, the Controllers and Treasurers group evaluated the employees red flags as slightly more effective than the Human Resource Directors group.

Table 7: AVERAGE FRAUD DETECTING EFFECTIVENESS OF EACH EMPLOYEE RED FLAG

Employee Red Flag Indicators	**Chief Executive Management**	**Controllers and Treasurers**	**Human Resource Directors**
Employees Carrying Unusual Large Sums of Cash	4.21	3.95	3.49
Employees Providing Unreasonable Responses to Questioning	4.15	3.59	3.65

Creditors and Collectors Appearing in Workplace	4.00	3.72	3.53
Employees Bragging about Significant New Purchases	3.96	3.86	3.35
Employees Gambling Beyond Ability to Sustain the Loss	3.94	3.86	3.69
Lack of Segregation of Duties in More Vulnerable Areas	3.94	3.76	3.29
Employee Lifestyle Changes	3.93	3.60	3.41
Employees Refusing Promotions in Fear of Detection	3.89	3.74	3.51
Employees Excessive Drinking and Other Personal Bad Habits	3.84	3.62	3.45
Employees Easily Annoyed at Reasonable Questions	3.84	3.59	3.37
High Employee Turnover in More Vulnerable Areas of Committing Fraud	3.83	3.43	3.39
Employees Refusal to Take Vacation or Sick Leave	3.76	3.36	2.63
Employees Borrowing Money from Co-Workers	3.71	3.45	3.16

The most common red flags for fraud committed by employees include employees providing unreasonable responses to questioning, creditors and collectors appearing in the work place, lack of appropriate segregation of duties, constantly refusing promotion, and refusal to take vacation or sick leave among others.

In Table 8, the 203 respondents reported 27 different ways that fraud was detected by their organizations. As shown in Table 8, the most common ways fraud was detected was by informants and internal auditors. The most common methods were informants followed by internal auditors, fraudulent documents, missing funds, auditing of online transaction activities, among others. For more details, see Table 8.

Table 8: DIFFERENT WAYS THAT FRAUD WAS DETECTED BY ORGANIZATIONS

Different Ways Fraud Was Detected	**Number**	**Percentage**
Informants	50	14.8%
Internal Auditing	38	11.2%
Fraudulent Transactions and Fraudulent Documents	32	9.5%
Missing Funds	25	7.5%
Random Sample of Documents and Files	21	6.3%
Audited Online Transactional Activities	14	4.2%
Security System Checks and Analysis	14	4.2%
Personal Purchases Using Company Funds	14	4.2%

Unauthorized Purchases and Unauthorized Payments	13	3.9%
Computer System Checks and Analysis	12	3.6%
Unauthorized Credit Card Charges	11	3.3%
Mathematical Discrepancies and Not Balancing	10	3.0%
Fraudulent Purchases and Altered Documents	9	2.7%
Missing Documents	9	2.7%
Compared Credit Card Receipts and Bank Statements	9	2.7%
Audited Timecards and Electronic Surveillance	7	2.1%
Tax Discrepancies	6	1.8%
Auditing Software Analysis	6	1.8%
Electronic Analysis of Data	6	1.8%
Inventory Shortages	6	1.8%
Fraudulent Contractors	5	1.5%
Billing and Invoice Discrepancies	4	1.2%
IT Department Detection	4	1.2%
Fraudulent Wire Transfers	3	.9%
Perpetuators Arrested and Prosecuted	3	.9%
Fraudulent Computer Logging In Access Attempts	2	.6%
Monthly Closing Processes	2	.6%
Totals	335	100%

In Table 9, the 203 respondents disclose 26 different types of evidence that proves fraud was committed.

Table 9: TYPES OF EVIDENCE THAT PROVED FRAUD WAS COMMITTED IN ORGANIZATIONS

Types of Evidence Proving Fraud Was Committed	**Number**	**Percentage**
Missing Funds	75	19.4%
Fraudulent Documents	44	11.4%
Informants	34	8.8%
Fraudulent Credit Card Receipts	27	7.0%
Fraudulent Transactions	21	5.5%
Computer System Information Output	18	4.7%
Internal Auditing Evidence	18	4.7%
Fraudulent Computer or Online Transactions	18	4.7%
Missing Documents	12	3.1%
Fraudulent Vendor Invoices	12	3.1%
Fraudulent Canceled Checks	11	2.9%
Security System Information Output	11	2.9%
Computer System Information Output	10	2.6%

Not Balancing	10	2.6%
Fraudulent Payroll Documents	9	2.3%
Fraudulent Tax Documents	8	2.1%
Bank Documents, Statements and Reconciliations	7	1.8%
Missing Inventory Items	6	1.6%
Unauthorized Purchase Transactions	5	1.3%
Unauthorized Signatures on Documents	5	1.3%
Auditing Software Evidence	5	1.3%
Spreadsheet Analysis of Data	5	1.3%
Police Detected/Arrested and District Attorneys Prosecuted	4	1.0%
Missing Assets	4	1.0%
IT Department Detected Fraud	3	.8%
Fraudulent Wire Transfer Documents	3	.8%
Totals	385	100%

CONCLUSIONS

The purpose of this study was to examine which financial red flags are the most effective in detecting fraud as seen from the eyes of three groups of professional financial statement users: Chief Executive Officers and Chief Financial Officers, Controllers and Treasurers, and Human Resource Directors. The findings of this study has substantive validity in that this study's respondents, Chief Executive Officers and Chief Financial Officers, Controllers and Treasurers, and Human Resource Directors, are highly qualified and experienced financial statement users with stellar professional certifications. Their views based on survey responses roughly converged highlighting the importance of the red flags addressed in this research.

The types of fraud detected by the organizations were classified into 21 categories according to the 203 respondents in Table 3. The type that occurred the most was embezzlement, credit card fraud, and theft. According to Chief Executive Officers and Chief Financial Officers, Controllers and Treasurers, and Human Resource Directors, the most frequent management-involved red flags, in Table 4, include missing documents, financial transactions not making any sense, contracts resulting in no products, management reluctance to provide information to auditors, and management decisions dominated by a single individual or small groups. In Table 5, the top four employee related red flags are carrying unusually large sums of cash, providing unreasonable responses to questions, evidence of heavy gambling, and creditors or collectors appearing in the work place. Employee behaviors send warning signals to vigilant internal auditors and interested parties. These signals could include lavish changes in life style, increased propensity for drinking and gambling, and borrowing money from co-workers, among others.

The top three indicators of average fraud detecting effectiveness of red flags were financial transactions not making any sense, missing documents, management decisions dominated by a single individual or small groups for management red flags, as shown in Table 6. Employee red flag average fraud detecting effectiveness, in Table 7, were employees carrying unusual large sums of cash, employees providing unreasonable responses to questioning, and creditors and collectors appearing in workplace. Table 8 displayed the top four ways that fraud was detected by organizations: informants, internal auditing, fraudulent transactions and fraudulent documents, and missing funds. Table 9 focused on the types of evidence proving that fraud was committed and the four prevalent categories were missing funds, fraudulent documents, informants, and fraudulent credit card receipts.

This research is obviously limited by the relatively small sample size (n = 203), but the quality of the respondents indicates a very high level of reliability, as delineated by their professional titular roles and credentials, as well as their earned certifications. This study's findings should lead to further research into usefulness of indicating which specific red flags are considered the most important by experienced professional users. All users of financial statements need to be aware of the most effective red flags in order to monitor a situation and then take immediate corrective measures, as needed.

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