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DETERMINANTS OF THE BIAS AND INACCURACY OF MANAGEMENT EARNINGS FORECASTS

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ABSTRACT

The safe harbor provisions have increased over the years, following the Private Securities Litigation Reform Act (PSLRA) of 1996 and the Securities Litigation Uniform Standards Act (SLUSA) of 1998. The objective is to encourage more earnings guidance by managers. However, a number of firms like Coca Cola and Gillette moved to abandon quantitative earnings forecasts, due to concerns over the markets' response when they miss their forecasts. This study examines the determinants of management earnings forecasts bias and inaccuracy. The evidence suggests that forecast bias and inaccuracy are not systematically associated with diversification however, are associated with the fraction of nonoperating assets. Also, capital structure, audit quality and institutional holdings are systematic determinants of forecast bias and inaccuracy. Finally, industry attributes of munificence, dynamism and concentration are indicators of inherent imperfections of management forecasts, but are exogenous to management's control. The reasons for, and implications of these findings are discussed.

JEL: M41, M48

KEYWORDS: Management Forecasts, Bias, Inaccuracy, Determinants, Litigation Costs, Safe Harbor, Munificence, Dynamism, Concentration. All Data Are Available from the Public Sources Mentioned

INTRODUCTION

Management earnings forecasts are very important for many reasons. They help to guide the public and analysts to predict firms' earnings (Baginski and Hassell, 1990, Baginski, Conrad and Hassell, 1993, Pownall, Wasley and Waymire, 1993). They are used by managers to reduce information asymmetry prior to issuing securities (Frankel et al., 1995). They influence market expectations about firm value (Patell, 1976, Penman, 1980), and about industry earnings (Bosall IV et. al., 2013). However, users who feel hurt, say by the bias and inaccuracy of the forecasts, often sue the managers for deceit. In fact two securities litigation reform laws on safe harbor have been enacted (in 1996 and 1998) to help protect managers from any wrongful legal action by users. Also, the Regulation Fair Disclosure forbids managers from providing selective guidance to analysts. However, these regulations seem inadequate for encouraging managers to issue earnings forecasts since the majority of firms do not issue forecasts and some of those that used to issue are discontinuing such activity (Byrnes, 2003, Deloitte, 2009). Proper policy that will ensure an enabling environment for the free flow of information like earnings guidance requires a systematic examination of forecast errors for their determinants. This study examines the association between firms' earnings-relevant economic factors and management earnings forecast bias and inaccuracy. The economic factors include the nature of business activities, the structure of the industry, and the measurement and disclosure controls that impact on the firm's information environment. This study is further motivated by the fact that prior research seems to assume that management forecast attributes are driven largely by managerial incentives. However, managers are not only financial information suppliers but also corporate decision makers, whose information processing capabilities influence all dimensions of corporate endeavors (Gong et al., 2011).

Specifically, both internal and external factors impact on all dimensions of managerial decisions, and through that, the earnings amount and expectations thereof. The factors include the firm's industry

structure and its economic activities that give rise to the earnings. They also include factors that impact on the measurement and disclosure of the earnings, such as the extent of managerial disclosure discretion, apart from managerial incentives to issue misleading actual and forecast earnings. Consider for example an argument that managers manage earnings to beat forecasts. Though this sounds possible, high audit quality and pressures from institutional holders should render this less probable. A true assessment of the determinants of forecast attributes begins with an analysis of factors that determine the properties of the earnings and for that matter the earnings expectations.

Firms' actual and forecast earnings-relevant economic activities can be classified into operating, investing and financing. For these activities, we consider both geographic and line of business diversification (complexity of operations), non-operating assets relative to total assets (for investments), and capital structure using leverage (for financing), respectively. These are based on prior research (Thomas, 2002, Duru and Reeb, 2002, Anabila, 2012, Myers, 2001), on the implications of these factors for firms' earnings realizations and expectations. For firms' disclosure quality, we consider audit quality and pressure by institutional shareholders, because these constrain management reporting discretion (Behn et al., 2008, Piotroski and Roulstone, 2004). Also, industry concentration, munificence, and dynamism, which prior research has virtually ignored, are important external factors that provide a context for firms' earnings possibilities. We obtain annual management forecasts for 1995 through 2008 from *FIRSTCALL*, and financial and diversification data from *COMPUSTAT*. We consider only point management forecasts issued within the fiscal year for the fiscal year and we use the last of such forecasts. The foregoing criteria yield 3,894 firm-years (annual observations) for the analysis.

Our results are as follows. First, management forecasts exhibit a mean optimism bias (forecasts are greater than actuals). This has the potential to expose the firms to litigation. Second, the evidence shows that unlike analysts' earnings forecasts (Thomas, 2002, Duru and Reeb, 2002), management forecast bias and inaccuracy are not significantly associated with diversification. Thus, the implications of diversification for analysts' forecasts as per prior studies are likely due to subjective use of management forecasts. Analysts should decipher information from management forecasts objectively, rather than compromise quality to curry management's favor (Feng and McVay, 2010).

Third, forecast bias is positively (negatively) associated with investment in nonoperating assets (leverage, institutional holdings, audit quality, industry competition, dynamism and munificence). Forecast inaccuracy is negatively (positively) associated with investment in nonoperating assets and institutional holdings (leverage, audit quality, industry concentration, dynamism and munificence). These results suggest that nonoperating investments help management to beat their forecasts and reduce forecast absolute errors. This is because such assets are relatively liquid and can be readily mobilized and redeployed by management in pursuit of reporting objectives. Therefore, users should pay particular attention to firms' nonoperating activities that are of a continuing nature when forecasting earnings. Also, institutional holders seem to pressure management to be optimistic and to make less forecast errors. The results also suggest that leverage (due to the external monitoring that it engenders and the interest expense that it imposes), and audit quality, prevent management from managing earnings to beat expectations and to reduce forecast errors. The results relating to industry attributes draw attention to earnings relevant external factors outside the firm's control. Industries that are more concentrated (SHERF), feature fast growth (MUNIF), and are unstable or volatile (DYNAM) as defined by Boyd (1995), characterize more biased and erroneous forecasts. Users like analysts should research the earnings prospects of firms in such industries, rather than rely on management for earnings guidance.

We defer further discussion of the results, including those on the control variables of size, forecast horizon and forecast frequency, to the results section. This study further contributes to the literature as follows. First, prior research generally assumes that forecast attributes are driven largely by managerial incentives. But this study relates forecast attributes to the firm's earnings-relevant activities, measurement

and disclosure quality, and industry attributes. It identifies factors such as industry attributes and institutional holdings that present inherent earnings uncertainty and pressure management to adopt a particular earnings outlook. The impact of these determinants explains in part why some firms do not issue earnings forecasts, suggesting that managers really need further protection in order to issue forecasts. Users should control for such factors to reduce their exposure to management forecast imperfections. The study proceeds as follows. The next section reviews the literature and states the hypothesis. The third section describes the methodology and data, and the fourth discusses the results. The fifth section summarizes and concludes.

LITERATURE REVIEW AND STATEMENT OF HYPOTHESIS

Prior Research

Various studies have examined management earnings forecast attributes from different perspectives and contexts. One such perspective borders on the frequency and availability of forecasts. Kile et al. (1998) shows that management earnings forecasts, especially non-quantitative ones, are frequently disclosed. Frankel et al. (1995) show that firms that access the capital markets disclose earnings forecasts more frequently to mitigate information asymmetry before the offering. Waymire (1985) shows that firms with less volatile earnings issue forecasts more frequently, and earlier in time than firms with more volatile earnings. This is because the high earnings volatility exposes the firm to litigation costs and loss of reputation, and the frequent disclosures are meant to revise the forecasts for new information to reduce such costs. Baginski et al. (2002) suggest that a greater frequency of management forecasts is associated with a less litigious environment (Canada) than a more litigious one (USA).

Another perspective of the literature shows that management forecasts are informative to analysts and investors about future earnings prospects and firm value (Patell, 1976, Penman, 1980, Jennings, 1987, Pownall et al., 1993, Baginski and Hassell, 1990). Frankel et al. (1995) document a strong interest on the part of management to disclose forecasts in order to reduce information asymmetry between managers and the public, prior to equity offerings. Others show that the information content increases with the accuracy of prior management earnings forecasts (Williams, 1996). More recently, Bosall IV et al. (2013), show that management forecasts contain macroeconomic information on the industry, beyond the firm-specific information. The usefulness of the forecasts however is limited by at least two different but linked themes. First is the limited availability of the forecasts. Second is the attributes, such as the inaccuracy and bias of the forecasts. Often, the market reacts negatively to the inaccuracy, and users who are hurt by the bias and inaccuracy of the forecasts resort to litigation against the management. However, the potential usefulness of the forecasts prompted the Private Securities Litigation Reform Act (PSLRA hereafter) of 1995, followed by the Securities Litigation Uniform Standards Act (SLUSA) of 1998.

These laws increased the safe harbor provisions to motivate managers to issue earnings forecasts. Despite the broader protection offered managers by the new legislature, a few firms disclose quantitative management earnings forecasts while some of the disclosing firms moved to stop disclosing such forecasts, citing the users' negative reaction to the forecast attributes (Deloitte, 2009, Byrne, 2003, Pownall et al., 1993). How can managers be effectively encouraged to provide earnings forecast guidance without fear of the users' reaction? For the most part, research studies on the properties of management forecasts have examined the managerial incentives and the credibility of the forecasts. For example, Irani (2003) shows that distressed firms' forecasts are optimistic. Rogers and Stocken (2005), show that the credibility of the forecasts decreases with management's likelihood of facing litigation, the ability to profit from insider trading, and the opportunity to shift risk for financially distressed firms. However, the public's ability to detect whether management forecasts are misleading limits management's ability to pursue those incentives through the forecasts. Feng and McVay (2010) document evidence showing that analysts' compromise their forecasts quality by overweighting management forecasts to curry favor from

management for investment banking business. Some studies highlight circumstances under which management earnings forecasts may be more useful and credible. For example, Hirst et al. (2007) shows using experimental tests that disaggregated management forecasts (forecast of earnings coupled with components such as sales, cost of sales, selling and administrative expenses) are perceived to be more credible, clear and a mark of financial reporting quality, compared to aggregated forecasts.

Most of the foregoing research assumes rather interestingly that management has absolute control over the forecast attributes. However, Gong et al. (2011) find that management forecast errors (bias) persist over time, are unavoidable in a world of uncertainty yet have implications for the efficiency of managerial decision making. Understanding the forecast properties enables users to better utilize the forecasts, because managers are both corporate decision makers and financial information suppliers whose information processing capability impacts on all dimensions of corporate earnings-relevant decisions including operations, investments, and financing (Gong et al., 2011). Given the significance of management forecasts, identifying the determinants of the forecast errors could help analysts and the public to assess the reliability of the forecasts and the reasons for their properties. Knowledge of the determinants could also help guide the effort towards encouraging managers to issue earnings forecasts. This study seeks to contribute in this regard.

Statement of Hypothesis

Prior studies by Thomas (2002) and Duru and Reeb (2002) suggest that the complexity of operating activities, namely, line of business and geographic diversification have implications for earnings expectations. Those studies focus on analysts' forecast attributes. Following those studies, we conjecture that management forecast bias and inaccuracy are each positively associated with diversification. Anabila (2012) also shows in the context of analysts' forecasts that nonoperating activities (investments) relative to operating activities has implications for earnings expectations. Investments are more liquid (compared say to machinery) and so management can readily move them to the most profitable area in pursuit of their earnings objective, including beating management forecasts. Arguably, such assets are less linked to managerial ability since they are not operated by management. Therefore, we conjecture that forecast bias and inaccuracy are positively associated with nonoperating assets relative to total assets.

Disclosure quality or information environments, all things being equal, are higher for firms that are subject to monitoring by lenders (Myers, 2001), have higher audit quality due to being audited by the BIG 4 (Behn et al., 2008), and have higher institutional holdings (Piotroski and Roulstone, 2004). Firms with higher values of these factors would be pressured to be optimistic but would have limited room to manipulate earnings towards a reporting objective. Therefore, we conjecture that bias and inaccuracy are each associated with leverage, audit quality, and institutional holdings.

Industry structure is generally external to the firm and the higher the uncertainty, the higher the forecast errors. Prior research has not generally related this to differences in management forecast properties. We conjecture that forecast bias and inaccuracy are associated with concentration (no competition), munificence (abundance of resources) and dynamism (instability in the industry) as defined by Boyd (1995). Based on all the foregoing, we hypothesize in null form that:

H1. There is no relation between management forecast bias on one hand and diversification, investments, financial leverage, disclosure quality and industry concentration, munificence and dynamism, on the other.

H2. There is no relation between management forecast inaccuracy on one hand and diversification, investments, financial leverage, disclosure quality and industry concentration, munificence and dynamism, on the other.

METHODOLOGY AND DATA

Methodology

We examine first the respective correlations between the forecast attributes and the determinants. We then estimate a multiple regression that explains these forecast attributes using the determinants and controlling for prior determinants of the forecast attributes. The hypothesis purports to explain forecast attributes (bias and inaccuracy) using complexity of operations (diversification), nonoperating assets (investments), financing (leverage), audit quality (BIG 4 dummy), institutional holdings (institutional percent ownership), industry features (concentration, munificence and dynamism). We control for size, forecast horizon, and number of forecasts identified in prior research (e.g. Gong et al., 2011). We use the following models:

$$\begin{aligned} BIAS_{i,t} &= \alpha_0 + \alpha_1 * BUSSD_{i,t-1} + \alpha_2 * GEOSD_{i,t-1} + \alpha_3 * NONAS_{i,t-1} + \alpha_4 * LEV_{i,t-1} \\ &+ \alpha_5 * BIG4_{i,t-1} + \alpha_6 * INSTPCS_{i,t-1} + \alpha_7 * SIZA_{i,t-1} + \alpha_8 * HORIZON_{i,t} \\ &+ \alpha_9 * OBSCIG_{i,t} + \alpha_{10} * SHERF_{i,t-1} + \alpha_{11} * MUNIF_{i,t-1} + \alpha_{12} * DYNAM_{i,t-1} + \varepsilon_{i.t} \end{aligned} \quad (1)$$

and

$$\begin{aligned} FACC_{i,t} &= \alpha_0 + \alpha_1 * BUSSD_{i,t-1} + \alpha_2 * GEOSD_{i,t-1} + \alpha_3 * NONAS_{i,t-1} + \alpha_4 * LEV_{i,t-1} \\ &+ \alpha_5 * BIG4_{i,t-1} + \alpha_6 * INSTPCS_{i,t-1} + \alpha_7 * SIZA_{i,t-1} + \alpha_8 * HORIZON_{i,t} \\ &+ \alpha_9 * OBSCIG_{i,t} + \alpha_{10} * SHERF_{i,t-1} + \alpha_{11} * MUNIF_{i,t-1} + \alpha_{12} * DYNAM_{i,t-1} + \varepsilon_{i.t} \end{aligned} \quad (2)$$

where:

BIAS=forecast bias, FACC=forecast inaccuracy (both for forecast attributes); BUSSD=business segment diversification index, GEOSD=geographic segment diversification index (both for complexity of operations); NONAS=proportion of nonoperating assets, LEV=financial leverage, BIG4=BIG4 auditor dummy, INSTPCS=institutional shareholding percentage, SIZA=size, HORIZON=forecast horizon, OBSCIG=number of forecasts issued during the fiscal year for the fiscal year, SHERF=Herfindhal index of industry sales concentration, MUNIF=industry munificence, DYNAM= industry dynamism. The variables SIZA, HORIZON and OBSCIG are the control variables based on prior research identified in the literature review section. The computations of BUSSD and GEOSD are as follows:

$BUSSD_{i,t} = 1 - \sum_{j=1}^{J}\left[Sales_{i,t,j} / \left(\sum_{j=1}^{J} Sales_{i,t,j} \right) \right]^2$, $GEOSD_{i,t,k} = 1 - \sum_{k=1}^{K}\left[Sales_{i,t,k} / \left(\sum_{k=1}^{K} Sales_{i,t,k} \right) \right]^2$, for all jϵJ number of business segments and kϵK number of geographic segments, for firm i in year t. Of the industry attributes, SHERF is the sales Herfindhal index of concentration in the industry, computed as

$SHERF_{i,D} = \sum_{i=1}^{D}\left[Sales_{i,t,} / \left(\sum_{i=1}^{D} Sales_{i,t} \right) \right]^2$ for all iϵD, that is firms 'i' in industry group D. Munificence

(MUNIF) is a standardized measure of industry sales growth computed following Boyd (1995; 306) as the slope coefficient, divided by mean value. The munificence slope coefficients are based on a regression of time against industry sales value, estimated for a given year using the five preceding years' data, and the

mean value is the mean over the munificence years of the annual industry sales. Dynamism (DYNAM) is a standardized measure of the volatility of industry sales growth rate over the munificence period, i.e. the standard error of regression slope coefficient divided by the mean of the industry sales over the munificence period. MUNIF, DYNAM, and SHERF are based on 3-digit SIC in this study. Size is proxies for exposure to political costs such as litigation. The frequency of forecasts captures the number of revisions of forecasts as new information becomes available.

Data

We obtain the management earnings forecasts and actual earnings from the *FIRSTCALL CIG and Actuals files*. We consider all point management forecasts issued within the fiscal year for that fiscal year. For example, if a firm has calendar fiscal year 2005, we consider forecasts dated within January 1st, 2005 through December 31st, 2005. We use only the last of such forecasts for the firm for that fiscal year. We do not consider forecasts dated after the fiscal year in order to avoid preannouncements. Following prior research, we scale the forecasts bias and inaccuracy by price as of the beginning of the year (Baginski et al., 1993, Pownall et al., 1993, Williams, 1996). Specifically, for each firm year, we compute forecast bias and inaccuracy respectively as: FBIAS= (actual EPS – last forecast EPS)/beginning price, and FACC=absolute value of (FBIAS). From the *FIRSTCALL CIG* database, we also obtain: HORIZON (forecast horizon) = log (end of fiscal year less date of the last forecast); and OBSCIG (forecast frequency) = number of the forecasts issued within and for the fiscal year.

We obtain fundamental financial and industry data from the *COMPUSTAT* fundamental annual file and other sources follows: Price per share (for scaling forecasts and actual EPS) at the end of the prior fiscal year. SIZA = log (total assets) from *COMPUSTAT*, INSTPCS = the shares outstanding (excluding those without voting rights) held by institutions as per *THOMPSON FINANCIAL INSTITUTIONAL HOLDINGS* database as of 2006 (2006 data are used for 2007 and 2008), as a percentage of shares outstanding in *COMPUSTAT* at the end of the year; both BUSSD=business segment diversification, and GEOSD=geographic segment diversification, are computed as defined under the methodology section using *COMPUSTAT SEGMENT* files data; BIG4= 1 if audited by BIG 4, zero otherwise. The industry structure variables of MUNIF, DYNAM and SHERF are computed following the description under the methodology section, based on 3-digit SIC Codes using *COMPUSTAT* data. We winsorize forecast errors and the other financial variables values below (above) the second (99th) percentile to the second (99th) percentiles respectively. Our sample covers 1995 through 2008 fiscal years. Table 1 describes the sample selection steps.

Table 1: Sample Selection

Panel A: Number of firm-year (annual) observations – 1995 through 2008	
Number of numeric management forecasts issued within the fiscal year, for the fiscal year.	40,268
Retaining only point numerical forecasts, only first and last forecast for each firm-year	11,349
Final: Firms-years (annual observations) at the intersection of *FIRSTCALL* and *COMPUSTAT*.	3,894

Management forecasts and actual earnings are obtained from the FIRSTCALL database, for fiscal years. Forecasts for each firm year must have been issued within the beginning to the end of the fiscal year, and for that fiscal year. All other financial data are obtained from COMPUSTAT Annual (Industrial, Full Coverage and Research) and Segment files.

From Table 1, the final sample comprises 3,894 firm-years (annual observations) at the intersection of all the databases. The sample drops by nearly two thirds to the final sample when we require a minimum of two point forecasts issued within the fiscal year for the fiscal year. This suggests that even when firms issue point forecasts, they do not do so frequently.

Table 2 shows that the forecasts tend to be optimistic. This is because for the forecast errors or bias (BIAS), the mean is -0.7839, the minimum is -11.9024, and the 1st quartile is -1.0035, which have higher

absolute values than the maximum of 5.3812, and the 3rd quartile of 0.1372. The tabulated forecast errors are small because of the scaling by price. Also, within the fiscal year and for firms that issue at least 2 forecasts (OBSCIG), the firms issue a mean (median) of 4.1361 (4) annual forecasts for the fiscal year. The forecast horizon (HORIZON) has a mean of 4.1785 and a median of 4.2047, which are quite close.

Table2: Summary Distribution of Main Test Variables

Variable	Mean	St. Dev	Minimum	1st quartile	Median	3rd quartile	Maximum
$BIAS_t$	-0.7839	2.1883	-11.9024	-1.0035	0.0000	0.1372	5.3812
$FACC_t$	1.3298	2.9643	0.0000	0.0698	0.2468	1.3617	11.9024
$INSTPCS_{t-1}$	0.6939	0.2561	0.0000	0.5732	0.7502	0.8785	1.0000
$BUSSD_{t-1}$	0.2356	0.2804	0.0000	0.0000	0.0000	0.4932	0.8025
$GESOD_{t-1}$	0.2334	0.2631	0.0000	0.0000	0.0786	0.4969	0.7588
$SIZM_{t-1}$	8.0019	1.5007	4.8865	6.9174	7.8314	9.0055	12.0673
$SIZA_{t-1}$	7.9091	1.5223	4.9573	6.7534	7.7744	8.8996	11.9166
$BIG4_{t-1}$	0.9647	0.1846	0.0000	1.0000	1.0000	1.0000	1.0000
$BIG4_t$	0.9625	0.1900	0.0000	1.0000	1.0000	1.0000	1.0000
$HORIZON_t$	4.1785	0.7385	1.6094	4.0431	4.2047	4.3567	5.6095
$OBSCIG_t$	4.1361	1.7112	2.0000	3.0000	4.0000	5.0000	10.0000
$MUNIF_{t-1}$	0.0872	0.0729	-0.1901	0.0478	0.0886	0.1309	0.2811
$DYNAM_{t-1}$	0.0224	0.0218	0.0034	0.0093	0.0146	0.0271	0.1162
$SHERF_{t-1}$	0.0889	0.0871	0.0084	0.0409	0.0552	0.0978	0.4932
LEV_{t-1}	0.2329	0.1706	0.0000	0.0970	0.2211	0.3394	0.7482
$NONAS_{t-1}$	0.0642	0.1119	0.0000	0.0000	0.0140	0.0700	0.5608

N=3,894. Following is a description of how the variables are computed for each period t (t-1 implies the prior year). BIAS: actual EPS less last annual forecast issued by management (FIRSTCALL CIG_Est) before the end of the fiscal year, divided by price (COMPUSTAT annual data199) at the beginning of the year. FACC: absolute value of BIAS. INSTPCS: institutional shareholdings at the end of the year (excluding those without voting rights), as a percent of shares outstanding. HORIZON: log of number of days to the end of the fiscal year since the last annual forecast was made, BUSSD: 1 minus the sum of the squares of the sales of all the business segments divided by the square of the total sales, for the fiscal fiscal year. GEOSD: 1 minus the sum of the squares of the sales of the geographic segments divided by the square of the total sales, for the fiscal year, SIZA: log of total assets (in millions of dollars) as of the end of the period, BIG4 (not tabulated): dummy equal 1 if auditor of the corporation is a BIG4 audit firm, zero otherwise. OBSCIG: number of annual earnings forecasts issued within the year for the year. MUNIF: munificence or abundance of resources in the industry, operationalized as a standardized measure of industry sales growth computed as (See Boyd, 1995; 306) the regression slope coefficient, divided by mean value. Coefficients are based on regression of time against value of sales, estimated for a given year based on the five preceding years. DYNAM (Dynamism): the volatility within the industry, operationalized using a standardized measure of the volatility of industry sales growth rate over the munificence period, i.e. the standard error of regression slope coefficient divided by the mean sales. SHERF: extent of monopoly, or lack of industry competition (squares of sales of firms in the 3-digit SIC, divided by square of the sum of the sales in the SIC). Sales Hirschman-Herfindahl industry concentration index, computed as the sum of the squares of market shares (based on sales) of firms within a given industry. LEV: leverage, i.e. fraction of assets financed by debt (total debt/total assets). NONAS: nonoperating assets as a fraction of total assets.

Since these represent about 65 and 67 days respectively, they suggest that on average, the last forecasts for the year are issued a little over two months to the year end, well within the fourth quarter of the year, but well before the year end. Therefore, they are not preannouncements. Most of the firms in the sample have BIG 4 auditors (BIG4 mean is 0.9625, median is 1), high institutional holdings (mean INSTPCS is 0.6939, median is 0.7502), significant leverage (mean LEV of 0.2329, some as high as 0.7482), and diverse proportions of nonoperating assets (mean NONAS of 0.0642, maximum of 0.5608).

RESULTS

For a perspective of the univariate relations, we estimate and report correlation coefficients in Table 3. They are all Pearson coefficients. The observations are pooled (not sorted, say by year).

Since the results in this table are based only on pairwise correlation, they are meant to provide a basis for what to expect in the multivariate tests. For example, correlations amongst the independent variables would prompt tests for multicollinearity. From the table, BIAS is negatively associated with INSTPCS (-0.039), BIG4 (-0.054), LEV (-0.061), MUNIF (-0.065), DYNAM (-0.059) and SHERF (-0.034), but positively associated with BUSSD (0.040), GEOSD (0.052), and non-operating investment (0.066). Also, FACC is negatively associated with BIAS, INSTPCS, GEOSD, and NONAS but positively associated

with BUSSD, BIG4, MUNIF, DYNAM, SHERF, and LEV. These stated extracts from the table focus on pairings of the dependent with the independent variables and generally support our conjectures under the prior research section. However, they need to be subjected to scrutiny in a multiple regression setting. Therefore, we skip further discussion of the implications, preferring instead to look at the implications of the relations amongst the independent variables. The table shows that some of the independent variables are significantly correlated. The following pairs are examples: BUSSD and INSTPCS, BIG4 and BUSSD, BIG4 and GEOSD, and LEV and INSTPCS. These necessitate tests for multicollinearity in the multiple regression setting where we assess the incremental association between the forecast attributes and the independent variables. The results of such tests are reported in Table 4 below.

Table 3: Correlation Coefficients for Main Test Variables

Panel A: Correlation between forecast bias and independent variables									
Variable	$BIAS_t$	$INSTPCS_{t-1}$	$BUSSD_{t-1}$	$GEOSD_{t-1}$	$BIG4_{t-1}$	$MUNIF_{t-1}$	$DYNAM_{t-1}$	$SHERF_{t-1}$	LEV_{t-1}
$FACC_t$	-0.580***								
$INSTPCS_{t-1}$	-0.039**								
$BUSSD_{t-1}$	0.040**	-0.037**							
$GEOSD_{t-1}$	0.052***	0.017	0.425***						
$BIG4_{t-1}$	-0.054***	0.060***	0.083***	0.055***					
$MUNIF_{t-1}$	-0.065**	0.059***	-0.045***	-0.025	-0.013				
$DYNAM_{t-1}$	-0.059***	-0.084***	-0.042***	-0.224***	0.002	-0.206***			
$SHERF_{t-1}$	-0.034**	-0.005	-0.045***	-0.194***	-0.149***	0.118***	0.280***		
LEV_{t-1}	-0.061***	-0.046***	-0.009	-0.157***	0.078***	-0.035**	0.115***	-0.051***	
$NONAS_{t-1}$	0.066***	-0.011	-0.006	0.034**	0.029*	0.021	-0.018	-0.109***	-0.148***
Panel B: Correlation between forecast inaccuracy and independent variables									
Variable	$FACC_t$	$INSTPCS_{t-1}$	$BUSSD_{t-1}$	$GEOSD_{t-1}$	$BIG4_{t-1}$	$MUNIF_{t-1}$	$DYNAM_{t-1}$	$SHERF_{t-1}$	LEV_{t-1}
$INSTPCS_{t-1}$	-0.173***								
$BUSSD_{t-1}$	0.011**	-0.037**							
$GEOSD_{t-1}$	-0.022	0.017	0.425***						
$BIG4_{t-1}$	0.095**	0.060***	0.083***	0.055***					
$MUNIF_{t-1}$	0.089**	0.059***	-0.045***	-0.025	-0.013				
$DYNAM_{t-1}$	0.078***	-0.084***	-0.042***	-0.224***	0.002	-0.206***			
$SHERF_{t-1}$	0.058***	-0.005	-0.045***	-0.194***	-0.149***	0.118***	0.280***		
LEV_{t-1}	0.062***	-0.046***	-0.009	-0.157***	0.078***	-0.035**	0.115***	-0.051***	
$NONAS_{t-1}$	-0.060***	-0.011	-0.006	0.034**	0.029*	0.021	-0.018	-0.109***	-0.148***

*This table reports Pearson correlation coefficients for the main test variables that are examined. The variables are defined in Table 2. Significance at 1% or better, 5% or better and 10% or better are denoted by ***, **, and * respectively.*

In Table 4, based on models 1 and 2 from the methodology section, we estimate separate regressions with forecast attributes (bias and inaccuracy respectively) on earnings relevant factors (operations, investments, and financing), disclosure quality and industry structure. In Panel A, we consider all the independent variables directly. In Panel B, we control for industry using dummies for which we do not report the test statistics, as is customary with most prior research. As suggested by the results discussed under Table 3 above, we estimate "Variance Inflation Factors" (VIF) in each model to infer the incidence of collinearity. Since the VIFs are all less than 2, the results are not afflicted by collinearity.

From the table, BUSSD and GEOSD are both insignificant in both Panels A and B. This suggests that for the sample, complexity of operating activities is not a determinant of management forecasts bias and inaccuracy. Since Thomas (2002) and in particular Duru and Reeb (2002) suggest that these firm attributes are associated with poor attributes of analysts' forecasts, then the differences in these results suggest that diversified firms characterize more information asymmetry between managers and the analysts. The table shows that NONAS (the proportion of investments) is positively associated with bias (1.1913 and 0.5960 in Panels A and B) but negatively associated with forecast inaccuracy (-1.3920 and -0.9400 in Panels A and B). This suggests that the relative liquidity of these assets compared to operating assets such as equipment and land, allows management to deploy them with more flexibility to source profits and meet or beat their own forecasts, and to reduce forecast errors. Similar to the results on diversification, this finding contrasts with prior research relating analysts' forecasts to investments

(Anabila, 2012). Financing structure (LEV) is negatively associated with bias (-0.7849 and -0.8198 in Panels A and B) but positively associated with forecast inaccuracy (1.1916 and 1.3563 in Panels A and B). This suggests that debt financing, likely due to the potential volatility introduced by the interest charge, reduces the predictability of earnings even by management. Further, the scrutiny of lenders makes it difficult for managers to manage earnings towards their reporting objective, which is to beat the forecasts. For disclosure quality, INSTPCS is negatively associated with forecast bias (-0.3483 and -0.2063 in Panels A and B) and negatively associated with inaccuracy (-2.1129 and -2.3319 in Panels A and B). These suggest that institutional holdings constitute a source of pressure on management to be optimistic but the managers are less capable of managing their earnings. Audit quality (BIG4) is negatively associated with bias (-0.1219 and -0.1459 in Panels A and B) but positively associated with inaccuracy (0.5079 and 0.4993). These suggest that clients of BIG 4 auditors are optimistic, but are also tend to be inaccurate in their predictions likely at least in part because their auditors limit their ability to manage their earnings to meet or beat their forecasts.

Table 4: Regression of Forecast Bias and Accuracy on Determinants

	Model 1		**Model 2**	
Variable	**Slope**	**VIF**	**Slope**	**VIF**
Panel A: Controls for fundamental industry attributes				
Intercept	0.4489	0.00	1.9682***	0.00
$BUSSD_{t-1}$	0.0969	1.26	0.1605	1.26
$GEOSD_{t-1}$	0.1470	1.35	0.1165	1.35
$NONAS_{t-1}$	1.1913***	1.04	-1.3920***	1.04
$INSTPCS_{t-1}$	-0.3483**	1.04	-2.1129***	1.04
$SIZA_{t-1}$	0.0649**	1.24	-0.1895***	1.24
$BIG4_{t-1}$	-0.1219**	1.05	0.5079*	1.05
LEV_{t-1}	-0.7849***	1.14	1.1916***	1.14
$HORIZON_t$	-0.3270***	1.27	0.3610***	1.27
$OBSCIG_t$	0.0725***	1.34	-0.0970***	1.34
$SHERF_{t-1}$	-0.5380***	1.26	2.3049***	1.26
$DYNAM_{t-1}$	-5.4145***	1.23	7.7484***	1.23
$MUNIF_{t-1}$	-1.1989**	1.09	1.1464**	1.09
Adj. Rsq.	*0.0371*		*0.0684*	
Panel B: Controls for industry groups (dummies), omits their parameters				
Intercept	1.1699	0.00	1.8686	0.00
$BUSSD_{t-1}$	0.1063	1.32	0.2156	1.32
$GEOSD_{t-1}$	0.0573	1.62	0.1487	1.62
$NONAS_{t-1}$	0.5960*	1.10	-0.9400**	1.10
$INSTPCS_{t-1}$	-0.2063**	1.07	-2.3319***	1.07
$SIZA_{t-1}$	0.0710**	1.36	-0.1861***	1.36
$BIG4_{t-1}$	-0.1459**	1.04	0.4993*	1.04
LEV_{t-1}	-0.8198***	1.19	1.3563***	1.19
$HORIZON_t$	-0.3088***	1.28	0.3238***	1.28
$OBSCIG_t$	0.0743***	1.34	-0.0870***	1.34
Adj. Rsq.	*0.0620*		*0.0875*	

*This table reports results for regressions of forecast bias and inaccuracy on fundamentals for operating, investing, financing, and control activities, as well as other determinants. All variables are defined in Table 2. VIF refers to "Variance Inflation Factor", and Adj.Rsq refers to "Adjusted R-Square". The total number of observations (N) equals 3,894 (see Table 1). Significance at 1% or better, 5% or better and 10% or better are denoted by ***, **, and * respectively.*

As discussed in earlier sections, size (SIZA) proxies for litigation risk, forecast frequency (OBSCIG) proxy for frequency of revisions and improvement in information, and forecast horizon (HORIZON) proxies for staleness of information. These are control variables based on prior research (Guo et al., 2011). Thus, big firms are less inclined to mislead or issue erroneous forecasts, so it makes sense that SIZA is positively (negatively) associated with bias (inaccuracy) as per the results. The implication of forecast frequency is similar to that for size, which is consistent with the results. From the table, the longer the forecast horizon, the higher the forecast bias and inaccuracy because forecasts issued earlier would not benefit from recent information.

The industry structure variables are each negatively associated with forecast bias (-1.1989 for MUNIF, -5.4145 for DYNAM, and -0.5380 for SHERF) and positively associated with forecast inaccuracy (1.1464, 7.7484 and 2.3049 for MUNIF, DYNAM and SHERF respectively). This suggests that the industry structure variables are essentially uncertainty indicators. The abundance of sales growth, volatility of sales growth, and concentration in the industry have a positive impact on optimism bias and inaccuracy of the managers' forecasts. Prior research tends to control for industries using dummies, the estimates for which are discarded afterwards because they do not provide any meaning. Here, the slope estimates for specific industry attributes provide a basis for inference. Clearly, the industry structure is external to the firm and accordingly, developments in the external environment tend to be beyond the control of management. This intuition is consistent with the results.

Overall, the results show that managerial forecast errors are due not only to incentive reasons but also to genuine uncertainty on the part of management. The evidence shows that managers, especially of large firms which are the most exposed to litigation costs, cope partly with such costs by issuing pessimistic forecasts. However, managers seem to lack mechanisms to cope with the pressure that factors like the industry structure, institutional holdings, auditors and market participants put on them, for both high expected and realized earnings. This explains why some firms have stopped issuing quantitative forecasts even after increased safe harbor provisions.

SUMMARY AND CONCLUSION

Prior research has focused largely on the implications of managerial incentives for managerial forecast bias and inaccuracy. This study shows that management forecasts exhibit an optimism bias on average. The bias and inaccuracy are associated with the firm's earnings-relevant factors, disclosure quality and industry attributes, apart from the managerial incentive factors examined by prior research. The safe harbor provisions may be helping some firms to forecast earnings to the public. However, they lack a mechanism to cope with the pressure that market participants put on managers, for both high expected and high realized results. This explains why some firms have stopped issuing quantitative forecasts even after increased safe harbor provisions. Also, some determinants of forecast attributes identified in this study, such as industry concentration, dynamism, and munificence are beyond the control of management. Such factors expose management to a threat of litigation. On the other hand, factors within the firm, such as diversification and leverage are well under management control and should not be the source of management forecast inefficiency. If management is supported to forecast earnings, they would reduce the information asymmetry in the public that is attributable to such internal factors. Our study focused on the bias and accuracy of forecasts because they are readily measurable and constitute the focus of most prior research. We found interesting results as discussed above. Another construct that is often used in connection with forecasts is precision (the converse of dispersion). This is a more difficult construct to use for management forecasts. This is because unlike in the case of analysts' forecasts where several analysts provide forecasts on one firm, based on which dispersion can be assessed, we usually we have one management team issuing forecasts on each firm. However, future research can construct precision based say on the nature and types (e.g. range, qualitative, ceiling or floor) of management forecasts and examine whether the independent variables of this study explain precision. Also, our study is limited to data that is available in FIRSTCALL and so is limited to the USA. This limitation is suffered by all prior research in this area and beyond. Future research can extend our analysis to outside the USA to provide an international perspective on how to improve firms' information environment by encouraging and supporting management to issue earnings guidance and forecasts.

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WHEN DO COMPANIES FUND THEIR DEFINED BENEFIT PENSION PLANS?

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ABSTRACT

This paper extends the accounting academic literature on pension funding strategy by looking at a more recent data set, directly examining contributions to defined benefit pension plans, and considering the effect of changing economic conditions over time on pension plan funding. I find that the average funded status of defined benefit pension plans has changed over time in response to changing market conditions. In addition, managers respond to these changes differently depending on firm specific incentives to make contributions to their pension plans. I find that companies that have employees protected by unions, more costly plans, higher levels of cash from operations, higher levels of plan underfunding, tax incentives, and debt contracting incentives contribute more to their pension plans. In contrast, I find that companies with other investment opportunities for their free cash, and companies with pension plans assets earning higher returns contribute less to their pension plans. This paper has implications for regulators and standard setters considering how to deal with pension funding shortfalls, accounting professionals auditing companies with pension plans, CFOs determining their company's pension funding strategy, and investors and creditors evaluating the risks that companies with defined benefit pension plans are taking on.

JEL: J32, M41, M59

KEYWORDS: Accounting for Defined Benefit Pension Plans, Pension Plan Funded Status

INTRODUCTION

There has been a growing concern about the ability of corporations to provide retirement benefits to their employees. In recent years, there has been a shift away from the generous retirement benefits packages of the 1970s and 1980s towards defined contribution plans, such as 401(k) plans (Munnell and Soto 2007). However, some companies are still providing defined benefit pension plans (hereafter pension plans), which are more expensive on average, to their employees. In addition, companies that have reduced retirement benefits or closed participation in pension plans to new employees still face the costs of funding the plans for retirees whose benefits were protected from plan changes.

Companies regularly lobby Congress for pension funding relief. As an example, in 2004 Congress responded to pressure from large corporations with unfunded pension plans and changed the way that companies calculate the pension obligation for purposes of the legal funding requirements (Walsh 2004). More recently, AT&T has requested approval to contribute preferred equity to its pension plan in lieu of a cash contribution (Chasan 2013) and a coalition of companies and labor unions is petitioning Congress to change the law to allow the benefits of retired employees to be cut (Hicken 2013). This paper examines two related research questions about the funding of pension plans. First, how has the average funded status of the pension plans of U.S. publicly traded companies varied over time in response to changing market conditions? Second, what are the determinants of companies' pension plan funding strategies?

I first evaluate the average pension plan funded status for all U.S. publicly traded companies with pension plans during the period 1998 to 2006. The funded status of most pension plans should reflect current economic conditions because the benefit obligation should be measured using the yield on high quality

corporate bonds, and pension assets are largely comprised of stocks and bonds. As expected, I find that pension plans were overfunded on average in the late 1990s when the stock market was doing well, and became underfunded on average when the stock market declined in 2000, 2001, and 2002. To make up for this decline, companies have tripled their level of contributions over the 1998 to 2006 time period.

I next investigate the determinants of pension plan contributions. Based on a review of the literature, I identify several incentives that managers have to make or withhold contributions to their pension plans. I find that older companies, companies whose employees are protected by unions, and companies with more costly plans contribute more to their pension plans. Companies who are generating higher levels of cash from operations also contribute more to their pension plans. This is after controlling for other investment opportunities, which are associated with a lower level of pension contributions. Extreme underfunding triggers legal requirements to make up the shortfall, and I find that companies with more underfunded plans in the previous year contribute more in the current year. Finally, companies contribute more when they have tax incentives and debt contracting incentives to do so.

This paper makes several important contributions. First, it extends the accounting academic literature on pension funding strategy (see, e.g., Francis and Reiter 1987; Asthana 1999) by looking at a more recent data set, directly examining contributions to pension plans, and considering the effect of changing economic conditions over time on pension plan funding. Second, the findings of this paper should be of interest to regulators and standard setters considering how to deal with pension funding shortfalls. Third, the findings of this study are relevant to accounting professionals dealing with accounting for and auditing companies with pension plans, CFOs determining their company's pension funding strategy, and investors and creditors evaluating the risks that companies with pension plans are taking on.

The remainder of this paper is organized as follows. The next section reviews the literature. The following section describes the methodology, research design and sample selection. Next the results are reported and the final section concludes the paper.

LITERATURE REVIEW

Pension Plan Funded Status over Time

I first evaluate the average funded status of the pension plans of all U.S. publicly traded companies. The funded status is defined as the fair value of retirement plan assets less the expected liability or projected benefit obligation (PBO). The PBO is defined as the actuarial present value of future retirement benefits attributed to service rendered to date and should be based on estimated future events such as compensation increases, turnover, and mortality (Financial Accounting Standards Board (FASB) 1985). To estimate the PBO, management must make several assumptions, such as what the employees' salaries will be at the time of retirement, how long the employees are expected to live, and what the appropriate discount rate is to estimate the present value of the future benefits.

The funded status of most pension plans should reflect current economic conditions. Pension plans typically invest in a mix of stocks and bonds, and as the stock market grows or declines, pension plans realize gains or losses on the pension plan assets. I expect that the pension plan funded status will be positively related to stock market returns. In addition, the discount rate used to estimate the PBO should be based on the rate at which the retirement benefit could be effectively settled and should reflect the return on high quality fixed-income investments (FASB 1985). The Securities and Exchange Commission (SEC) staff considers securities receiving one of the two highest ratings given by a recognized ratings agency to be high quality (e.g., a rating of Aa or higher by Moody's Investors Service). I expect that the pension plan funded status will be positively related to the yield on high quality fixed-income investments (a higher discount rate results in a lower PBO and a higher funded status).

Determinants of Pension Plan Contributions

Although the Employee Retirement Income Security Act of 1974 (ERISA) requires a certain level of plan funding, companies have some flexibility due to things like the ability to make up funding shortfalls over a number of years (Munnell and Soto 2007). Companies may or may not choose to fully fund their pension plans depending on regulatory requirements, economic conditions, and company specific incentives. In this section, I identify five broad determinants of pension plan funding: firm characteristics related to the overall cost of the plan, financial constraints faced by the firm, the extent of underfunding, tax incentives, and opportunity costs.

Firms with more costly pension plans will have a higher PBO and will have to contribute more to the pension plan to maintain the same funding level as firms with less costly plans. I identify five indications of a more costly pension plan. First, defined benefit pension plans are more prevalent among larger, older companies. In the early 1980s, most workers with pensions were covered by defined benefit plans, and since that time there has been a shift towards defined contribution plans (such as a 401 (k) plan) (Munnell and Soto 2007). In addition, older companies are more likely to have a more mature workforce and may have to contribute more to older plans to cover the payments to retirees (Munnell and Soto 2007). I expect that larger companies and older companies will contribute more to their pension plans.

Another indication of a more costly plan is the presence of organized labor. Unions negotiate on the employees' behalf to obtain a good benefits package. In addition, companies with a significant union presence are less likely to freeze a retirement plan or reduce retirement benefits due to the difficulty of negotiating a plan freeze with the union (Munnell and Soto 2007; Atanasova and Hrazdil 2010; Comprix and Muller 2011). If a company can't reduce retirement benefits, then additional benefits will continue to accrue to the employees and additional contributions will have to be made. I expect that highly unionized companies will contribute more to their pension plans.

The cost of a pension plan is directly related to the number of workers employed by a company and the terms of the pension plan (i.e., the pension benefit formula). I expect that companies that increase the number of employees will contribute more to their pension plans. Conversely, companies that reduce the number of employees through restructurings or other activities should be able to contribute less to their pension plans. Finally, the overall cost of the pension plan should ultimately be reflected in the yearly pension expense. I expect a positive relation between pension expense and pension plan contributions.

Another determinant of pension plan funding is financial constraints faced by the company. One type of financial constraint is the level of leverage maintained by a company. Companies with high levels of leverage often face debt contracting issues in the form of debt covenant restrictions and performance pricing provisions (Duke and Hunt 1990; Press and Weintrop 1990; Asquith et al. 2005). In addition, large unfunded pension liabilities are associated with bond default risk and bond rating downgrades (Wang and Zhang 2013). Therefore, companies with a large amount of debt have incentives to fund their pension plans to prevent bond rating downgrades, as well as debt covenant violations and performance pricing triggers related to leverage ratios. I expect that highly levered companies will contribute more to their pension plans.

A second type of financial constraint relates to the ability to fund the pension plan through operating cash flows. Companies with strong operating cash flows have the resources to fund their pension plan, and pension plans are a good place to store internal funds because of favorable tax treatment (Francis and Reiter 1987). I expect a positive relation between pension expense and pension plan contributions.

The extent of underfunding is a third determinant of a company's pension funding strategy. Under ERISA companies are required to contribute to a pension plan when the level of funding falls below a certain

ratio, and companies with extreme underfunding are at greater risk of being subject to additional funding requirements (Munnell and Soto 2007). Due to the legal requirements to fund pension plans, I expect a negative relation between the extent of plan funding and pension plan contributions. In other words, companies with overfunded plans will contribute less and companies with underfunded plans will contribute more.

As discussed in the previous section, companies do not have complete control over the funded status of their pension plans due to changing market conditions. As market conditions improve, the pension plan assets earn a higher return on the invested stocks and bonds and the opposite occurs when market conditions deteriorate. As the funded status improves due to a higher return on plan assets, then companies will be obligated to contribute less of their operating cash. Therefore, I expect a negative relation between the return on pension plan assets and pension plan contributions.

A fourth determinant of pension plan funding is a company's tax incentives. Contributions to an employer sponsored pension plan are tax deductible for the company (Munnell and Soto 2007). Therefore, companies with higher marginal tax rates have a greater incentive to make contributions due to the tax deduction than companies with lower marginal tax rates (Francis and Reiter 1987). However, once the plan assets exceed a certain level of funding, any contributions made to the plan are not tax deductible (Asthana 1999; Munnell and Soto 2007). I expect that companies with underfunded plans and high marginal tax rates will contribute more to their pension plans.

Finally, companies have a finite amount of internally generated operating funds and retirement plan contributions divert resources from other investing opportunities. Rauh (2006) finds that companies with high capital expenditures contribute less to their pension plans. In other words, companies with investment opportunities to spend their money on are less likely to contribute to their pension plan once their minimum obligations are met. Therefore, I expect a negative relation between capital expenditures and pension plan contributions.

DATA AND METHODOLOGY

Sample Selection

I select a sample of U.S. companies with pension plans that have the necessary data for the 1998 to 2006 time period. The sample begins in 1998 because that is the year when data on pension contributions is available on Compustat, which allows the study to cover the entire universe of publicly traded companies with pension plans. In each regression, outliers were removed by excluding the top and bottom 1% of all continuous variables. The final sample has 6,945 annual observations and is comprised of 1,606 firms.

Research Design

In the previous section, I first discussed reasons why the funded status of pension plans is expected to vary over time due to changing economic conditions. I examine this empirically by looking at the average change in the funded status of pension plans over time, as well as the change in the PBO and plan assets. I compare this change to market information that is expected to be related to the pension plan funded status: the return on large company stocks, the return on long-term corporate bonds, and the yield on high quality corporate bonds.

I next identified several determinants of companies' pension plan funding strategy: firm characteristics related to the overall cost of the plan, financial constraints faced by the firm, the extent of underfunding, tax incentives, and opportunity costs. I use these determinants to develop the following regression model explaining pension plan contributions:

$$CONTR_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 FIRMAGE_{it} + \beta_3 UNION_{it} + \beta_4 \Delta EMP_{it} + \beta_5 COST_{it} + \beta_6 DEBT_{it-1} + \beta_7 CFO_{it} + \beta_8 FUNDSTAT_{it-1} + \beta_9 RETURN_{it} + \beta_{10} MTR_{it} + \beta_{11} CAPX_{it} + \sum_{j=0}^{7} \beta_{12+j} IND_j + \varepsilon_{it} \quad (1)$$

The dependent variable ($CONTR_{it}$) is the company contribution to the pension plan in year t, deflated by total assets. Included in each regression but not reported in the tables are dummy variables to control for industry differences at the one-digit SIC code level (IND_j).

The first five independent variables capture firm characteristics that are indications of the overall cost of the plan. Larger firms tend to have more extensive retirement packages. Firm size ($SIZE_{it}$) is defined as the log of the market value of equity. Older firms are expected to have a more mature workforce and more retirement age employees, and companies may have to contribute more to older plans to cover the payments to retirees. The age of the firm ($FIRMAGE_{it}$) is defined as the number of years that Compustat has reported information on the company. Companies with a significant union presence are more likely to provide generous retirement benefits and less likely to freeze a retirement plan. Following D'Souza et al. (2001), I define the variable $UNION_{it}$ as 1 if greater than fifty percent of the employees belong to a union, and 0 otherwise. Events like expansion or restructuring lead to growth or decline in the pension plan. I capture this using the change in the number of employees (ΔEMP_{it}), deflated by total assets. Finally, I define the overall cost of the plan ($COST_{it}$) as the average pension expense over the past two years, deflated by total assets. When pension plans are more costly, companies are expected to make larger contributions to cover the higher cost. Therefore, I expect a positive relation between company contributions ($CONTR_{it}$) and $SIZE_{it}$, $FIRMAGE_{it}$, $UNION_{it}$, ΔEMP_{it}, and $COST_{it}$.

The next two independent variables capture the financial constraints faced by the firm. I use the ratio of total liabilities to total assets ($DEBT_{it-1}$) as a measure of leverage. Beginning of the year leverage is used to capture the level of leverage before any contributions made that year. I expect that companies with a higher level of debt will contribute more to their pension plan to improve the funded status to improve or maintain bond ratings and manage performance pricing provisions. Therefore, I expect a positive relation between company contributions ($CONTR_{it}$) and $DEBT_{it-1}$. Average cash from operations over the past two years, deflated by total assets (CFO_{it}) captures the ability to contribute to the retirement plan out of operating income. I expect a positive relation between $CONTR_{it}$ and CFO_{it}.

$FUNDSTAT_{it-1}$ and $RETURN_{it}$ represent the extent of any underfunding as well as current economic conditions. The magnitude of any underfunding is captured by $FUNDSTAT_{it-1}$, which is the beginning of the year pension plan funded status less the amount recognized on the balance sheet, deflated by total assets. Companies are required by law to contribute to a pension plan when the level of funding falls below a certain ratio. When a plan is unfunded, $FUNDSTAT_{it-1}$ would be negative and I expect a negative relation between $CONTR_{it}$ and $FUNDSTAT_{it-1}$. The percentage return on pension plan assets ($RETURN_{it}$) captures a reduction in the need to fund the plan when the retirement plan assets earn a higher return. This variable also controls for the change in the funded status due to changing market conditions. I expect a negative relation between $CONTR_{it}$ and $RETURN_{it}$.

Until a certain funding level is reached, companies with higher marginal tax rates have a greater incentive to make contributions due to the tax deduction. The variable MTR_{it} is the marginal tax rate if the plan is underfunded, and 0 if the plan assets exceed the PBO. The marginal tax rate data was obtained from John Graham (see Graham and Mills 2008). I expect a positive relation between $CONTR_{it}$ and MTR_{it}.

Finally, firms with investment opportunities to spend their money on are less likely to contribute to their pension plan once their minimum obligations are met. To capture this, I include the average capital expenditures over the past two years, deflated by total assets ($CAPX_{it}$). I expect a negative relation between $CONTR_{it}$ and $CAPX_{it}$.

RESULTS AND DISCUSSION

Pension Plan Funded Status over Time

Table 1 reports descriptive information about the PBO, plan assets, funded status, company contributions, and return on plan assets over the period 1998 to 2006 for all firms in Compustat reporting pension plan information. The projected benefit obligation ranges from 5.03 million for firms in the tenth percentile to 1.8 billion for firms in the ninetieth percentile. This reflects both the obligation and the size of the firms in the sample. Firm size is controlled for in all future analyses. The median firm has an underfunded pension plan of 4.53 million. The extent of plan underfunding is larger than overfunding as can be seen by firms in the tenth percentile having plans underfunded by 172.56 million and firms in the seventy fifth percentile having plans that are just barely funded.

Table 1: Descriptive Information about the Funded Status

(in millions)	10th Percentile	25th Percentile	Median	75th Percentile	90th Percentile
PBO	5.03	18.79	95.00	440.88	1,851.46
Plan Assets	2.69	14.61	81.66	397.77	1,795.00
Funded Status	-172.56	-37.40	-4.53	0.93	62.00
Contributions	0.00	0.20	2.16	12.33	54.21
Return on Plan Assets	-7.81%	0.00%	5.63%	11.97%	17.28%

Shown is descriptive information about the funded status for the final sample of companies with pension plans over the period 1998 to 2006. The funded status is defined as the plan assets less the projected benefit obligation (PBO). Contributions are the amount that the company contributed to the pension plan and the return on plan assets is the actual % return that the pension plan assets earned.

Table 2 reports the average PBO, plan assets, and funded status each year over the 1998 to 2006 time period for all firms in Compustat reporting pension plan information. It also reports information on how much the firms contributed to their pension plans on average and what the average return on pension plan assets was. Finally, Table 2 reports information on the overall market conditions each year: the return on large company stocks, the return on long-term corporate bonds, and the yield on high quality corporate bonds.

Table 2: Funded Status of Defined Benefit Pension Plans over Time

	Average Across All Firms (in millions)					Market Information		
Year	PBO	Plan Assets	Funded Status	Contributions	Return on Plan Assets	Return on Large Company Stocks	Return on Long-term Corporate Bonds	Yield on High Quality Corporate Bonds
1998	765	842	77	16	6.3%	28.58%	10.76%	6.73%
1999	764	978	214	17	7.3%	21.04%	-7.45%	7.87%
2000	764	915	151	14	3.6%	-9.11%	12.87%	7.62%
2001	822	811	-11	13	-4.6%	-11.88%	10.65%	7.41%
2002	915	727	-188	36	-8.3%	-22.10%	16.33%	6.83%
2003	1,019	875	-144	53	16.7%	28.70%	5.27%	6.11%
2004	1,138	982	-156	45	9.7%	10.87%	8.72%	5.81%
2005	1,196	1,051	-145	46	8.1%	4.91%	5.87%	5.85%
2006	1,252	1,194	-58	43	10.1%	15.80%	3.24%	5.77%

Shown is the average across all firms with defined benefit pension plans over the period 1998 to 2006. The funded status is defined as the plan assets less the projected benefit obligation (PBO). Contributions are the amount that the company contributed to the pension plan and the return on plan assets is the actual % return that the pension plan assets earned. The market information is economy-wide and is not restricted to firms with defined benefit pension plans. The return on large company stocks and long-term corporate bonds was obtained from Ibbotson's Stocks, Bills, Bonds, and Inflation. The yield on high quality corporate bonds is the average of the yield on corporate bonds rated Aaa and Baa by Moody's as reported in the monthly Federal Reserve statistical release.

As discussed above, the funded status of most pension plans should reflect current economic conditions because the PBO should be measured using the yield on high quality corporate bonds, and pension assets are largely comprised of stocks and bonds. As expected, pension plans were overfunded in the late 1990s

when the stock market was doing well. More specifically the average pension plan was overfunded by $77 million and $214 million in 1998 and 1999, respectively; years when the average return on large company stocks was 28.58 percent and 21.04 percent, respectively. When the stock market declined in 2000, 2001, and 2002, there was a sizeable decrease in pension plan assets leading to many pension plans becoming underfunded. In addition, the yield on high quality corporate bonds has declined steadily since 1999, leading to higher PBOs and exacerbating the underfunding problem. The highest underfunding occurred in 2002, when the average pension plan was underfunded by $188 million. The largest improvement occurred in 2006, when the average funded status changed from $145 million underfunded to only $58 million underfunded.

The typical pension plan invests in a mix of stocks and bonds and the return on pension plan assets has followed trends in large company stock returns and the return on long-term corporate bonds. More specifically, the return on plan assets was negative in 2001 and 2002 (-4.64 percent and -8.3 percent, respectively) and improved to 16.7 percent when the stock market reported a 28.7 percent rebound in 2003. As you would expect, companies have increased on average their level of contributions to make-up for the deterioration in the funded status over time. More specifically, companies contributed between $13 and $17 million on average during the 1998 to 2001 time period when pension plans were overfunded. The average level of contributions tripled after that as plans became more underfunded. For example, the average company contributed $46 million in 2005 and $43 million in 2006.

Descriptive Statistics

Table 3: Descriptive Statistics and Variable Definitions

	Mean	Std. Dev.	10th Percentile	Median	90th Percentile
$CONTR_{it}$	0.005	0.007	0.000	0.002	0.014
$SIZE_{it}$	7.064	1.977	4.485	7.159	9.559
$FIRMAGE_{it}$	29.222	16.366	7.000	32.000	51.000
$UNION_{it}$	0.087	0.282	0.000	0.000	0.000
ΔEMP_{it}	-0.0001	0.002	-0.001	0.000	0.001
$COST_{it}$	0.003	0.007	-0.002	0.002	0.010
$DEBT_{it-1}$	0.640	0.212	0.372	0.639	0.894
CFO_{it}	0.084	0.058	0.017	0.079	0.160
$FUNDSTAT_{it-1}$	-0.006	0.035	-0.043	-0.003	0.025
$RETURN_{it}$	0.070	0.177	-0.085	0.086	0.185
MTR_{it}	0.193	0.154	0.000	0.272	0.350
$CAPX_{it}$	0.052	0.044	0.013	0.041	0.099

Shown are the descriptive statistics for the final sample of companies used in the regression analyses. The sample covers the period 1998 to 2006 and is comprised of 1,606 firms and 6,945 observations. Outliers are excluded by removing the top and bottom 1% of each continuous variable. All financial variables are deflated by total assets.

Variables are defined as follows:

$CONTR_{it}$ = *company contributions to the defined benefit pension plan;*
$SIZE_{it}$ = *the log of the market value of equity;*
$FIRMAGE_{it}$ = *the age of the firm in years;*
$UNION_{it}$ = *indicator variable equal to 1 if greater than fifty percent of the employees belong to a union, and 0 otherwise; hand-collected;*
ΔEMP_{it} = *change in the number of employees;*
$COST_{it}$ = *average pension expense over the past two years;*
$DEBT_{it-1}$ = *beginning of the year ratio of total liabilities to total assets;*
CFO_{it} = *average cash from operations over the past two years excluding pension contributions;*
$FUNDSTAT_{it-1}$ = *beginning of the year unrecorded pension asset or liability (defined as the funded status less the amount recorded on the balance sheet);*
$RETURN_{it}$ = *actual percentage return on pension plan assets;*
MTR_{it} = *the marginal tax rate if the plan is underfunded and 0 if the plan is overfunded;*
$CAPX_{it}$ = *average capital expenditures over the past two years.*

Table 3 reports descriptive information about the regression variables in model (1) for the entire sample of companies with pension plans. The average company has a mean market value of equity of $1,169

million (size is defined as the natural log of the market value of equity and the natural log of 1,169 equals 7.064). The average firm has also been in business a long time—29 years. This is expected as it is the companies in older, established industries that tend to have defined benefit pension plans. Over the sample period, the average company generated positive cash from operations (mean CFO_{it} of 0.084) and invested in the future through purchasing more property, plant and equipment each year (mean $CAPX_{it}$ of 0.052). Consistent with the information presented in Tables 1 and 2, on average, the sample companies' pension plans were underfunded (mean $FUNDSTAT_{it-1}$ of -0.006).

Determinants of Pension Plan Contributions

The results from estimating model (1) are reported in Table 4. With two exceptions ($SIZE_{it}$ and ΔEMP_{it}), the results are consistent with the expectations developed in the literature review section. The $SIZE_{it}$ variable is insignificantly different from zero. This may be due to lack of variation in this variable as the sample is comprised of large, mature firms with defined benefit pension plans. As expected, the age of the firm ($FIRMAGE_{it}$) is positively related to pension plan contributions (p>0.01). Older companies often have to make additional contributions to cover payments to retirees. This might also explain the insignificance of $SIZE_{it}$ as older companies also tend to be larger.

Table 4: Determinants of Pension Plan Contributions

	Coefficient	t-statistic
Intercept	-0.0002	-0.36
$SIZE_{it}$	-0.00004	-0.93
$FIRMAGE_{it}$	0.00004***	8.11
$UNION_{it}$	0.001***	3.67
ΔEMP_{it}	-0.135***	-3.16
$COST_{it}$	0.386***	30.89
$DEBT_{it-1}$	0.002***	5.54
CFO_{it}	0.009***	6.24
$FUNDSTAT_{it-1}$	-0.037***	-15.24
$RETURN_{it}$	-0.001***	-2.55
MTR_{it}	0.003***	6.21
$CAPX_{it}$	-0.007***	-3.52
Number of observations	6,945	
Adjusted R^2	0.315	

Shown are the results from a regression of company contributions to the defined benefit pension plan ($CONTR_{it}$) on the log of the market value of equity ($SIZE_{it}$), the age of the firm in years ($FIRMAGE_{it}$), an indicator variable equal to 1 if greater than fifty percent of the employees belong to a union ($UNION_{it}$), the change in the number of employees deflated by total assets (ΔEMP_{it}), the average pension or postretirement expense over the past two years deflated by total assets ($COST_{it}$), the beginning of the year ratio of total liabilities to total assets ($DEBT_{it-1}$), the average cash from operations over the past two years excluding pension contributions deflated by total assets (CFO_{it}), the beginning of the year unrecorded pension asset or liability deflated by total assets ($FUNDSTAT_{it-1}$), the actual percentage return on pension plan assets ($RETURN_{it}$), the marginal tax rate if the plan is underfunded and 0 if the plan is overfunded (MTR_{it}), and average capital expenditures over the past two years deflated by total assets ($CAPX_{it}$). The sample covers the period 1998 to 2006 and is comprised of 1,606 firms and 6,945 observations. Outliers are excluded by removing the top and bottom 1% of each continuous variable.

****Significantly different from zero at the 0.01 level based on a t-test.*

There is a positive relation between $CONTR_{it}$ and both $UNION_{it}$ and $COST_{it}$ (p>0.01), indicating that companies contribute more to their pension plan when the plan is more costly. In addition, companies with organized labor have less flexibility when it comes to reducing or freezing benefits, which leaves them in a position where they have to make contributions to the plan to maintain funding levels. Contrary to expectations, there is a negative relation between $CONTR_{it}$ and ΔEMP_{it}. On average, companies that reduce their workforce make greater contributions to their pension plan. This may be related to increasing funding to cover workers laid-off as part of restructuring plans.

Companies with higher debt contribute more to their pension plan, as can be seen by the positive relation between $CONTR_{it}$ and $DEBT_{it-1}$ ($p>0.01$). This is consistent with managers of high debt companies funding their pension plan to avoid bond rating downgrades and debt covenant problems. In addition, there is a positive relation between $CONTR_{it}$ and CFO_{it} ($p>0.01$). Companies have a higher level of contributions to their pension plans when they have the ability to fund the plan due to a higher level of cash from operations. This is after controlling for alternative investment opportunities (captured by $CAPX_{it}$) and is consistent with the idea that pension funds are a good place to store internal funds (see Francis and Reiter 1987).

Companies with extremely underfunded plans contribute more to their pension plan, as can be seen by the negative relation between $FUNDSTAT_{it-1}$ and $CONTR_{it}$ ($p<0.01$). This is expected because companies need to meet minimum funding requirements. The pressure to fund the pension plan through cash contributions is lessened when the pension plan assets earn a high rate of return and the plan effectively becomes self-funding. This is captured by the negative relation between the return on plan assets ($RETURN_{it}$) and $CONTR_{it}$ ($p<0.01$).

There is a positive relation between MTR_{it} and $CONTR_{it}$ ($p<0.01$). Companies with higher tax rates make larger contributions to the pension plan as they benefit more from taking a deduction for the contribution. Finally, consistent with Rauh (2006), I find a negative relation between $CAPX_{it}$ and $CONTR_{it}$ ($p<0.01$). Companies with other investment opportunities contribute less to the plan.

CONCLUSION

In recent years, many corporations have struggled with how to provide retirement benefits to their employees and how to fund pension plans that are growing increasingly more expensive. This paper examines two related research questions about the funding of pension plans. First, how has the average funded status of the pension plans of U.S. publicly traded companies varied over time in response to changing market conditions? Second, what are the determinants of companies' pension plan funding strategies?

I first evaluate the average pension plan funding for all U.S. publicly traded companies with pension plans during the period 1998 to 2006. As expected, I find that pension plans were overfunded on average in the late 1990s when the stock market was doing well, and became underfunded on average when the stock market declined in 2000, 2001, and 2002. To make up for this decline, companies have tripled their level of contributions over the 1998 to 2006 time period. I next investigate the determinants of pension plan contributions. I find that older companies, companies whose employees are protected by unions, companies with more costly plans, companies who are generating higher levels of cash from operations, and companies with more underfunding contribute more to their pension plans. In contrast, companies with other investment opportunities contribute less to their pension plans. Finally, companies contribute more when they have tax incentives and debt contracting incentives to do so.

This paper has implications for regulators and standard setters considering how to deal with pension funding shortfalls, accounting professionals dealing with accounting for and auditing companies with pension plans, CFOs determining their company's pension funding strategy, and investors and creditors evaluating the risks that companies with pension plans are taking on. I document that the funded status of pension plans is very sensitive to changing market conditions, making it difficult for companies to manage the funding levels of their plans even when they are diligent about making contributions. In addition, although companies are legally required to maintain a certain level of funding, the legal funding rules provide flexibility, such as allowing several years to make up a funding shortfall. This allows companies choices about when to fund their plans and this study documents that their cash contributions are correlated with firm specific incentives such as tax benefits and alternative opportunities for use of

funds. Investors and creditors should evaluate whether a company's pension funding levels give rise to additional risk (such as not being able to make legally required contributions). In addition, auditors should consider whether a company's funding strategy leads to higher audit risk in situations where the contributions are lower than expected.

This paper has a couple of limitations. First, the sample period of 1998 to 2006 was chosen because it is a recent time period with a range of stock market returns that reflect average economic conditions experienced by companies. The sample was purposely not extended to the financial crisis that occurred in 2008 and the subsequent recovery because this period may not be generalizeable to other years. An interesting extension of the study would be to examine whether the results differ around the time of the financial crisis. Second, this study uses publicly available data from companies' financial statements. Form 5500 (filed with the Internal Revenue Service) contains additional information that may be helpful in understanding companies funding strategies, such as the ratio of active to retired employees. An interesting area for future research would be to hand-collect data from the form 5500 for a small sample of companies in order to more fully investigate tax and other funding incentives.

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BIOGRAPHY

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MARGINAL TAX RATES AROUND THE HAWAII ITEMIZED DEDUCTION CLIFF

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ABSTRACT

The State of Hawaii allows paid State taxes as an itemized deduction on the State income tax return. The deduction is available only for individuals with Federal adjusted gross income less than $200,000. Hawaii also limits total itemized deductions to $50,000 for individuals with Federal adjusted gross income of $200,000 or above. These provisions create a tax cliff that implies extraordinary marginal tax rates. The added dollar of income from $199,999 to $200,000 triggers a loss of the entire tax paid deduction and caps itemized deductions at $50,000. We compute marginal tax rates for adjusted gross income levels around the $200,000 tax cliff. *Results indicate marginal tax rates reach levels as high as 367,100 percent. The paper provides taxpayers with concise information regarding the importance of these Hawaii tax cliffs and suggests policy changes.*

JEL: H2, H71

KEYWORDS: Hawaii State Taxes, Marginal Tax Rates

INTRODUCTION

Hawaii tax provisions include a tax cliff related to itemized deductions. The tax cliff has two components. The first component results from a provision that State taxes paid are deductible for married filing joint (MFJ) returns reporting Federal AGI below $200,000. However, the tax is not deductible for MFJ returns reporting Federal adjusted gross income (AGI) of $200,000 or above. The second component limits the sum of all itemized deductions to $50,000 for MFJ returns reporting $200,000 or more of Federal AGI. A provision that reduces itemized deductions by 3 percent for each dollar of Federal AGI in excess of $166,800 further exacerbates the cliff.

This paper explores implications of the Hawaii Itemized Deduction Tax Cliff for taxpayers and recommends policy changes. Hawaii is one of several states to adopt itemized deduction limitations. However, other states, under pressure to increase revenues, may adopt similar policies or modify existing policies, which further explains our motivation for this study. Moreover, the Federal Tax Code is scheduled to impose itemized deduction limitations in 2013 through a provision called the Pease Limitation. These limitations will reduce certain Federal itemized deductions to the lesser of (1) 3% of the adjusted gross income above a certain amount, or (2) 80% of the itemized deductions otherwise allowed for the year. The results here provide some guidelines on how best to implement these Federal limitations. The results will also be useful for Hawaii taxpayers who must manage their income around these limitations through extensive tax planning.

Identification of marginal tax rates is important both for taxpayers and tax authorities (Scholes, Wolfson, Erickson, Maydew and Shevlin, 2005) whether or not a tax cliff is involved. On occasion tax laws impose unusually high or low marginal tax rates that motivate various behaviors among taxpayers clustered by income level, a phenomenon often referred to as *tax clienteles* (Scholes et al., 2005). In some situations these behaviors may be desired such as the case of tax credits associated with the installation of solar devices. In other situations the behavior may not be desired such as the use of IRA's

as a short-term income management tool (Jalbert, Fleischman and Jalbert, 2009). Extreme marginal tax rates can provide important motivations for small businesses to locate in one area or another.

The remainder of the paper is organized as follows. In the next section the paper discusses relevant Hawaii tax laws. The following section provides a review of the extant literature. Next, we compute marginal tax rates for income levels around the Hawaii tax cliffs. The paper closes with some policy recommendations and concluding comments that are applicable to policymakers in Hawaii as well as other states and the Federal government.

HAWAII TAX LAW

The State of Hawaii collects tax revenues through four primary sources: general excise taxes (GET) transient accommodations taxes (TAT), individual income tax (IIT) and corporate income taxes (CIT). Other taxes in Hawaii include the Fuel Tax, Unemployment Insurance Tax, Cigarette and Tobacco Tax, Insurance Premium Tax, Public Service Company Tax, Motor Vehicle Taxes and Fees, Liquor Tax, Conveyance Tax, Banks and other Financial Corporations Tax and Estate and Transfer Tax (2012 Study of Hawaii Tax System).

The Hawaii GET is based on gross proceeds of sales or income of businesses. It is responsible for about 57.6 percent of General Fund revenue. The tax is set a 4 percent. The county of Honolulu levies a 0.5 percent GET surcharge. GET tax is due on the tax collected, raising the effective tax rate to 4.686 and 4.166 for activities inside and outside of Honolulu County respectively (2012 Study of Hawaii Tax System, Final Report, p. 40-42).

The transient accommodation tax rate equals 9.25 percent. The tax is levied on the amount charged for rooms or apartments that will house a visitor who lives in the room for 180 consecutive days or less. Most receipts from this tax pass on to the respective counties within Hawaii. This TAT is responsible for 5.4 percent of total revenue and 1.4 percent of General Fund revenue (2012 Study of Hawaii Tax System, Final Report, p. 44-45).

The Hawaii Corporate Tax Rate ranges from 4.4 percent on income up to $25,000 to 6.4 percent on income over $100,000. State collections from this tax have declined by 19.4 percent since 2007. This may be attributable in part to tax loss carry forwards and carry backs (2012 Study of Hawaii Tax System, Final Report, p. 55). It may also be due to small business opting for non-corporate organizational forms.

The Hawaii Individual Income Tax is the second largest revenue generating tax, responsible for 28.8 percent of General Fund revenue. The Hawaii income tax has twelve brackets. The State income tax rate for married couples filing a joint return ranges from 1.4 percent on income up to $4,800 ($2,400 for single filers and $3,600 for head of household filers) to 11 percent on incomes over $400,000 ($200,000 for single filers and $300,000 for head of household filers). The standard deduction in Hawaii for the 2012 tax year is $4,000 for Married couples filing a joint return ($2,000 for Single or Married Filing Separate returns and $2,920 for Head of Household). This is an important consideration. Because of these low thresholds, itemized deductions are perhaps a more important element of State taxes in Hawaii than in other states. The low standard deduction levels provide considerable motivation for taxpayers to itemize their deductions (2012 Study of Hawaii Tax System, Final Report, p. 42-43).

In general, expenses that qualify for itemizing in the state of Hawaii include medical and dental expenses that exceed 7.5 percent of State AGI, interest expense on home mortgages and on Investments, contributions to charities, casualty and theft losses that exceed ten percent of Hawaii AGI and State taxes paid. However, for tax years after 2010, the State placed some limitations on the amount of itemized deductions that can be claimed (Hawaii Tax 2012 form N-11, Itemized Deduction Worksheet).

Hawaii tax law specifies that taxpayers may take their choice of paid State income taxes or Hawaii paid GET tax as an itemized deduction on the state return. Hawaii Senate Bill 570 provides limitations on the extent to which income taxes paid can be deducted on the State return. It also provides a limitation on the total itemized deductions that can be claimed on the State return (Hawaii Senate Bill 570, 2011). These provisions have the effect of creating a tax cliff.

The first tax cliff component results from a provision that the deduction for State taxes paid is allowed only if Federal adjusted gross income is less than $100,000 for single or married filing separately taxpayers, less than $150,000 for head of household taxpayers, or less than $200,000 for married taxpayers filing a joint return or qualifying widow or widower. Thus, taxes paid are entirely deductible, or entirely non-deductible, when AGI changes by a single dollar. Crossing the tax cliff implies the loss of a substantial tax deduction.

The second tax cliff component relates to a provision that establishes an itemized deduction limit for taxpayers with Federal AGI exceeding a threshold. For taxpayers having Federal AGI of $200,000 or higher, the State itemized deduction is limited to $50,000. The provision limits itemized deductions to $37,500 for Head of Household taxpayers with Federal AGI above $150,000 and $25,000 for Single Taxpayers with Federal AGI above $100,000. These deduction limits are scheduled to expire on December 31, 2015. Hawaii Senate Bill 1091 entered January 24, 2013 also proposes to exempt charitable contributions from these limitations. As of March 2013 this exemption law has not been passed.

Another Hawaii provision that states the sum of all itemized deductions must be reduced by 3 percent for each dollar of Federal AGI in excess of $166,800 for MFJ ($83,400 if filing separately) exacerbates both cliff components. Thus for a MFJ taxpayer having $175,000 of Federal AGI and $25,000 of otherwise qualifying itemized deductions, the allowed State tax deduction is reduced by $246 ($175,000-$166,800)*0.03.

The 2012 Study of Hawaii Tax System, Final Report suggests a number of modifications to the Hawaii tax code. However, none of these suggestions address the tax cliff effects noted here. Thus, the specific objective of this paper is to critically evaluate these tax cliffs and to propose suggested alternatives to the Hawaii State tax system. The more general objective of this study is to illustrate the complex by-products of tax legislation which may be unintentional. Ultimately, we wish to underscore the absurd marginal tax rates that emanate here from well-intentioned tax policy designed to raise Hawaii revenues. These implications are relevant for policymakers in Hawaii as well as other states and the Federal government.

LITERATURE REVIEW

If individuals do not accurately perceive their marginal tax rates, taxing authorities can create tax provisions that take advantage of misperceptions even if some tax consequences were not intended. For example, Fujii and Hawley (1988) test the accuracy with which individuals perceive marginal tax rates. They compare perceived and computed marginal tax rates for 3,824 American households. They find that taxpayers accurately perceive the marginal tax rates they face. Bruce, Fox and Yang (2010) examine how state personal income tax structure affects the levels of state personal income tax bases. They examine panel data from fourteen states. Their results show that tax rates on wage and capital income have no impact on the bases reported by the states. They argue their findings imply that taxpayers engage in planning to control differential tax effects.

Bach, Corneo and Steiner (2012) examine optimal top marginal tax rates under income splitting for couples. They derive a formula for the optimal top marginal tax rate that depends on the elasticity and

income distributions of both couples and singles in the economy. They examine the formula using German taxpayer data and find that the optimal tax marginal tax rate is about 66% and should be applied only to very high incomes.

A number of authors attempt to estimate marginal tax rates. Prante and John (2012) calculate the combined state and federal top marginal effective tax rate for each of the United States and for varying income sources. They find for tax year 2012, Hawaii taxpayers face a combined State and Federal top marginal tax rate of 44.4 percent on wages, which ranks Hawaii below only California as the highest taxed state. Magg, Steuerle, Chakravarti and Quakenbush (2012) examine the impact of high marginal tax rates on low-income families. They find that a single parent with two children can experience an average marginal tax rate of over 100 percent or as low as 26 percent as their income moves from 100% to 150 percent of the poverty level. Reed, Rogers and Skidmore (2011) develop a new method to compute marginal tax rates that are time variant. They find that Hawaii has the third highest marginal State tax rate at 12.5 percent. Hawaii trails only New York and Maine for highest state marginal tax rates.

Of critical importance to government policymakers is the extent to which tax and other policies stimulate or retard economic growth. A large body of literature examines this issue. McBride (2012) provides an excellent review of the literature. While most researchers find a negative relationship between tax levels and economic growth, the evidence is mixed. The bulk of the research suggests a negative relationship between higher taxes and economic growth. Barro and Redlick (2011) find that a one percent cut in the average marginal tax rate increases the following year per capita Gross Domestic Product (GDP) by 0.5 percent. Halcombe and Lacombe (2004) find that states that raised income taxes average a 3.4 percent reduction in per capita income. A number of other authors find negative relationships between tax rates and economic growth (see Ferede and Dahlby, 2012; Reed, 2008; Tomljanovich, 2004; Chernick, 1997 and Mullen and Williams, 1994). On the other hand, Mendoza, Milesi-Ferretti and Asea (1997) find overall that tax burden levels have no effect on investment or growth. Katz, Mahler & Franz (1983) find that taxes reduce savings, but do not affect growth or investment.

These mixed findings suggest that more research is needed to address marginal tax rate behavioral implications. We contend the present Hawaii tax cliff legislation provides a natural experiment to illustrate absurd marginal tax rate consequences that emanate from otherwise well-intentioned legislation that begs significant Hawaii taxpayer behavioral response as we shall illustrate.

MARGINAL TAX RATE CALCULATIONS

This section provides calculations of marginal tax rates surrounding the tax cliff identified above. The first section examines the paid State tax limitation on itemized deductions. The second section examines the total itemized deductions limitation.

State Taxes Paid Limitation

This section shows marginal tax rate computations for Federal AGI levels approaching and breaching the tax cliff and thereby triggering the State tax paid limitation on itemized deductions. Consider a married couple that files a joint return. The entire income of the couple is Hawaii state income. The taxpayer works a state job that pays $135,000 per year. The taxpayer defers 30,000 in income through a combination of tax-deferred accounts. The spouse is self-employed. The self-employment income may be managed between tax years using a combination of income management, expense management and a Simplified Employee Pension account.

During 2012, the taxpayer made $28,000 in estimated Federal tax payments and $7,000 in estimated State payments all of which are applicable to the 2012 return. In addition, Hawaii State tax of $2,000 was paid

in 2012, associated with the 2011 tax year return. The employer withheld the following amounts on wages paid to the taxpayer: $12,600 for Federal taxes, $6,500 for State of Hawaii taxes, $4,624.50 for Social Security taxes and $1957.50 for Medicare taxes. The State withholding rate here equals approximately 5.2 percent of employment income. The only listed deductions are taxes paid as noted above and interest expense on a first mortgage of $25,000.

Using the above data, we calculate the total tax due by changing the amount of self-employment income realized in the tax year. We then compute the State marginal tax rate (SMTR), the Federal marginal tax rate (FMTR) and combined State and Federal marginal tax rate (CMTR) respectively using the following formulas:

$$SMTR = \frac{Change\ in\ State\ Taxes\ Payable}{Change\ in\ Federal\ Adjusted\ Gross\ Income} \quad (1)$$

$$FMTR = \frac{Change\ in\ Federal\ Taxes\ Payable}{Change\ in\ Federal\ Adjusted\ Gross\ Income} \quad (2)$$

$$CMTR = \frac{Change\ in\ Federal + Change\ in\ State\ \ Taxes\ Payable}{Change\ in\ Federal\ Adjusted\ Gross\ Income} \quad (3)$$

We use TurboTax Home and Business 2012 to complete all tax calculations. Table 1 shows the resulting computations relating to the State tax paid limitation on itemized deductions. Each column in Table 1 shows the results for a different income level. Column 1 shows the computations for Federal AGI of $199,013 and Federal Taxable Income of $150,913. The total Federal tax due equals $32,587. Social Security Taxes represent $2,552 of the tax due. For Hawaii tax purposes, the tax deduction is $15,500 and the interest deduction is $25,000. The 3 percent limit reduces these amounts to allowed deductions of $39,534 implying taxable income of $157,732. State tax due equals $11,520.

The second column shows results of computations for Federal AGI of $199,999. The section labeled State Analysis shows the State AGI increased by $986 over the previous estimate and the tax due increased by $87 representing an 8.824 percent marginal tax rate.

The section labeled Fed Analysis W SS shows the Federal tax computations including the effects of Social Security Taxes. This analysis considers all taxes, including Social Security, in calculating the marginal tax rate. For Column 2, the results indicate a Federal AGI change of $986. The Federal tax change of $303 represents a 30.73 percent marginal tax rate.

The section labeled Fed Analysis WO SS ignores the effects of Social Security taxes when computing the marginal tax rate. We complete this analysis because, unlike other federal taxes, taxpayers receive a direct benefit from paying Social Security Tax. The benefit an individual receives depends directly upon the amount of money the individual pays into the system. Evaluating future benefits associated with paying additional Social Security Taxes is beyond the scope of this paper. We mitigate this element by providing computations with and without consideration of Social Security tax. The Column 2 results show a tax change of $276 representing a 27.992 percent marginal tax rate.

The section labeled Federal + State shows the combined federal and state marginal tax rate. Calculations are completed both including and excluding Social Security taxes. The results show 39.544 and 36.815 percent combined marginal tax rates when considering and ignoring Social Security taxes respectively.

Table 1: Tax Computations for Hawaii Tax Deduction Limitation

Federal	1	2	3	4	5	6	7	8	9
Net Bus Income	95,289	96,289	96,290	97,289	98,289	99,289	100,289	101,298	102,289
Total Income	200,289	201,289	201,290	202,289	203,289	204,289	205,289	206,289	207,289
Fed AGI	199,013	199,999	200,000	200,986	201,973	202,959	203,946	204,932	205,919
Fed Tax Income	150,913	151,899	151,900	152,886	153,873	154,859	155,846	156,832	157,819
Fed Taxes	32,587	32,890	32,890	33,193	33,495	33,799	34,102	34,405	34,707
SS Portion of Fed	2,552	2,579	2,579	2,606	2,632	2,659	2,686	2,713	2,739
State									
State AGI	199,013	199,999	200,000	200,986	201,973	202,959	203,946	204,932	205,919
Tax Deduction	15,500	15,500	0	0	0	0	0	0	
Interest Deduction	25,000	25,000	24,004	23,974	23,945	23,915	23,886	23,856	23,826
Allowed Deduction	39,534	39,504	24,004	23,974	23,945	23,915	23,886	23,856	23,826
Taxable Income	157,732	158,789	174,290	175,306	176,322	179,044	178,396	179,412	180,471
State Tax Due	11,520	11,607	12,886	12,970	13,054	13,141	13,225	13,308	13,396
State Analysis									
State Tax Change		87	1,279	1,363	1,447	1,534	1,618	1,701	1,789
State AGI Change		986	1	987	1,974	2,960	3,947	4,933	5,920
State Marginal Rate		8.824	127,900	138.095	73.303	51.824	40.993	34.482	30.220
Fed Analy W SS									
Federal Tax Change		303	0	303	605	909	1,212	1,515	1,817
Fed AGI Change		986	1	987	1,974	2,960	3,947	4,933	5,920
Fed Marginal Tax Rate		30.730	0.000	30.699	30.648	30.709	30.707	30.712	30.693
Fed Analysis WO SS									
Fed Tax Change		276	0	276	552	829	1,105	1,381	1,657
Fed AGI Change		986	1	987	1,974	2,960	3,947	4,933	5,920
Fed Marginal Tax Rate		27.992	0.000	27.964	27.964	28.007	27.996	27.995	27.990
Combined Fed and State									
Combined Fed and State W SS		39.554	127,900	168.794	103.951	82.534	71.700	65.194	60.912
Combined Fed and State WO SS		36.815	127,900	166.059	101.266	79.831	68.989	62.477	58.209

Table 1: Continued

Federal	10	11	12	13	14	15	16	17	18
Net Bus Income	103,289	104,289	105,289	106,289	107,289	112,289	117,289	122,289	147,289
Total Income	208,289	209,289	210,289	211,289	212,289	217,289	222,289	227,289	252,289
Fed AGI	206,906	207,892	208,879	209,865	210,852	215,785	220,718	225,651	250,316
Fed Tax Income	158,806	159,792	160,779	161,765	162,752	167,685	172,618	177,551	202,216
Fed Taxes	35,011	35,314	35,617	35,920	36,223	37,738	39,253	40,768	48,344
SS Portion of Fed	2,766	2,793	2,820	2,847	2,873	3,007	3,141	3,275	3,945
State									
State AGI	206,906	207,892	208,879	209,865	210,852	215,785	220,718	225,651	250,316
Tax Deduction									
Interest Deduction	23,797	23,767	23,738	23,708	23,678	23,530	23,382	23,234	22,495
Allowed Deduction	23,797	23,767	23,738	23,708	23,678	23,530	23,382	23,234	22,495
Taxable Income	181,487	182,544	183,560	184,576	185,635	190,799	195,963	201,127	226,947
State Tax Due	13,480	13,567	13,651	13,735	13,822	14,248	14,674	15,100	17,230
State Analysis									
State Tax Change	1,873	1,960	2,044	2,128	2,215	2,641	3,067	3,493	5,623
State AGI Change	6,907	7,893	8,880	9,866	10,853	15,786	20,719	25,652	50,317
State Marginal Rate	27.117	24.832	23.018	21.569	20.409	16.730	14.803	13.617	11.175
Fed Analysis W SS									
Federal Tax Change	2,121	2,424	2,727	3,030	3,333	4,848	6,363	7,878	15,454
Fed AGI Change	6,907	7,893	8,880	9,866	10,853	15,786	20,719	25,652	50,317
Fed Marginal Tax Rate	30.708	30.711	30.709	30.712	30.710	30.711	30.711	30.711	30.713
Fed Analysis WO SS									
Fed Tax Change	1,934	2,210	2,486	2,762	3,039	4,420	5,828	7,235	14,168
Fed AGI Change	6,907	7,893	8,880	9,866	10,853	15,786	20,719	25,652	50,317
Fed Marginal Tax Rate	28.001	27.999	27.995	27.995	28.001	27.999	28.129	28.204	28.157
Fed and State									
Fed and State W SS	57.825	55.543	53.727	52.281	51.120	47.441	45.514	44.328	41.888
Fed and State WO SS	55.118	52.832	51.014	49.564	48.411	44.730	42.932	41.821	39.333

This table shows tax computations for a married couple that files a joint return. The entire income of the couple is Hawaii state income. The taxpayer works a state job that pays $135,000 per year. The taxpayer defers 30,000 in income through a combination of tax deferred accounts. The spouse is self-employed. The self-employment income may be managed between tax years using a combination of income management, expense management and a Simplified Employee Pension account. During 2012, the taxpayer made $28,000 in estimated Federal tax payments and $7,000 in estimated State payments all of which are applicable to the 2012 return. In addition, a tax of $2,000 was paid in 2012, associated with the 2011 tax year return. The employer withheld the following amounts on wages paid to the taxpayer: $12,600 for Federal taxes, $6,500 for State of Hawaii taxes, $4,624.50 for Social Security taxes and $1957.50 for Medicare taxes. The only listed deductions are taxes paid as noted above and interest expense on a first mortgage for $25,000.

The third column shows tax computations when Federal AGI equals $200,000, a single dollar more than the results reported in column two. The additional dollar of income affects the Hawaii tax cliff. In this case, the paid State tax deduction of $15,500 is no longer allowed. Total State itemized deductions are reduced by $15,100 ($39,504 – 24,404). State taxable income increases by $15,501 (from $158,789 to $174,290) and state tax increases by $1,279. This tax increase, associated with a single dollar of additional income, implies a 127,900 percent marginal tax rate! The Federal tax does not change, as the dollar of additional income does not result in an additional dollar of taxes.

Column four shows results when State AGI increases to $200,986, an additional $987 over the $199,999 AGI reported in column two. This change results in a state tax increase of $1,363 implying a 138.095 percent Hawaii State marginal tax rate on the $987 additional income. Federal tax increases by $303 and $276 when Social Security taxes are included and excluded respectively. The implied marginal Federal tax rates equal 30.699 percent and 27.964 percent. Combined State and Federal marginal tax rates equal 168.794 and 166.059 percent respectively, when including and excluding Social Security taxes.

An examination of the remaining columns in Table 1 shows the combined marginal tax rate for Federal AGI of $201,973 continues to exceed 100 percent. Thus, the combined Federal and State tax authorities confiscate the entire addition to earnings from Federal AGI of $199,999 to approximately $202,000. As AGI increases, the marginal tax rate on income over $199,999 decreases as the tax paid deduction loss has a smaller impact. Indeed the itemized deduction limitations impact asymptotically disappears with Federal AGI increases. However, the Sate marginal tax rate remains above 30 percent, and the combined State and Federal tax rates remain above 60 percent for Federal AGI levels up to approximately $206,000. The State marginal tax rate remains above 25 percent for Federal AGI levels up to approximately $207,500. It remains above 20 percent for AGI levels up to approximately 210,000.

Maximum Itemized Deduction Limitation

In this section, we examine the $50,000 limitation on total itemized deductions for MFJ taxpayers with Federal AGI of $200,000 or more. Consider the same taxpayer discussed above. However, the taxpayer experiences an additional $70,000 medical expense for the tax year. Serious medical and other events can result in such large expenses for many taxpayers. Medical expenses are subject to the limitation that only those medical costs that exceed 7.5 percent (in 2012) of Federal adjusted gross income are allowed as an itemized deduction. The additional deduction affects the $50,000 total itemized deduction limit. In a manner analogous to the previous section, taxes due and marginal tax rates are again calculated.

Table 2 displays the results relating to the total itemized deduction limitation of $50,000 for MFJ taxpayers with Federal AGI of $200,000 or more. The first column shows computations for Federal AGI of $199,013. Federal tax due equals $18,568. State tax due equals $6,967. The tax deduction equals $15,500 and the interest deduction equals $25,000. The medical deduction equals $55,074. The total deduction equals $94,608 representing the phase out of deductions of 3 percent for each dollar of income in excess of $166,800. The total deduction does not reflect the $50,000 limitation because Federal AGI has not yet crossed the $200,000 threshold.

Column 2 shows the results when Federal AGI equals $199,999. The results show allowable itemized deductions equal $94,504. The increase in Federal AGI over the previous column is $986. The increase in State taxes equal $94, implying a 9.533 percent marginal tax rate. Federal tax increases by $290 and $263 implying 29.412 and 26.673 percent marginal Federal tax rates when considering and excluding Social Security effects respectively. The combined marginal tax rates are 38.945 and 36.207 percent respectively.

Table 2: Analysis of Total Itemized Deduction Limitation

Federal	1	2	3	4	5	6	7	8	9
Net Bus Income	95,289	96,289	96,290	97,289	98,289	99,289	100,289	101,298	102,289
Total Income	200,289	201,289	201,290	202,289	203,289	204,289	205,289	206,289	207,289
Fed AGI	199,013	199,999	200,000	200,986	201,973	202,959	203,946	204,932	205,919
Fed Tax Income	95,839	96,899	96,900	97,960	99,021	100,081	101,142	102,202	103,263
Fed Taxes	18,568	18,858	18,870	19,160	19,448	19,739	20,032	20,324	20,615
SS Portion of Fed	2,552	2,579	2,579	2,606	2,632	2,659	2,686	2,713	2,739
State									
State AGI	199,013	199,999	200,000	200,986	201,973	202,959	203,946	204,932	205,919
Tax Deduction	15,500	15,500	0	0	0	0	0	0	
Interest Deduction	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Medical Deduction	55,074	55,000	55,000	54,926	54,852	54,778	54,704	54,630	54,556
Allowed Deduction	94,608	94,504	50,000	50,000	50,000	152,959	50,000	50,000	50,000
Taxable Income	102,658	103,789	148,294	149,280	150,267	151,295	152,282	153,268	154,297
State Tax Due	6,976	7,070	10,741	10,823	10,904	10,989	11,070	11,152	11,237
State Analysis									
State Tax Change		94	3,671	3,753	3,834	3,919	4,000	4,082	4,167
State AGI Change		986	1	987	1,974	2,960	3,947	4,933	5,920
State Marginal Rate		9.533	367,100	380.243	194.225	132.399	101.343	82.749	70.389
Fed Analysis W SS									
Federal Tax Change		290	12	302	590	881	1,174	1,466	1,757
Fed AGI Change		986	1	987	1,974	2,960	3,947	4,933	5,920
Fed Marginal Tax Rate		29.412	1,200	30.598	29.889	29.764	29.744	29.718	29.679
Fed Analysis WO SS									
Fed Tax Change		263	12[1]	275	537	801	1,067	1,332	1,597
Fed AGI Change		986	1	987	1,974	2,960	3,947	4,933	5,920
Fed Marginal Tax Rate		26.673	1,200	27.862	27.204	27.061	27.033	27.002	26.976
Federal + State									
Fed + State W SS		38.945	368,300	410.841	224.113	162.162	131.087	112.467	100.068
Fed + State WO SS		36.207	368,300	408.105	221.429	159.459	128.376	109.751	97.365

Table 2: Continued

Federal	10	11	12	13	14	15	16	17	18
Net Bus Income	103,289	104,289	105,289	106,289	107,289	112,289	117,289	122,289	147,289
Total Income	208,289	209,289	210,289	211,289	212,289	217,289	222,289	227,289	252,289
Fed AGI	206,906	207,892	208,879	209,865	210,852	215,785	220,718	225,651	250,316
Fed Tax Income	104,324	105,384	106,445	107,505	108,566	113,869	119,172	124,475	150,990
Fed Taxes	20,907	21,199	21,491	21,783	22,075	23,534	24,994	26,454	34,001
SS Portion of Fed	2,766	2,793	2,820	2,847	2,873	3,007	3,141	3,275	3,945
State									
State AGI	206,906	207,892	208,879	209,865	210,852	215,785	220,718	225,651	250,316
Tax Deduction									
Interest Deduction	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Medical Deduction	54,482	54,408	54,334	54,260	54,186	53,816	53,446	53,076	51,226
Allowed Deduction	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Taxable Income	155,284	156,311	157,298	158,284	159,313	164,329	169,345	174,361	199,442
State Tax Due	11,318	11,403	11,484	11,565	11,650	12,064	12,478	12,892	14,961
State Analysis									
State Tax Change	4,248	4,333	4,414	4,495	4,580	4,994	5,408	5,822	7,891
State AGI Change	6,907	7,893	8,880	9,866	10,853	15,786	20,719	25,652	50,317
State Marginal Rate	61.503	54.897	49.707	45.561	42.200	31.636	26.102	22.696	15.683
Fed Analysis W SS									
Federal Tax Change	2,049	2,341	2,633	2,925	3,217	4,676	6,136	7,596	15,143
Fed AGI Change	6,907	7,893	8,880	9,866	10,853	15,786	20,719	25,652	50,317
Fed Marginal Tax Rate	29.666	29.659	29.651	29.647	29.642	29.621	29.615	29.612	30.095
Fed Analysis WO SS									
Fed Tax Change	1,862	2,127	2,392	2,657	2,923	4,248	5,601	6,953	13,857
Fed AGI Change	6,907	7,893	8,880	9,866	10,853	15,786	20,719	25,652	50,317
Fed Marginal Tax Rate	26.958	26.948	26.937	26.931	26.933	26.910	27.033	27.105	27.539
Federal + State									
Fed + State W SS	91.168	84.556	79.358	75.208	71.842	61.257	55.717	52.308	45.778
Fed + State WO SS	88.461	81.845	76.644	72.491	69.133	58.546	53.135	49.801	43.222

This table shows tax computations for a married couple filing a joint return. The entire income of the couple is Hawaii state income. The taxpayer works a state job that pays $135,000 per year. The taxpayer defers 30,000 in income through tax-deferred accounts. The spouse is self-employed. Self-employment income may be managed between tax years using income management, expense management and a Simplified Employee Pension account. During 2012, the taxpayer made $28,000 in estimated Federal tax payments and $7,000 in estimated State payments all of which apply to the 2012 return. The taxpayer also paid $2,000 of tax in 2012, associated with the 2011 tax year return. The employer withheld the following amounts on wages: $12,600 for Federal taxes, $6,500 for State of Hawaii taxes, $4,624.50 for Social Security taxes and $1957.50 for Medicare taxes. Listed deductions include taxes paid as noted above, interest expense on a first mortgage for $25,000 and $70,000 of medical expenses. [1] Notice the Federal AGI Change is $1 and Federal tax change is $12. This occurs because the added dollar of income causes a category change in the tax table. Taxable income of $96,899 falls between "at least $96,850 but less than $96,900" with a corresponding tax of $16,279. Taxable income of $96,900 falls between "at least $96,900 but less than $96,950" with a corresponding tax of $16,291.

The third column shows results when Federal AGI equals $200,000. In this column, both limitations have been activated. The State tax paid deduction is no longer allowed because Federal AGI now exceeds $200,000. However, due to the large medical expense this loss of deduction is not the determining factor for allowed itemized deductions. The second component, which limits total itemized deductions to $50,000, determines the allowed itemized deductions. Thus, for a single dollar of additional Federal AGI, the allowed itemized deduction is reduced by $44,504 ($94,504 - $50,000). The tax due reflects this loss of deductions. The State tax due increase by $3,671 ($10,741 - $7,070). This increase implies a 367,100 percent State marginal tax rate! The federal tax increases by $12 implying a 1,200 percent marginal tax rate. This rather large federal marginal tax rate occurs because the additional dollar of income triggers a shift in tax table categories. The combined Federal and State tax rate equals 368,300 percent!

The fourth column shows the calculations for Federal AGI of $200,986. State taxes increase to $10,741, an increase of $3,671 over the results for Federal AGI of $199,999. The change represents a 380.243 percent marginal State tax rate. Federal Taxes increase by $302, representing a 30.598 percent marginal tax rate. The combined State and Federal Marginal tax rates now equal 410.841 and 408.841 percent respectively when including and excluding Social Security taxes. The State Marginal tax rate exceeds 100 percent until Federal AGI reaches approximately $204,000. The combined State and Federal Tax rate does not fall below 100% until Federal AGI reaches approximately $206,000. Thus the entire increase in Federal AGI from $199,999 to $206,000 is confiscated by the either the Federal or State tax authority. The combined marginal tax rate remains above 75 percent until Federal AGI surpasses approximately $210,000. The combined marginal tax rate remains above 50 percent until Federal AGI surpasses approximately $226,000.

These marginal tax rates require individuals and businesses to carefully plan their Federal AGI. Discovering that your income exceeds the tax cliff after the tax year has closed would be a costly error so prudent forward-looking tax planning is essential. However, a careful entrepreneur may be able to manage Federal AGI after the tax year close by opening a SIMPLE or SEP retirement account. These actions are not without cost since such an account might not be otherwise optimal.

POLICY IMPLICATIONS

We do not argue the policy appropriateness or inappropriateness of phasing out itemized deductions for higher income taxpayers. In their wisdom, the Hawaii governing authority has determined that such action is desirable. However, few would argue the marginal tax rates presented here represent an optimal taxation system. Thus, we suggest an alternate tax system that might function better without detracting from the primary objectives of existing laws. We recommend the Hawaii tax authority modify the tax system to phase in the itemized deduction limitations. Such a phased approach would create less onerous marginal tax rates. Perhaps a reasonable goal in setting the phase in would be to ensure that marginal State tax rates for any income level do not exceed 20 percent.

We recommend eliminating the current combined three itemized deduction limitation system. We suggest relying instead on a variation of the three percent limitation to accomplish a goal similar to the existing combined three limitations. The proposed system would be simpler to implement, create more equitable marginal tax rates and treat all itemized deductions equally. Indeed, there are certain issues associated with providing preference for one class of itemized deductions over another. The Hawaii Senate Bill 1091 entered for consideration January 24, 2013 proposes to exempt charitable contributions from these limitations. Certainly, a case can also be made for exempting medical expenses from the limitation. We recommend equal treatment for all limitations with regard to total deduction limits.

We propose the following: Begin the phase out of itemized deductions at Federal AGI of $100,000. For Federal AGI levels of $100,000 or less, limit itemized deductions to Federal AGI. For Federal AGI above

$100,000, the maximum allowed itemized deduction declines by $0.25 for each dollar of Federal AGI exceeding $100,000. Thus, for a taxpayer with Federal AGI of $200,000 the maximum allowed itemized deduction equals $75,000 ($100,000 – ($200,000-$100,000)*0.25). For a taxpayer with $201,000 of Federal AGI, the maximum allowed itemized deduction equals $74,750. For taxpayers with Federal AGI above $300,000 the maximum allowed deduction equals $50,000. We recommend designing the approach to integrate with the Federal Tax Code Pease Limitation. The approach described here substantially achieves the objectives of the current law. However, the approach described here results in more reasonable implied marginal tax rates.

CONCLUDING COMMENTS

This study analyzes Hawaii State income tax itemized deduction limitations that currently create a tax cliff. The tax cliff includes two components. The first component occurs because the Hawaii State taxes paid itemized deduction is disallowed for married filing jointly taxpayers with Federal AGI of $200,000 or above ($100,000 for single or married filing separately and $150,000 for qualifying heads of household). The second component limits total itemized deductions claimed on the State return to $50,000 for married filing joint returns with income of $200,000 or more ($37,500 for qualifying Head of Household taxpayers with Federal AGI of $150,000 and $25,000 for single or married filing separately tax returns). A third provision that mandates the sum of all itemized deductions be reduced by 3 percent for each dollar of income in excess of $166,800 ($83,400 for separate filers) exacerbates the tax cliff.

We calculate marginal tax rates associated with each component of the tax cliff. Results show the State tax-deduction limitation can result in marginal Hawaii State tax rates than can reach or exceed 127,900 percent. That is, a single dollar of additional income increases the tax due by $1,279. Results show the $50,000 limitation on total itemized deduction can produce marginal State tax rates that reach or exceed 367,100 percent where a single dollar of additional income implies an increase in State taxes of $3,671.

Clearly these tax rates are sub-optimal. We provide recommendations for redesigning the Hawaii State tax system that achieves the general objectives of itemized deduction limitations without injecting extraordinary marginal tax rates into the system. We encourage lawmakers to consider these and other proposals to improve the Hawaii tax system. We also encourage the Federal tax authority and states seeking to adopt similar proposals to consider the issues identified here in developing their own policies.

It is rare for extraordinary marginal tax rates to exist. While they present certain problems as identified in this research, they also present a unique opportunity for research as well as incentivized tax planning. Future research might examine how Hawaii taxpayers respond to the tax cliffs. Taxpayers should plan their Federal AGI to minimize the effects of the limitations. For example, taxpayers may temporarily avoid the Hawaii tax cliff by selling capital loss stocks to offset capital gains or shifting discretionary business income into another taxable year. A possibly better strategy would be to increase deductible contributions into a qualified retirement plan. Because of tax planning, we expect a large number of Hawaii taxpayers to report Federal AGI clustered just below $200,000. These taxpayers have an incentive to manage their income and deductions to remain within the itemized deduction limitation. There might also exist a corresponding void in taxpayers with Federal AGI of incomes that just exceed $200,000. The extent that Federal AGI clustering occurs presents a significant opportunity for future research.

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THE ROLE OF DERIVATIVES IN THE FINANCIAL CRISIS AND THEIR IMPACT ON SECURITY PRICES

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ABSTRACT

This study takes on two divergent notions concerning derivatives; that they are dangerous instruments (Warren Buffet) versus the concept that they help to reduce risk (Allen Greenspan). These notions are assessed from the perspective of the recent Financial Crisis in which derivatives were assigned a good deal of the blame for the meltdown. This study analyzes three different study periods; Pre-Crisis (2003, 2004, 2005), Crisis (2008, 2009, 2010), and Post-Crisis (2011, 2012, 2013-1st quarter). In addition, the study also analyzes three different groups of firms containing 100 firms each; firms engaging in the use of derivatives and accepting TARP funds, firms engaging in derivatives and not accepting TARP funds, and firms not engaging in derivatives and not accepting TARP funds. Results indicate that for Crisis and Post-Crisis periods, investors tend to discount accounting earnings releases in making investment decisions. For the firms using derivative and not accepting TARP funds and firms not using derivatives and not accepting TARP funds, the results across all three study periods are almost identical, accounting earnings reflect positive information-enhancing signals on security prices. This does not mean that security prices continued a steady upward trek, but only that investors placed a greater positive reliance on earnings in making investment decisions, in other words, they tended to not discount earnings releases.

JEL: G3, M41, N2

KEYWORDS: Derivatives, Security Prices, TARP

INTRODUCTION

In the fall of 2008, the U.S. Congress implemented the Emergency Economic Stabilization Act as a result of the financial crisis which began that same year. The Act created the Troubled Asset Relief Program (TARP). It was the largest component of the government's measures to address the sub-prime mortgage crisis and resulted in expenditures of close to $1 trillion taxpayer dollars. These "troubled assets" were defined as residential or commercial mortgages, securities, obligations, or other instruments which in many cases were utilized for speculative purposes under the banner of "derivatives."

Derivatives, also referred to as "futures contracts," have functioned for more than 100 years to act as a hedge against fluctuations in prices of items such as commodities, metals, energy products and financial instruments. Control of derivatives was insured under the Commodity Exchange Act (CEA) of 1936, which called for regulation and oversight of derivatives. Significant growth in the use of derivatives occurred at about the same time the Federal government decided to deregulate them in 2000 through passage of the Commodity Futures Modernization Act (CFMA). As a result, derivative growth along with the simultaneous removal of all controls associated with them, help lead to the worse financial meltdown in the U.S. economy in more than 75 years.

Derivatives are viewed by many as complex and murky in nature, however, they are not new to the financial scene. The early derivatives market began in the 1860s and consisted of farmers and grain merchants coming together in Chicago to hedge price risks in such commodities as corn, wheat, soy and other grain products. This began what came to be known as "futures" contracts. The traditional futures contract is an agreement between a seller and a buyer that the seller will deliver a product to the buyer at a

price agreed to when a contract is first entered and the buyer will accept and pay for the product at some agreed upon future date. In addition, the buyer has the opportunity to liquidate some or all of the product prior to delivery. Although developed initially in the agricultural sector, derivatives quickly spread into the metals, energy and financial sectors.

Because of the debilitating effect of agricultural prices during the Depression, President Roosevelt recommended to Congress the first market reform that impacted derivatives. The Commodity Exchange Act (CEA) of 1936 restricted, as far as possible, the use of futures purely for speculative purposes, thus relieving commodity producers of injury and thus producing some amount of control over the use of derivatives. In addition, the CEA called for a formal and regulated exchange through which transactions may occur. Futures contracts were required to be traded on a publicly transparent market, fully regulated, and ensuring that commitments would be backed by adequate capital.

By the 1980s, a variant of futures contracts was developed, commonly referred to as "swaps." They are defined as an agreement between two parties to exchange a series of cash flows measured by different interest rates, exchange rates, or prices with payment calculated by reference to a base amount. An example of an interest rate swap would be where one party exchanges a variable rate obligation on an existing loan for a fixed rate obligation. The expectation is that the fixed rate will be lower than the variable rate. Thus, instead of buying or selling a single future rate (as would be true under a traditional futures contract) there now exists the potential for the "swapping" of commitments. As these complex derivative types took hold during the 1980s and 1990s the Commodity Futures Trading Commission (CFTC) granted them exemption from the CEA of 1936. This caused the number of interest rate swaps, currency swaps, and other swaps to increase at a significant rate. This culminated in the Commodity Futures Modernization Act (CFMA) of 2000. Signed into law by President Clinton, the CFMA removed derivative transactions, from all the regulatory requirements established in 1936 by the CEA. Those parties engaging in derivatives were now exempt from capital adequacy requirements, reporting and disclosure, regulation of intermediaries, self-regulation, and bars on fraud or manipulation and excessive speculation. The Securities and Exchange Commission (SEC) was also barred from derivatives oversight. Through the passage of this Act lay the seeds for the destruction that would come in less than a decade.
By October, 2008, the value of the unregulated derivatives market was estimated to be in excess of $60 trillion. Included in that amount was somewhere close to $30 trillion in credit swaps. At the same time, a perfect storm was developing. The Federal government was pursuing a course of easy money for home loans through maintaining low interest rates and providing Federally-backed less-than-secure home loans. Many of these "sub-prime" loans became embedded in the $30 trillion of credit swaps. As a result, when defaults began to occur, they first created a mortgage crisis, which developed into a credit crisis, which then turned into a "once in a century" systematic financial crisis that, but for a huge U.S. taxpayer intervention, may have led in the fall of 2008 to a worldwide devastating Depression.

Although the use of derivatives has become widespread throughout the U.S. economy over the past 25 years, not all public companies have engaged in their use. In fact, of the public companies listed in *Fortune 500* as of June 1, 2013, only 108 have recorded in their financial notes the use of such instruments. As a note, of all the companies accepting TARP bailout monies, 93% were engaged in the use of some form of derivatives prior to the inception of TARP. Derivatives were not the only cause of the financial meltdown, neither were all public companies that engaged in their use crippled from a financial standpoint. It should be clear that futures contracts in the form of derivatives must possess some benefit by shifting risk, otherwise they would not be used at all. Given that derivatives have been, and will continue to be used as instruments that permit the potential minimization of future financial risks, the question must be asked, "to what extent do they affect the security price of the firms that utilize them?" Clearly, if the objective of management is to maximize the return to the stockholders, some firms may be inhibited from using derivatives if they are viewed to minimize stock prices. On the other hand, if derivative use ultimately increases the stock price, more firms would elect their use.

The purpose of this study is to assess the role that derivatives play on the security prices of firms. In particular, do firms that engage in derivative use find that their change in stock price is significantly different from firms that do not utilize derivatives? Specifically, three study periods are assessed; 1) a Pre-Crisis period of 2003-2005, 2) Crisis Period of 2008-2010, and 3) a Post-Crisis period of 2011- 2013. A sample of 100 publicly traded firms which accepted TARP funds and engaged in derivative use is analyzed in all three periods in order to ascertain any significant differences in stock prices for these firms across the time periods. In addition, a sample of 100 publicly traded firms which did not accept TARP funds and does not engage in derivative use is analyzed in the three study periods for the purpose of determining any differences in stock prices. A third sample of 100 firms is also analyzed during the three sample periods. These are publicly traded firms which did engage in derivative usage but were not in peril to the point of accepting TARP funds. The three samples are then analyzed to assess any differences among them. Findings from such a comparison might have significant impact to current and potential investors of firms which engage in derivative instruments. The article will first provide a summary of past and current relevant literature, followed by the hypotheses of the study. The data and methodology will then be elaborated, followed by results by hypothesis and concluding remarks.

LITERATURE REVIEW

The use of derivatives is a contentious issue. Nevertheless, whether on subscribes to Warren Buffet's warning about the danger of derivatives or Allen Greenspan's assertion that derivatives reduce risk (Berry 2003), the fact is that derivatives are popular and growing in use (Bodner et al 1995, Wolfson and Crawford 2010). Therefore, given the place of derivatives in the financial market place, it seem reasonable to ask what, if any, information content they provide in relation to security prices.

Many studies have examined the risk associated with derivative usage (Cornfield 1996, Guay 1999, Kuprianov 1995, Newman 1994, Hentschel and Kothari 2001). In general, these studies note that firms use derivatives as a hedge against exposure, but find that compared to firms which do not use derivatives, there does not appear to be any measurable difference in risk. This would lead one to suspect that no market impact from the use of derivative instruments would be found.

In addition to risk, other researchers have examined the role of derivatives in an earnings management context. Jan Barton (2001) examined this issue and presented evidence "consistent with managers using derivatives and discretionary accruals as partial substitutes for smoothing earnings." An implication of this finding is that derivatives may indeed have a market impact through their effect on corporate earnings.

The main contentions of the financial school of thought that link derivatives to the financial crisis lie in the artificial credit boom. The credit expansion created systematic risk, which led to the use of derivatives as an attempt to reduce the risk. The derivatives were traded in a market that lacked transparency, and proper regulation, i.e., the Over the Counter Market (OTC), (Stulz 2009). In addition, there is a popular belief that derivatives do not contribute any financial or economic substance to the general economy but are mere financial gambling devices (Gilani 2008). As a result, many arrive at the conclusion that derivatives do indeed lay at the root of the financial crisis.

But how exactly can things go wrong for buyers and sellers of derivative instruments and how can this in turn lead to adverse earnings results which may in turn affect stock prices? Skeel and Partnoy 2007, describe the scenario in which this can occur. The ease of credit, in conjunction with loose U.S. monetary policy led to the mispricing of credit. This means that loans which eventually turned out to be sub-prime in nature were bundled together with loans with lesser risk, the risk on the bundle was underestimated. As a result, mispricing on the bundled rate led to highly leveraged bets for the holders of such bundles. The subsequent defaults led to a massive attempt to unwind these bundles but it was too late from a liquidity

standpoint, the effects then steamrolled and permeated national and international financial markets. All of this unraveled in a few weeks. Holders of undervalued derivatives were forced to record current period losses as the swaps took place, placing downward pressure on earnings and forcing greater securitization (Pertrova 2009).

Given the use, nature, and circumstances that have swirled around derivative financial instruments, and based on the research undertaken to date, it becomes even more important to determine the link that derivatives have to stock prices. As the Financial Accounting Standards Board (FASB) continues to struggle to identify what exactly their role should be in the derivatives debate, it is important to understand the relationship that derivatives have to stockholder wealth, and stockholder wealth is ultimately dictated by the price of the stock.

HYPOYHESIS DEVELOPMENT

As previously noted, recent studies of derivatives do not directly link derivative usage to information content of earnings and security returns. However, if a correlation is established, evidence may suggest that firms could directly or indirectly affect the price of their stock in the capital markets through use (or non-use) of derivatives.

As one test, earnings are analyzed for incremental information content relative to security prices for public companies utilizing derivatives, and accepting TARP funds. Three study periods are assessed: 1) Pre-Crisis Period (2003, 2004, 2005). These years are perceived to be years in which the economy was going through expansion and institutional profitability was growing. 2) Crisis-Period (2008, 2009, 2010). These years are the years in which public companies began to have financial difficulties leading to troubled assets and they also began to accept TARP funds. 3) Post-Crisis Period (2011, 2012, 2013). During 2011, 93% of all TARP funds were paid back to the U.S. Treasury. In addition, many public companies were started back on what they termed the "road to recovery."

Absent extraneous factors (i.e., change in corporate form, change in management, change in ownership, etc.) there should not be significant difference in information content of earnings across study periods. Thus, the first hypothesis tests for the existence of market reaction for firms using derivatives that accepted TARP funding across the above three study periods. Stated in the null form, the hypothesis tested is:

H1: Earnings information content of security prices for public companies utilizing derivatives and accepting TARP funding is not significantly different across study periods.

The next test is similar to the first but now assesses public companies utilizing derivatives and not accepting TARP funds. Since more than 1,000 public companies accepted TARP funds, it may be inferred that if any public firm met the guidelines for distribution of TARP monies, namely the presence of troubled assets, then they would qualify for receipt of funds. Firms not receiving TARP funding are presumed to not have been in need of the Federal resources. Thus, the second hypothesis tests for the existence of market reaction for firms using derivatives that did not accept TARP funding across the above three study periods. Stated in the null form, the hypothesis tested is:

H2: Earnings information content of security prices for public companies utilizing derivatives and not accepting TARP funding is not significantly different across study periods.

The last test assesses public companies that have not used derivatives and have not accepted TARP funding. If derivatives as a whole contain no incremental earnings information, we should see consistency in results when comparing firms that do use derivatives with firms that do not use them. If,

however, a difference exists, it should be pronounced when comparing the groups. This test allows for such a comparison. Stated in the null form:

H3: Earnings information content of security prices for public companies not utilizing derivatives, and not accepting TARP funding is not significantly different across study periods.

DATA AND METHODOLOGY

The sample consists of analysis of quarterly security returns during each of the following test periods:

1. Pre-Crisis period (2003, 2004, 2005)
2. Crisis period (2008, 2009, 2010)
3. Post-Crisis period (2011, 2012, 2013-1st quarter)

The sample of firms consisted of three groups:

1. 100 public companies engaging in derivatives usage as identified in the financial notes for each of the above three periods, and having accepted TARP funds.
2. 100 public companies engaging in derivatives usage as identified in the financial notes for each of the above three periods, and having not accepted TARP funds.
3. 100 public companies not engaging in derivative usage for each of the above three periods, and having not accepted TARP funds.

Because the majority of firms accepting TARP monies consisted of those engaged in financial services, the sample pool is limited to those firms contained in SIC code 738909 (Financial Services). In addition, security price data must be available from the Center for Research on Security Prices (CRSP), earnings data is available on Compustat, and financial notes information is accessible through the Electronic Data Gathering and Retrieval System (EDGAR). Capitalization of firms contained in the study range from $10 million to $45 billion. Each of the three sample groups contains a similar array of firms within this capitalization range. The range was broad enough to be as inclusive as possible and also to meet the requirement for the same number of firms in each sample.

Test of Hypotheses

The purpose of these tests is to assess the relative information content of the security prices to the earnings for the firms using derivatives, and receiving TARP funds, for each of the three time periods detailed in the study. Quarterly financial data is typically released by each publicly held firm within two weeks following the close of the quarter. Based on this information, stock traders respond along with the stock price itself. The premise set forth by Ball and Brown (1968) and others, was that earnings, more specifically, "unexpected earnings" was causing the stock price to move. Ball and Brown (1968) assumed that investors used prior year reported earnings as a benchmark for the level of earnings they expected the firm to report in the current year. They then selected a sample of 261 NYSE-listed firms with earnings across the period 1957-1965. They classified a firm based upon whether current year earnings were up or down relative to the prior year earnings. Then, they tracked the stock price performance across an 18-month period starting 12 months before the current year earnings were announced. To facilitate comparison across firms, they examined stock returns (change in stock price during a period scaled by beginning of period stock prices) rather than stock prices. Also, to control for market-wide movements in stock prices they examined abnormal returns rather than raw returns (roughly speaking, abnormal returns are the difference between the raw stock return and the average market return). Much to the surprise of many doubters, they discovered that stock returns of good news firms

increased over the period, and the stock returns of bad news firms declined. In particular, if an investor had bought good news (sold bad news) firms at the start of the accounting period, the investor would have outperformed the overall market by 6 (9) percent. Thus, they showed that unexpected earnings have information content in the sense that they "reflect" the economic events that drive investor decisions during the accounting period.

The logical extension of Ball and Brown's study was to see whether the magnitude of unexpected earnings (as opposed to merely the sign of unexpected earnings) was related to the magnitude of the stock price response. Beaver, Clarke and Wright (1979) addressed the issue and discovered, in fact, that the magnitude of unexpected earnings was related to the magnitude of the stock price response. Again, they focused on market-adjusted stock returns to facilitate across-firm comparisons and to control for market-wide movements in stock prices. Ball and Brown (1968) and Beaver, Clarke and Wright (1979) show that despite the deficiencies of historical cost accounting, accounting earnings are potentially useful to investors. They also ushered in the so-called information perspective on the decision usefulness of accounting. The information perspective implies that investors' response to accounting information can provide a guide as to what type of information is or is not valued by investors.

The next logical question to ask was whether the market responded more strongly to unexpected earnings in some firms, and less strongly in other firms. This question is quite pertinent to accountants because we potentially would be better able to design financial statements if we knew the factors that predict when and why investors respond more strongly (less strongly) to financial statement information. Consistent with the literature, the term "Earnings Response Coefficient," or "ERC" is used to describe the strength of the market response to unexpected earnings. To understand this line of research, one needs to have an intuitive understanding of how investors might respond to accounting information in light of single person decision theory, portfolio theory, and efficient market theory. Here is the basic idea: Let's say that last period's earnings were $1 and, accordingly, that is the level of earnings an investor expects this year. When this year earnings are announced, the level of earnings are, say, $1.25, implying a $0.25 earnings surprise. If the investor believes this $0.25 level of unexpected earnings is a one-time shot that will not recur into the future, the investor will increase his assessment of stock value by $0.25. However, if the investor believes this $0.25 unexpected increase in earnings is a permanent boost to earnings that will recur in future years, then the investor's increase in stock price is $0.25 + the present value of receiving $0.25 into perpetuity. Given this framework for thinking about how investors should respond to unexpected earnings, it can be predicted that investors will respond more strongly to unexpected earnings when those earnings are expected to persist into the future. It can also be predicted that investors' response to unexpected earnings will be smaller the higher the discount rate they use in discounting those unexpected earnings that are expected to be received into perpetuity.

Subsequent numerous studies have tested these predictions, and here is what they found:

(1) ERC are increasing in the persistence of earnings. This has implications for accountants because it suggests the importance of clearly identifying on the income statement those transactions that are nonrecurring transactions (Baginski and Hassell, 1990).

2) ERC are decreasing in the riskiness of the firm and the leverage of the firm because both imply that investors demand higher expected returns and thus will use a higher discount rate in discounting the unexpected earnings expected to persist into the future. Thus, accountants should minimize the opportunities for off-balance sheet financing (or make sure the off-balance sheet financing is transparent) (Ajinkya, Atiase, and Gift, 1991).

(3) ERC are increasing in the growth opportunities of the firm because unexpected earnings reported by growth firms are expected to persist into the future. Thus, the forward-looking MD&A disclosures are

particularly important because they provide information about growth opportunities (Collins, Kothari, and Sloan, 1994).

(4) ERC are increasing in the quality of accounting accruals. Thus, detailed information about the components of accounting accruals might be useful to investors (Lev, 1989).
Therefore, the above extant theory and rationale was used to replicate the model first used by Ball and Brown in 1968 in order to establish that there is a correlation between earnings and security prices, that model is shown below. The Dow Jones News Retrieval Service (DJNRS) was used to identify the date that each firm released quarterly financial data for the study periods. This date of data release is known as the event date. The following model is established for determining information content:

$$CARit = a + b1T1UEit + b2T2UEit + b3T3UEit + b4MBit + b5Bit + b6MVit + eit \quad (1)$$

Where:

CARit	=	Cumulative abnormal return firm i, time t
a	=	Intercept term
T1 UEit	=	Unexpected earnings for Pre-Crisis firm i, time t
T2UEit	=	Unexpected earnings for Crisis firm i, time t
T3UEit	=	Unexpected earnings for Post-Crisis firm i, time t
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 coefficients b1, b2, and b3 are the traditional earnings response coefficient (ERC), found to have correlation with security prices in traditional market based studies, for the three separate study periods. Unexpected earnings (UEi) is measured as the difference between the management earnings forecast (MFi) and security market participants' expectations for earnings proxied by 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 100 firms during each study period; Pre-Crisis (b1 variable), Crisis (b2 variable), and Post-Crisis (b3 variable). This is done in order to assess any differences in information content of security prices to earnings releases in each of the study periods. The coefficients b4, b5, and b6, 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 b4 through b6 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). 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

Hypothesis 1 Results

As indicated in Table 1, for firms utilizing derivatives and accepting TARP funds, the coefficient representing the Pre-Crisis ERC, b1, is positive .12 (.01 significance level) indicating a positive security price effect for the 100 firms in the study prior to receiving TARP funds. However, the coefficient representing the Crisis ERC, b2, is negative -.10 (.01 significance level) indicating a negative security price effect for the 100 firms in the study during this study period in which TARP funds were received. The coefficient representing the Post-Crisis ERC, b3, is also negative at -.03 (.01 significance level) indicating a negative security price effect for the 100 firms in the study in a post-TARP environment. Although the b3 ERC is negative, it seems to have a more muted negative effect than the Crisis study period ERC (b2). Study results therefore, indicate that investors view earnings for firms containing derivatives to contain information content in the Pre-Crisis study period, this information content provides information enhancing signals, while the Crisis period information content is interpreted to be much more noisy and less informative, and the Post-Crisis period information content is still perceived to be less informative than the Pre-Crisis period, but more informative than the Crisis period. All other control variables are not significant at conventional levels. As a result of these findings, Hypothesis 1, which states that, for firms utilizing derivatives, there exists no information content difference on security prices in Pre-Crisis, Crisis, and Post-Crisis periods for the sample of 100 financial institutional TARP-recipients, must be rejected.

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 (VIP) was utilized. Values of VIP exceeding 10 are often regarded as indicating multicollinearity. In the test of hypothesis 1, a VIP of 2.0 was observed, thus indicating a non-presence of significant multicollinearity.

Table 1: Test of Hypothesis 1

Model: CARit = a + b1T1UEit + b2T2UEit + b3T3UEit + b4MBit + b5Bit + b6MVit + eit
Sample: 100 firms utilizing derivatives and accepting TARP funds

a	b1	b2	b3	b4	b5	b6	Adj. R2
0.2	0 .12	-0.1	-0.03	0.14	0.06	0.02	
-0.88	(1.67)***	(1.75)***	(1.68)***	-0.11	-0.28	-0.31	0.191

CARit	=	Cumulative abnormal return firm i, time
a	=	Intercept term
T1UEit	=	Unexpected earnings for Pre-Crisis firm i, time t
T2UEit	=	Unexpected earnings for Crisis firm i, time t
T3UEit	=	Unexpected earnings for Post-Crisis firm i, time t
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

*Table 1 assesses information content of the security prices for 100 firms. These are firms that utilized derivatives and accepted TARP funding. Analysis represents Pre-Crisis periods (b1), Crisis periods (b2), and Post-Crisis periods (b3). The first line values indicate coefficient value, while the second line values indicate significance of the coefficients. *** Significant at the 0.01 level*

Hypothesis 2 Results

The purpose of this test is to assess the relative information content of the security prices to the earnings for the sample of firms using derivatives, and not accepting TARP funds, for each of the three time periods detailed in the study. Similar parameters and regressions are utilized. As indicated in Table 2, the coefficient representing the Pre-Crisis ERC, b1, is positive .14 (.01 significance level) indicating a

positive security price effect for the 100 derivative-utilizing firms. The coefficient representing the Crisis ERC, b2, is also positive at, .04 (.01 significance level) indicating a positive security price effect for the 100 firms. Although the positive effect is diminished from the Pre-Crisis period, the unexpected earnings for these firms still provides a positive information enhancing signal to security prices. The coefficient representing the Post-Crisis ERC, b3, is again positive at .08 (.01 significance level) indicating a near return to Pre-Crisis levels for the 100 firms as to the information content of earnings. Study results therefore, indicate that investors view earnings for firms containing derivatives and not engaged in the acceptance of TARP funds to contain positive information content in the Pre-Crisis study period, the Crisis study period, and the Post-Crisis study period. All other control variables are not significant at conventional levels. As a result of these findings, Hypothesis 2, which states that there exists no information content difference on security prices in Pre-Crisis, Crisis, and Post-Crisis periods for the sample of 100 financial institutions utilizing derivatives and not receiving TARP funds, cannot be rejected.

To assess the presence of multicollinearity, the Variance Inflation Factor (VIP) was utilized. Values of VIP exceeding 10 are often regarded as indicating multicollinearity. In the test of hypothesis 2, a VIP of 2.2 was observed, thus indicating a non-presence of significant multicollinearity.

Table 2: Test of Hypothesis 2

Model: CARit = a + b1T1UEit + b2T2UEit + b3T3UEit + b4MBit + b5Bit + b6MVit + eit
Sample: 100 firms utilizing derivatives and not accepting TARP funds

a	b1	b2	b3	b4	b5	b6	Adj. R2
0.31	0.14	0.04	0.08	0.19	0.12	0.09	
-0.72	(1.68)***	(1.71)***	(1.66)***	-0.22	-0.4	-0.18	0.179

CARit	=	Cumulative abnormal return firm i, time
a	=	Intercept term
T1UEit	=	Unexpected earnings for Pre-Crisis firm i, time t
T2UEit	=	Unexpected earnings for Crisis firm i, time t
T3UEit	=	Unexpected earnings for Post-Crisis firm i, time t
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

*Table 2 assesses information content of the security prices for 100 firms. These are firms that utilized derivatives and did not accept TARP funding. Analysis represents Pre-Crisis periods (b1), Crisis periods (b2), and Post-Crisis periods (b3). The first line values indicate coefficient value, while the second line values indicate significance of the coefficients. *** Significant at the 0.01 level*

Hypothesis 3 Results

The purpose of this test is to assess the relative information content of the security prices to the earnings for the sample of firms not using derivatives, and not accepting TARP funds, for each of the three time periods detailed in the study. Similar parameters and regressions are utilized. As indicated in Table 3, the coefficient representing the Pre-Crisis ERC, b1, is positive .13 (.01 significance level) indicating a positive security price effect for the 100 non-derivative-utilizing firms. The coefficient representing the Crisis ERC, b2, is also positive at, .11 (.01 significance level) indicating a positive security price effect for the 100 firms. The coefficient representing the Post-Crisis ERC, b3, is again positive at .10 (.01 significance level) indicating a near return to Pre-Crisis levels for the 100 firms as to the information content of earnings. Study results therefore, indicate that investors view earnings for firms not containing derivatives and not engaged in the acceptance of TARP funds to contain similar positive information content throughout all periods in the study. All other control variables are not significant at conventional levels. As a result of these findings, Hypothesis 3, which states that there exists no information content difference on security prices in Pre-Crisis, Crisis, and Post-Crisis periods for the sample of 100 financial institutions not utilizing derivatives and not receiving TARP funds, cannot be rejected.

To assess the presence of multicollinearity, the Variance Inflation Factor (VIP) was utilized. Values of VIP exceeding 10 are often regarded as indicating multicollinearity. In the test of hypothesis 3, a VIP of 2.1 was observed, thus indicating a non-presence of significant multicollinearity.

Table 3: Test of Hypothesis 3

Model: CARit = a + b1T1UEit + b2T2UEit + b3T3UEit + b4MBit + b5Bit + b6MVit + eit **Sample: 100 firms not utilizing derivatives and not accepting TARP funds**							
a	**b1**	**b2**	**b3**	**b4**	**b5**	**b6**	**Adj. R2**
0.21	0.13	0.11	0.1	0.28	0.19	0.12	
-0.44	(1.66)***	(1.68)***	(1.65)***	-0.14	-0.32	-0.14	0.185

CARit	=	Cumulative abnormal return firm i, time
a	=	Intercept term
T1UEit	=	Unexpected earnings for Pre-Crisis firm i, time t
T2UEit	=	Unexpected earnings for Crisis firm i, time t
T3UEit	=	Unexpected earnings for Post-Crisis firm i, time t
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

*Table 3 assesses information content of the security prices for 100 firms. These are firms that did not utilize derivatives and did not accept TARP funding. Analysis represents Pre-Crisis periods (b1), Crisis periods (b2), and Post-Crisis periods (b3). The first line values indicate coefficient value, while the second line values indicate significance of the coefficients. *** Significant at the 0.01 level*

CONCLUDING COMMENTS

This study took on two divergent notions concerning derivatives; that they are dangerous instruments (Warren Buffet) versus the concept that they help to reduce risk (Allen Greenspan). These notions were assessed from the perspective of the recent Financial Crisis in which derivatives were assigned a good deal of the blame for the meltdown. The study assessed three different study periods; Pre-Crisis (2003, 2004, 2005), Crisis (2008, 2009, 2010), and Post-Crisis (2011, 2012, 2013-1st quarter). In addition, the study also analyzed three different groups of firms containing 100 firms each; firms engaging in the use of derivatives and accepting TARP funds, firms engaging in derivatives and not accepting TARP funds, and firms not engaging in derivatives and not accepting TARP funds. The study attempted to provide empirical evidence regarding the information content of earnings on security prices for firms using derivatives versus firms not using derivatives. An inherent limitation of the study is the limited time periods which were available during the research. This is particularly true of the Post-Crisis time period which utilizes only three full years and one quarter. Future research would extend these study periods and possibly incorporate more firms so that a stronger conclusion may be reached.

Table 4 highlights the effect of the information content of each study period on security prices. Results indicate that for firms using derivatives and accepting TARP funds, the Pre-Crisis period shows positive information-enhancing signals of accounting earnings on security prices, while the Crisis and Post-Crisis periods indicate negative information-enhancing signals on security prices. This means that for Crisis and Post-Crisis periods, investors tend to discount accounting earnings releases in making investment decisions. For the firms using derivative and not accepting TARP funds and firms not using derivatives and not accepting TARP funds, the results across all three study periods are almost identical, accounting earnings reflect positive information-enhancing signals on security prices. This does not mean that security prices continued to march upward, but only that investors placed a greater positive reliance on earnings in making investment decisions, in other words, they tended to not discount earnings releases.
The bottom line is that both Warren Buffet and Allen Greenspan were both correct. When used properly derivatives may be seen to reduce firm risk, but when used improperly, they could be dangerous and lead

to potential financial ruin. In addition, investors do not perceive differently firms that use derivatives (i.e., use them correctly), from firms that do not use derivatives. The implication of this study is that there are many lessons to be learned from the Financial Crisis. One big lesson is the proper use of derivatives and that investors (many of them institutional) are savvy enough to discern those firms that have an extraordinary ability to utilize derivatives from those that do not.

Table 4: Summary Statistics-Information Content of Security Prices

	b1 Variable Pre-Crisis	b2 Variable Crisis	b3 Variable Post-Crisis
Hypothesis 1 (use derivatives accept TARP funding)	Positive Significant	Negative Significant	Negative Significant
Hypothesis 2 (use derivatives don't accept TARP funding)	Positive Significant	Positive Significant	Positive Significant
Hypothesis 3 (do not use derivatives or accept TARP funding)	Positive Significant	Positive Significant	Positive Significant

Table 4 summarizes the effect of the information content on the security prices for each study period. Pre-Crisis periods (b1), Crisis periods (b2), and Post-Crisis periods (b3) are assessed. Hypothesis 1 assesses firms that used derivatives and accepted TARP funding, Hypothesis 2 assesses firms that used derivatives and did not accept TARP funding, Hypothesis 3 assesses firms that did not use derivatives or accept TARP funding.

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BIOGRAPHY

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THE IMPACT OF IFRS ADOPTION DURING THE 2008 FINANCIAL CRISIS ON THE RELATIONSHIP BETWEEN YIELD AND ACCOUNTING VARIABLES

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ABSTRACT

This research tests the impact of the financial crisis on the informational content of accounting numbers. The study is based on IAS-IFRS in the French context. The period chosen in this study is 2006 to 2011, divided into two periods: Pre-crisis 2006-2007 and post-crisis 2009-2010-2011. The results show the 2008 financial crisis contributed to reducing the information content of accounting numbers due to lack of confidence created by investors towards the information published on the basis of international standards.

JEL: C12, M41

KEYWORDS: IAS-IFRS, Crisis, Accounting Information and Performance

INTRODUCTION

The objective of accounting as identified by the Financial Accounting Standards Board (FASB) in 1973 and adopted by the International Accounting Standards Board (IASB) in 1989 is to provide useful and quality information to assess the ability of the company to generate future cash flows and to enable decision-making. The emergence and development of multinational concerns, the growth of international financial markets and changing investor behavior has, among other factors, contributed to the internationalization of economic activity. As a result of this phenomenon, financial reporting has spread beyond national borders. However, interpretation and understanding of financial information at the international level is hindered by a multitude of factors, including diversity of accounting principles and rules governing the preparation of reports. Various bodies (International Accounting Standards Board (IASB) and the European Union (EU)) have made considerable efforts since the 1970s to harmonize accounting rules in different countries, with the aim of improving the usefulness of financial information in the international context (Callao et al. (2007)).

Among other factors, the non-mandatory nature of the standards issued by the IASB, the flexibility and ease of compliance with EU directives and, most seriously, the lack of political will in the countries concerned, rooted in local culture and a strong national outlook, have so far prevented the attainment of a truly harmonized framework for useful financial reporting. Awareness within the EU of the need to make progress towards achieving international comparability resulted in the approval of Regulation 1606/2002, which provides for the mandatory application of International Financial Reporting Standards (IFRS) by business groups listed on European stock markets as of January 2005. The approval of this regulation has resulted in the adoption of IFRS in European countries.

A number of European countries including Belgium, France, Germany and Italy have allowed listed companies to use international accounting standards instead local Generally Accepted Accounting Principles (GAAP) since 1998. Many European listed companies were early adopters that choose to use International Financial Reporting Standards (IFRS) issued by the International Accounting Standards Board (IASB) in preparing consolidated financial statements before the European Commission's

stipulation for it to be done by 2005 (Bhimani (2008)). Yet, only a decade earlier, the European Commission had actively considered the establishment of its own European accounting standard setting body rather than opt for any form of international convergence.

Currently, over 100 countries have implemented IFRS or at least have taken steps to adopt these standards in the future (Alali & Cao, (2010)). The U.S. Securities and Exchange Commission (SEC), in Concept Release No.33-8879 (July 2007), ruled that it will "accept from foreign private issuers in their filings with the Commission, financial statements prepared in accordance with IFRS as issued by the IASB without reconciliation to GAAP as used in the United States". To arrive at this ruling, the SEC noted that the Commission has long viewed reducing the disparity between the accounting and disclosure practices of the United States and other countries as an important objective both for the protection of investors and efficiency of capital markets.

In the late 1990s, multinational corporations seeking financing in European capital markets reported their accounts using international accounting standards to facilitate their search for capital. Firms listed on US exchanges had to report under US GAAP. A number of research investigations have sought to explore the merits of using a single set of global accounting standards for reporting purposes (Alexander & Nobes (2008)). Some scholars discuss how agency costs can be countered by the benefits of adopting IFRS (Dumortier & Raffournier (1998); El-Gazzar et al. (1999) and Hung (2001)). The regulatory environment as a factor affecting the success of global accounting harmonization had also been studied (Bushman & Piotroski (2006) and Lang et al. (2003). Renders et al. (2007) noted that IFRS is more likely to be adopted in countries with strong laws protecting investors and/or extensive corporate governance recommendations.

The pace of globalization over the past decade has led enterprises and information users to seek greater clarity, comparability and simplicity in understanding organizational processes and in evaluating firm performance. This brought to the forefront debates and regulation relating to the standardization of financial reporting globally. Thus the wide spread and growing receptivity to international accounting harmonization in many quarters can be partly explained in terms of satisfying information exchange functions necessitated by the rapid globalization of business and the need to enhance the capacity of firms to raise capital in international markets. But the road to harmonized standards is not linear, demarcated entirely by the technical resolution of comparability issues, arguments about the efficiency of particular standards of financial reporting, or cost-benefit analysis of convergence options. Technical and functional imperatives partially explain normative accounting shifts. Understanding why, in the context of the US economy and its financial regulatory system, there exists willingness to consider an alternative to US GAAP as a world standard, requires a wider view of how such change can come about (Bhimani (2008)).

Business and other issues analyzed in connection with the adoption of IFRS in Europe are varied, although a few studies have addressed the impact of adoption on accounting figures during the crisis. In fact, our study is one of the first to consider these issues in the field of European accounting information. A growing body of literature examines the quality of accounting information associated with adoption of IFRS and the predecessor set of standards, International Accounting Standards (IAS). The research to date provides mixed evidence on whether accounting information from such systems exhibits higher quality than those associated with application of local accounting standards (Leuz & Wysocki (2008)).

This paper examines the role of IAS-IFRS standards adoption on the relationship between economic and accounting measures during 2008 crisis in the French context. Our decision to use the French context is explained by the fact that few researchers have previously studied it. It is considered a new context after the adoption of IAS-IFRS in 2005. The objectives of our research are to first, perform the analysis of the relationship between economic and accounting measures before the crisis. Second, the analysis of the relationship between economic and accounting measures after the crisis. Third, an analysis of IAS-IFRS

adoption during the 2008 financial crisis is conducted. We first present the literature review, then the methodology and the results and finally the paper closes with some concluding comments.

LITERATURE REVIEW

Two research streams on IFRS adoption exists: the first stream studies the comparison between countries or in the same country between local and international accounting systems. The second research stream studies the impact of the announcement of company earnings.

Addressing the adoption of IFRS in EU, Horton & Serafeim (2006) examined market reaction to the announcement of the earnings at the end of the accounting period and value relevance of reconciliation adjustments from UK companies in the transition to IFRS compliance. The sample consists of 85 firms from the London Stock Exchange (FTSE 350) for 2005. The authors employed an event study methodology and a market value model. They found the reconciliation adjustment from UK GAAP to IFRS to be value relevant with respect to earnings but not to shareholders' equity. Landsman et al. (2012) examined whether the information content of earnings announcements–abnormal return volatility and abnormal trading volume–increases in countries following mandatory IFRS adoption; and conditions and mechanisms through which increases occur. Their findings suggest information content increased in 16 countries that mandated adoption of IFRS relative to 11 countries that maintained domestic accounting standards, although the effect of mandatory IFRS adoption depends on the strength of legal enforcement in the adopting country. Utilizing a path analysis methodology, they found evidence of three mechanisms through which IFRS adoption increases information content: reducing reporting lag, increasing analyst following, and increasing foreign investment. Using European data, Armstrong et al. (2007) reported that the stock market reacts positively to the early adoption of IFRS, which suggests that European equity investors perceive net benefits due to convergence of accounting standards and improved information quality following IFRS adoption.

Lenormand & Touchais (2009) examined 160 French companies included in the SBF 250 index for 2004. They compared the relevance of the information content provided by IFRS against French GAAP. They examine cross-sectional data using a model which analyzes the association between stock prices and accounting earnings. They find the adoption of IFRS leads to a significant increase in the explanatory power (R^2) from 71.7% to 73.5%. This indicates that IFRS increased the association between earnings and stock prices. Studying the association between stock yields and accounting earnings they found also a significant increase in explanatory power from 30.9% to 33% for firms that adopted IFRS. These results summarize that adoption of IFRS leads to a reduction in information asymmetry. International standards lead to financial information of greater relevance in relation to local GAAP.

The same result also appears in the research of Bartov et al. (2005). These authors compared the value relevance of financial statements produced by three accounting standards: the US GAAP, German GAAP and IAS. First, they performed a cross-sectional study of 417 German firms between 1998 and 2000. They found that the return on equity and net income is significant and positive for companies using IFRS. Then they conducted a study of event, but on a sample of 37 companies during the period 1994-2000, and found that after the adoption of IFRS, equity returns become more connected to accounting income than before adoption. The authors showed that the information content of accounting earnings is higher following the adoption of international standards.

Outside the EU, Lin & Chen (2005) investigated the incremental value relevance obtained from reconciling accounts prepared under Chinese accounting standards to IFRS. The sample consisted of 53 to 79 listed companies per year on the Chinese stock exchange markets for the period 1995–2000. The authors applied the Ohlson model and the returns model and found that earnings and equity book values

determined under Chinese GAAP provide more relevant accounting information for the purpose of determining the shares prices than IFRS.

The study of Goodwin et al. (2008) has two main parts. First, they documented the effect of IFRS on key accounting information and ratios. Using a sample of 1,065 listed firms, they found the mean (median) of total liabilities has increased and the mean (median) of total equity has fallen. Total assets and earnings are higher under IFRS but the changes are not significant apart from the increase in the half-year earnings median. IFRS increases the leverage ratio. Second, they examined the relative value relevance of IFRS earnings and equity and the incremental value relevance of IFRS over Australian Generally Accepted Accounting Principles (A-GAAP). Using models with market prices and returns as dependent variables, they carried out their tests on annual earnings (net income) and equity measured at the changeover date to IFRS. They found no evidence that IFRS earnings and equity are more value relevant than A-GAAP, as well as, weak evidence that the aggregate changes for earnings and equity are incrementally value relevant to A-GAAP.

Barth et al. (2005) used data from 24 countries over a 15-year period to 2004 and found the transition to IFRS resulted in improved accounting quality using a variety of measures. Specifically, they found that IFRS results in more timely recognition of losses and higher R^2s in regressions of market value on earnings and book value.

Hung & Subramanyam (2007) used a sample of 80 German firms, which voluntarily adopted IFRS over the period 1998-2002 and provided accounts under German GAAP and IFRS for the same period. Using price 'levels' models, they found that total assets and book value of equity, as well as variability of book value and net income, are higher under IFRS than under German Accounting Rules (HGB). They also found that book value of equity and net income under IFRS are no more value relevant than the amounts under HGB. Further, they reported that earnings and equity under IFRS are incrementally value relevant to German GAAP. Both coefficients are highly significant but the earnings coefficient sign is negative which they suggest is consistent with more measurement errors in the IFRS earnings than in the German earnings (Bartov et al. (2005)).

To examine the ability of the adjustments to explain market value, Goodwin et al. (2008) used share-based payment instrument (SHA), income tax (TAX), goodwill (GOO), intangibles (INT), provisions (PRO), investments (INV), leases (LEA), impairment (IMP), foreign exchange translation (FX) and other (OTH) which is the catch-all component. The equity adjustment for tax (TAX) is negative indicating that those adjustments weaken associations with price. The coefficient for goodwill (GOO) adjustment to earnings is positive and significant suggesting that investors do not view depreciation (amortization) as a wasting asset. The intangibles' (INT) coefficients for earnings and equity are negative, suggesting the changes to accounting for intangibles under IFRS are inconsistent with investors' beliefs about the value of intangibles. The coefficients for provisions (PRO) for earnings and equity are both significant, suggesting that fair valuing of provisions is sufficiently reliable to be value relevant, but the negative signs imply that the accounting is inconsistent with investor beliefs. The negative coefficient for investments (INV) for earnings also suggests that investors view these adjustments differently from the accounting policy. The coefficient for impairment (IMP) is negative indicating that write-offs of different types of assets in earnings under IFRS polices are also inconsistent with investor beliefs, although the equity adjustment is not significant. Results indicate that the IFRS earnings level coefficient is positive and significantly associated with returns.

Callao et al. (2007), based on the Spanish IBEX-35 companies, focus on the effects of new standards on comparability and relevance of financial reporting in Spain. They addressed these objectives by seeking significant differences between accounting figures and financial ratios under two sets of standards (i.e. Spanish GAAP and IFRS). The accounting variables used are balance sheet variables (fixed assets,

inventories, debtors, cash, current assets, total assets, equity, long-term liabilities, short-term liabilities, total liabilities, long-term resources, total equity and liabilities); income statement variables (operating income, ordinary income, net income and net income attributable to equity holders of the parent); and financial ratios (current ratio, acid test, cash ratio, solvency, indebtedness, return on assets per operating income and ordinary income, return on equity per ordinary income and net income). They concluded that the financial statements of Spanish firms adopting IFRS reflect increases in cash and cash equivalents, long-term and total liabilities and in the cash ratio, indebtedness and return on equity; and decreases in debtors, equity, operating income and solvency ratio and return on assets (measured in terms of the operating income).

Ormrod & Taylor (2004) studied the impact of the change from UK GAAP to IFRS on covenants included in debt contracts. They suggest the change is likely to result in more volatile reported earnings figures, in addition to differences in reported profits and balance sheet items. A movement towards cash flow-based covenants might thus be seen as one method of moderating the uncertainty for borrowers arising from the introduction of IFRS.

Ernstberger & Vogle (2008) critically examined the impact of voluntary adoption of Internationally Accepted Accounting Principles (IAAP, IAS/IFRS and US GAAP) on the cost of equity capital in Germany. First, the authors found an overall cost of equity-capital estimates in the Capital Asset Pricing Model (CAPM) for companies applying IAAP are significantly lower compared to those applying German GAAP. Second, the enhanced multi-factor model that incorporates the accounting-regime differences (called "GM model") absorbs the cost of equity-capital differences. Third, changes of the institutional background in Germany and of the accounting standards lead to different cost of equity capital effects for sub-periods of the 1998–2004 voluntary-adoption periods, while particularly controlling for effects like self-selection, cross-listing, and New Market (Neuer Markt) listing.

Schipper (2005) described a series of implementation effects associated with the mandatory adoption of IFRS in the EU. The IASB had found it necessary to provide detailed implementation guidance for IFRS, otherwise accountants and auditors turn to US GAAP or jurisdiction-specific European GAAP. Likewise, the adoption of IFRS coupled with the IASB's commitment to international convergence with the FASB places additional pressure on two reporting issues: defining the reporting entity for consolidation purposes and developing reliable fair value measures.

In Germany, Schiebel (2006) examined the value relevance of IFRS and German GAAP. The sample included 24 German companies listed on the Frankfurt stock exchange market (12 companies publishing exclusively German GAAP consolidated reports for the period 2000–2004 and 12 companies publishing exclusively IFRS consolidated reports for the period 2000–2004). The author conducted different regressions of market capitalization on consolidated equity book value using a simple linear regression analysis, finding that German GAAP are significantly more value relevant than IFRS. These findings are mixed; with some studies showing that the change to IFRS improves value relevance (Bartov et al. (2005); Harris & Muller (1999) and Horton & Serafeim, (2006)), and others showed it worsens value relevance (Lin & Chen (2005) and Schiebel (2006)). Still others found no conclusive evidence either way (Niskanen et al. (2000)). They examined the improvement in the value relevance of accounting information as a result of the application of IFRS rather than local GAAP.

Kinnunen et al. (2000) exploited a unique market setting in Finland, where foreign investors are restricted in their trading of certain shares. This permits the authors to examine the relative value relevance of Finnish GAAP and voluntarily adopted IFRS between two investor groups. They found that IFRS improves the information content for foreign investors but not for domestic investors. Another Finnish study conducted by Niskanen et al. (2000), examined components of reconciliations to IFRS for 18 Finnish firms that using voluntarily IAS/IFRS over the period 1984 to 1992. They reported that aggregate

earnings difference is value irrelevant for explaining returns but that untaxed reserves adjustments and consolidation differences are value relevant.

More recently, Christensen et al. (2007) examined the economic consequences for UK firms of the European Union's decision to impose mandatory IFRS. They showed cross-sectional variations in both short-run market reactions and long-run changes in cost of equity associated with the decision. This suggests that mandatory IFRS adoption does not benefit all firms in a uniform way but results in winners and losers. Using a price levels regression, Hu (2003) reported that Chinese GAAP is more value relevant than IFRS using a sample of 252 firm-years (Eccher and Healey (2003)).

According to the above-mentioned studies, we formulate the following hypotheses:

H_1: The crisis has an effect on the relationship between yield and assets turnover.
H_2: The crisis has an effect on the proportion of equity invested in fixed assets.
H_3: The crisis has an effect on earnings.
H_4: The crisis has an effect on dividends.
H_5: The crisis has an impact on the liabilities.
H_6: The crisis has a negative effect on the relationship between accounting information and yield.

METHODOLOGY

We selected a sample of 220 companies-year observations listed on the French stock market that adopted the IAS-IFRS since 2005. To study the impact of adoption on the manipulation of accounting figures, we chose two study periods, the pre-crisis period 2006-2007 and the post-crisis period 2009-2011. The results obtained from both periods will be compared. We analyze the correlation relationship between discretionary accruals and accounting and financial data published by the French firms before and after the crisis. We eliminated financial companies and other enterprises with sector-based accounting rules.

The yield per share for a period of time t can be expressed as follows:

$$R_{it} = \frac{P_{it+1} - P_{it} + D_{it} + d_{att} + d_{sous}}{P_{it}} \quad (1)$$

P_{it} is the value of investment at beginning of the period.
P_{it+1} is the value of this investment at the end of the period.
D_{it} is dividends paid during the period.
d_{att} represents the rights of attribution.
d_{sous} represents the rights of subscription.

Accounting and financial information were collected annually from of 45 French companies websites. We were able to distribute transactions over the five financial years (2006, 2007 and 2009, 2010, 2011) in two sets. The first set, related to the period before the financial and economic world crisis. The second considers the behavior of the market after the crisis. So we have 88 firm-observations for the first period (before crisis) and 132 firm-observations for the second period (after crisis). This allows the study of different ratios related to the financial structure, margins and overall income and financing. Among these ratios, 13 were selected in our study. They are the key points of the analysis made by financial analysts (Nafti & Baccouche (2007)) at the introduction of companies to the stock market or after its introduction as shown in Table 1.

Table 1: Selected Accounting Variables

Variables	Nature of Each Variable
V_1	Turnover / Customers (Customers Turnover)
V_2	Turnover / Net Fixed Assets (Assets Turnover)
V_3	Turnover / Equity (Equity Turnover)
V_4	Non-Current Liabilities / Equity
V_5	Net Fixed Assets/Total asset
V_6	Current Asset/Total Asset
V_7	Non-Current Liabilities/Total Asset
V_8	Current Liabilities/Total Liabilities
V_9	Equity / Net Fixed Assets
V_{10}	Earnings / Turnover
V_{11}	Earnings / Equity
V_{12}	Net income/Turnover
V_{13}	Dividend per Share

This table shows the variables examined in this study.

The empirical validation of the relationship yield-accounting information requires the measurement at a given date the relationship between Y_{it} value or market performance R_{it} of a company i and one or more accounting variables intended to reflect the ability of the firm to create wealth and to pay dividends:

$$Y_{it} = \alpha_0 + \alpha_1 VC_{it}^1 + \alpha_2 VC_{it}^2 + \cdots + \alpha_k VC_{it}^k + \upsilon_i + \varepsilon_i \quad (2)$$

Where:

Y_{it}: represents the dividend yield;
VC_{it}^k: represents the accounting variable *k* published by the company *i* at *t* (see Table 1);
υ_i: represents the specific effects of companies;
ε_i: represents the error term.

Our model can be written as follows:

$$R_{it} = \alpha_0 + \alpha_1 V_1 + \alpha_2 V_2 + \alpha_3 V_3 + \alpha_4 V_4 + \alpha_5 V_5 + \alpha_6 V_6 + \alpha_7 V_7 + \alpha_8 V_8 + \alpha_9 V_9 + \alpha_{10} V_{10} + \alpha_{11} V_{11} + \alpha_{12} V_{12} + \alpha_{13} V_{13} + \upsilon_i + \varepsilon_i \quad (3)$$

The adjusted coefficient of correlation (adj. R^2) of the previous model is used to assess the intensity of the relationship between the level or changes in yield and accounting information. Most studies have only retained earnings as an explanatory variable of profitability or market value of the company. They have relatively poor performance and their coefficients of determination (R^2) are low. Indeed, the model developed and tested in the study of Beaver et al. (1997) measures the relationship between changes in share price and those of earnings. According to this study, the earnings may change for reasons that have nothing to do with the price change. The share price may also change due to events that have no relationship with earnings. Finally, share prices and earnings are two endogenous variables. In the same line of thought, Kothari et al. (2003) used, as in the case of several other researches, earnings as a benchmark in the relationship of yield-earnings. Their study is based on aggregate earnings news. They find the relationship between yield and earnings is markedly different when we use aggregate data.

STUDY RESULTS

Impact of the Adoption of IAS-IFRS before the Crisis

The examination of the correlation matrix presented in Table 2, allows us to conclude the existence of multicollinearity. According to Kennedy (1998) multicollinearity in a data set is considered if at least one

simple correlation coefficient between the independent variables is at least 0.8 in absolute value. In fact, there is a significant correlation relationship between the following variables as is shown in Table 2:

V_5 (Net Fixed Assets/Total asset) and V_2 (Turnover / Net Fixed Assets (Assets Turnover)
V_6 (Current Asset/Total Asset) and V_2 (Turnover / Net Fixed Assets (Assets Turnover)
V_6 (Current Asset/Total Asset) and V_5 (Net Fixed Assets/Total asset)
V_7 (Non-Current Liabilities/Total Asset) and V_4 (Non-Current Liabilities / Equity)
V_8 (Current Liabilities/Total liabilities) and V_3 (Turnover/Equity)
V_9 (Equity / Net Fixed Assets) and V_4 (Non-Current Liabilities / Equity)
V_{12} (Net income/Turnover) and V_{11} (Earnings / Equity)

Table 2: Correlation Matrix of the Independent Variables

	V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	V_9	V_{10}	V_{11}	V_{12}	V_{13}
V_1	1.000												
V_2	-0.2406	1.000											
V_3	-0.2038	0.6562	1.000										
V_4	-0.0280	-0.3377	0.2976	1.000									
V_5	0.3524	**-0.8453**	-0.4305	0.3813	1.000								
V_6	-0.3524	**0.8453**	0.4305	-0.3813	**-1.000**	1.000							
V_7	0.1419	-0.6164	-0.0755	**0.8719**	0.6461	-0.6461	1.000						
V_8	-0.3443	0.7388	**0.8076**	-0.0503	-0.6165	0.6165	-0.4723	1.000					
V_9	-0.1542	0.5532	-0.1606	**-0.8389**	-0.6757	0.6757	-0.7798	0.1164	1.000				
V_{10}	0.1796	-0.5518	-0.6366	-0.0516	0.5762	-0.5762	0.2692	-0.5840	-0.0421	1.000			
V_{11}	-0.1218	0.0639	0.1978	0.0626	0.0256	-0.0256	0.0280	0.1291	-0.0045	0.4588	1.000		
V_{12}	-0.1229	0.0307	0.1653	0.0442	0.0514	-0.0514	0.0413	0.0891	0.0155	0.4752	**0.9697**	1.000	
V_{13}	0.1689	-0.3875	-0.1968	0.0652	0.4833	-0.4833	0.2163	-0.2368	-0.2184	0.4957	0.3771	0.3497	1.000

This table shows the correlation matrix of the independent variables used in this study.

This observation brings us to eliminate five variables from the model to avoid having a biased model. The eliminated variables are:

V_3: Turnover / Equity (Equity Turnover)
V_4: Non-Current Liabilities / Equity
V_5: Net Fixed Assets/Total asset
V_6: Current Asset/Total Asset
V_{12}: Net income/Turnover

Table 3 presents the correlation matrix for the remaining variables. From Table 3, we conclude the absence of multicollinearity for all remaining variables. In fact, all correlation coefficients between the remaining independent variables are less than 0.8 in absolute values.

Table 3: Correlation Matrix of the Remaining Independent Variables

	V_1	V_2	V_7	V_8	V_9	V_{10}	V_{11}	V_{13}
V_1	1.000							
V_2	-0.2406	1.000						
V_7	0.1419	-0.6164	1.000					
V_8	-0.3443	0.7378	-0.4723	1.000				
V_9	-0.1542	0.5532	-0.7798	0.1164	1.000			
V_{10}	0.1796	-0.5518	0.2692	-0.5840	-0.0421	1.000		
V_{11}	-0.1218	0.0639	0.0280	0.1291	0.0045	0.4588	1.000	
V_{13}	0.1689	-0.3875	0.2163	-0.2368	-0.2184	0.4947	0.3771	1.000

This table shows a correlation matrix of independent variables used in this study.

Table 4 presents the regression estimates of the equation:

$$R_{it} = \alpha_0 + \alpha_1 V_1 + \alpha_2 V_2 + \alpha_3 V_7 + \alpha_4 V_8 + \alpha_5 V_9 + \alpha_6 V_{10} + \alpha_7 V_{11} + \alpha_8 V_{13} + \upsilon_i + \varepsilon_i, \quad (4)$$

where:

V_1: Turnover / Customers (Customers Turnover)
V_2: Turnover / Net Fixed Assets (Assets Turnover)
V_3: Turnover / Equity (Equity Turnover)
V_7: Non-Current Liabilities/Total Asset
V_8: Current Liabilities/Total Liabilities
V_9: Equity / Net Fixed Assets
V_{10}: Earnings / Turnover
V_{11}: Earnings / Equity
V_{13}: Dividend per Share
υ_i: Specific effects of companies

The results presented in Table 4 show that the eight variables chosen to be in the model, explain the dividend yield at 35.51% (adjusted R^2). This is a good value for a regression performed on 88 observations (44 firms observed over 2 years). The adjusted R^2 (35.5%) is significantly different from zero, which proves the existence of a relationship between accounting and performance variables. Moreover, all the empirical studies in this direction proved the existence of a correlation between these two types of variables (economic and accounting) with percentages of correlation different from one study to another (Ball & Brown (1968), Toms (2002), Cheng (2005) and Bao (2004)). None of these studies has found there is no such relationship.

Table 4: Regression Results of R_{it} to Remaining Accounting Variables (2006-2007)

Model A: $R_{it} = \alpha_0 + \alpha_1 V_1 + \alpha_2 V_2 + \alpha_3 V_7 + \alpha_4 V_8 + \alpha_5 V_9 + \alpha_6 V_{10} + \alpha_7 V_{11} + \alpha_8 V_{13} + \upsilon_i + \varepsilon_i$

	Parameter Estimate	**t**	**Probability> | T |**
Constant	0.0236	0.21	0.832
V_1	-0.0068	-0.78	0.443
V_2	**-0.0317**	**-2.00**	**0.053****
V_7	0.0688	0.53	0.602
V_8	0.1805	0.87	0.388
V_9	**0.0175**	**3.45**	**0.001***
V_{10}	0.0240	0.90	0.372
V_{11}	0.0463	-0.43	0.671
V_{13}	-0.5606	-0.29	0.776

This table shows regression results. Adjusted R^2 = 35.51%, chi2 = 14.47 with Prob.>0.07 (Hausman specification test)
*Significant at: *1%, **5% and ***10% (***)*

According to the results presented in Table 5, the overall significance chi^2 test shows that the coefficients α_k are different from zero (prob. = 0.02) and the Lagrangian test shows the existence of heterogeneity among variables (prob. = 0.9097). This is corrected by the introduction into the model of an element υ_i expressing specific effects of companies.

Table 5: Econometric Tests Related to Model A

Tests	**Chi2**	**Prob. > chi2**	**H_0**
Test of global significance for α_k	2.48	0,0298	Reject $\alpha_1 = \alpha_2 = \cdots = \alpha_k = 0$
Test of Breusch and Pagan Lagrangian	0.01	0.9097	Heterogeneity
Hausman specification test	14.47	0.0703	Accept corr $(\upsilon, V) = 0$

This table shows the results of statistical tests related to Model A.

The results of our study, presented in Table 4, are obtained through estimates based on the fixed effect model (fixed effect) and that, using the Hausman test (chi2 = 14.47 and prob. > chi2 equal to 0.07) which means that H_0 is accepted and corr $(\upsilon, V) = 0$ is a prerequisite for the Generalized Least Squares (GLS) model to be Best Linear Unbiased Estimator (BLUE) and convergent.

In addition, from Table 4, we notice variable coefficients V_2 and V_9 are significant. These two ratios represent asset turnover and the ratio of equity to total assets. This result leads us to conclude that first, before the crises, we find a significant and negative (-0.0317) relationship between the yield of the French listed companies and the proportion of assets turnover. This result can be explained by the significant investments made by the company after the adoption of the international standards since 2005. These investments have increased both the value of assets (acquisition of new software) and business expenses (training), which resulted in a significant decrease in operating income of certain companies. Second, before the crises, we found a significant and positive (0.017) relationship between French listed companies yield and the proportion of their equity from net assets. This result reflects the accounting impact after the adoption of the international standards since 2005. Indeed, this change increases the revaluation account and the level of equity. Other variables, included in Model A and presented in Table 4, are not significant. However, these variables contribute to explain the dividend yield at 35.51%.

According to the work of Lev and Thiagarajan (1993), accounting data can explain 13% to 35% of the variation in the market value of companies. The most relevant for the assessment indicators turn out to be the current earnings, inventories, investment, gross margin, R&D and employee productivity.

Impact of the Adoption of IAS-IFRS after the Crisis

The examination of Table 6 presenting the correlation matrix of the variable allows us to detect a significant correlation relationship between variables. As stated earlier, significant correlation between independent variables is considered if the value of the correlation coefficient between the independent variables is at least 0.8 in absolute values. The following variables have a significant correlation coefficient:

V_7 (Non-Current Liabilities/Total Asset) and V_4 (Non-Current Liabilities / Equity)
V_7 (Non-Current Liabilities/Total Asset) and V_8 (Current Liabilities/Total liabilities)
V_{12} (Net income/Turnover) and V_{10} (Earnings / turnover)

Table 6: Correlation Matrix of the Independent Variables

	V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	V_9	V_{10}	V_{11}	V_{12}	V_{13}
V_1	1.000												
V_2	0.1205	1.000											
V_3	0.2138	0.6977	1.000										
V_4	-0.0195	-0.3397	0.2159	1.000									
V_4	0.2647	-0.7381	-0.3573	0.4223	1.000								
V_6	-0.0726	0.6930	0.4190	-0.3387	-0.7840	1.000							
V_7	0.0039	-0.4403	-0.0105	**0.8513**	0.5536	-0.4538	1.000						
V_8	0.0427	0.5841	0.2678	-0.6440	-0.5759	0.5406	**-0.8124**	1.000					
V_9	-0.0716	0.4613	0.1319	-0.6526	-0.6732	0.4759	-0.7062	0.4751	1.000				
V_{10}	0.2413	-0.3623	-0.1667	0.1653	0.5545	-0.5214	0.1982	-0.1772	-0.2180	1.000			
V_{11}	0.2681	-0.4452	-0.1941	0.2391	0.6319	-0.5535	0.2829	-0.2565	-0.3405	**0.9557**	1.000		
V_{12}	0.2964	0.0801	0.0415	-0.1261	0.1979	-0.1897	-0.0707	0.2092	-0.2220	0.6057	0.5797	1.000	
V_{13}	0.1463	-0.3435	-0.1403	0.2318	0.4726	-0.5400	0.2213	-0.0995	-0.2288	0.6716	0.6008	0.4509	1.000

This table presents a correlation matrix of independent variables used in the analysis.

This result brings us to eliminate three variables from the model to avoid having a biased model:

V_4 (Non-Current Liabilities / Equity)
V_7 (Non-Current Liabilities/Total Asset)
V_{12} (Net income/Turnover)

The examination of the correlation matrix of the remaining variable presented in Table 7, allows us to conclude the inexistence of multicollinearity. In fact, all correlation coefficient between the remaining independent variables are less than 0.8 in absolute values.

Table 7: Correlation Matrix of the Remaining Independent Variables

	V_1	V_2	V_3	V_5	V_6	V_8	V_9	V_{10}	V_{11}	V_{13}
V_1	1.000									
V_2	0.1205	1.000								
V_3	0.2138	0.6977	1.000							
V_5	0.2647	-0.7381	-0.3573	1.000						
V_6	-0.0726	0.6930	0.4190	-0.7840	1.000					
V_8	0.0427	0.5841	0.2678	-0.5759	0.5406	1.000				
V_9	-0.0716	0.4613	0.1319	-0.6732	0.4759	0.4751	1.000			
V_{10}	0.2413	-0.3623	-0.1667	0.5545	-0.5214	-0.1772	-0.2180	1.000		
V_{11}	0.2964	0.0801	0.0415	0.1979	-0.1897	0.2092	0.2220	0.6057	1.000	
V_{13}	0.1463	-0.3435	-0.1403	0.4726	-0.5400	-0.0995	-0.2288	0.6716	0.4590	1.000

Table 8 presents the regression estimates of the equation

$$R_{it} = \alpha_0 + \alpha_1 V_1 + \alpha_2 V_2 + \alpha_3 V_3 + \alpha_4 V_5 + \alpha_5 V_6 + \alpha_6 V_8 + \alpha_7 V_9 + \alpha_8 V_{10} + \alpha_9 V_{11} + \alpha_{10} V_{13} + \upsilon_i + \varepsilon_i, \quad (5)$$

where:

V_1: Turnover / Customers (Customers Turnover)
V_2: Turnover / Net Fixed Assets (Assets Turnover)
V_3: Turnover / Equity (Equity Turnover)
V_5: Net Fixed Assets/Total asset
V_6: Current Asset/Total Asset
V_8: Current Liabilities/Total Liabilities
V_9: Equity / Net Fixed Assets
V_{10}: Earnings / Turnover
V_{11}: Earnings / Equity
V_{13}: Dividend per Share
υ_i: Specific effects of companies

Table 8: Regression Results of R_{it} to Remaining Accounting Variables (2009-2011)

Model B: $R_{it} = \alpha_0 + \alpha_1 V_1 + \alpha_2 V_2 + \alpha_3 V_3 + \alpha_4 V_5 + \alpha_5 V_6 + \alpha_6 V_8 + \alpha_7 V_9 + \alpha_8 V_{10} + \alpha_9 V_{11} + \alpha_{10} V_{13} + \upsilon_i + \varepsilon_i$ (5)

	Parameter estimate	**t**	**Probability> | T |**
Constant	-0.0626	-0.38	0.702
V_1	0.0009	0.07	0.945
V_2	0.0308	1.54	0.124
V_3	-0.1624	-1.18	0.238
V_5	0.0615	0.49	0.626
V_6	-0.2163	-1.24	0.216
V_8	**0.2314**	1.65	**0.100*****
V_9	-0.0309	-1.05	0.293
V_{10}	-0.0259	-0.48	0.630
V_{11}	**-0.3341**	-2.50	**0.012***
V_{13}	**1.0319**	48.87	**0.000***

This table shows regression results. Adjusted R^2 = 15.86%, chi2 = 13.9 with Prob.>0.1259 (Hausman specification test). Significant at: *1%, **5% and ***10% (***)

The results presented in Table 8 and corresponding to model B, show the ten variables chosen to be in the model, explain the dividend yield at 15.86% (adjusted R^2). This value is significantly different from zero, which proves the existence of relationship between accounting and performance variables. Moreover, from Table 8, we confirm a significant correlation relationship between Yield and dividends (V_{13}).

According to the results presented in Table 9, the overall significance Chi2 test shows the coefficients α_k are different from zero (prob. = 0) and the Lagrangian test shows the inexistence of heterogeneity among variables (prob. = 0.0001). This is corrected by the introduction into the model of an element υ_i expressing specific effects of companies.

Table 9: Econometric Tests Related to Model A

Tests	Chi2	Prob. > chi2	H_0
Test of global significance for α_k	3719.52	0,0000	Reject $\alpha_1 = \alpha_2 = \cdots = \alpha_k = 0$
Test of Breusch and Pagan Lagrangian	15.43	0.0001	No Heterogeneity
Hausman specification test	13.90	0.1259	Accept corr $(\upsilon, V) = 0$

This table shows statistical tests related to Model A.

The results of our study, presented in Table 8, are obtained through estimates based on the random effect model (random effect) and using the Hausman test (chi2 = 13.90 and prob. > chi2 equal to 0.1259). In addition, from the observation of Table 8, we found the coefficient of variable V_1 is clearly insignificant in the model. For this reason, we decided to remove it from the model.

Table 10 Presents the Regression Estimates of the Equation

$$R_{it} = \alpha_0 + \alpha_1 V_2 + \alpha_2 V_3 + \alpha_3 V_5 + \alpha_4 V_6 + \alpha_5 V_8 + \alpha_6 V_9 + \alpha_7 V_{10} + \alpha_8 V_{11} + \alpha_9 V_{13} + \upsilon_i + \varepsilon_i, \text{ where:} \quad (6)$$

V_2: Turnover / Net Fixed Assets (Assets Turnover)
V_3: Turnover / Equity (Equity Turnover)
V_5: Net Fixed Assets/Total asset
V_6: Current Asset/Total Asset
V_8: Current Liabilities/Total Liabilities
V_9: Equity / Net Fixed Assets
V_{10}: Earnings / Turnover
V_{11}: Earnings / Equity
V_{13}: Dividend per Share
υ_i: Specific effects of companies

Table 10: Regression Results of R_{it} to Remaining Accounting Variables (2009-2011)

Model C: $R_{it} = \alpha_0 + \alpha_1 V_2 + \alpha_2 V_3 + \alpha_3 V_5 + \alpha_4 V_6 + \alpha_5 V_8 + \alpha_6 V_9 + \alpha_7 V_{10} + \alpha_8 V_{11} + \alpha_9 V_{13} + \upsilon_i + \varepsilon_i$

	Parameter Estimate	t	Probability> | T |
Constant	-0.0599	-0.38	0.703
V_2	**0.0310**	1.60	**0.110*****
V_3	-0.0163	-1.19	0.236
V_5	0.0623	0.50	0.618
V_6	-0.2169	-1.26	0.207
V_8	**0.2317**	1.66	**0.097*****
V_9	-0.0313	-1.07	0.284
V_{10}	-0.0259	-0.49	0.627
V_{11}	**-0.3346**	-2.51	**0.012***
V_{13}	**1.0319**	49.19	**0.000***

This table shows regression results. Adjusted R^2 = 15.82%, chi2 = 10.43 with Prob.>0.2364 (Hausman specification test) Significant at: *1%, **5% and ***10% (***)

The results presented in Table 10 show that the nine variables chosen to share the analysis of panel data, explain the dividend yield at 15.82% (adjusted R^2). This is a good rate for a regression performed on 132 observations (44 firms observed over 3 years). These results are in concordance with the work of Lev and Thiagarajan (1993) stating that accounting data can explain 13% to 35% of the variation in the market value of companies.

According to the results presented in Table 11, the overall significance of the Chi2 test shows the coefficients α_k are different from zero (prob. = 0) and the Lagrangian test shows the inexistence of heterogeneity among variables (prob. = 0.0001). This is corrected by the introduction into the model of an element υ_i expressing specific effects of companies.

Table 11: Econometric Tests Related to Model C

Tests	Chi2	Prob. > chi2	H_0
Test of global significance for α_k	3726.68	0,0000	Reject $\alpha_1 = \alpha_2 = \cdots = \alpha_k = 0$
Test of Breusch and Pagan Lagrangian	15.93	0.0001	No Heterogeneity
Hausman specification test	10.43	0.2364	Accept corr $(\upsilon, V) = 0$

This table shows statistical test results.

The results of our study, presented in Table 10, are obtained through estimates based on the random effect model (random effect) and using the Hausman test (chi2 = 10.43 and prob. > chi2 equal to 0.2364).

Based on the above results, the variable V_2 has a significant coefficient (as in Model A before the crisis). However, the V_2 coefficient is positive (unlike Model A). This result shows that French listed companies did not enter into new long-term investment processes after the crisis. They were more interested in increasing turnover and keeping their customers. Moreover, the very small and insignificant coefficient of variable V_8 shows that companies were trying to sell more on credit to maximize revenue. At this stage, we confirm our first hypothesis (H_1). Table 10 also shows that variables V_8 (current liabilities / Total Liabilities), V_{11} (earnings / equity) and V_{13} (dividend per share) have significant coefficients of 0.231, -0.334 and 1.03 respectively. This leads to the conclusion that after the crises companies adopted a policy of short-term debt to maintain levels of performance, profits and dividends. All these variables were not significant before the crisis. Consequently, we confirm our hypotheses H_2, H_3, H_4 and H_5.

Comparative Analysis of the Results

Table 12 summarizes the results, detailed above, of the regression estimates of the equation

$$R_{it} = \alpha_0 + \alpha_1 V_1 + \alpha_2 V_2 + \alpha_3 V_3 + \alpha_4 V_4 + \alpha_5 V_5 + \alpha_6 V_6 + \alpha_7 V_7 + \alpha_8 V_8 + \alpha_9 V_9 + \alpha_{10} V_{10} + \alpha_{11} V_{11} + \alpha_{12} V_{12} + \alpha_{13} V_{13} + \upsilon_i + \varepsilon_i \quad (7)$$

for model A and model C.

From the regression results presented in Table 12, we conclude that our final hypothesis (H_6) is confirmed. Pre-crisis accounting numbers explain the yield variation of 35.51%, while after the crisis this rate decreased to 15.82% (Table 12). This is due to the mistrust and lack of confidence that investors have had towards the accounting information published after the crisis.

CONCLUSION

This research tests the economic crisis impact the informational content of accounting information based on the IAS-IFRS in the French context. We selected a sample of 220 companies-year observations listed

on the French stock market that adopted the IAS-IFRS since 2005. The period chosen in this study is 2006 to 2010 (five years), divided into two periods: Pre-crisis 2006-2007 and post-crisis 2009-2010-2011. The results obtained from both periods are compared. We analyzed the correlation relationship between discretionary accruals and accounting and financial data published by French firms before and after the crisis. We eliminated financial companies and other enterprises with sector-based accounting rules.

Table 12: Impact of the Crises on the Relationship Yield-Accounting Variables

$$R_{it} = \alpha_0 + \alpha_1 V_1 + \alpha_2 V_2 + \alpha_3 V_3 + \alpha_4 V_4 + \alpha_5 V_5 + \alpha_6 V_6 + \alpha_7 V_7 + \alpha_8 V_8 + \alpha_9 V_9 + \alpha_{10} V_{10} + \alpha_{11} V_{11} + \alpha_{12} V_{12} + \alpha_{13} V_{13} + \upsilon_i + \varepsilon_i$$

	Results after the Crises			Results before the Crises	
Variables	**Parameter Estimate**	**Probability> | T |**	**Variables**	**Parameter Estimate**	**Probability>| T |**
Constant	-0.059	0.7	Constant	0.023	0.832
-	-	-	V_1	-0.006	0.443
V_2	**0.031**	**0.1*****	V_2	**-0.0317****	**0.053****
V_3	-0.016	0.236	-	-	-
V_5	0.062	0.618	-	-	-
V_6	-0.216		-	-	-
-		0.2	V_7	0.688	0.602
V_8	**0.231**	**0.09*****	V_8	0.18	0.388
V_9	-0.0312	0.284	V_9	**0.017***	**0.001***
V_{10}	-0.0259	0.627	V_{10}	0.024	0.372
V_{11}	**-0.334**	**0.012***	V_{11}	0.0463	0.671
V_{13}	**1.03**	**0.000***	V_{13}	-0.56	0.776

This table shows results of regression on the impact of the crises on the relationship between Yield and Accounting Variables. Before the Crisis: Adjusted R^2: 15.82%, chi2: 10.42 with Prob. > 0.2364 (Hausman specification test). After the Crisis : Adjusted R^2: 35.51%, chi2: with Prob. > 0.07 (Hausman specification test).

The results show that before, the crises **t**he adoption of IAS-IFRS affects negatively (-0.0317) the relationship between the yield of the French listed companies and the proportion of assets turnover. This result can be explained by significant investments made by companies at the date of transition to international standards. These investments have increased both the value of assets and business expenses, which resulted in a significant decrease in operating income of certain companies. Moreover, the adoption of IAS-IFRS affects positively (0.017) the relationship between the yield of French listed companies and the proportion of equity from assets. This result reflects the accounting impact of the transition to international standards. Indeed, this change increases the revaluation account and the level of equity. For the period after the crises, the results show that French listed companies did not enter into new long-term investment process. They are more interested in increasing their turnover and keeping their customers. The very small and insignificant coefficient of the Customer Turnover variable shows that companies are trying to sell more on credit to maximize their revenue. Companies after the crisis adopt the policy of short-term debt to keep the same level of performance, profits and therefore dividends. All these variables were not significant before the crisis. Finally, the pre-crisis accounting information explained 35.51% of the yield, while after the crisis this rate decreased to 15.82%.

The present research can be extended to include more European Union (EU) countries and ideally, the 28 countries and study the impact of IFRS adoption during the 2008 crisis on the relationship between yield and accounting variables. The results will be interesting and challenging since each country has its own culture and local accounting rules (local GAAPs) but linked to the EU accounting rules and laws in general and to the adoption of the IFRS in 2005 in particular.

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ACCOUNTING AND AUDITING PRACTICES IN NON-GOVERNMENTAL ORGANIZATIONS: EVIDENCE FROM FIJI

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ABSTRACT

This paper examines the accounting and auditing practices in non-governmental organizations. It seeks to understand accounting processes and reporting practices in non-governmental organizations. Non-governmental organizations have become important institutions in world affairs but accounting research has not developed significant interest in their operations and accounting practices. We use content analysis on the annual reports of 20 non-governmental organizations operating in Fiji. The results show variations in the accounting and auditing practices of the non-governmental organizations. Further analysis indicates that a number of factors influence the accounting and auditing practices of non-governmental organizations. Our analysis shows that financial reporting practices are in part shaped by the requirements of donor agencies and influence of specific stakeholder groups. We also find that the need to legitimize their operations also influences the accounting and auditing practices of non-governmental organizations. This paper contributes to the limited empirical research on the accounting and auditing practices of non-governmental organizations in developing markets.

JEL: M40, M41

KEYWORDS: Non-governmental Organizations, Accounting, Auditing

INTRODUCTION

The institutional structure of free-market societies is defined by the existence of three main sectors, the public sector, the private business sector and the private non-governmental sector (Weisbrod, 1975). The public sector comprises of state-owned companies, government entities and agencies that fall under parliamentary regulation. The private sector on the other hand operates with a capitalist view, their annual accounts are subject to an independent audit and they are controlled by ownership interests. Apart from these two relatively well-defined sectors, there is another more complex and heterogeneous sector. The non-governmental sector includes charities, churches, clubs, credit and trade unions, cultural, educational, disability service, environmental, health support, religious, social welfare service, sporting, women, youth, business, and professional organizations. Non-Governmental Organisations (NGOs) are organizations that are not part of government and are not conventional for-profit businesses. The existence of a substantial number of non-governmental organizations can be explained by altruistic motives. Some also arise out of market failure which government does not sufficiently correct for, for example, organizations protecting the environment. These entities have been characterized as exhibiting complexity in their aims, in the way in which they affect society, in the overlapping relationship for which they may be held accountable and in the diffused exchange relationship, which markets, do not capture (Jegers and Lapsley, 1998).

Non-governmental organizations contribute significantly to the development of economies. The growing importance of NGOs and the increasing amount of resources managed by NGOs has increased the demand for financial information. There is, as a result, a two-fold effect on demand for financial information for NGOs. First, NGOs need to obtain funds from donors in competition with other NGOs and private and public entities to carry out their activities. In negotiations about activities and funding

arrangements with sponsors, government agencies, lenders and other entities, financial performance information contributes to showing the efforts and accomplishments of the entity and can help obtain social and financial support. In addition, the growing amount of funds flowing through these types of organizations calls for more accountability to stakeholders including donors and the public. This need for accountability gives rise to the need for a comprehensive and robust regulatory framework upon which the financial reporting systems could be based. This is what is lacking in many economies including developed ones. Research interest in this sector has also grown in the international arena. This can be evidenced by the creation of a special section in the American Accounting Association dedicated to this sector. Given the importance of this sector, financial reporting regulations are underdeveloped for such organizations. The regulators in many developed countries have for long focused on the regulatory requirements of listed public entities, however, only recently did this sector receive attention from researchers. Hence, there is a lacuna, in regulations related to financial reporting as well as research into the financial reporting practices by such organizations.

This paper explores the accounting and auditing practices of NGOs in Fiji. It seeks to provide insights that will provide regulators, legislators, and stakeholders a better understanding of the factors that shape financial reporting practices of NGOs. The rest of this paper is organised as follows. Section 2 provides a review of literature and presents the research questions that are explored in this paper. Section 3 presents the methodology employed followed by section 4 that presents the results of this study. Section 5 concludes this paper.

LITERATURE REVIEW

In Fiji, the Charitable Trusts Act (1965) governs the establishment of NGOs. This act, however, provides no requirements or guidance on reporting by entities registering under the act (this can be enforced by the registrar but there are no specific provisions). The law (Fijis Charitable Trusts Act) also fails to provide for issues related to governance of organizations created under the act (Lakshman, 2004). This indicates apparent lacuna in regulations related to financial reporting by NGOs in Fiji as the accountability functions of the NGOs are not well defined in law. The Value Added Tax Decree 1991 and the Income Tax Act (Cap 201) are some of the other laws that affect the NGO operations in Fiji.

Apart from the Charitable Trust Act being the principal legislation, separate laws exist that governs particular NGOs. For example Religious Bodies Registration Act for religious organizations; Friendly Societies Act for 'friendly societies'; Clubs Act for clubs; Trade Union Act for trade unions and Cooperative Act for the cooperatives. Some legislation governing the professional bodies include the Legal Practitioners Act for lawyers and the Fiji Institute of Accountant's Act for accountants. Other NGOs still are registered under specific Acts such as Fiji Disabled Peoples Association, which is registered under the Fiji National Council for Disabled Persons Act (1994), and the children Homes registered under the Juvenile Act. Over 500 NGOs are in existence in Fiji (Mohanty, 2008). These NGOs provide services in various sectors including the environmental sector, the health sector and the education sector. NGOs contribute immensely to the education sector in Fiji. Nearly 90 per cent of secondary and technical vocational schools in Fiji are operated by NGOs (Mohanty, 2008) together with a substantial number of primary schools. Several NGOs participate in the health sector amongst these are the Fiji Disabled People's Association, Fiji Crippled Children Society, Fiji Society for Blind, and JP Bayley Trust. Additionally, AIDS Task Force of Fiji, Fiji Cancer Society, and Kidney Foundation of Fiji are some of the leading agencies for NGO initiatives in their respective fields.

There exist a number of NGOs indulging in environment conservation, for example, South Pacific Action Committee on Human Ecology and the Environment (SPACHEE), Green Peace Pacific, Pacific Concern Resource Centre (PCRC), World Wide Fund for Nature (WWF) and the Wildlife Conservation Society.

Overall, NGOs contribute significantly to the society and the economy of Fiji and the rest of the world. We now look at issues related to the financial reporting of NGOs.

Bird and Morgan-Jones (1981) conduct a survey of financial reporting by charity organisations in the United Kingdom (U.K.). They found that amongst a sample of 85 NGOs, accounting practices varied widely. Ashford (1991) reviewed the accounts of 56 NGOs and found similar results to Bird and Morgan-Jones (1981). There was a wide variety of accounting practices being employed by charitable organisations 10 years later in the U.K.Goddard and Assad (2006) investigated the phenomena of accounting by NGOs in Tanzania. They report that accounting reports provided by NGOs played the role of navigating organisational legitimacy (in many cases to donors) and that, these reports played minimal role in internal decision-making. Ebrahim (2003) noted the same and stated that "upward" or "external" accountability to donors are well in place while "internal" or downward" mechanisms are underdeveloped. A range of other studies also provides evidence on financial reporting practices of NGOs (see for example Bekkers, 2002, Harper and Harper, 1988, Alvey, 1995, Cordery and Bakerville-Morley, 2005). These studies and others recommend that changes are needed in order to improve the financial reporting practices of NGOs. Various studies look at the interplay between donor agencies and their role in the financial reporting practices of NGOs. Gordon and Khumawala (1999) provide evidence that donors to NGOs do use financial reports in making donation decisions.

However, they also note that this is also influenced by the donors' motivations and circumstances surrounding their giving. Prior studies such as Weisbrod and Dominguez (1986), Posnett and Sandler (1989), Tinkelman (1999), Greenlee and Brown (1999), Okten and Weisbrod (2000), Parsons (2003), Tinkelman (2004), Tinkelman and Mankaney (2007), Parsons (2007) provide evidence that accounting information does influence donor decisions. These studies show that NGOs with higher program ratios get more donations from donors. Program ratio is the ratio of reported program expenses to the total expenses of an NGO. These program ratios are also subject to manipulation by NGOs (Jones and Roberts, 2006, Keating at al., 2008). Apart from manipulating these ratios, Yetman and Yetman (2012) provide evidence that NGOs also manipulate their management and general administrative expenses.

Kitching (2009) investigates the value of auditing on donations to NGOs. He reports that auditing has a positive impact on donations. Yetman and Yetman (2013) provide further evidence to suggest that donors do discount low-quality financial reports in their decision-making. Dellaportas et al. (2008) argued that, as it is, the donors to NGOs experience a great deal of difficulty in understanding the allocation of their funding through the financial reports prepared by NGOs. He attributed this to the lack of regulation and guidelines on financial reporting by NGOs. The issues related to financial reporting are not only important to NGOs and the public in developing countries where majority of the studies have been conducted but also in small developing island countries such as Fiji. However, to recommend and apply changes to the financial reporting practices of NGOs in Fiji would require that we have a good understanding of the status of the financial reporting practices of NGOs first.

In Fiji, there are 500 active NGOs (Mohanty, 2008). These NGOs are operating under the Charitable Trusts Act (1965). An analysis of the Charitable Trusts Act reveals that it does not provide guidelines on financial reporting. It does not even require organisations registered under it to prepare and file reports with the registrar of charitable organisations. This gives us a unique opportunity to investigate financial reporting by NGOs in a potentially unregulated market. It also gives us an opportunity to understand the factors that motivate NGOs to prepare financial reports in a seemingly unregulated market. Therefore, the following research questions are developed:

RQ1: What is the current state of NGO financial reporting in Fiji?

RQ2: What factors motivate NGOs to prepare and provide financial reports in an unregulated market?

DATA AND METHODOLOGY

We analyse the content of annual reports of a sample of NGOs to understand the current state of financial reporting by such organisations. In order to understand the factors motivating NGOs in preparing financial reports, in-depth interviews were conducted with the executives and accountants of the respective organisations. NGOs operating in Fiji are chosen as the sample in this study. The sample is drawn from a list of NGOs compiled by Mohanty (2008). This list is an exhaustive list of all NGOs registered and operating in Fiji and their contact details. A random sample of 20 NGOs were picked from the list. The sample consists of NGOs operating in a range of sectors including education, health, environment, and sports. Table 1 shows the distribution of the sample. There are 3 labor unions, 5 educational institutions, 2 religious bodies, 2 health sector related organizations, 3 sports related organizations, 3 professional membership organizations and 2 regional associations in the sample.

Table 1: Distribution of the NGOS by Sector

	N = 20	Percent
Labour Unions	3	15%
Education	5	25%
Religious	2	10%
Health	2	10%
Sports	3	15%
Professional Membership Associations	3	15%
Regional Associations	2	10%
		100%

This table presents the distribution of the sample by the sector in which the organizations operate. There are 20 organizations in the sample.

Two methods of data collection are employed in this paper. The first method involves the use of content analysis on archival data from the annual reports for the year 2011. The annual reports were collected from offices of the organizations selected as our sample. The accounting and auditing practices were analyzed with reference to several variables related to financial reporting. Descriptive statistics is used to analyze the current state of NGO financial reporting.In order to gain a deeper understanding of the financial reporting practices and choices, in-depth interviews were conducted with the executives from the selected NGOs. The purpose of the interviews was to complement the content analysis. The interviews were recorded on a digital recorder and were later transcribed and analyzed.

RESULTS

Table 2 provides the descriptive statistics of the financial reporting practices amongst NGOs. The table shows that almost all the organisations prepare and present a statement of receipts and payments and a balance sheet (95% and 90% respectively). However, only 50% of the organisations present a statement of cash flow. NGOs in Fiji are not required to prepare and present financial reports under the Charitable Trusts Act (1965). Regardless of the absence of any regulation requiring the preparation of financial reports majority of the sampled organizations do prepare and present the basic financial statements. In the interviews with the executives of the large regional NGOs and local NGOs that seek international sources of finances, it was revealed that donor requirements shape their financial reporting practices. In most cases, international donor agencies require that recipient organisations report on a regular basis and that a reputable auditing firm (preferably an international audit firm) audit the annual financial statements.

The analysis also indicates that not all of the entities prepare financial reports in accordance with accounting standards or GAAP. Only 11 (55%) out of the 20 organisations follow the Fiji Accounting Standards. The rest prepare their financial reports using no applicable accounting standards. However, they do prepare the financial statements under accrual accounting. All the organisations employed historical cost accounting. It was interesting to note that one organisation which purports to apply only

historical cost accounting in the preparation of its financial reports had revalued its properties. This presents an inconsistency in the application of accounting policies.

Table 2: Descriptive Statistics on Accounting and Auditing Practices

	N= 20	Percent
Financial Statement Presentation		
Statement of Receipts and Payments	19	95%
Balance Sheet	18	90%
Statement of Cash Flow	10	50%
Accounting Policies and Standards		
Fiji Accounting Standards	11	55%
Other Accounting Standards/GAAP	0	0%
No Accounting Standards or GAAP	9	45%
Auditing		
Audited Financial Statements	18	90%
Audited by:		
International Accounting Firm	6	30%
Local National Accounting firm	10	50%
Individuals	2	10%

This table presents the descriptive statistics on the accounting and auditing practices of non-governmental organisations for the entire sample.

Table 3 presents the results by the different sectors in which the NGOs operate. The results indicate that NGOs operating as regional associations produce all the three common financial statements, follow the applicable accounting standards and have the accounting statements audited by reputable accounting firms. This may be because regional NGOs receive significant amounts of international donor funding and have greater motivation to apply accounting standards and produce quality reports to satisfy donor agency requirements. Educational organisations, on the other hand, hardly comply with applicable accounting standards or get their financial statements audited by reputable audit firms. This may be because most of these educational institutions are small organisations operated by small community based committees and rely very little on international donor funding. They do produce audited financial statements because this is required to be furnished to the Ministry of Education in Fiji, which provides grants to these educational institutes.

Table 3: Descriptive Statistics on Accounting and Auditing Practices by Organization Type

	Labor Unions	Education	Religious	Health	Sports	Professional Associations	Regional Associations
Financial Statement Presentation	**N = 3**	**N = 5**	**N = 2**	**N = 2**	**N = 3**	**N = 3**	**N = 2**
Statement of Receipts and Payments	3	5	2	2	2	3	2
Balance Sheet	3	3	2	2	3	3	2
Statement of Cash Flow	1	0	1	1	2	3	2
Accounting Policies and Standards							
Fiji Accounting Standards	2	1	1	1	2	2	2
Other Accounting Standards/GAAP	0	0	0	0	0	0	0
No Accounting Standards or GAAP	1	4	1	1	1	1	0
Auditing							
Audited Financial Statements	3	5	1	2	2	3	2
Audited by:							
International Accounting Firm	0	0	0	1	1	2	2
Local National Accounting firm	3	4	1	1	1	0	0
Individuals	0	1	0	0	0	1	0

This table presents descriptive statistics on the accounting and auditing practices of non-governmental organisations segregated by organisation type.

Our analysis also shows that not all organisations had their financial statements audited. Table 2 shows that only 18 out of the 20 organisations presented an auditor's report in their annual report. All the

organisations that had an audit had engaged an external party to audit their financial reports. Table 2 indicates that 6 of the 20 organisations (30%) engaged a Big 4 international auditing firm as their auditor while 10 (50%) employed a local accounting firm as their auditor. Two (10%) of the organisations had their financial statements audited by individuals who were not on the roll of public accountants/auditors in Fiji.The larger local and regional NGOs mostly engaged the Big 4 international auditing firms as auditor. This is partially due to the requirement laid down by their fund donors to get their financial reports audited by credible auditors (preferably, international auditing firms). These NGOs are also in a position to afford the services of international audit firms.

The smaller local NGOs engaged local accounting firms or individuals as their auditors. It was also interesting to note that an organisation within our sample was audited by an individual who was not on the roll of accountants in Fiji. The individual, however, claimed to be an "accredited auditor" in the audit report. In the in-depth interviews with the executives of a number of small NGOs, it was revealed that the cost of auditing and the availability of auditors in their locality are factors affecting the appointment of registered auditors and accountants. Another factor that is important to small local NGOs in the selection of auditors is the benefits of appointing a qualified auditor against the cost of such an auditor. In most cases, small NGOs operating a primary or secondary school simply do not see the benefit of hiring a qualified auditor. The audit fees paid by the organisations to their auditors ranged from $FJ 150 to $FJ 8,750. A number of the organisations also purchased significant amounts of non-audit services from their auditors. The non-audit fees for a number of these organisations exceeded the audit fees.

Auditors are independent persons and the provision of other services by the auditors may have an impact on their independence (at least in perception). In this regards, in many jurisdictions the joint provision of audit and non-audit services is restricted for for-profit entities. In Fiji, there are no such restrictions for for-profit entities. Our interview with the executives of the NGOs revealed that they do not have adequate staff to prepare their accounts or conduct internal audits; therefore, they engage their auditors to provide such services. The issue of lack of staff is not isolated to any specific type or size of NGO. One of the reasons NGOs face this issue according to them is because accounting employees do not see a career in not-for-profit entities and as a result, employee turnover is high. It is also very difficult to attract good accounting staff. On a related issue, the executives of the smaller local NGOs reveal that they have very limited knowledge of accounting and financial reporting and that they keep their receipts and invoices, which they forward, to their accountant. The accountant then prepares the financial reports and provides an audit report. The accountant in most cases is a tax agent (as opposed to a qualified auditor) in the locality. This raises issues of independence of the auditor and the credibility of the audit report.

The auditor in these cases prepares the financial reports and provides an independent audit report on the financial reports. This may lead to a conflict of interest for the auditor and a loss of independent judgement. Another major issue raised in our in-depth interviews was lack of facilities and proper systems of accounting. A contributing factor to this problem was the lack of qualified accounting staff. Another issue related to this is the fact that most systems and processes are manual for many of the selected NGOs. Even in NGOs where they had computing power and accounting software's, the staffs were not well trained in using them. These issues pose challenges for NGOs in relation to financial reporting. It is recommended that guidelines in relation to accounting by NGOs be made available. It is also recommended that minimum reporting requirements be incorporated into the Charitable Trusts Act (1965) to improve accountability by such organisations.

It is also recommended that minimum reporting requirement take in to account the needs of the users of financial reports of very small NGOs as well. The smaller NGOs do play a critical role in the education and sports sector in Fiji. It is also recommended that Fiji Institute of Accountants (the accounting standard setter in Fiji) consider the issuance of some form of financial reporting guidance for NGOs. This will lead

to consistencies in the presentation of financial information and definitely improve accountability and transparency.

CONCLUDING COMMENTS

The purpose of this paper was to analyse the accounting and auditing practices of NGOs in Fiji and to investigate the motivations behind NGO financial reporting in a seemingly unregulated environment. In order to analyse the current state of NGO financial reporting, we conducted a content analysis of a sample of NGO annual reports. In-depth interviews were also conducted to understand the motivations behind the financial reporting practices. The sample consisted of 20 NGOs operating in Fiji. The analysis reveals that even in the absence of regulations, NGOs do produce financial reports. It is also revealed that a wide range of accounting practices is employed by these organisations. There are inconsistencies in the application of accounting conventions identified in this paper. Auditing practices are also questionable in certain cases. In the absence of regulations, auditors are providing a range of non-audit services to their audit clients. This may have implications for their independence.

Our interviews with the executives of the NGOs reveals that they are short staffed in the accounting area. It is also noted that many of the regional NGOs and NGOs that seek international sources of funding are more concerned about their financial reporting processes. These NGOs employ international auditing firms to improve the credibility of their financial reports. These NGOs also seek to apply the applicable accounting standards and GAAP in the preparation of their financial reports. The results of our study indicate that there is a need to regularise financial reporting and auditing for NGOs in Fiji. The establishment of guidelines of financial reporting and auditing will improve the transparency and accountability by such organisations. This is particularly important given the importance of such organisations to the society and the economy of Fiji.

There are a number of limitations in this paper. First, we selected a sample of 20 NGOs from a population of 500. While there are different types of NGOs in the sample, a larger sample may provide better insights to the issues at hand. Second, the sample consists of NGOs operating in a single geographical location. Future research may extent the geographical coverage to include more developing countries. Future studies may also want to compare the financial reporting and auditing practices of NGOs in developing and developed countries to provide some insights how these practices differ amongst countries at different levels of development and different regulatory environments.

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A STANDARDIZED NET INCOME SHARES MODEL TO DEVELOP BASIC CHILD SUPPORT GUIDELINES

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ABSTRACT

Research regarding child support typically focuses on the effects of child support awards and its underlying principles within child support models. However, researchers have invested little effort in the analysis of child support guideline comparisons or in the development of analyses to determine whether state adopted guidelines seem reasonable based on state-specific macroeconomic variables. This analysis intends to develop a model to determine the reasonableness of child support guidelines for states that use the income shares method based on the net income of both parents. Further, it intends to suggest that the development of a standard model is possible and, to a certain extent, needed, to obtain interstate uniformity. Findings suggest that the implementation of such a model could lead to more equitable and uniform basic child support awards.

KEYWORDS: Child Support, Basic Child Support Awards, Income Shares Model, Forensic Accounting, Family Law

JEL: D11, D31, H31, K36, M49, M59

INTRODUCTION

Child support regimes have a vital influence on the well-being of children around the world. In the United States of America (USA), increasing divorce rates, unplanned parenting and out of wedlock pregnancies have presumably led to a surge in single parent households. According to the United States Census Bureau, as of 2007, about 26.3% of all children in the USA live with one parent while the other lives elsewhere and 13.7 million single parents have custody of about 21.8 million children under 21. Furthermore, 53% of custodial parents worked full-time yet nearly 25% of custodial parents had incomes below the poverty level. Finally, even though child support due nationally totaled about $34.1 billion, only 63% of the amounts due were paid on time and 53.2% of custodial parents did not receive all of the support due. The selected statistics summarized above lead to one unquestionable conclusion; that is, child support is an essential component of our lives and one of the most important factors in the development of our children. Thus, the development of child support guidelines is a major public policy concern that, even though tailored to the particular needs of every region, should certainly consider empirical results without each specific jurisdiction. Nonetheless, the literature contains no single attempt to develop a standardized formula for the development of child support guidelines. As such, and given the absence of formula standardization efforts, this analysis intends to develop a formula that may help policymakers ascertain the reasonableness of guidelines based on personal per capita income. This paper provides an introduction to the available literature in the subject, as a basis for the model that we are proposing. It then summarizes the data used and the methodology implemented to develop a standardized child support guideline development formula as well as the related results and conclusions.

LITERATURE REVIEW

The United States Congress recognizes the sovereign nature of states in regards to the design and implementation of child support regimes. Nonetheless, in order to incentivize the development of uniform intra-state child support standards, it approved the 1988 Family Support Act, which mandated states to develop numerical guidelines for the adjudication of child support awards. Further, it required

that the guidelines establish a rebuttable presumption that the amount derived as child support from their application is correct (Bieniewicz, 1999). States, which almost immediately adopted guidelines, mainly use one of two generally accepted methods to determine child support awards namely, "Percentage of Obligor's Income" or "Income Shares". Despite these efforts, deviations from the guidelines are still relatively common, particularly in low-income families and in high-income families. (Brinig and Allen, 2010). Under the Percentage of Obligor's Income approach ("POI"), basic child support awards are based on the non-custodial parent's income and the number of children to be supported. For child support purposes, gross income generally includes income from all sources (a generally broad definition). On the other hand, net income typically refers to gross income less mandatory deductions (i.e. income tax withholding, FICA withholdings, and other government required withholdings) and other allowable deductions (insurance policy premiums, provided the minor or minors are beneficiaries, and contributions to pension plans, among others). Thus, the approach does not consider the custodial parent's income except as required for the allocation of special expenses, including, inter alia, education and medical expenses. The percentages applied to the non-custodial parent's income vary by State and are based on each state's policymakers' assessment of child rearing expenses (US House of Representatives, 1996).

On the other hand, States that use the Income Shares ("IS") approach estimate basic child-rearing expenses based on the application of a percentage to the combined income of both parents and the allocation of that result between the parents based on their respective incomes, gross or net. The underlying groundwork supporting the IS model is that children should receive the same proportional share of parental income had the family stayed intact (Beyer, 1991). The percentage applied in these states then represents an estimate of basic child-rearing expenses for a specific combined income level.

The use of the POI approach or model does not seem to protect children's rights as every child has an inalienable right to receive, from each parent, an adequate amount of support. The absence of the custodial parent's income in the determination of the basic child support awards points to an inherent inconsistency as both parents should contribute to all child-rearing expenses. The IS model, however, incorporates the income of both parents in the calculation of basic child-rearing expenses thereby safeguarding children's rights. States that establish basic child support awards based on gross income do not consider that citizens should pay income taxes, contribute to the Social Security system, plan for retirement and provide for their own health. Thus, models that use net income as the primary variable in basic child support adjudication lead to more realistic and reasonable estimates of parents' child support obligations. Percentages applicable to gross income may certainly be lower than those applicable to net income but this still does not consider possible differences in the taxation of the different types of income, which then seems to favor the use of net income rather than gross income for child support adjudication.

Even though the models or approaches seem straightforward, courts may use discretion in deviating from the guidelines, particularly in high-income cases. The lack of clarity within state designed and implemented methods, as well as deviation processes, may lead to inconsistent child support awards in different cases with similar fact patterns (Nelson, 2011). Thus, child support awards for parents with similar income from different states or different regions of a state may be significantly dissimilar. (Raatjes, 2011). Child-support regulations fall outside the scope of Congress' constitutional powers yet federal intervention in child support guideline development has promoted the application of empirical evidence to support estimates. Essentially, Section 302.56(h) of Title 45 of the Code of Federal Regulations provides that "[a]s part of the review of a State's guidelines…, a State must consider economic data on the cost of raising children and analyze case data, gathered through sampling or other methods, on the application of, and deviations from the guidelines. The analysis of the data must be used in the State's review of the guidelines to ensure that deviations from the guidelines are limited." As such, in addition to promoting the use of actual data, the federal government promotes the development of guidelines that lead to a limited number of cases in which deviations from the guidelines would be appropriate. Thus, the mandate's rationale is to promote uniformity and fairness.

The conundrum of calculating fair and equitable child support awards has been, continues to be, and most certainly will continue to be, one of the main issues in Family Courts across the United States, and, foreseeably, the world. Forensic Accountants, Forensic Economists, Lawyers, Judges, Policymakers, parents and children are all stakeholders in all analyses related to child support as they all have an inherent interest in the insertion of justice, reasonableness and equality within child support regimes. However, given the varying degrees of complexity in the guidelines and the use of different approaches, the implementation of uniform formulas seems to resemble a Holy Grail or an unreachable goal. The complexity of the guidelines, the differences in implementation mechanisms and the constitutionally supported absence of specific federal intervention in the development of guidelines leads to a dramatically heterogeneous structure that promotes lack of uniformity and increased controversy. (Pirog-Good and Brown, 1996). The concomitant principle underlying each state's guidelines provides that the established percentages intend to estimate actual child-rearing expenses. All of the models used to adjudicate child support awards are somehow linked to estimates of child-rearing expenditures.

Therefore, even though there is no actual consensus about the most appropriate or valid model to develop the estimates, the percentages used are, or should be, the result of economic research on child rearing costs (Williams, 1994). The use of a mathematical equation provides a reasonably straightforward manner to estimate child-rearing expenses. In Kansas, the processes to develop the basic child support award table or guideline incorporated the use of a logarithmic equation that considers the decrease of child-rearing expenses as a percentage of income. In order to quantify the basic child support award as a percentage of income considering the level of family income, states stratify the population of families based on income levels and then develop estimates of expenditures on children as a function of family income. These efforts typically rely upon individual household data gathered by the Census Bureau on behalf of the Bureau of Labor Statistics in the Consumer Expenditure Survey. Essentially, "expenditures functions contained in these studies involve what in mathematics is called a power function, or, a function that is linear in logarithmic form. [The function then allows policymakers] to use expenditure survey data that has already been grouped into income classes by family size in the interest of updating the child support schedules." (Terrell and Messer, 2009).

Empirical research demonstrates that child-rearing expenses are higher as a percentage of income, obligor only or combined, at lower income levels whereas they are lower at higher income levels. (Garfinkel, I. and Melli, 1990). Thus, child-rearing expenses vary depending on the level of available family income leading to the alluded "power function". This phenomenon, which is known as Engel's Law, has been embraced by conservative economists such as Milton Friedman and by liberal economists such as John M. Keynes. (Friedman, 1957). The decrease in child-rearing expenses as a percentage of income when income increases, has also been recognized by most states. The application of said principle has led to guidelines that provide for a decrease in the ratio of basic child support awards to income as the latter increases (Betson, 1990). The evidence seems to suggest that the ratio of child-rearing expenses to income arises out of a logarithmic function as policymakers consider Engel's law in developing guidelines. Some states have established a type of income ceiling in their guidelines to avoid child support awards that lead to the unjust enrichment of custodial parents. For instance, the Florida child support guidelines provide for basic child support awards for combined income levels of up to $10,000. Once combined monthly incomes reach this threshold, a flat rate applies, much lower than that applicable to the $10,000 combined income level. Pursuant to the Florida guidelines, if the parties in a child support case have a combined net monthly income of $12,000, then a rate of 14.37% applies to the first $10,000 of combined income, whereas a 5% rate applies to the combined income exceeding $10,000, without a specific limit. Some Courts may question even the Florida approach for high-income cases, as the "power function" principle should be followed, even in deviations from the guidelines for cases where the obligor's income exceeds the income ceiling. For instance, the Connecticut Supreme Court remanded a case for further proceedings as the trial court ordered a high income obligor to share a fixed percentage of his annual bonus as part of his child support obligation (Maturo v. Maturo, 296 CR 113 (2010)). The

opinion established that, even though the trial court has ample discretion in awarding child support, the application of a fixed percentage to the non-custodial parent's bonus violates the spirit of the guidelines. The Court described the trial court's judgment as "an open-ended, variable child support award that constituted an increase, rather than a decrease, in the percentage of the parties' combined net weekly income over that established for families at the upper limit of the guidelines' schedule." (Maturo v. Maturo, supra). In reaching its conclusion the Court interpreted the applicable guidelines, which are based on the IS model, and asserted that an increase in the support obligation is not necessarily equitable merely because the noncustodial parent has a higher earnings capacity. Specifically, the Court held that children's needs, as a percentage of income, do not increase automatically and at the same rate whenever household income increases; on the contrary, even the guidelines' preamble states that empirical research demonstrates that spending on child-rearing expenses, as a percentage of family income, decreases as a as that income increases. As such, "families at higher income levels do not have to devote most or all of their incomes to perceived necessities. Rather, they can allocate some proportion of income to savings and other expenditures as well as discretionary adult goods.'' (Maturo v. Maturo, supra).

Based on the above, even though the determination of the award lies in the judge's discretion, the application of a formula, albeit modified, is encouraged. (Lori, 2011). In Weinstein v. Weinstein, 62 So. 3rd 878 (2011), the Louisiana Court of Appeals explained why the determination of child support awards based on the guidelines is presumptively correct but not infallible. The court concluded that the percentage applicable to the highest income levels in the guidelines may not be merely extrapolated to establish the basic child award in cases where income exceeds the guidelines' ceiling. The Court concluded, "that simple extrapolation of the guidelines, without considering the child's needs, is not an acceptable method…The support for a child or children of a more affluent lifestyle, as in this case, is a concern for the courts to address on a case by case method. We find by simply extrapolating from the guidelines without concern and discretion by the court in balancing the needs and lifestyle of the child or children, could lead to excessive child support awards." (Weinstein v. Weinstein, supra).

Given that each state should consider economic data in the development of guidelines, a model based on the interstate differences of one macroeconomic variable that incorporates or measures the average intrastate level of income should provide a tool to evaluate and ponder basic child support awards. Variations in per capita personal income, a highly accessible measure of mean income within a certain economic aggregate, could very well provide a standardized measure to develop a uniform model that incorporates measures of state developed child rearing expense estimates as a function of a macroeconomic variable that considers differences in economic conditions between states.

THE MODEL, DATA AND METHODOLOGY

There is certainly not an absolute or universal mathematical formula to adjudicate basic child-support awards in all cases. Nonetheless, the existence of possible deviations from the guidelines as well as the absence of a uniform evaluation system leads to inconsistent results in the child support arena. However, the conceptual framework summarized above leads to a very simple yet powerful inference; given that state guidelines incorporate (or should incorporate) a basic economic principle, Engel's Law, a formula extrapolated from the application of guidelines to income levels should lead to a uniform basic child-rearing expense estimation model. Said model should include a macroeconomic variable that represents State-specific conditions. As mentioned above, child support stakeholders lack a tool to determine whether state specific guidelines are reasonable. Further, even though States have had over two decades of experience in developing estimates of child-rearing expenses, no single specific attempt has been made to delineate a uniform formula, adjusted to fit the economic particularities of each State, or to create a tool to determine the reasonableness of specific state guidelines. However, given that States have had ample experience in establishing child support guidelines and that the guidelines must be based on underlying economic data, current guidelines should provide reasonably accurate estimates of basic child-rearing

expenses. The underlying assumption in this analysis is that an aggregate result of the application of the actual guidelines should lead to a reasonable estimate of the relationship between child-rearing expenses and a state specific macroeconomic variable; namely, per capita personal income. If this were not the case, then we would acknowledge that, after almost twenty-three years of the adoption of the 1988 Family Support Act, state policymakers have developed completely erroneous estimates. As such, we obtained the observations used to develop our formula from actual State specific guidelines.

Structural differences in state guidelines, such as the specific definitions of income, net or gross, special items, medical expenses and childcare costs, and maximum presumptive child support awards make the development of a standardized formula virtually impossible. However, this analysis suggests that the basic child support awards, as a percentage of per capita personal income, has a solid logarithmic relationship amongst the guidelines. Thus, the findings lead us to believe that it is possible to develop a uniform formula as long as it is adjusted for state specific conditions. Guidelines that follow the IS model use either gross or net income as the basis to establish child support awards.

The use of gross income leads to lack of uniformity, as it does not consider income available after taxes. For instance, a parent with $40,000 in annual income from salaries and wages is worse off than a parent with $40,000 annual income derived from federally tax-exempt interest income or income taxed at favorable rates. The parent that received income from salaries and wages is subject to income and social security taxes, whereas the parent who receives all income from fully exempt sources has higher aggregate disposable income. Nonetheless, if gross income, rather than net income is used in the application of specific percentages, both parents will probably be responsible for similar support amounts, yet their financial circumstances are significantly different. Therefore, the IS method based on net income rather than gross income promotes fairness as well as increased uniformity in award adjudication.

Table 1: Income Share States

State	Basis of Income	PCPI ($)	State	Basis of Income	PCPI ($)
Alabama	G	2,825	Nebraska	N	3,288
Arizona	G	2,910	New Jersey	N	4,226
California	N	3,583	New Mexico	G	2,810
Colorado	G	3,554	New York	G	4,067
Connecticut	N	4,661	North Carolina	G	2,961
Florida	N	3,265	Ohio	G	3,033
Georgia	G	2,952	Oklahoma	G	3,027
Idaho	G	2,681	Oregon	G	3,085
Indiana	G	2,908	Pennsylvania	N	3,427
Iowa	N	3,186	Rhode Island	G	3,549
Kansas	G	3,304	South Carolina	G	2,757
Kentucky	G	2,775	South Dakota	N	3,230
Louisiana	G	3,197	Tennessee	G	2,937
Maine	G	3,109	Utah	G	2,705
Maryland	G	4,076	Vermont	N	3,355
Massachusetts	G	4,291	Virginia	G	3,719
Michigan	N	2,969	Washington	N	3,620
Minnesota	G	3,565	West Virginia	G	2,718
Missouri	G	3,078	Wyoming	N	3,979

Table 1 enumerates all states that use the income shares approach. States that apply the IS percentages to combined gross income have been identified as G whereas states that apply the percentages to net income have been identified as N. It also includes the monthly per capita personal income (PCPI) for each State based on data from Table SA04 of the U.S. Bureau of Economic Analysis, State Annual Personal Income, as revised on March 23, 2011.

This analysis focuses only on states that base basic child support award adjudication on the IS approach using the parents' net income. Thus, we first segregated the population of 39 states that use the IS approach between those that apply percentages for basic child-rearing expense estimate development to gross income and those that apply it to net income ("NI"). (Table 1). The data used to determine whether the selected guidelines are based the IS shares model and either gross or net income was obtained through an author performed analysis of each states' guidelines.

The analysis incorporates guidelines for all IS–NI states except California as its specific model requires application of different variables, including who is the highest earner between the parents and poverty or high-income adjustments. Inclusion of these variables makes it impractical to incorporate California guidelines in the analysis, as the objective is to develop a formula that standardizes basic child support awards considering a macroeconomic indicator. The remaining eleven states that use the IS model do not incorporate additional variables. After identifying the States with guidelines based on IS-NI, we calculate state specific basic child support awards for parental combined income levels from $2,000 per month to $12,000 per month, at $100 increments for one to five children. Calculations were based on each state's applicable December 31, 2010 guidelines. We estimated basic child rearing expenses for each IS-NI State in selected combined NI intervals based on related guidelines. Appendix I summarizes the estimates of aggregate basic child rearing expenses, per combined NI interval, as calculated here. The first row provides the aggregate basic child support obligation for the 11 IS-NI states if the parental combined net income amounts to $2,000 per month. Given that there are 11 states NI-IS states, the first parental combined net income (CNI) level amounts to $22,000. The summation of the corresponding basic child support award for one child of each of the 11 States amounts to $5,329.

The rationale for a $2,000 combined monthly net income floor lies on the assumption that, within the general population, a person must earn no less than $7.25 per hour, the U.S. federal minimum wage as of June 30, 2010, which translates into approximately $1,255.70 of gross monthly income. It follows then, that the monthly minimum combined parental gross income, within the average U.S. population should amount to at least $2,511.40. Thus, the $2,000 floor in the analysis provides for the inclusion of average low earners. On the other hand, the rationale for the $12,000 ceiling lies on the use of limits on combined NI in several of the IS-NI states. Essentially, most guidelines in IS states provide for a ceiling on presumptive child support based on the economic theories discussed earlier. In most cases, once parental combined income reaches a certain level, the guidelines allow the judge to apply equity considerations to justify any increase in the awards. However, in certain cases, such as Florida, once the combined net income reaches a certain amount, a very low flat rate is applied to NI in excess of the ceiling to award additional basic child support. Given that this analysis aims to develop a general formula to evaluate reasonableness, a $12,000 ceiling provides sufficient coverage to include the high-end of the middle class.

Once basic child rearing expenses for each income level had been quantified, we obtained 2010 monthly per capita personal income data for each IS State from Table SA04 of the U.S. Bureau of Economic Analysis, State Annual Personal Income, as revised on March 23, 2011. (Table 1). The basic child rearing expense per our calculations (Appendix I) was then used to calculate child-rearing expense estimates for each combined NI level as a percentage of combined NI for 1 to 5 children. To incorporate macro-economic variables chosen for this analysis, we calculated the combined NI levels as a percentage of aggregate per capita personal income. Appendix II summarizes the analysis results. As depicted in Appendix II, in the aggregate of the 11 IS-NI states, when combined monthly parental income amounts to 56.11% of the state's PCPI, child-rearing expenses for one child are estimated at 24.22% of CNI. The author also performed these calculations to develop the formula. Finally, we generated regression analyses for each quantity of children to obtain a logarithmic equation that bases basic child-rearing expense estimate for IS-NI states on the relationship between parents' combined monthly NI and monthly per capita personal income. The proposed model is the following:

$$y = a\ln(x) + c \qquad (1)$$

Where:

y = Percentage of basic child rearing expenses applicable to the income level engrained in the independent variable x.

x = Specific Combined Income Level ($) / Monthly Per Capita Personal Income.
a = Coefficient.
c = Intercept.

RESULTS

The regression analyses performed for each quantity of children in the household led to the following coefficients and intercepts to be incorporated in the formula described above.

Table 2: Model's Coefficients and Intercepts**

Number of Children	A	C	R^2
1	-0.068	0.2165	99.20%
2	-0.102	0.3154	99.24%
3	-0.125	0.3752	99.19%
4	-0.138	0.4196	99.02%
5	-0.149	0.4589	98.91%

Table 2 summarizes the coefficients (a) and intercepts (c) derived from the regression analyses performed based on the data obtained in the analysis documented in Appendix II. Refer to Appendix III for regression analyses results in graphical form.

As expected, the model's coefficient in every category is negative, suggesting an increase in combined NI, leads to a decrease in the percentage applicable to estimate basic child-rearing expenses. Thus, the model validates that Engel's Law is intertwined in the IS-NI model estimates. Further, given the model's R^2 exceeds 98% for all households with 1 to 5 children, it follows the model has statistically predictive value. Nonetheless, to determine whether the formulas obtained from the regression analyses lead to reasonable estimates of the guidelines' percentages, we applied the formulas to each State considering the relationship between each state's per capita personal income and the specific level of combined NI for which we generated an estimate. The R2 measures derived from our analysis, as depicted in Table 3, suggest the model leads to results that resemble the guidelines. Thus, application of the model to each State per capita personal income measures suggests the model has predictive value. For instance, the logarithmic relationship of basic child support obligation applicable to one child in Connecticut based on our model and the one derived from the actual Connecticut guidelines reflects a 96.49% R2.

Table 3: R-Square of Relationship between Model Application Results and Actual Guidelines

State	R-Square % (1 Child)	R-Square % (2 Children)	R-Square % (3 Children)	R-Square % (4 Children)	R-Square % (4 Children)
CT	96.49	97.11	97.11	97.36	97.34
FL	93.97	93.84	94.08	94.03	93.85
IA	98.23	93.83	96.96	94.01	90.44
MI	99.91	99.72	99.88	99.89	99.75
NE	98.76	98.39	98.49	96.00	93.99
NJ	96.68	97.10	97.27	97.28	97.27
PA	98.22	98.18	98.11	98.11	98.10
SD	98.81	98.75	98.80	98.75	98.74
VT	96.65	96.86	97.41	97.41	97.41
WA	86.65	86.19	86.08	83.28	83.13
WY	99.22	99.08	98.65	98.99	98.99

Table 3 specifies the R-square derived from the relationship between the results of the application of our model to each State and the actual guidelines for each amount of children receiving support. The logarithmic relationship of the basic child support obligation applicable to one child in Connecticut based on our model and the one derived from the actual Connecticut guidelines reflects a 96.49% R-Square.

According to our analysis, the models developed for one to five children provides reasonable estimates of child-rearing expenses. Essentially, the lowest R-Square obtained amounted to 83.13%, State of Washington for five children. Thus, even though we did not calculate the t-statistic for each result, the mere fact that the application of the models to each of the 11 States for each quantity of children led R-Square measurements in excess of 65% suggests the models have statistically significant predictive power. The independent variable in our analysis, the relationship between the combined NI and the state-

specific per capita personal income, provides a sound macroeconomic variable to explain differences in child-rearing expense estimates within the 11 IS-NI states. However, that fact does not entirely explain whether there is some relationship between the differences in the model results and guideline percentages and the difference between the state-specific per capita personal income and the average per capita personal income for the 11 IS-NI states.

The underlying questions are whether over-average state-specific per capita personal incomes lead to higher or lower basic child rearing expense estimates. As depicted in Table 4, our model leads to higher percentage estimates of child-rearing expenses than those in related guidelines for States with over-average per capita personal income and vice-versa. For example, Connecticut enjoys a monthly per capita personal income of $4,661, 30.77% higher than the 11 ID-NI states' average of $3,564. Our model for one child, applied to Connecticut for monthly combined NI levels of $2,000 to $12,000 in $100 increments, leads to aggregate differences of 88.97 percentage points when compared to the guidelines. In other words, the summation of the residuals derived from the differences between the percentage per guidelines and the model's results amounted to 88.97 percentage points. Thus, our model leads to a higher estimate of basic child rearing expenses than that engrained in the related guideline for high-income states. On the other hand, in Michigan, which has monthly per capita personal income of $2,969, or 16.70% lower than the 11 ID-NI states' average, the aggregate differences between the percentages per the guidelines and those per our model amounted to -752.55. Therefore, the model results in a lower estimate of basic child-rearing expenses than embedded in the related guidelines for low-income states.

Finally, the correlation coefficients for aggregate percentage point differences between model and guidelines, and the percentage differences between states' monthly per capita personal income and the 11 IS-NI states' average, suggest that, even though the correlations are not perfect, they do reflect a certain degree of statistical significance. Thus, although the model leads to reasonable estimates of child-rearing expenses as a percentage of combined net income, the differences noted between the model's results is attributable to the level of wealth in specific states.

Table 4: Correlation Analysis of Differences

	Sum Of Percentage Point Differences: M - G for CNI Levels From $2,000 - $12,000 In $100 Increments					
	Number of Children					
State	**1**	**2**	**3**	**4**	**5**	**% Difference AVG PCPI v. State PCPI**
CT	88.97%	320.26%	542.63%	621.24%	665.62%	-30.77%
FL	-31.04%	-233.07%	-471.95%	-546.58%	-574.60%	8.39%
IA	-65.94%	-258.31%	-36.47%	29.45%	90.45%	10.61%
MI	-16.03%	-342.43%	-776.69%	-922.21%	-752.55%	16.70%
NE	-214.20%	-286.06%	-258.21%	-413.22%	-495.78%	7.75%
NJ	-3.11%	186.92%	380.65%	442.75%	471.27%	-18.57%
PA	14.23%	50.86%	109.96%	138.01%	142.10%	3.85%
SD	0.13%	28.67%	74.48%	99.90%	102.17%	9.38%
VT	11.22%	-114.51%	161.36%	-212.89%	-243.14%	5.87%
WA	141.39%	25.30%	-153.17%	-215.08%	-215.38%	-1.57%
WY	100.40%	316.80%	533.23%	611.07%	658.10%	-11.64%
r	**-49.94%**	**-86.88%**	**-79.22%**	**-80.44%**	**-80.44%**	

Table 4 summarizes the results of our analysis of differences between the percentage of monthly combined net income used for basic child-rearing expenses per our model and that per the state-specific guidelines. It also provides the correlation coefficient between the aggregate differences of basic child rearing expense estimates and the percentage difference between state-specific per capita personal income and the average per capita personal income for the 11 IS-NI states.

CONCLUDING COMMENTS

Family relations, including child-support related disputes, will continue to puzzle all stakeholders. Human nature, and the policies and processes in place to promote economic fairness are and must remain malleable. However, a higher degree of stability and uniformity within child-support related policies will certainly lead to a higher level of fairness, which should provide increased harmony. This analysis

validates that it is possible to develop a uniform formula to estimate basic child-rearing expenses and to provide for the inclusion of variables that consider state-specific elements in the design of uniform guidelines. The use of a logarithmic model, the alluded "power function", acknowledges Engel's Law; essentially, that as income increases, the percentage of said income consumed decreases.

However, the assessment and analysis herein documented may be expanded. As such, other research matters and objectives could be addressed from an economic and statistical standpoint. First, even though States that use the IS approach based on gross income do not recognize that income taxes and other deductions and obligations decrease income in unequal basis, this analysis may be emulated for states that use gross income rather than net income. Second, while results may not necessarily vary significantly, some kind of population-based weighted-average of child-rearing expense estimates could be developed in order to provide increased, albeit marginal, certainty to the model. Furthermore, the inclusion of state-specific poverty levels and/or percentage of welfare recipients in the model may lead to increased accuracy and to explanations for the differences in inter-state child-rearing expense estimates. Finally, further analysis may be performed to identify factors that explain the reason for the gap noted between the estimates generated by the model and actual state-specific guidelines. Specifically, said additional research should lead to the identification of factors or variables that might help to explain the gap noted in richer and poorer states. All parents have a moral, natural and legal obligation to provide for their progeny. This responsibility not only encompasses financial support but also love, guidance, care, and attention. Child-support regimes must therefore lead to the adjudication of fair child-support awards and not to the implicit tolerance of an unjust enrichment to either the obligor or the custodial parent.

APPENDIX

Appendix I: Aggregate Basic Child Rearing Expenses for the 11 IS-NI States

CNI US$	NUMBER OF CHILDREN				
	1	2	3	4	5
22,000	5,329	7,803	9,244	10,277	11,182
23,100	5,590	8,169	9,744	10,791	11,736
24,200	5,827	8,546	10,223	11,334	12,328
25,300	6,075	8,895	10,661	11,844	12,879
26,400	6,320	9,251	11,084	12,333	13,416
27,500	6,560	9,598	11,501	12,797	13,940
28,600	6,793	9,934	11,897	13,223	14,432
29,700	7,021	10,262	12,287	13,656	14,901
30,800	7,252	10,612	12,698	14,104	15,389
31,900	7,472	10,919	13,059	14,519	15,850
33,000	7,669	11,204	13,391	14,910	16,271
34,100	7,873	11,479	13,703	15,280	16,683
35,200	8,061	11,743	14,019	15,654	17,090
36,300	8,245	11,994	14,300	15,997	17,463
37,400	8,421	12,272	14,618	16,375	17,876
38,500	8,589	12,506	14,890	16,701	18,239
39,600	8,746	12,734	15,156	17,024	18,586
40,700	8,905	12,964	15,418	17,341	18,945
41,800	9,061	13,198	15,690	17,646	19,300
42,900	9,234	13,449	15,983	17,979	19,682
44,000	9,398	13,691	16,263	18,291	20,048
45,100	9,546	13,902	16,506	18,562	20,370
46,200	9,685	14,095	16,726	18,809	20,667
47,300	9,818	14,278	16,940	19,052	20,941
48,400	9,945	14,453	17,139	19,276	21,185
49,500	10,069	14,622	17,332	19,494	21,431
50,600	10,191	14,796	17,523	19,711	21,668
52,800	10,444	15,136	17,917	20,155	22,160
53,900	10,569	15,310	18,116	20,385	22,409
55,000	10,687	15,481	18,320	20,602	22,649
56,100	10,808	15,647	18,513	20,820	22,887
57,200	10,926	15,809	18,703	21,039	23,129
58,300	11,055	15,982	18,904	21,263	23,380
59,400	11,167	16,151	19,097	21,482	23,617
60,500	11,285	16,314	19,282	21,693	23,852
61,600	11,401	16,473	19,469	21,901	24,079

62,700	11,517	16,630	19,651	22,109	24,308
63,800	11,626	16,789	19,836	22,311	24,535
64,900	11,740	16,949	20,017	22,516	24,751
66,000	11,854	17,110	20,202	22,723	24,977
67,100	11,964	17,274	20,384	22,927	25,199
68,200	12,072	17,430	20,567	23,127	25,415
69,300	12,183	17,592	20,755	23,334	25,641
70,400	12,301	17,763	20,954	23,553	25,881
71,500	12,427	17,939	21,154	23,783	26,133
72,600	12,542	18,108	21,351	24,003	26,373
73,700	12,660	18,277	21,547	24,220	26,606
74,800	12,775	18,444	21,735	24,434	26,835
75,900	12,891	18,603	21,930	24,642	27,067
77,000	13,004	18,769	22,113	24,855	27,295
78,100	13,124	18,939	22,310	25,073	27,535
79,200	13,236	19,095	22,482	25,272	27,732
80,300	13,340	19,248	22,655	25,471	27,966
81,400	13,451	19,409	22,837	25,669	28,196
82,500	13,562	19,559	23,008	25,870	28,412
83,600	13,671	19,710	23,183	26,070	28,624
84,700	13,791	19,875	23,366	26,280	28,856
85,800	13,898	20,028	23,542	26,480	29,072
86,900	14,006	20,182	23,716	26,678	29,292
88,000	14,111	20,332	23,889	26,878	29,510
89,100	14,219	20,485	24,063	27,078	29,722
90,200	14,328	20,635	24,238	27,275	29,943
91,300	14,442	20,796	24,422	27,483	30,169
92,400	14,547	20,944	24,589	27,678	30,380
93,500	14,656	21,096	24,761	27,873	30,595
94,600	14,757	21,238	24,919	28,060	30,796
95,700	14,852	21,375	25,080	28,242	30,994
96,800	14,949	21,513	25,231	28,416	31,183
97,900	15,048	21,644	25,389	28,593	31,389
99,000	15,149	21,790	25,555	28,784	31,602
100,100	15,241	21,918	25,707	28,958	31,789
101,200	15,333	22,049	25,861	29,135	31,979
102,300	15,426	22,176	26,012	29,311	32,172
103,400	15,520	22,311	26,167	29,484	32,360
104,500	15,616	22,440	26,322	29,663	32,555
105,600	15,714	22,586	26,488	29,851	32,764
106,700	15,810	22,712	26,635	30,026	32,943
107,800	15,905	22,836	26,776	30,186	33,125
108,900	15,995	22,963	26,920	30,349	33,304
110,000	16,087	23,087	27,055	30,512	33,479
111,100	16,183	23,212	27,196	30,671	33,660
112,200	16,279	23,352	27,353	30,850	33,853
113,300	16,371	23,472	27,492	31,008	34,026
114,400	16,467	23,596	27,632	31,170	34,206
115,500	16,557	23,720	27,776	31,330	34,381
116,600	16,641	23,841	27,911	31,490	34,553
117,700	16,731	23,955	28,041	31,648	34,717
118,800	16,822	24,088	28,195	31,806	34,906
119,900	16,911	24,207	28,331	31,977	35,082
121,000	16,999	24,322	28,466	32,139	35,251
122,100	17,084	24,442	28,604	32,292	35,426
123,200	17,168	24,564	28,742	32,449	35,596
124,300	17,260	24,680	28,878	32,608	35,771
125,400	17,351	24,808	29,023	32,777	35,957
126,500	17,429	24,922	29,154	32,930	36,122
127,600	17,511	25,035	29,284	33,080	36,289
128,700	17,595	25,151	29,416	33,236	36,453
129,800	17,682	25,279	29,560	33,399	36,635
130,900	17,773	25,405	29,713	33,572	36,823
132,000	17,862	25,529	29,858	33,741	37,007

Appendix I summarizes the summation of the basic child rearing expenses for each of the 11 IS-NI states for monthly combined net income from $2,000 to $12,000 in $100 intervals. Essentially, the basic child rearing expense estimates for each of the 11 IS-NI was calculated for one child thru five children for each combined net income ("CNI") interval. Then, the resulting basic child rearing expenses, per the guidelines, was added. For example, the summation of the basic child support obligation for each of the 11 IS-NI states per the related guidelines when the combined net income amounts to $2,000 per month and there is only one child, is $5,329.

Appendix II: Aggregate Basic Child Rearing Expenses as a Percentage of Combined Net Income for the 11 IS-NI States

CNI / PCPI	NUMBER OF CHILDREN				
	1	2	3	4	5
56.11%	24.22%	35.47%	42.02%	46.71%	50.83%
58.92%	24.20%	35.36%	42.18%	46.72%	50.80%
61.73%	24.08%	35.31%	42.25%	46.84%	50.94%
64.53%	24.01%	35.16%	42.14%	46.82%	50.91%
67.34%	23.94%	35.04%	41.98%	46.72%	50.82%
70.14%	23.86%	34.90%	41.82%	46.53%	50.69%
72.95%	23.75%	34.74%	41.60%	46.23%	50.46%
75.75%	23.64%	34.55%	41.37%	45.98%	50.17%
78.56%	23.55%	34.45%	41.23%	45.79%	49.96%
81.37%	23.42%	34.23%	40.94%	45.51%	49.69%
84.17%	23.24%	33.95%	40.58%	45.18%	49.31%
86.98%	23.09%	33.66%	40.18%	44.81%	48.92%
89.78%	22.90%	33.36%	39.83%	44.47%	48.55%
92.59%	22.71%	33.04%	39.39%	44.07%	48.11%
95.39%	22.52%	32.81%	39.09%	43.78%	47.80%
98.20%	22.31%	32.48%	38.68%	43.38%	47.38%
101.00%	22.09%	32.16%	38.27%	42.99%	46.93%
103.81%	21.88%	31.85%	37.88%	42.61%	46.55%
106.62%	21.68%	31.57%	37.54%	42.22%	46.17%
109.42%	21.52%	31.35%	37.26%	41.91%	45.88%
112.23%	21.36%	31.12%	36.96%	41.57%	45.56%
115.03%	21.17%	30.83%	36.60%	41.16%	45.17%
117.84%	20.96%	30.51%	36.20%	40.71%	44.73%
120.64%	20.76%	30.19%	35.81%	40.28%	44.27%
123.45%	20.55%	29.86%	35.41%	39.83%	43.77%
126.26%	20.34%	29.54%	35.01%	39.38%	43.29%
129.06%	20.14%	29.24%	34.63%	38.96%	42.82%
131.87%	19.96%	28.95%	34.28%	38.56%	42.38%
134.67%	19.78%	28.67%	33.93%	38.17%	41.97%
137.48%	19.61%	28.40%	33.61%	37.82%	41.58%
140.28%	19.43%	28.15%	33.31%	37.46%	41.18%
143.09%	19.27%	27.89%	33.00%	37.11%	40.80%
145.90%	19.10%	27.64%	32.70%	36.78%	40.43%
148.70%	18.96%	27.41%	32.43%	36.47%	40.10%
151.51%	18.80%	27.19%	32.15%	36.16%	39.76%
154.31%	18.65%	26.97%	31.87%	35.86%	39.42%
157.12%	18.51%	26.74%	31.60%	35.55%	39.09%
159.92%	18.37%	26.52%	31.34%	35.26%	38.77%
162.73%	18.22%	26.32%	31.09%	34.97%	38.46%
165.54%	18.09%	26.11%	30.84%	34.69%	38.14%
168.34%	17.96%	25.92%	30.61%	34.43%	37.84%
171.15%	17.83%	25.74%	30.38%	34.17%	37.55%
173.95%	17.70%	25.56%	30.16%	33.91%	37.27%
176.76%	17.58%	25.38%	29.95%	33.67%	37.00%
179.56%	17.47%	25.23%	29.76%	33.46%	36.76%
182.37%	17.38%	25.09%	29.59%	33.26%	36.55%
185.18%	17.28%	24.94%	29.41%	33.06%	36.33%
187.98%	17.18%	24.80%	29.24%	32.86%	36.10%
190.79%	17.08%	24.66%	29.06%	32.67%	35.88%
193.59%	16.98%	24.51%	28.89%	32.47%	35.66%
196.40%	16.89%	24.38%	28.72%	32.28%	35.45%
199.20%	16.80%	24.25%	28.57%	32.10%	35.26%
202.01%	16.71%	24.11%	28.39%	31.91%	35.01%
204.82%	16.61%	23.97%	28.21%	31.72%	34.83%
207.62%	16.52%	23.84%	28.05%	31.53%	34.64%
210.43%	16.44%	23.71%	27.89%	31.36%	34.44%
213.23%	16.35%	23.58%	27.73%	31.18%	34.24%
216.04%	16.28%	23.47%	27.59%	31.03%	34.07%
218.84%	16.20%	23.34%	27.44%	30.86%	33.88%
221.65%	16.12%	23.22%	27.29%	30.70%	33.71%
224.46%	16.03%	23.10%	27.15%	30.54%	33.53%
227.26%	15.96%	22.99%	27.01%	30.39%	33.36%
230.07%	15.88%	22.88%	26.87%	30.24%	33.20%

232.87%	15.82%	22.78%	26.75%	30.10%	33.04%
235.68%	15.74%	22.67%	26.61%	29.96%	32.88%
238.48%	15.68%	22.56%	26.48%	29.81%	32.72%
241.29%	15.60%	22.45%	26.34%	29.66%	32.55%
244.10%	15.52%	22.34%	26.21%	29.51%	32.39%
246.90%	15.44%	22.22%	26.06%	29.36%	32.21%
249.71%	15.37%	22.11%	25.93%	29.21%	32.06%
252.51%	15.30%	22.01%	25.81%	29.07%	31.92%
255.32%	15.23%	21.90%	25.68%	28.93%	31.76%
258.12%	15.15%	21.79%	25.55%	28.79%	31.60%
260.93%	15.08%	21.68%	25.43%	28.65%	31.45%
263.74%	15.01%	21.58%	25.31%	28.51%	31.30%
266.54%	14.94%	21.47%	25.19%	28.39%	31.15%
269.35%	14.88%	21.39%	25.08%	28.27%	31.03%
272.15%	14.82%	21.29%	24.96%	28.14%	30.87%
274.96%	14.75%	21.18%	24.84%	28.00%	30.73%
277.76%	14.69%	21.09%	24.72%	27.87%	30.58%
280.57%	14.62%	20.99%	24.60%	27.74%	30.44%
283.37%	14.57%	20.89%	24.48%	27.61%	30.30%
286.18%	14.51%	20.81%	24.38%	27.50%	30.17%
288.99%	14.45%	20.72%	24.27%	27.37%	30.03%
291.79%	14.39%	20.63%	24.15%	27.25%	29.90%
294.60%	14.34%	20.54%	24.05%	27.13%	29.77%
297.40%	14.27%	20.45%	23.94%	27.01%	29.63%
300.21%	14.21%	20.35%	23.82%	26.89%	29.50%
303.01%	14.16%	20.28%	23.73%	26.77%	29.38%
305.82%	14.10%	20.19%	23.63%	26.67%	29.26%
308.63%	14.05%	20.10%	23.53%	26.56%	29.13%
311.43%	13.99%	20.02%	23.43%	26.45%	29.01%
314.24%	13.93%	19.94%	23.33%	26.34%	28.89%
317.04%	13.89%	19.85%	23.23%	26.23%	28.78%
319.85%	13.84%	19.78%	23.14%	26.14%	28.67%
322.65%	13.78%	19.70%	23.05%	26.03%	28.55%
325.46%	13.72%	19.62%	22.95%	25.93%	28.44%
328.27%	13.67%	19.54%	22.86%	25.82%	28.32%
331.07%	13.62%	19.48%	22.77%	25.73%	28.22%
333.88%	13.58%	19.41%	22.70%	25.65%	28.13%
336.68%	13.53%	19.34%	22.62%	25.56%	28.04%

Appendix II summarizes the average percentage of combined net income ("CNI") that represents child rearing expenses in the 11 IS-NI states in the analysis' population classified by income level and number of children. Income level, however, has been depicted as a percentage of Per Capita Personal Income ("PCPI"). For example, in the aggregate of the 11 IS-NI states, if the applicable CNI represents 56.11% of the state's PCPI, then child-rearing expenses are estimated at 24.22% of CNI. Essentially, the CNI / PCPI percentage was derived from the summation of CNI intervals divided by the summation of PCPI for the 11 IS-NI states in the population.

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THE RISK-RETURN TRADE-OFF OF INVESTING IN LATIN AMERICAN EMERGING STOCK MARKETS

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ABSTRACT

In this paper we examine risk-return trade-off of investing in Latin American emerging stock markets. In particular, the study seeks to examine whether equities from Latin American emerging markets might have offered the Canadian investor high returns for a relatively low level of risk when combined into a portfolio of Canadian shares. Optimal portfolios were derived based on historic (ex-post) observations and evaluated utilizing the mean return per unit of risk (MRPUR) performance measure. In particular, the performance of the MRPUR-optimal emerging market portfolio was compared with the MRPUR of a portfolio consisting solely of Canadian shares to determine whether any benefits resulted from diversifying into the emerging stock markets over the ten-year periods. The results revealed substantial differences in the risk-return characteristics of the MRPUR-optimal portfolios.

JEL: G11, G15

KEY WORDS: Emerging Stock Market, Optimal Portfolio, Risk-Return Characteristics, Equity Portfolio, Portfolio Diversification

INTRODUCTION

In this paper, we examine the risk-return trade-off of investing in Latin American emerging stock markets. In the past decade, Canada's Foreign Direct Investment in South and Central America grew almost 6-fold (583%). Canada's international investment position in 2001 totaled $13.6 billion, (ECLAC, 2003). International capital markets have seen the gradual removal of restrictions on capital flows, starting with the developed economies and moving on to the developing economies. This worldwide trend initiated a degree of international capital mobility, particularly towards emerging market countries. In particular, this deregulation combined with structural change over the years has resulted in the development and technological advancement of the Toronto Stock Exchange (TSX), making it one of the leading capital markets in the world and Canada's principal market for equity trading. Its market trading activity, consistent growth and ongoing development increasingly attributed to foreign investors who, in an effort to diversify their portfolios more effectively, are tapping into foreign capital markets and buying foreign securities characterizes the TSX. As such, technology and globalization are increasingly becoming an integral part of the world's equity and debt markets, especially those in Canada.

De Jong and De Roon (2005), Donadelli and Prosperi (2012), suggest that financial and real market openness increase, ex-post, expected excess returns in emerging stock markets. In line with Donadelli and Prosperi (2012), Karadagli (2012) finds that the overall level of globalization significantly improves firm performance in emerging countries. The emerging markets have become more integrated into the global financial system (Bekaert, 1995; Bekaert and Harvey, 1995; Harvey, 1995; Barari, 2003; Bekaert et al., 2003), implying a diminution in the benefits from diversifying into Latin American emerging stock markets. Most emerging markets have now undergone various degrees of financial liberalization.

As emerging markets grow and develop greater financial and trade links with each other and with developed markets, they become more correlated; some of the potential gains associated with investment in emerging stock markets, namely, risk reduction via international diversification are therefore likely to

fade away. This may reduce the appetite of international investors for emerging market equities. However, despite the increasing integration of emerging markets with the rest of the world, this does not imply that the diversification benefits of investing in emerging markets have disappeared; their correlations with developed markets have remained low (Drummen and Zimmermann, 1992; Speidell and Sappenfield, 1992). Investing in emerging markets also enables international investors to diversify risk, thereby achieving more effective insurance than purely domestic arrangements would provide. In addition, the existence of perceived barriers to investment in these markets restricts the inclusion of emerging market equities in diversified portfolios, and hence, also limits the integration of these markets in the global market (Derrabi and Leseure, 2003).

In order to shed more lights on this issue, an investigation into the risk-return trade-off of investment, in Latin American emerging markets is undertaken in this study. This study provides an analysis on whether Latin American emerging markets have continued to offer substantial diversification benefits to Canadian investors despite having become more closely integrated with world financial markets in recent years. Second, this analysis considers the viability of Latin American emerging market equities as effective tools for diversification during times of financial crisis, several of which spanned the period of this study. The Canadian economy can be characterized by its growth, stability, and trade relationships. Rodriguez (2007) find that in the aggregate, Latin American fund managers demonstrate forecasting ability as evidenced by a positive and statistically significant attribution return.

The reminder of this paper is organized as follows: The related literature and the scope of this research study. The research method and methodology are outlined and data are described. Finally the results of the study and conclusions are presented.

LITERATURE REVIEW

Research into cross-border links in emerging stock markets was boosted by the growth and increasing openness of these markets, as well as the speed and virulence with which past financial crises in emerging market economies (EMEs) spread to other countries. Bekaert, Harvey and Ng (2003) analyze the implications of growing integration with global markets for local returns, volatility, and cross-country correlations, covering a diverse set of EMEs in, Latin America, in particular, Chen, Firth and Rui (2002) look at evidence of regional linkages among Latin American stock markets. This study provides a review of the existing literature regarding the potential benefits of international portfolio diversification. The case for international diversification is even stronger when emerging equity markets are included as part of the investor's investment strategy. Such emerging markets have been shown to provide investors with excellent opportunities for high returns as well as risk reduction and risk diversifications in emerging economies can be decreased (Abumustafa, 2007; Jain and Sehgal, 2013).

Kumar and Thenmozhi (2012) find that the volume does not influence stock returns and volatility incorporated by market participants in their trading strategies. Global stock markets are more correlated than ever as international capital markets become more integrated (Longin and Solnik, 1995; De Jong and De Roon, 2005; Goetzmann et al., 2005; Carrieri et al., 2007; Pukthuanthong and Roll, 2009). Eun et al. (2008) reveal that benefits from diversified international investments have eroded and thus investors can benefit from investing in foreign countries. Emerging markets have also attracted attention due to their high growth and high volatility and the changes in volatility behavior have indeed been induced by financial liberalization of emerging markets (Cunado et.al (2009); Dobano (2013). However, although emerging market returns are more volatile than the returns of their industrialized counterparts, they are relatively uncorrelated with each other and with developed markets. By holding well-diversified portfolios, these low return correlations can reduce risk and potentially yield high returns that are not

available developed markets. Muga and Santamaria (2007) pointed out that momentum strategies yield profit in the Latin American emerging markets. While a substantial body of research has shown the risk reduction advantages associated with investing in countries with low returns correlations, the perceived risks and difficulties of investing in some of these emerging markets is a notable drawback which may discourage global investors from investing in emerging market equities as much as portfolio theory would recommend (Errunza and Losq, 1987; Chuhan, 1994). Hence, investor's portfolios demonstrate strikingly high weightings towards home country equities. Notably, emerging market returns appear to be driven primarily by country factors, which provide opportunities for diversification benefits and as such equity prices, credit and leading rate play a relevant role of investment in emerging market (Peltonen et.al (2012).

DATA AND METHODOLOGY

This study examines the risk-return trade-off of investing in Latin American emerging stock markets from the perspective of a Canadian investor. In particular, optimal portfolios of Latin American emerging market firms were constructed and compared with portfolios consisting of Canadian shares only. This analysis was based on historic (*ex-post*) observations over (i) the whole ten-year period ending 2007 (ii) each one-year period; (iii) each two-year period; and (iv) each five-year period, based on weekly observations, to determine whether any potential benefits from diversifying into Latin American emerging markets existed for Canadian investors. Following the Markowitz framework (1952), these portfolios were then evaluated using a measure of portfolio performance. In particular, portfolios were evaluated using the ratio of mean return to standard deviation of return (MRPUR). The mean return of a portfolio was calculated according to the formula:

$$R_{p=\sum_{i=1}^{N} Y_i R_i} \tag{1}$$

where R_p is the return on the portfolio, Y_i is the proportion of the portfolio invested in share i, and R_i is the return on share i. Similarly, the standard deviation of a portfolio return was computed according to the formula:

$$Std.Dev_{\rho=\sqrt[N]{j=1}}\left(\sum_{J=1}^{N} Y^2 j\sigma^2 j + \Sigma\Sigma Y_j Y_k \sigma jk\right) \tag{2}$$
$$j = 1 \quad k = 1 \quad k \neq j$$

where $Std.Dev_p$ is the standard deviation of the portfolio, Y_j and Y_k is the proportion of the portfolio invested in share j and k, σ^2_j is the variance of share j, and σ^2_{jk} is the covariance between shares j and k.

Employing a selective technique, the optimal MRPUR portfolios were identified; the initial portfolio chosen was the best single firm. Subsequent firms were added to the portfolio, resulting in the highest MRPUR possible, until all 204 emerging market firms were included in the portfolio. The performance of the maximum MRPUR portfolio of emerging market equities was then compared against the MRPUR of a portfolio consisting solely of Canadian shares, as represented by the S&P TSX (Toronto Stock Exchange) Composite index to determine whether any benefits resulted from diversification into these emerging market equities over the specific period considered. Specifically, the maximum MRPUR portfolio is the set of equities, which has achieved the highest MRPUR ratio possible. Consequently, a set of equities may not be included in the equally weighted maximum MRPUR portfolio. The optimal MRPUR portfolio is the one, which has achieved the highest value according to the formula:

$$S_{opt=\frac{Mean\ Return\ for\ Equally-Weighted\ Portfolios\ (S_j)}{Standard\ Deviation\ of\ Return\ for\ Equally\ Weighted\ Portfolio\ (S_j)}} \tag{3}$$

Where S_{opt} is the equally weighted optimal portfolio based on the set of equities S_j, where $j=1,N$.

The construction of these overall optimal portfolios reflects the maximum diversification benefits possible from investing in the Latin American market countries over a particular time period. Specifically, it is assumed that a risk-averse investor wishes to maximize the portfolio's expected return while minimizing the variance of returns. Such a portfolio is considered optimal because it identifies the best risk/return combination from a financial point of view.

RESULTS AND DISCUSSION

The results from the study confirm the previous findings reported by Sinclair et al. (1997) and Fifield (1999), which revealed the presence of a very important time factor in explaining the returns of emerging market shares. More specifically, the results have suggested that there is significant variation in the Latin American emerging market share returns from one year to the next and from one month to the next. This strong time effect suggests that fund managers and active investors in Latin American emerging market countries should be alert to changes in share returns over time and review their portfolios regularly. Thus, the findings imply that share returns in the Latin American emerging markets considered may be difficult to forecast.

The analysis conducted in this study has demonstrated that on an *ex-post* basis, Latin American emerging market equities offered the Canadian investor excellent opportunities for increasing portfolios returns while simultaneously reducing portfolio risk. On average, the portfolios comprised of emerging market firms had a substantially lower standard deviation of return and a higher mean return than the portfolios made up of Canadian companies. Thus, a portfolio which included Latin American emerging market shares could have offered the Canadian investor a considerably greater MRPUR ratio than a similar investment strategy in which the choice was limited to include only Canadian equities in all test periods examined. The growing linkages of emerging stock markets into the global financial market due to the relaxation of barriers to entry in emerging markets, increased financial and trade links, improved access to global information, and globalization in general, have all contributed to an increase in the share return correlations between this particular grouping of emerging markets and Canada. Yet, the results from the analysis have shown that diversification efforts which include equities from Latin American emerging markets have continued to result in sizeable benefits to the international investor even in recent years; their return correlations have remained sufficiently low to attract global investors despite their integration into the global financial system.

Furthermore, the construction of various sub-optimal emerging market portfolios displayed reward-to-risk ratios that were far greater than the optimal reward-to-risk ratios of the Canadian-only portfolios in all test periods examined, despite the financial crisis and their contagion effects on Latin American financial markets. Third, in order to reap the full benefits from portfolio diversification, the optimal emerging market portfolio consisted of at minimum, five companies spread over four Latin American emerging markets. However, in most test periods over the ten-years, 25 to 29 firms were required to capture the optimal-MRPUR benefits associated with risk diversification in Latin American emerging market equities. The results from this analysis are consistent with Poon et al. (1992) and Newbould and Poon (1993), and contradict the results documented by Evans and Archer (1968) and Wagner and Lau (1971). The evidence strongly suggested that diversification across country is a much more effective tool for risk reduction than diversification across industry.

The tables show the risk-return characteristics of the MRPUR-optimal and sub-optimal portfolios over (i) each one-year sub-period; (ii) each two-year sub-period; (iii) each five-year sub-period and (iv) over the whole sample period. More specifically, Table 1 details the portfolio mean return, the portfolio standard deviation of return, and the MRPUR ratio of the optimal portfolio over the various test periods. The

MRPUR ratio of the optimal portfolio comprised of equities from the Latin American emerging markets considered is evaluated against the corresponding figure for the MRPUR portfolio comprised of only Canadian shares to determine whether any potential diversification benefits existed for the Canadian investor. Table 2 details the size and MRPUR of portfolios that attained 95, 90, 85, 80, 75, 70, 65 and 60 per cent of the MRPUR-optimal emerging markets portfolio in the various test periods in order to determine the extent to which the portfolios comprised of emerging market shares exceeded the MRPUR-optimal portfolios comprised of only Canadian shares.

In assessing the risk-return characteristics of the portfolios detailed in Table 1, it is clear that the performance of the Latin American emerging market MRPUR-optimal portfolios was considerably better than that of the Canadian-only MRPUR-optimal portfolios in each test period. The Latin American emerging market portfolio recorded the highest MRPUR-optimal portfolio in the one-year test period, where a reward-to-risk ratio of 4.2190 was achieved, primarily because of the low standard deviation of emerging market returns (0.0007). On the other hand, Canadian shares earned a reward-to-risk ratio of only 0.3908 in the same year; this is the highest MRPUR ratio achieved among all test periods for a portfolio comprised of Canadian-only equities, albeit, a value almost one-eleventh the size of the reward-to-risk ratio of its less developed counterpart. More impressively, the MRPUR ratio of the Latin American emerging market portfolio in the five-year period (0.3000) was a staggering 214 times that of the Canadian-only portfolio (0.0014). The equities from Latin American emerging markets recorded the lowest MRPUR-optimal portfolio in period 6 (0.1950), chiefly as a result of a high-risk level (0.0238). Nevertheless, this ratio compares favorably with the MRPUR ratio of the Canadian-only portfolio (-0.0047). One final point to note is that the Canadian-only portfolios recorded a negative MRPUR in some periods. For example, the negative MRPUR ratio of -0.1195 for a portfolio comprised of Canadian-only securities provided the domestic investor with the lowest reward-to-risk ratio over all test periods; a portfolio return of -0.0028 was earned in this period.

Table 1: Risk-Return Characteristics of the MRPUR-Optimal Portfolio

	Latin America			Canada		
Period	**Return**	**Std.Dev**	**MRPUR**	**Return**	**Std.Dev**	**MRPUR**
1	0.0032	0.0007	4.219	0.0049	0.0126	0.3908
2	0.0021	0.0012	1.647	0.0006	0.0171	-0.0336
3	0.0121	0.015	0.81	0.0021	0.0134	0.1577
4	0.0189	0.0199	0.951	0.0043	0.0126	0.3432
5	0.0100	0.0141	0.7111	0.0021	0.0176	0.1185
6	0.0046	0.0238	0.195	0.0002	0.0329	-0.0047
7	0.0226	0.0159	1.4218	0.005	0.0215	0.2315
8	0.0073	0.0104	0.7068	0.001	0.034	0.0308
9	0.0104	0.0118	0.88	0.0029	0.0274	-0.1044
10	0.002	0.001	1.937	0.0028	0.0235	-0.1195

The table summarizes the risk-return characteristics of the MRPUR-optimal portfolio of Latin American emerging market Equities in various sub-periods and over the whole sample period. The risk-return characteristics of the Canadian-only MRPUR-optimal portfolio in each test period are included in the table in order to facilitate a comparison.

In exploring the potential gains from diversification in Latin American emerging markets, the results from this mean-variance analysis clearly suggest that a portfolio, which included Latin American emerging market shares, could have offered the Canadian investor a considerably higher MRPUR than a parallel investment strategy in which the choice was restricted to Canadian equities only.

Table 2, which highlights the risk-return characteristics of the MRPUR sub-optimal portfolios over various test periods, confirms the dominance of the Latin American emerging market portfolios over their developed market counterpart. In particular, the Table 2 displays the size and MRPUR ratio of the portfolios that attained 95, 90, 85, 80, 75, 70, 65 and 60 per cent of the optimal portfolio value in each test period. In all cases, the sub-optimal portfolios achieved an MRPUR that was greater than the MRPUR of the Canadian-only portfolios. For example, even at 60 per cent of the MRPUR-optimal portfolio, the emerging market portfolio was considerably greater than the optimal portfolio comprised of Canadian companies in every test period. For instance, over the five years, the MRPUR of the portfolio at this level was an astounding 129 times that of the Canadian-only portfolio. Clearly, an examination of tables 1 and 2 suggests that investors who diversified their portfolios internationally to include equities from Latin American emerging market countries would have achieved a significantly greater reward-per-unit-of-risk than investors who diversified within a single nation, such as Canada.

The results from this analysis therefore support the findings of De Santis (1993), Islam and Rodriguez (2007), Shachmurove (1998) and Susmel (1998), which are unanimous in their conclusion that diversification among developing countries in Latin America can yield substantial gains in portfolio performance. Moreover, although the integration process has increased correlation values between this particular grouping of emerging markets and Canada, the results from this analysis show that diversification efforts, which include equities from Latin American emerging markets, have resulted in sizeable benefits for the international investor in more recent years. The results also reveal the diversification value of Latin American emerging markets during times of financial crisis.

Table 2: Risk-Return Characteristics of the MRPUR Sub-Optimal Portfolio

Portfolio	100%		95%		90%		85%		80%	
Period	Size	MRPUR	Size	MRPUR	Size	MRPUR	Size	MRPUR	Size	MRPUR
1	44	4.219	50	4.0081	55	3.7971	81	3.5862	89	3.3752
2	29	1.647	47	1.5647	57	1.4823	64	1.4	8	1.3176
3	14	0.81	26	0.7695	32	0.729	37	0.6885	41	0.648
4	25	0.951	14	0.9035	43	0.8559	50	0.8084	58	0.7608
5	8	0.7111	18	0.6755	31	0.64	36	0.6044	42	0.5689
6	5	0.195	8	0.1853	10	0.1755	12	0.1658	14	0.156
7	37	1.4218	44	1.3507	49	1.2796	54	1.2085	13	1.1374
8	7	0.7068	11	0.6715	17	0.6361	20	0.6008	23	0.5654
9	30	0.88	38	0.836	42	0.792	9	0.748	6	0.704
10	27	1.937	33	1.8402	50	1.7433	18	1.6465	61	1.5496

The majority of the test periods examined required between 25 to 29 emerging market firms to capture the optimal MRPUR benefits associated with diversification in Latin American emerging market equities. This is shown graphically in Table 3, which depicts the results of the MRPUR-optimal portfolio for the whole ten-year sample period. The Table 3 shows that increasing the number of equities in the portfolio beyond 27 reduces the overall benefits from diversifying into the shares from Latin American emerging markets. This finding contradicts the widely accepted notion that the benefits of diversification are virtually exhausted when a portfolio contains approximately 10 shares. For example, Evans and Archer (1968) concluded that a portfolio consisting of 10 different shares was sufficiently diversified, stating that the results of their study 'raise doubts concerning the economic justification of increasing portfolio sizes beyond 10 or so securities. However, the results reported here are consistent with those of Wagner and

Lau (1971), Solnik (1974), and Poon et al. (1992), who indicated that there are considerable opportunities for reducing risk by expanding the portfolio size well beyond 10 shares.

Table 2: Risk-Return Characteristics of the MRPUR Sub-Optimal Portfolio

Portfolio	75%		70%		65%		60%	
Period	Size	MRPUR	Size	MRPUR	Size	MRPUR	Size	MRPUR
1	104	3.1643	115	2.9533	126	2.7424	138	2.5314
2	83	1.2353	94	1.1529	106	1.0706	121	0.9882
3	45	0.6075	50	0.567	2	0.5265	60	0.486
4	67	0.7133	76	0.6657	86	0.6182	97	0.5706
5	48	0.5333	55	0.4978	62	0.4622	71	0.4267
6	16	0.1463	18	0.1365	21	0.1268	24	0.117
7	66	1.0664	74	0.9953	85	0.9242	99	0.8531
8	29	0.5301	35	0.4948	41	0.4594	46	0.4241
9	57	0.66	63	0.616	3	0.572	77	0.528
10	67	1.4528	71	1.3559	77	1.2591	81	1.1622

The table summarises the risk-return characteristics of the Latin American emerging market portfolio.
The table details the size and mean return per unit of risk (MRPUR) of portfolios that attained various percent of the MRPUR-optimal portfolio in the various test periods.

Furthermore, although Newbould and Poon (1993) do not state a specific number of shares that constitutes a well-diversified portfolio, they do suggest that the number should be greater than 20. An analysis of the tables also suggests that companies from some Latin American countries appeared more often in the optimal MRPUR portfolio than companies from other Latin American countries. This is confirmed by a chi-squared test of homogeneity, which was performed for each test period. In particular, this test rejected the homogeneity of frequency of occurrence for the 1-year, 2-year and 5-year sub-periods.

For example, over the ten one-year sub-periods (p-value of 0.000), Brazilian firms (59) and Chilean firms (93) were included most frequently in the optimal portfolio, while firms in Argentina (4) and Venezuela (6) appeared least often. Columbian, Mexican and Peruvian firms appeared 18, 29 and 17 times, respectively. Similar results were obtained for the five two-year sub-periods (p-value of 0.000) and the two five-year sub-periods (p-value of 0.000). In particular, firms in Brazil (35) and Chile (45) appeared quite frequently in the 2-year MRPUR-optimal portfolios, while firms in Argentina (1), Columbia (7), Mexico (12), Peru (12) and Venezuela (3) appeared less often than average.

Similarly, firms in Brazil (12) and Chile (13) appeared most often in the 5-year MRPUR-optimal portfolio, while firms in Columbia (3), Mexico (5), Peru (3) and Venezuela (1) appeared less often than average. In fact, Argentinean firms failed to make a single appearance in the 5-year optimal portfolios. These results therefore indicate that there is a propensity for firms situated in some Latin American countries to appear more often in the MRPUR-optimal portfolio than firms from other Latin American countries. The results from this analysis are consistent with Fifield (1999); Fifield et al., (2001) who concluded that the inclination of firms in some countries to appear quite frequently in the optimal portfolio suggests some element of persistence in the country-specific composition of the optimal portfolio.

Table 3: Number of Companies That Make Up the MRPUR-Optimal Portfolio in Each One-Year Sub-Period

Year Country	1	2	3	4	5	6	7	8	9	10	Total
ARG	2	0	0	0	0	0	0	0	1	1	4
BRA	13	8	2	8	0	1	13	2	7	5	59
CHI	15	14	5	7	3	2	15	3	16	13	93
COL	4	2	1	1	1	1	1	0	3	4	18
MEX	4	4	4	6	3	1	4	2	1	0	29
PER	5	1	0	1	1	0	3	0	2	4	17
VEN	1	0	2	2	0	0	1	0	0	0	6
Total	44	29	14	25	8	5	37	7	30	27	226

The table summarizes the composition of the MRPUR-optimal portfolios in each one-year sub-period. In particular, the table details the number of companies in each market that are included in the MRPUR-optimal portfolio in each one-year sub-period.

CONCLUSION

This study has tested the risk-return trade-off of investing in Latin American emerging stock markets over the ten-year period. Optimal portfolios were derived based on historic (*ex-post*) observations and evaluated utilizing the mean return per unit of risk (MRPUR) performance measure. In particular, the performance of the MRPUR-optimal emerging market portfolio was compared with the MRPUR of a portfolio consisting solely of Canadian shares to determine whether any benefits resulted from diversifying into the emerging stock markets over the various periods considered. The results revealed substantial differences in the risk-return characteristics of the MRPUR-optimal portfolios.

On average, the portfolios comprised of emerging market firms had a substantially lower standard deviation of weekly returns and a higher mean weekly return than the portfolios made up of Canadian shares; a portfolio which included Latin American emerging market shares could have offered the Canadian investor a significantly greater MRPUR than a similar investment strategy in which the choice was limited to include only Canadian equities. This finding is consistent with previous studies which have concluded that there are benefits to including Latin American emerging market assets in a globally diversified portfolio in the form of higher portfolio returns and/or a reduction in portfolio risk (De Santis, 1993; Islam and Rodriguez, 1998; Shachmurove, 1998; Susmel, 1998). Impressively, despite the growing integration of emerging stock markets into the global financial market, the results from this analysis continue to support the rationale for diversification, even in recent years. Moreover, these markets were shown to provide diversification value during times of financial crisis when diversification is most valuable.

This study has followed the mean-variance Markowitz (1952) framework, which assumes normally distributed data. However, it is necessary to note that one limitation of this study is that the data are, in fact, not normally distributed. Nonetheless, this study attempts to overcome the non-normality of the data by using log returns, which more closely follow a normal distribution. Furthermore, the methodology follows those of previous studies; scholars have acknowledged that emerging market returns deviate from the standard distributional assumption (Harvey, 1995; Bekaert et al, 1998). In spite of this criticism, they have used Markowitz methodology. Additionally, even if the data are non-normal, the resulting outcome from the data in this study will still provide the optimal risk-return trade-off as measured by MRPUR criteria.

There is growing conviction amongst the investment community that as both developed and emerging markets have become more integrated with the rest of the world, the role of industrial effects are playing an increasingly important role in explaining return variation at the expense of country-specific factors.

Managers interested in investing in the emerging markets of Latin American countries should give great consideration to their country allocation process; the industry factor appears to play an inferior role as part of a diversification strategy. This finding is consistent with the results of previous academic studies, which have also documented the presence of a dominant country component in the share returns of emerging and developed markets. However, it has been established that ignoring industrial factors will lead to an important loss of diversification benefits; investors should consider both cross-country and cross-industry diversification as a way to improve portfolio performance. There is growing conviction amongst the investment community that as both developed and emerging markets have become more integrated with the rest of the world, the role of industrial effects are playing an increasingly important role in explaining return variation at the expense of country-specific factors. However, an examination of the structure of Latin American emerging market returns over a recent time period has indicated that country selection, rather than industry selection, is still the more important determinant in explaining the cross-sectional share return variation in portfolio returns for emerging market investment strategies in the Latin American region over the decade. However, an examination of the structure of Latin American emerging market returns over a recent time period has indicated that country selection, rather than industry selection, is still the more important determinant in explaining the cross-sectional share return variation in portfolio returns for emerging market investment strategies in the Latin American region over the decade.

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AUDITORS' PERCEPTIONS OF AUDIT FIRM ROTATION IMPACT ON AUDIT QUALITY IN EGYPT

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ABSTRACT

This study aims to explore professional auditors' perceptions of the impact of audit firm rotation on audit quality. It also investigates the possible benefits and determining factors of mandatory auditor rotation. A sample of 83 auditors was drawn from a group of large firms and another of smaller firms in Egypt. Data were analyzed using one sample t-test; the findings indicate that auditors' perceived mandatory rotation of auditors to have a positive effect on audit quality, a negative effect on client-specific knowledge, and a positive impact on auditors' independence. The impact from the auditors' perspective of industry specialization and fee dependence on the relationship between mandatory auditor rotation and audit quality was also determined.

JEL: M

Keywords: Mandatory Auditor Rotation; Audit Quality; Auditor's Independence; Egypt

INTRODUCTION

The effect of auditor tenure on auditor independence and audit quality has a long and controversial history. The controversy has largely been fueled by financial scandals, such as the Enron scandal 2001, which raised concerns about whether auditor tenure reduces auditor independence and audit quality. This has raised regulatory interest in using mandatory auditor rotation regulations to enhance auditor independence and reduce the likelihood of audit failure. Therefore, legislative authorities in the United States, for example, issued the Sarbanes-Oxley Act in 2002. The Sarbanes-Oxley (SOX) Act defines mandatory audit firm rotation as *"the imposition of a limit on the period of years during which an accounting firm may be the auditor of record"* (Harris, 2012, p.1). Specifically, it mandates the lead auditor, or coordinating partner and the reviewing partner to rotate off the audit every five years so that the engagement can be viewed with fresh and skeptical eyes (SOX, 2002). The U.S. Congress noted in passing the Sarbanes-Oxley Act the potential benefits of audit tenure to shareholders and various stakeholders (U.S. Senate [2002], Title II, C). It indicated that audit tenure is a means of improving audit quality and therefore it increases the quality of general-purpose financial statements (Carey and Simnett, 2006). In something of a compromise to the parties on each side of the issue, Section 203 of SOX requires a registered public accounting firm to rotate its lead or coordinating audit partner and the reviewing partner so that neither role is performed by the same auditor for the same issuer for more than five consecutive years (Manry, 2003).Many countries such as those in the European Union, the United Kingdom, Hong Kong, China, Japan, Australia, Canada, and Mexico have also passed acts requiring mandatory audit partner rotation (Tafara, 2006).

In contrast to audit partner rotation, however, mandatory audit firm rotation is still debatable. The Conference Board supports the use of audit firm rotation even when audit partner rotation is in use to improve auditor independence (Conference Board, 2005). Many countries such as Brazil, Italy, and Singapore have adopted mandatory audit firm rotation rather than mandatory audit partner rotation (Carey and Simnett, 2006, Tafara, 2006).

Nevertheless, the U.S. General Accounting Office (GAO) pointed out that it would be more prudent to wait for a few years before assessing the effectiveness of implementing the Sarbanes-Oxley Act (SOX)

reform (Ghosh and Moon, 2005). Therefore, the GAO recommends that the Securities and Exchange Commission (SEC) and the Public Company Accounting Oversight Board (PCAOB) monitor and evaluate the effectiveness of the mandatory auditor rotation requirements of SOX in enhancing auditor independence and audit quality (GAO, 2003).

These reforms have attracted the attention of several researchers (e.g., Carey and Simnett, 2006; Tafara, 2006; Manry, 2003; Chen et al., 2008) to examine the impact of audit partner or audit firm rotation on audit quality or earnings quality. However, the results of these studies are fragmented and inconsistent (Chen et al., 2008). In addition, the literature so far seems to have looked into audit rotation in the Western context, while some preliminary results in other contexts suggest that different contexts may cause different effects of audit rotation on audit quality (Lim and Tan, 2010).Moreover, existing research has concentrated on examining the effects on audit quality of audit firm rotation rather than audit partner rotation, with the exception of a few studies, such as Carey and Simnett (2006) and Chen et al. (2008). Against this background, the limitations of existing research may limit generalization of the findings in other contexts, e.g., other countries or reforms. Therefore, this study set out to explore the perceptions of auditors and users of financial statements on the effects of audit firm rotation on audit quality in Egypt.

The outline of the present paper is as follows. The next section reviews related studies and develops the research hypotheses. Section three describes the research design and sample selection and section four discusses the empirical results. The final section discusses the results and presents their implications, suggesting directions for future research.

LITERATURE REVIEW

Based on the in-depth interviews (described below) and previous literature, the research framework was developed (see Figure 1). The model displays the direct and indirect effects of auditor tenure on audit quality due to increased client-specific knowledge and reduced independence, and the potential joint effects of auditor tenure and auditor specialization and fee dependence. The study hypotheses are based on the key links in this model.

Audit Tenure and Audit Quality

Audit quality can be defined in a number of ways and from different perspectives. DeAngelo (1981) defines audit quality as the market-assessed probability that certain financial statements contain material errors and that the auditor will both discover and report them. This definition reflects two main aspects that are related to the phenomena under investigation, i.e. the level of competence of the audit firm (or auditor expertise and experience) and the level of independence.

The main argument of mandatory audit firm rotation is based on the notion that auditors are more likely to compromise on audit quality as the length of the auditor-client relationship (i.e., audit tenure) increases. This is perhaps because auditing a firm for a long time may make auditors over-familiar with the client, complacent, and prone to blind spots (Harris, 2012).In contrast, opponents of mandatory audit firm rotation argue that, with periodic rotation, the lack of client-specific knowledge and experience among new auditors impairs audit quality (Kwon, 2010).

As noted above, there are two forms of mandatory audit rotation: at the audit firm level and at the audit partner level. However, despite the fact that audit partner rotation has been suggested for many years, most studies have focused on investigating the effect on audit quality of audit firm tenure rather than audit partner tenure. This is perhaps due to the lack of data on partner tenure. Many countries do not disclose the audit partner's name. Moreover, in countries where audit partner rotation is mandatory, there can be

no case of long partner tenure, and hence we cannot investigate whether long partner tenure would lead to low audit quality.

There are mixed and varied findings in this regard, but findings are generally inconsistent with the argument that earnings/audit quality deteriorates with extended audit firm tenure. For example, some studies have found that audit quality improves with auditor tenure (Geiger and Raghunandan, 2002; Mansi et al. 2004; Ghosh and Moon, 2005; Mansi et al., 2004; Chen et al., 2008). In particular, the investigation can be cited by Myers et al. (2003) of the relation between audit firm tenure and two measures of accruals: discretionary accruals and current accruals. Myers et al. (2003) investigate the relation between audit firm tenure and two measures of accruals: discretionary accruals and current accruals. They find a negative relationship between accruals and audit firm tenure, which suggests that longer tenure by an audit firm puts greater limits on earnings management.

Moreover, Myers et al. (2004), using restatements as a proxy for financial reporting quality, find that audit firm tenure is not associated with the probability of restating annual financial statements. They also find no relationship between audit firm rotation and the likelihood that the auditor will identify the need for a restatement. In the same vein, Carcello and Nagy (2004) use cited fraudulent financial reporting as a proxy for audit quality and find that fraudulent financial reporting is more likely to occur in the first three years of audit firm tenure. However, they do not find any evidence that fraudulent financial reporting is more likely to increase with increasing tenure by the audit firm.

Nevertheless, there are other studies that show some conflicting results. Davis et al. (2002) provide evidence that extended audit firm tenure is associated with both positive and negative effects on audit quality. Moreover, Carey and Simnett (2006) using working capital accruals as a proxy for audit quality, find no relationship in the Australian audit market between audit partner tenure and audit quality. However, when using the incidence of going concern opinions and the proclivity to beat earnings benchmarks as proxies for audit quality, they find that audit quality declines when audit partner tenure increases (Carey and Simnett, 2006).

From a different perspective, Johnson et al. (2002) argue that the relationship between audit quality and audit partner tenure depends on the length of the tenure. They argue that audit tenure can be classified into three categories: short (two to three years), medium (four to eight years), and long (nine or more years).They find that short tenure is associated with larger absolute discretionary accruals but long tenure is not, which suggests that long audit firm tenures are not associated with a decline in earnings quality. In addition, Manry et al. (2008) find that, when partner tenure exceeds seven years, audit quality improves for small clients only.

In light of this, whether or not longer audit firm tenure impairs audit quality is still an unresolved question. To address it, the first hypothesis is formulated as follows:

H1. The longer the audit tenure, the lower the audit quality

The opposite and conflicting predictions and findings in prior studies on to the relation between audit tenure and audit quality may be attributable to the failure to jointly examine moderating factors such as auditors' specialization, fees dependence, and auditors' incentives (Doyle and Ge, 2007; Daugherty et al., 2012).Therefore, the following sections focus on identifying the important factors that may moderate the relationship between auditor rotation and audit quality.

Client-specific Knowledge

Arguments in favor of extended auditor–client relations rest primarily on an expertise argument. Previous research has consistently indicated that auditor experience has a positive influence on audit quality (Dougherty et al., 2012). For example, Brazel et al. (2010) find that client-specific knowledge, a proxy for auditor experience, increases auditors' ability to detect fraud indicators.

On a related note, some studies (e.g., Lenox, 1999) argue that non-audit activities performed by the audit firms tends to lead to increasing the auditor's experience and knowledge of the client's operations and environment, and hence increase the ability to detect misstatement in the financial statements. Therefore, providing non-audit activities to the client can have a positive rather than a negative impact on audit quality.

Therefore, mandatory audit firm or audit partner rotation, in particular when there are no effective knowledge-transfer strategies, may lead to the loss of both explicit and tacit client- specific knowledge, and hence to reduced audit quality. Accordingly, it is hypothesized that:

H2: Auditors perceive auditor rotation to have a negative impact on auditor client-specific knowledge, and hence to reduce audit quality

Auditors' Independence

Auditor independence is the cornerstone of the auditing profession. Auditor independence refers to the probability that auditors will report the misstatement in financial statements (Colbert and Murray, 1998) and the ability of auditors to resist pressure from a client (Goldman and Barlev, 1974). Therefore, auditors who have a high degree of independence will have a high probability of detecting and reporting errors or financial misstatements, and hence will be able to determine the true status of the audited firm, i.e. make a high quality audit (DeAngelo, 1981; Colbert and Murray, 1998).

One of the debated factors that affect auditor independence is auditor tenure. It is argued that longer associations between audit partners and their clients can create personal relationships that make it more difficult for the auditor to act independently of the preferences of the client (DeAngelo, 1981). This is further aggravated by the fear of auditors of losing a steady stream of future audit revenues, in particular from important clients who pay the auditor significant audit fees. Accordingly, this may lead auditors to comply with the client's demands (Lim and Tan, 2010). Thus, mandatory partner rotation mitigates the closeness of the relationship between audit partners and their clients, and enhances the auditor's ability to resist pressure from management. The results of this stream of research (e.g., Hattifield et al., 2011) suggest that there is a positive association between audit firm/or audit partner rotation and the magnitude of proposed audit adjustments. Simnett and Carey (2006) also find a negative relationship between auditor independence and the likelihood of issuing a going concern opinion as a proxy of audit quality.

Hence it may be argued that auditor rotation can enhance auditor independence and therefore increase the probability of detecting and reporting financial misstatements. This elicits the hypothesis that:

H3: Auditors perceive auditor rotation to have a positive impact on auditors' independence, and hence on audit quality.

Auditors' Specialization

Auditors' specialization refers to auditors' being specialized in auditing specific industries. This is usually determined by the ratio of the number of clients from a specific industry to the total number of clients of

the auditor (Lim and Tan, 2010). Prior research results indicated that there is a positive association between the level of the auditors' industry specialization and audit quality (Hogan and Jeter, 1999). This is probably because audit firms which are industry specialized invest time and financial resources in developing personnel and technology in specific industries, which should lead to better understanding of the clients' business, operations, and risks, and hence to improved audit quality(Lim and Tan, 2010). As a result, auditors working in audit firms which are industry specialists have more opportunities to develop expertise than those working in non-specialist firms (Bell et al. 2005), and are also less likely to be misled by management representations (Lim and Tan, 2010).

Auditor industry specialization is also a proxy for the incentives for auditors to protect their reputation and minimize litigation risk (Krishnan, et al., 2007).Auditors who are industry specialists probably have incentives to protect their reputation because they have more to lose from poor audit quality in terms of losing future revenue streams and fee premiums. Thus, they have greater incentives than have non specialists to make high quality audits, be more independent, so as to avoid damaging this reputation (Shu, 2000). In light of this, auditor industry specialization can be considered to be proxy for both expertise and the incentive to protect this expertise.

In terms of the relation between auditor tenure and industry specialization, one of the arguments against mandatory auditor rotation is the alleged loss of auditor expertise. Nevertheless, auditors who are industry specialists begin the audit of a new client with superior knowledge of the industry, which facilitates their understanding of the client relative to non specialists (Lim and Tan, 2010), and offsets the negative effect of mandatory auditor rotation on auditor expertise.

Some studies examine the interaction between auditor tenure and auditor specialization, but results differ depending on the measure used for audit quality. Myers et al. (2003) find no such interaction with discretionary accruals. In contrast, using discretionary accruals and restatements as measures for audit quality, other studies document this interaction (Stanley and Dezoort 2007; Gul et al. 2009).

From a different perspective, as auditor tenure increases, auditors tend to develop more blind spots in terms of detecting problems and errors in the client's financial statements. This probably arises because of reduced vigilance through over familiarity with the client, or because the auditor has not kept sufficiently abreast of changes in the client and in the industry (Manry et al., 2008). Nevertheless, the personal and technological resources of audit firms specializing in particular industries is likely to enable their auditors to be more responsive to changes in the client's business or industry. To the extent that the environment is dynamic over time, these arguments suggest that audit quality is more likely to increase with tenure for specialist auditors than for non specialist auditors (Lim and Tan, 2010). Accordingly, we posit that greater clarity on the auditor tenure–performance relationship requires the joint consideration of the auditor's industry specialization and hypothesize the following:

H4: As auditor tenure increases, audit quality increases with auditors' industry specialization

Fee Dependence

Proponents for auditor rotation argue that, with extended auditor tenure, the auditor becomes less independent and audit quality goes down, resulting from fee dependence between auditor and client. However, with mandatory auditor rotation, auditors will be more independent because the audit engagement will not be perceived as permanent and hence, they will not be risking a stream of revenues that they believed would continue uninterruptedly (Dao et al., 2008; Ye et al., 2011). In particular, this suggests that audit quality will be lower with longer auditor tenure, the effect being magnified by high fee dependence, because an auditor will be reluctant to lose a client who contributes significantly to the audit firm's income (Lim and Tan, 2010).

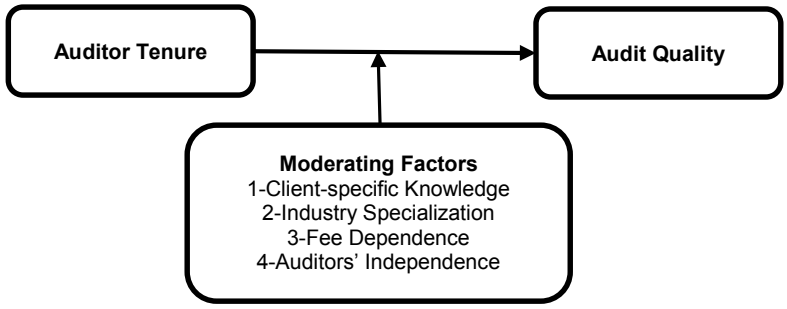
Nevertheless, studies which examine the relationship between auditor tenure and fee dependence reach varied and mixed conclusions. On the one hand, some studies examine the interaction between auditor tenure and audit fees. For example, Gul et al. (2007) find that non-audit fees (but not audit fees) are associated with poorer audit quality, in terms of higher discretionary current accruals for firms with short auditor tenure. On the other, Stanley and DeZoort (2007) find that, with short auditor tenure, audit fees are associated with improved audit quality, in terms of lower likelihood of restatement for firms. Thus, the joint consideration of fee dependence and auditor tenure on audit quality does not indicate a clear direction; with greater economic incentives to side with the client with higher fee dependence, audit quality may suffer with extended tenure. Accordingly, it is hypothesized that:

H5: As auditor tenure increases, audit quality decreases with high fee dependence

Exploratory Study

In order to better understand the effect of mandatory rotation on audit quality, nine semi-structured interviews with professional auditors from auditing firms' different sizes were conducted. Each interview lasted about two hours. Data from these interviews were used to develop the framework shown in Figure 1. In each interview, the participant was asked about his/her perceptions of the possible influence of mandatory auditor rotation on audit quality in general and on client-specific knowledge and auditor independence in specific. Participants were also asked about the role of industry specialization and fee dependence in the relationship between auditor rotation and audit quality. The results show that there is no mandatory auditor rotation in Egypt; however, some international companies and big national companies have a specific condition to change the auditor every three to five years. They tend to change either the audit partner or the whole audit firm. Moreover, some big audit firms have internal policies to change the audit partner every seven years. Furthermore, auditors have indicated many challenges that might affect the application of mandatory auditor rotation in Egypt, and hence, it is argued, impact on audit quality such as the significant gap between the audit quality of big auditing firms and that of other auditing firms; the lack of a wide pool of qualified auditors to choose from when changing auditors; and the significant variation in audit fees between big auditing firms and other auditing firms in Egypt.
The foregoing review of the literature, along with the results of the in-depth interviews, shows debated relationships between mandatory auditor rotation and factors such as client-specific knowledge and auditor independence, which in turn affect audit quality. In addition, there is also the debated joint effect of auditor mandatory rotation, industry specialization and fee dependence on audit quality. Figure 1 show these expected relationships.

Figure 1: The Research Framework



This figure shows the research framework that identifies the proposed independent and moderating variables that impact audit quality.

DATA AND METHODOLOGY

Research Setting: The Egyptian Accounting and Auditing Environment

All registered companies in Egypt are required to keep proper accounting records and prepare audited financial statements annually. The Company Law 159/1981 and its amendments require that external audits should be carried out in compliance with the Accounting Practice Law133/1951. In addition, the Capital Market Law 95/1992 and its amendments in 1997 requires all listed companies in the Egyptian stock exchange to prepare financial statements in compliance with the Egyptian Accounting Standards; in the absence of Egyptian Accounting Standards regarding the accounting treatment, the requirements set by the International Accounting Standards (IAS) will be applied (Wahdan et al., 2012). In the case of bank audits, the Central Bank of Egypt reviews the auditor's report and annual financial statements before the shareholders' meeting, according to the Banking Law 163/1967 (Wahdan et al., 2012). Finally, in the case of state-owned firms, the Central Auditing Organization, which is an independent public organization reporting directly to the Parliament, is responsible for auditing the state-owned firms (CAO, 2012).

According to the Accounting Practice Law 133/1951 and its amendments, public accountants must register with the General Register for the Accountants and Auditors, a unit in the Ministry of Finance, and does not require a qualifying examination for entry (CAO, 2012). In 2009, an Auditors Oversight Board (AOB) was established to monitor, inspect and review auditors' work and to assess auditors' independence and compliance with auditing standards (EFSA, 2012).

In Egypt, neither audit firm rotation nor audit partner rotation is mandatory or even a policy. However, there are signs of currently increasing concern by various stakeholders in Egypt to adopt mandatory audit firm rotation, in particular after recent political and administrative changes and demands for more transparency, to attract foreign investments and thus enhance economic growth and people's lives.

However, some features of the legal environment in Egypt which may affect the relationship between audit firm rotation and audit quality is that almost no lawsuits have ever been brought against audit firms in the past. In addition, the enforcement of the laws is typically weaker in Egypt than in other, Western, countries. Therefore, the auditor liability structure and the strength of law enforcement may affect the auditors' incentives to maintain audit quality. Moreover, audit firms face higher levels of potential liability than do auditors in countries where audit firms can be formed as entities with limited liability (e.g., the United States or the United Kingdom). Prior research has demonstrated the conditions under which audit quality is lower if auditors have limited liability, as opposed to unlimited liability (Dye, 1995). Finally, there is generally no separation between owners and management in public companies and communication with shareholders is markedly weak (Wahdan et al., 2012).

Population and Sample

The population includes all professional auditors working in all audit firms during the time of the study. There are 621 chartered accountants who are currently registered at the Egyptian Society of Accountants and Auditors, Cairo (Egyptian Society of Accountants and Auditors, 2012). In addition, there are more than 30,000 registered accountants at the Registration Committee for Accountants and Auditors in the Ministry of Finance list (Wahdan et al., 2012). However, no comprehensive list includes all the names and contact information of the working auditors at the time of the study. Accordingly, the study used a non-probability sample to select the participants of the study.

Most of the non-big audit firms are small firms which have one or more auditors, one of whom is usually the owner, with a trivial market share of the industry's clients. Therefore, the study used a quota sample

so as to be able to select the appropriate audit firms from the non-Big auditing firms which meet the criteria for testing the study hypotheses, such as having a significant market share, relevant auditing experience, and a considerable number of auditors and managerial levels.

The survey was distributed to 150 auditors from 9 different-sized auditing firms: 6 from the group of bigger auditing firms, and 3 from the remainder. Data were collected from September 2012 to January 2013. Of the surveys distributed, 86 were returned, a response rate of 55.3%. However, 3 surveys were discarded because of incompleteness. Therefore, only 83 surveys were used, comprising 51 from the partners in the group of bigger firms, and 32 from those in the remaining firms. Table 1 presents the sample description.

Table 1: Sample Description

Type of Auditing Firms **Items**	**Big-sized firms**	**Non Big-sized firms**
- No. of auditors in the sup-sample (Percentage)	51(61.4%)	32 (38.6)
- Auditors Experience (years)*	25 (1.28)	17 (1.56)
- Expert industries Auditors (years)*	5.2 (1.17)	3.4 (1.45)

*This table shows the characteristics of the sample; the 83 auditors in Egypt. * Numbers indicate means (standard deviation)*

Survey Instrument and Data Collection

The purpose of the study was explained to the Office Managing Partner, and his/her assistants among the professional staff. The number of surveys to be distributed in the firm was agreed and the surveys were sent to the Office Managing Partner for distribution to those partners willing to participate in the study. Each survey was prefaced by a covering letter, thanking the participant and requesting the participant not to consult with anyone while responding to the questions.

The measurement items used to operationalize the research constructs were derived from previous studies and the wording of the items was adjusted to match the present context. New items were added when necessary. The survey instrument included 17 statements, and participants were asked to rate their level of agreement with each statement on a 5-pointLikert scale ranging from 'strongly disagree' to 'strongly agree'. In addition, there were two demographic questions to determine the partner's experience and industry expertise. The measurement scales intended to represent the research variables were developed and tested to ensure the validity and reliability of the measurement scales.

Exploratory Factor Analysis (EFA) and Cronbach α were used to test the validity and reliability of the measurement scales. The results of EFA indicate that six factors were extracted from the data: auditor tenure, audit quality, client-specific knowledge, industry specialization, auditor independence, and fee dependence. Variables which loaded significantly > 0.5 on any factor and not > 0.3 on any other factor were considered to belong to the factor (Field, 2010). Therefore, some statements were excluded because they did not meet this criterion. In addition, the eigenvalues and cumulative variance results (4.73, 42,936% respectively) indicate that the construct validity of the instrument was satisfactory. Finally, with respect to the reliability test, all the Cronbach α results indicate that the reliability of these factors was always over 0.7.

RESULTS AND DISCUSSION

Results

With regard to the perceptions of audit engagement partners about the appropriate length of the audit tenure needed to become fully effective on a new audit assignment, the results show that partners reported an average (SD) of 3.8 (1.6) years to be able to achieve acceptable audit quality levels, as indicated in Table 2. Further analysis of the responses of partners shows that 26% of them believe they need more than 5 years to perform effective audit assignment, while only 16% claimed that they needed at least two years to effectively perform an audit assignment. Most of the auditors indicated that they needed between 3 and 5 years to understand the client and hence effectively perform an audit assignment. The results do not significantly differ by audit firm size, whether bigger or smaller, using the t-test statistical test as shown in Table 2.

Table 2: Partners' Responses about Appropriate Length of Audit Tenure

	Overall Sample	Big-sized Firms	Non Big-sized Firms	t-statistic
Length of audit tenure (Mean & SD)	3.8 (1.6)	3.9 (1.3)	3.6 (1.5)	1.12
≤ 2 years	13 (16%)	6(12%)	7 (23%)	1.06
> 2 years to ≤ 5 years	48 (58%)	33 (65%)	15 (47%)	1.11
> 5 years	22 (26%)	11(23%)	11 (30%)	0.99

*This table describes the overall sample, and the difference between groups of auditors in terms of audit tenure and auditors' experience. *, **, *** indicate significance at ≤ 0.05, 0.01, and 0.001 levels, respectively (two-tailed).*

The research framework that identifies the proposed independent and moderating variables that impact audit quality has been examined on two-levels: the overall sample level indicated in Table 3, and on the sub-samples level; i.e., the Big-sized auditing firms and Non Big-sized auditing firms indicated in Table 4. With respect to the implications of auditor rotation on audit quality, auditors were asked about their perceptions of the mandatory auditor rotation requirement on audit quality and the expected benefits, such as enhancing auditor independence along with the inevitable costs, such as the loss of client-specific knowledge. Their perceptions were also identified of the role of industry specialization in offsetting the negative impact on the relationship between mandatory auditor rotation and audit quality, in addition to the impact of fee dependence on magnifying the negative effect of extended auditor tenure on audit quality. One sample t-test was used to test the research hypotheses. Auditors' perceptions were determined according to the extent of their agreement on a 5-point scale (ranging from 1 'strongly disagree' to 5 'strongly agree') with a statement about the effects of mandatory partner rotation. Then, the difference of these answers from neutral was calculated as the difference between the mean of auditors' answers of the statements and the neutral. The t-test was used to examine whether the auditors' answers significantly differ from the neutral (i.e., Midpoint '3' on the Lickert scale) (Daugherty et al., 2012; Field, 2010).

Consistent with H1, auditors agree with the statement that mandatory auditor rotation will result in higher audit effort and hence improve audit quality. Further, they perceive that longer auditor tenure will make audit partners less skeptical or more complacent, as indicated by the means and p-values in Table 3.

Hypotheses 2, 3, 4 and 5 were supported. Consistent with H2, mandatory audit partner rotation reduces client-specific knowledge (Mean = 4.23, $p < 0.05$). In addition, audit engagement auditors believe that audit quality is greatly affected by the loss of client-specific knowledge due to mandatory partner rotation (Mean =4.01, $p < 0.01$). In support of H3, auditors' responses show that they believe mandatory partner rotation to positively affect auditors' independence, either their attitude of independence or their

impression of the partner's independence, as indicated in Table 3 (Mean = 4.24, $p < 0.01$, and 4.11, $p < 0.05$ respectively). Further, mandatory auditor rotation was also seen as reducing the likelihood of inappropriate attachment between auditor and client, i.e., reducing the likelihood of developing a mutual reciprocity of commercial or other privileges between the audit engagement partner and the client's management that would affect the auditors' independence and hence their ability to report financial misstatements (Mean = 3.95, $p< 0.05$).

Table 3: Perceptions of auditors of the effect of partner rotation on audit quality

Hypotheses	Statements		Mean (SD)	Diff. From Neutral[1]	t-statistic
H1: audit tenure & audit quality	1-	Mandatory partner rotation will result in higher audit effort	3.10 (1.23)	0.10	1.04
	2-	The longer the partner tenure, the more complacent s/he will be	3.45(1.42)	0.45	1.20
	3-	The longer the partner tenure, the less skeptical s/he will become	3.56 (1.20)	0.56	1.88
H2:audit tenure, client-specific knowledge, & audit quality	1-	Client-specific knowledge is lost due to partner rotation	4.23 (0.8)	1.23	2.03*
	2-	When audit partners are required to gain new client-specific knowledge, audit quality declines	4.01 (1.2)	1.01	2.10*
H3: audit tenure, independence, & audit quality	1-	Partner rotation improves the independence of the partner's attitude	4.24 (1.28)	1.24	2.36**
	2-	Partner rotation improves the impression of independence given by the partner	4.11 (1.40) 3.95 (1.50)	1.11	2.81*
	3-	Partner rotation reduces the likelihood of inappropriate client attachment		1.95	3.14 ***
H4: audit tenure, industry specialization, and audit quality	1-	when audit partners are required to gain new industry expertise, audit quality declines	4.46 (0.86)	1.46	3.05***
	2-	mandatory partner rotation will not reduce audit quality if the partner has industry expertise	3.92 (1.3)	0.92	2.04*
	3-	partners' industry specialization offsets the negative impact of mandatory partner rotation on audit quality	3.45 (0.92)	0.45	1.98*
H5: audit tenure, fee dependence, & audit quality	1-	the higher the fee dependence, the lower the audit quality	4.11 (1.34)	1.11	2.34**
	2-	the higher the fee dependence, the lower the audit quality, even if there is a mandatory partner rotation requirement	4.23 (1.62)	1.23	2.44**

1. Difference from Neutral: The difference between the mean of auditors' answers to the statements and the Neutral (Midpoint of the scale '3').
*This table shows the results for hypotheses testing. *, **, *** indicate significance at ≤ 0.05, 0.01, and 0.001 levels, respectively (two-tailed).*
The T-test examine whether the answers significantly differ from the neutral (Midpoint "3" on the Lickert scale ranging from 1 = totally disagree to 5 = totally agree).

Consistent with H4, auditors believe that industry specialization plays a major role in offsetting the negative impact of mandatory partner rotation on audit quality (Mean = 3.45, $p< 0.05$). Auditors believe that audit quality will not be reduced due to mandatory partner rotation if the auditor has industry expertise (Mean = 3.92, $p< 0.01$). However, as indicated in Table 3, if audit partners are required to gain new industry expertise, audit quality declines (Mean = 4.46, $p< 0.001$). A noteworthy observation here is that a significant difference between sub-samples (bigger and smaller audit firms) on the effect of industry specialization on the relationship between mandatory partner rotation and audit quality. The perceptions of auditors about the role of industry specialization on the relationship between mandatory partner rotation and audit quality is more apparent on the level of the bigger audit firms than on the level of the smaller audit firms as indicated in Table 4.

Finally, in support of H5, audit engagement partners agree that higher fee dependence will reduce audit quality (Mean = 4.11, $p< 0.05$). It has also been found that auditors believe that fee dependence will have a negative effect on audit quality even if partner rotation is mandatory (Mean = 4.23, $p< 0.01$). However, this differs significantly between the sub-samples (big-sized audit firm vs. non-big audit firms). More auditors from non-big audit firms think that mandatory partner rotation will not have a great effect on audit quality for important clients than auditors from big-sized audit firms as indicated in Table 4.

Discussion

This research aimed to shed further light on the relation between mandatory auditor rotation and audit quality. The research explores the perceptions of professional auditors in Egypt about the implications of mandatory auditor rotation on audit quality, at the same time identifying their perceptions of the expected benefits from and disadvantages of a partner rotation requirement. The auditors' perceptions indicate that there is a negative relation between long auditor tenure and audit quality. There is a negative relation between client-specific knowledge and mandatory auditor rotation. There is a positive relation between auditors' independence and mandatory auditor rotation. Industry specialization can offset the negative effect of mandatory rotation on audit quality. Finally, high fee dependence will negatively impact the argued positive impact of mandatory rotation on audit quality.

Table 4: Comparison between Perceptions of Auditors in Big-Sized and Non Big-Sized Auditing Firms about The Effect of Partner Rotation on Audit Quality

Hypotheses	Statements	Big-sized	Non Big-sized	t-statistic
H1: audit tenure & audit quality	1- Mandatory partner rotation will result in higher audit effort	3.12	3.10	1.12
	2- The longer the partner tenure, the more complacent s/he will be	3.11	3.12	1.09
	3- The longer the partner tenure, the less skeptical s/he will become	3.09	3.10	0.97
H2:audit tenure, client-specific knowledge, & audit quality	1- Client-specific knowledge is lost due to partner rotation	3.12	3.14	0.67
	2- When audit partners are required to gain new client-specific knowledge, audit quality declines	3.09	3.10	0.87
H3: audit tenure, independence, & audit quality	1- Partner rotation improves the independence of the partner's attitude	3.18	3.14	1.24
	2- Partner rotation improves the impression of independence given by the partner	3.15	3.20	1.08
	3- Partner rotation reduces the likelihood of inappropriate client attachment	3.09	3.12	0.98
H4: audit tenure, industry specialization, and audit quality	1- when audit partners are required to gain new industry expertise, audit quality declines	4.12	3.45	2.98*
	2- mandatory partner rotation will not reduce audit quality if the partner has industry expertise	4.22	3.24	2.11**
	3- partners' industry specialization offsets the negative impact of mandatory partner rotation on audit quality	4.23	4.02	2.98*
H5: audit tenure, fee dependence, & audit quality	1- the higher the fee dependence, the lower the audit quality	4.24	3.12	3.11*
	2- the higher the fee dependence, the lower the audit quality, even if there is a mandatory partner rotation requirement	3.65	3.05	3.45*

*This table shows the significance difference between perceptions of auditors about impact of audit rotation on audit quality using T-test Statistic. *, **, *** indicate significance at ≤ 0.05, 0.01, and 0.001 levels, respectively (two-tailed).*

Auditors' perceive longer audit tenure to have a negative effect on audit quality. This is perhaps because most of the auditors in our sample reported that they need at least two years to perform audits effectively. This result is consistent with the findings of Carey and Simnett (2006). Moreover, the in-depth interviews with auditors showed that partners need from three to five years to be able to understand client-specific operations and business, along with corporate governance mechanisms and internal auditing structure. Therefore, some auditors say that the five-year mandatory rotation requirement may in fact lead to effective audits rather than ineffective audits. This is because extended audit tenure leads to savings in audit effort and hence reduced the cost of the auditing process. It also leads to an increase in audit quality due to increasing the ability to find errors in the financial statements. In addition, some auditors commented that the negative impacts of extended auditor rotation, such as becoming complacent or losing the advantages of a fresh look, as indicated in the Sarbens-Oxley Act, are expected to become apparent after 5 years or more of an audit engagement relationship.

Inconsistently with previous discussions, the results indicate a positive relationship between client-specific knowledge and audit quality, and a negative relationship between mandatory auditor rotation and client-specific knowledge. Auditors agreed that they need time to develop client-specific knowledge and mandatory five-year partner rotation can harm audit quality due to the lack of client-specific knowledge. In line with this, Daugherty et al. (2012) note the importance of building client relationships. They find that it takes several years to establish relationships with the client's management. These relationships are crucial to identifying risk in order to develop the audit processes appropriate to addressing these risks. Accordingly, audit quality can be negatively affected when a lead partner who has gained this specific knowledge of the client is replaced.

In addition, the findings indicate that auditors in Egypt perceive industry specialization to be a major contribution of the audit firm to audit quality. This is because industry specialization enhances the pace and quality of the audit process, and increase the client's trust in the audit firm. Moreover, auditors agreed that it offsets the negative impact of auditor rotation on audit quality. Nevertheless, some of the auditors' comments in the in-depth interviews indicated that industry specialization augments part (but not all) of the lack of client-specific knowledge in very short-term audit tenure (less than three years). This is because firms working in the same industry are similar in terms of the company by-laws and industry regulations and rules, but there are still differences between them in terms of their business and accounting practices and policies. Furthermore, the results indicate that the perceptions of the auditors in smaller audit firms of the impact of industry specialization on the relationship between auditor rotation and audit quality is lower than the perceptions of auditors in the big audit firms. This is perhaps due to the lack of auditors who are industry experts in non-big audit firms in Egypt. Prior research has shown that industry specialization is a differentiation strategy which is primarily used by the big-sized auditing firms in Egypt, such as PricewaterhouseCoopers (PwC)-Egypt, as a means of differentiating itself from the rest of the market (Abdel-Meguid, 2011).

Another important finding is auditors' perceptions of mandatory partner rotation. It was shown that auditors generally agree that mandatory rotation will improve independence in attitude and the impression of independence. Mandatory partner rotation will also reduce the likelihood of inappropriate client attachment. Finally, with regard to the role of fee dependence, it was shown that auditors are inclined to agree that high fee dependence may make partners reluctant to lose a client who contributes significantly to the audit firm's income, even if the audit firm knows that these audit fees are not permanent, due to mandatory auditor rotation. A possible explanation for this result is that the audit market in Egypt is relatively saturated with weak demand for professional auditing services, the non-big auditing firms in particular, because the big auditing firms have almost 60% of the market share (EFSA, 2012). Therefore, a client once lost maybe very difficult to replace, given especially the limited number of public firms in Egypt (Anis, 2006).

CONCLUSION

The research aimed at exploring the perceptions of professional auditors in Egypt about the implications of mandatory auditor rotation on audit quality, at the same time identifying their perceptions of the expected benefits from and disadvantages of a partner rotation requirement. Using a survey-based approach with 83 auditors in a number of Big-sized and Non Big-sized auditing firms in Egypt, The findings show that the auditors' perceptions indicate that there is a negative relation between long auditor tenure and audit quality. There is a negative relation between client-specific knowledge and mandatory auditor rotation. There is a positive relation between auditors' independence and mandatory auditor rotation. Industry specialization can offset the negative effect of mandatory rotation on audit quality. Finally, high fee dependence will negatively impact the argued positive impact of mandatory rotation on audit quality.

The findings indicate that the auditors in our survey perceive that the length of audit tenure required to make effective audits should be between three and five years. Therefore, public policy legislators such as the Egyptian Financial Supervisory Authority (EFSA) and the Egyptian Society for Accountants and Auditors are advised to take this into consideration when developing the mandatory auditor rotation requirement. Furthermore, the findings indicate the crucial role in audit quality of client-specific knowledge and industry specialization. Thus, audit firms should invest in the information technology required to gather information and assess risks in different industries, and should keep auditors abreast of changes in the markets and industries. Moreover, for industry specialization to be effective, the audit firms should be learning organizations. Audit firm personnel should be committed to continually seeking new in-depth knowledge about clients and their industries (Abdel-Meguid, 2011)

Finally, our surveyed auditors acknowledged the positive impact of mandatory auditor rotation on audit quality and on auditors' independence. Therefore, legislators should issue auditor rotation requirements which take into consideration the appropriate audit tenure length to making effective audits in Egypt. They should also determine the appropriate cooling-off period required before an auditor can return to audit any client again. Moreover, the Auditors Oversight Board (AOB) should take high fee dependence into consideration when reviewing and assessing audit quality.

This research has some limitations that may be seen as possible avenues for future research. This study focused only on auditors' perceptions. Thus, future research can investigate the perceptions of other interested parties, such as clients, auditing profession associations and legislators. Moreover, this research reports only the perceptions of auditors. Hence, the causality implied by the research framework cannot be tested using this data. Future research could use case studies from different auditing firms representing different lengths of audit tenure and extract various indicators of audit quality in order to empirically test the causal relationship between audit tenure and audit quality in Egypt.

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INFORMATION SYSTEMS AND ACCOUNTING PRACTICES IN GHANAIAN PUBLIC INSTITUTIONS

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ABSTRACT

This study examines the effects of Information and Communication Technology on accounting practices in public institutions in Ghana. Data was collected from public institutions in Ghana using a questionnaire. The study revealed positive effects of Information and Communication Technology, such as timely delivery of financial statements, producing error free financial statements and the creation of avenue to access financial information. However, lack of Information Technology expertise, suitability and cost of accounting software and data security were seen as a major challenge to the adoption and use of Information and Communication Technology in public institutions. Though Information and Communication Technology has the potential to improve the efficiency and effectiveness of public sector accounting in Ghana, it must be backed by constant employee training and regular software upgrades to meet international accounting standards.

JEL: M15, M41, M48

KEYWORDS: Public Institutions, Accounting Information Systems, Information and Communication Technology

INTRODUCTION

The role of accounting in the public sector is wider than the production of the annual financial statements. Financial management is usually a more important task including developing and managing financial management systems and policies. The profession of accountancy has experienced unprecedented change during the past 20 years. It has moved from paper-based to Information and Communication Technology (ICT)-based, and the Internet has become a prevailing tendency. Similar to other professions in the service sector, recent technological developments provide accountants the opportunity to incorporate information systems in their profession. Information and Communication Technologies (ICTs) are used for customers' book keeping and liquidation of income tax statements. Growth in Accounting Practices and Information System is coming from the adoption of ICTs such as Debit Cards, Tax Software, Statistical Package for Social Sciences (SPSS) into Accounting Practices of most Public Institutions. Most Public Institutions have devised a way of recording and reporting transactions.

While it is widely acknowledged that Information and telecommunication technology (ICT) plays an increasingly important role in the field of accounting, the effects of ICT on accounting practices in the public sector has been studied relatively little. Based on a literature review of earlier research, we found limited knowledge about the effects of ICT on accounting practices in the public sector. Existing research has focused mostly on the relation between ICT investment and company performance (Melville, Kraemer and Gurbaxani, 2004), notably in studies that attempt to measure the level of ICT investment and company productivity (Dedrick, Gurbaxani and Kraemer, 2003) or the financial return on ICT investments (Dehning and Richardson, 2002).

The purpose of this study is to focus on the effects of ICT on current accounting practices in the public sector. We seek to prepare public sector accountants for the effects which ICT will pose, and contribute to the body of knowledge about the extent that ICT affects accounting practices in the public sector. The public sector consists of organizations whose control lies in the hands of the public rather than private owners. Their primary objective is to serve the public and not to make profit (Agalega, 2013). The large nature of the public sector means that huge volumes of business transactions are undertaken and as such there is the need for an effective and efficient accounting system. However, this seems not to be the case in the current public services system. The current situation creates a direct challenge for public-sector entities to provide accurate, reliable and timely accounting information to their citizens, donors, investors, lenders, employees and other stakeholders. The remainder of the paper is organized as follows. The introduction is followed by a literature review. The next section presents the methodology of the study and it is followed by results and discussions. The paper ends with a conclusion section.

LITERATURE REVIEW

Accounting practice is linked to the history of accounting. This is intertwined with the development of trade between tribes. There are records of commercial transactions on stone tablets dating back to 3600 BC (Stone, 1969). Early accountants were 'scribes' who also practiced law. Stone (1969) noted that, in ancient Egypt in the pharaoh's central finance department . . . scribes prepared records of receipts and disbursements of silver, corn and other commodities. One recorded on papyrus the amount brought to the warehouse and another checked the emptying of containers on the roof as it was poured into the storage building. Audit was performed by a third scribe who compared these records (p. 284).

Accounting as we know it today began in the fourteenth century in the Italian city-states of Florence, Genoa and Venice as a result of growth of maritime trade and banking institutions. The first bank with customer facilities opened in Venice in 1149. The Lombards were Italian merchants who were established as moneylenders in England at the end of the twelfth century. Balance sheets were evident from around 1400 and the Medici family (who were Lombards) had accounting records of "cloth manufactured and sold". The first treatise on accounting (although it was contained within a book on mathematics) was the work of a monk, Luca Pacioli, in 1494. The first professional accounting body was formed in Venice in 1581. Much of the accounting language is derived from Latin roots. "Debtor" comes from the Latin "debitum", something that is owed; "assets" from the Latin ad + satis, to enough, i.e. to pay obligations; "liability" from" ligare," to bind; "capital" from caput a head (of wealth). Even "account" derives initially from the Latin "computare," to count, while "profit" comes from "profectus", advance or progress. "Sterling" and "shilling" came from the Italian "sterlino" and "scellino" respectively, while the pre-decimal currency abbreviation "LSD" (pounds, shillings and pence) stood for "lire", soldi", "denarii".

Chandler (1990) traced development of the modern industrial enterprise from its agricultural and commercial roots as a result of the Industrial Revolution in the last half of the nineteenth century. By 1870, the leading industrial nations (United States, Great Britain and Germany) accounted for two-thirds of the world's industrial output. One consequence of growth was separation of ownership from management. Although the corporation, distinct from its owners, had been in existence in Britain since 1650, the separation of ownership and control was enabled by the first British Companies Act, which formalized the law in relation to "joint stock companies" and introduced the limited liability of shareholders during the 1850s. The London Stock Exchange had been formed earlier in 1773 by stockbrokers, who had previously worked from coffee houses.

The second consequence of growth was the creation of new organizational forms. Based on his extensive historical analysis, Chandler (1962) found that in large firm's structure followed strategy and strategic growth and diversification led to the creation of decentralized, multidivisional corporations like General Motors, where remotely located managers made decisions on behalf of absent owners and central head

office functions. Ansoff (1988) emphasized that success in the first 30 years of the mass-production era went to firms that had the lowest prices. However, in the 1930s General Motors "triggered a shift from production to a market focus" (p. 11). In large firms such as General Motors, budgets were developed to co-ordinate diverse activities. In the first decades of the twentieth century, the DuPont Company developed a model to measure the return on investment (ROI). ROI was used to make capital investment decisions and to evaluate the performance of business units, including the managerial responsibility to use capital efficiently.

Differences in interests, specialties, and levels in an organization, have resulted in different kinds of ICT systems. No single ICT system can provide all the information an organization needs. Large and medium-size firms have thousands of computer programs and hundreds of different systems. According to Laudon and Laudon (2009), even small firms have a collection of different systems: a system for conducting e-mail campaigns to customers, a system for monitoring advertisement placed on Google, a system for keeping track of basic sales transactions, a system of keeping track of vendors and so forth.

At a glance it can be tedious to comprehend the different systems in an institution and even how they relate to each other becomes problematic. In an attempt to describe this complex situation, Laudon and Laudon (2009) looked at these different systems from two perspectives: functional perspective that identifies systems in terms of the major organizational groups they serve, and a constituency perspective which identifies systems by their major business function. This to some extent coincides with that of O'Leary and O'Leary (2004). They argue to examine an organization's structure is to view it from a functional perspective since in large and medium sized organizations, computerized information systems do not just keep track of transactions and day-to-day business operations. They also support the flow of information either vertically or horizontally within the organization.

Over the past few years, electronic financial management tools have been introduced in nations across the world. There have been a number of government initiatives all over the world that use information technology to enhance development programs and improve public services. Different institutions in different countries have unique information systems with either the same or distinct function(s). For instance, unlike in other countries where an institutions ought to go through a rigorous steps for filing returns and payment of tax, in Peru, the National Superintendent Tax Administration (an institution in Peru) is charged with the collection and submission of taxes with aid of a computerized tax system known as *Tributacion Online*. United Nations Public Administrations Networks (UNPAN) 2003. This is somehow not different from the tax system in Chile. Even though in Chile, the Internal Taxation Service is responsible for collection of both individual and corporate taxes, Chili uses another Information System known as Online Tax System. The new online tax service was implemented using Oracle's Internet-based technology to replace its manual system for filing tax returns. It could be seen the technological platform created can streamline the cumbersome tax-filing and information process in the aforementioned countries while maintaining reliability. The new online tax system saves money on printing, distribution and processing time and has increased the accuracy of tax collection in the said countries. It equipped the tax authority with the resources it needed for the foreseeable future and offered taxpayers a higher standard of service along with swift, easy access to vital tax information. For example, the new system allows tax payers to file returns online and receive an assessment in 12 hours instead of several days, as had been necessary under the earlier manual system.

As part of the pending public financial management reforms in Ghana, The Controller and Accountant General's Department launched a new system of record keeping of state budgeting and financial management. The new system known as Ghana Integrated Financial Management Information System (GIFMIS) aids Ministries, Departments and Agencies to carry out processes of requesting, purchasing, receiving, paying and accounting for goods and services via electronic system. The system (GIFMIS) uses the latest version of Oracle E-Business Suite software and rallies on improved organization and business

processes. The catchment area of the new system includes seven Oracle E-Business suites modules namely: General Ledger, Accounts Payable, Account Receivable, Cash Management, Budgeting, Fixed Assets and Human Resource Management. The full implementation of the GIFMIS serves as the single source system for official budget creation and management, cash and treasury management, financial control, accounting and reporting for the country as a whole.

The application of ICT on accounting practice has become a subject of fundamental importance and concern to all public institutions and indeed a prerequisite for local and international competitiveness. The way accountants plan and make decisions on what and how to provide their service in the accounting profession has been greatly affected by ICT. This has continued to change the manner in which accounting practices and corporate relationships are organized worldwide and the variety of innovative device available to enhance and facilitate the speed and quality of service delivery. It is clear that the biggest favorable effect of ICT has been made on accounting. In creates the ability of companies to develop and use computerized system to track and record financial transactions properly and accurately. The recording of business transactions manually on ledgers, papers, spread sheets among others has been translated and computerized for quick and easy presentation of individual financial transactions and reports on them (Granlund and Mouritsen, 2003). Shanker (2008) ascertains the use of ICT in many organizations assists in reducing transactional cost, overcoming constraints of distance and have cut across geographic boundaries thereby assisting to improve activities within organizational boundaries

Computerized accounting systems enhance functionality of various accounting departments by increasing just in time accounting information. By enhancing timeliness of financial information, accountants can prepare reports and operations analysis that provides management an accurate view of current operations. The number of financial reports has been improved by computerized systems. Cash flow statements, market shares reports and departmental profit and loss are now more accessible with computerized system. A prior observation shows a computerized accounting system has internal check and balance measures to ensure transactions and accounts are properly balanced before the financial statements are finally prepared. It also ensures that individual transactions are properly recorded in journal entries.

Since the inception of ICT, computerized accounting systems have allowed accountants to quickly process large amounts of financial information through the accounting system. Quicker processing time for individual transactions lessens the amount of time needed to close each accounting period. Complex and difficult transactions that would have taken months or years to prepare would be done quickly and faster at a far cheaper cost. The question that most people, including the various users of financial reports often ask is, Does the incorporation of IT into business operations only affect accounting practices positively? Companies continue to spend more on ICT, yet ICT's contribution to productivity growth has been declining steadily. ICT in most institutions and accounting departments are commonly used for purposes other than intended. For instance, some vital information on financial reports are being sent to unauthorized places. On several instances files are being corrupted especially when money scandals are been detected. It also has financial implications especially when a particular accounting software is mishandled. For instance, it can cost an institution hundreds or thousands of Cedis each year depending on the degree of mishandling.

DATA AND METHODOLOGY

We selected and interviewed 40 employees of 30 public institutions in the Kumasi Metropolis. The employees were conveniently selected because of their expertise and experience which puts them in a best position to answer the research questions. The public institutions were selected using a purposive sampling method. The study relied on the mixed method strategy to gather primary data because it allows both quantitative and qualitative methods to overcome weakness of each other. Sources of secondary data included the institutions strategic plan, annual reports and accounting and auditing policies. This process

was instrumental in drafting the questionnaire. The questionnaire contained both closed-ended and opened questions. It was pre-tested to assess its effectiveness and also measured the most probable outcome of the study. The data was collected in April 2013 using a cross sectional method. The study was used to test the following hypothesis;

H0: ICTs have affected accounting practices since their introduction in Public Institutions' Accounting practices.

H1: ICTs have created no significant effect on public institutions' accounting practices

Model formulation

A linear regression was used to establish and ascertained the relationship between the effect of ICT on accounting practices in public institutions and the independent variables. Specifically, a logistic regression model was used since the level of measurements of the variables is nominal. Based on the variables identified above, the following function was formulated:

EITP = f (The effect of ICT on accounting practices in the public institutions) (1)
Consequent on the function, the following model is constructed:

$$EITP = \beta o + \beta_1 TFR + \beta_2 EFR + \beta_3 AFI + \beta_4 SC + \beta_5 RCW + \beta_6 CE + \mu \quad (2)$$

Where:

EITP = effects of ICT on accounting practices,
ß0 = a constant which indicate how a change in one of the independent variables affects the values taken by the dependent variable
TFR = timely delivery of financial reports,
EFR = provision of error free reports,
AFI = avenues to access financial information,
SC = large storage capacity,
RCW = reduction of clerical works,
CE = cost effectiveness,
μ = stochastic error term

RESULTS AND DISCUSSION

Table 1 shows the age variables. The category 21-30 years represented 15.0%, the category 51-60 years of age represented 20.0%. The category of 31-40 years represents 50.0% while those within the ages of 41-50 years represent 15.0%. In short, the sample shows that majority of the respondents were in their middle ages (31-40). The study had fewer representatives of both young and old respondents.

Table 1: Age of Respondents

Age	Frequency	Percentage
21-30	6	15.0
31-40	20	50.0
41-50	6	15.0
51-60	8	20.0
Total	**40**	**100.0**

This table depicts the age range of the respondents. The age column shows the age categories of the respondents. The column labelled frequency presents the number of respondents belonging to each category.

In relation to gender, the data shows that 75.0% of respondents were male while females accounted for 25.0%. The marital status of the respondents showed that, married respondents represented 45.0%, while the percentage of single respondents was also 45.0%. With regard to the respondents' educational level, Table 2 shows that the majority of the respondents were graduates (55.0%), with 15.0% of Diploma certificate holders, and 30.0% of post-graduate were represented.

Table 2: Educational Level of Respondents

Educational level	Frequency	Percentage
Diploma	6	15.0
Graduate	22	55.0
Postgraduate	12	30.0
Total	**40**	**100.0**

This table shows the educational background of the respondents. The educational level column indicates the degree levels of the respondents. The column labelled frequency indicates the number of respondents in each degree level. The percentage column indicates the fraction of respondents who belong to each degree level.

Information and Communication Technology Use in Accounting

In recent years, ICT has found itself in every sphere of life. It is used in the entertainment industry, manufacturing, health system, educational system, football as well as every aspect of work. In the same way, ICT is being used by accountants in every organization. There are now accounting software used in reporting accounting and economic reports, carried out during accounting year ends, the preparation of accounting records, statements such as Statement of Comprehensive Income, the Statement of Financial Position, cash flow statement, and income and expenditure accounts. The aim of this section is to identify types of accounting software and how they are used in organizations that formed this study. Data collected from the respondents as presented in Table 4.3 shows that, 90.0% of respondents are skilled in ICT while 10.0% are unskilled. This suggests the majority of respondents have what it takes to handle ICT in their organization and use them for accounting purposes. It also means the correct respondents have been selected for this study and can give the appropriate response in terms of the effect of ICT on accounting practices and the challenges associated with them.

Table 3: Knowledge in ICT

Knowledge	Frequency	Percentage
Skilled	36	90.0
Unskilled	4	10.0
Total	**40**	**100.0**

This table shows the knowledge level of the respondents in ICT. The column labelled knowledge shows a distinction between the knowledge levels. The Frequency column depicts the number of respondents who are knowledgeable in computers and those who are not.

With the above data giving a clear indication that the appropriate respondents have been selected for the study, it is also important to identify if their organizations have accounting software. From Table 4, we see that 95.0% of the respondents indicated that their respective institutions have accounting software. This also gives an indication that the right organizations were selected for the study.

Table 4: Does your Institution use an Accounting Software System

Response	Frequency	Percentage
Yes	38	95.0
No	2	5.0
Total	**40**	**100.0**

This table presents the results of respondents' organizations using ICT. It depicts that most of the respondents are familiar with ICT because their organizations are using it.

There are various accounting software used by these respondents. Similarly, they know some accounting software that are used in other organizations. Therefore both the accounting software their organizations use and those that they know of are presented in Table 5.

Table 5: Accounting Software Known and Used

Accounting Software Used	Accounting Software Familiarity
Sun Accounting	Branch operation system
Flexcube 6.9	Quickbooks
Repac	Topaz
Medicalpro	Tally
Sage accpac	Oracle
Ebos-E	Scala

This table shows the various accounting softwares being used by Public Institutions in Ghana. The column labelled "accounting softwares known of" indicates the softwares known to staff of Public Institutions but may not have used it before.

Effects of Information and Communication Technology on Accounting Practices

The biggest impact ICT has made on accounting is the ability of companies to develop and use accounting software to track and record financial transactions properly and accurately. This study sought to determine how ICT has affected accounting practices. We found that all respondents (100.0%) are of the view that ICT has affected accounting practices in their organizations. It is not surprising that ICT brings change wherever it is used. Table 6 presents findings on the effect of ICT on accounting practices. We see that only 5.0% strongly disagree that ICTs have helped in the timely delivery of financial statements. On the other hand 35.0% and 60.0% of respondents agree and strongly agree respectively that ICTs have help in the timely delivery of financial statements. Similarly on the issue of ICT helping in the issue of error free financial statements, 55.0% and 5.0% agree and strongly agree respectively. On the other hand, 5.0% and 5.0% of the respondents strongly disagree and disagree respectively that ICT helps in delivering error free financial statements to their companies. However, 30.0% of respondents remained neutral as to whether ICT helps in delivering error free financial statements.

On the issue of creating an avenue to accessing financial information, 50.0% and 30.0% of respondents agree and strongly agree respectively that ICT creates an avenue to access financial information. Table 6 shows that, 15.0% of respondents remained neutral on the issue of whether ICT creates an avenue to access financial information. The capacity of ICT to store large data cannot be doubted and this is clearly shown by the respondents. Some 65.0% of respondents strongly agree that the effect of ICT on their accounting practice is large storage capacity. Another 30.0% of respondents agree that ICT has enabled them to store large data easily while 5.0% of respondents remained neutral. The use of ICT involves the use of less paper and other clerical work. As can be seen from Table 6, 35.0% and 45.0% of the respondents strongly agree and agree respectively that one of the effects of ICT on accounting practices is the reduction of clerical work. However, 15.0% of respondents remained neutral as to whether accounting practices really had an effect on the reduction of clerical work. Running accounts is very expensive considering the time and the number of people involved. With the introduction of accounting software, it is expected that the time and number of people involve will be reduced. Indeed data from the field as presented in Table 6 shows that 30.0% and 40.0% of respondents strongly agree and agree respectively that the effect of ICT on accounting is cost effectiveness. The above findings show that, ICT has an enormous positive effect on the accounting practices of the organizations involved in this study.

Challenges of Information and Communication Technology on Accounting Practices

Despite numerous benefits of ICT to accounting practices listed above, they are not without challenges. The aim of this section is to identify challenges associated with ICT as applied to accounting practices in the organizations. As a result, 85.0% of the respondents indicated that there are number of challenges in

the use of ICT in accounting practices while 15.0% did not have any challenge with respect to the use of ICT in accounting systems and practices in their organizations. Table 7 shows some challenges of ICT on accounting practices adopted by the studied organizations. The adoption of an ICT accounting system means there must be employees with skills in IT to handle these systems. However from Table 7 shows that 10.0% and 25.0% of the respondents agree and strongly agree respectively that a lack of IT expertise is a challenge to the adoption of IT on accounting practices. On the other hand, 10.0% and 20.0% of respondents strongly disagree and disagree respectively that lack of IT expertise is a challenge to the adoption of IT on accounting practices. Some 35.0% of the respondents remained neutral. Clearly this is not a serious challenge of ICT on accounting practices.

Table 6: Effects of ICT on Accounting Practices

Effects	SDA	DA	N	A	SA
Timely delivery of financial statements	5	0	0	35	60
Provision of error-free financial statements	5	5	30	55	5
Creation of other avenues to access financial information	0	5	15	50	30
Large storage capacity	0	0	5	30	65
Reduction of clerical works	0	5	15	45	35
Cost effectiveness	0	0	30	40	30

This table presents the effect of ICT on Accounting Practices. The identified effects is presented under the column labelled 'effects'. The other columns are labelled as follows; Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree.

This study involves a series of public sector institutions with various purposes and accounting software programs. Some programs have been customize while others are general. This presents s challenge of suitability to the organization in question. From this perspective, only 10.0% and 10.0% of the respondents agree and strongly agree respectively that the suitability of the accounting software is a challenge. On the contrary, 20.0% and 35.0% strongly disagree and disagree respectively that suitability of the accounting software is a challenge while 30.0% remained neutral. The majority do not see suitability as a challenge. Part of the reason could be that, preparing financial statements and other accounting information and data are almost the same in every organization. Therefore, the generality and specificity of the accounting software is not a big issue. Cost associated with the acquisition of accounting software is another issue of concern. It could be a challenge to an organization depending on its financial status. Table 7 shows that purchase cost and implementation of accounting software is not a significant challenge to the respondents as 15.0% and 50.0% of them strongly disagree and disagree respectively that the cost of purchase and implementation of accounting software is a challenge to ICT and accounting practices. A minority of respondents, 5.0%, strongly agree that the cost of purchase and implementation of accounting software is a challenge to ICT and accounting practices.

The use of ICTs involves the use of electric power. It is important that power is available and in constant supply. We wished to determine if instability of power is a challenge to the use of ICT in accounting practices. The data as presented in Table 7 shows that 15.0% and 25.0% strongly disagree and disagree respectively that the instability of power is a challenge to the use of ICT in accounting practices. This may be due to the fact that, most of these organizations have installed generators and power plants and therefore are not affected by frequent power outages in the country. On the other hand, 15.0% and 20.0% of the respondents agree and strongly agree respectively that instability in power sy6stems is a challenge to the use of ICT in accounting practices. This could be due to the fact that these organizations don't have generators and power plants in place to respond to a loss of power. On the whole, a majority of respondents do not support the idea that instability in power is a challenge to accounting practices.

Frequently accounting deals with money and security is paramount in monetary matters. However, there is a huge outcry about security of IT and software in this fast moving technology era. It is imperative to identify whether data security and financial information is a challenge to the use of ICT in accounting practices. The data shows this is not a challenge as 10.0% and 50.0% strongly disagree and disagree

respectively that security of data and financial information is a challenge to the use of ICT in accounting practices. On the other hand, 25.0% and 10.0% agree and strongly agree respectively that security of data and financial information is a challenge to the use of ICT in accounting practices. Finally, machines and software are subject to breakdowns which can represent a challenge. Data as presented in Table 7 shows that 20.0% and 45.0% strongly disagree and disagree respectively that frequent system breakdowns is a challenge to ICT in accounting practices. Only 10.0% agree that that frequent system breakdowns is a challenge to ICT in accounting practices.

Table 7: Challenges of ICT in Accounting Practices

Challenges	SDA	DA	N	A	SA
Lack of IT expertise	10	20	35	25	10
Technology not suited to institution	20	35	30	10	10
Cost of purchase and implementation	15	50	5	20	5
Electrical power instability	15	25	25	15	20
Security of data and financial information	10	50	5	25	10
Frequent breakdown of systems	20	45	25	10	0

This table shows the challenges posed by ICT to Accounting Practices. The identified challenges is presented under the column labelled 'challenges'. The other columns are labelled as follows; Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree.

Testing Hypothesis of the Study

Linear regression was used to test the hypothesis that there is no significant effect of ICT on accounting practices. A positive effect of ICT on accounting practices was used as the dependent variable. The independent variables were timely delivery of financial reports, provision of error free reports, avenues to access financial information, large storage capacity, reduction of clerical works and cost effectiveness. The finding of this hypothesis is presented in Table 8 below. The test was conducted at a 95% confidence level. We see that all the independent variables were not significant (timely delivery of financial reports = 0.214, provision of error free reports = 0.860, avenues to access financial information = 0.837, large storage capacity = 0.129, reduction of clerical works = 0.297 and cost effectiveness = 0.300). This insignificance of the independent variables is highly reflected in the overall insignificance (0.506) of all the variables. It can also been seen that, the adjusted R square (0.300) was not strong enough to reject the hypothesis. It can therefore be concluded that the hypothesis "there is no significant effect of ICT on accounting practices in public institutions" was confirmed. These variables explain 54.8% of the hypothesis that "there is no significant effect of ICT on accounting practices in public institutions".

Table 8: Regression Results

Variables	B	Sig	R	R^2	Sig
Constant	1.761	0.006	0.548	0.300	0.506
Timely delivery of financial reports	0.121	0.214*			
Provision of error free reports	-0.015	0.860*			
Avenues to access financial info	-0.018	0.837*			
Large storage capacity	-0.251	0.129*			
Reduction of clerical works	0.090	0.297*			
Cost effectiveness	-0.084	0.300*			

This table reports the regression results used to test the hypothesis. The model reported here is:

$EITP = \beta o + \beta_1 TFR + \beta_2 EFR + \beta_3 AFI + \beta_4 SC + \beta 5 RCW + \beta 6 CE + \mu$: where the dependent variable is Accounting Practices. The symbol * *indicates significant at 5 percent level.*

DISCUSSION OF FINDINGS

This section discusses the findings of the study in conjunction with the literature. The first objective of this study was to identify various types of accounting software used in public sector institutions involved in this study. We found that different accounting software are being used including Sun Accounting,

Flexcube 6.9, Repac, Medicalpro, Sage accpac, Ebos-E, Quickbook, Topaz, Tally, Oracle and Scala. This finding confirms that of Laudon and Laudon (2009) that there are collections of different accounting software used by different organizations for different purposes. The proliferation of ICT and its advancement has resulted in many software and ICT facilities in every field.

The second objective of this study was to identify the effect of ICT on accounting practices. This was done through the use of simple frequency tables with percentages and a linear regression to test the statistical significance or otherwise of the hypothesis. We found that 35.0% and 60.0% of the respondents agree and strongly agree respectively that ICT have helped in the timely delivery of financial statements. Similarly on the issue of ICT helping in the issue of error free financial statements, 55.0% and 5.0% agree and strongly agree respectively. We also found that 50.0% and 30.0% of respondents agree and strongly agree respectively that ICT creates an avenue to access financial information. The findings also shows that 65.0% of the respondents strongly agree that the effect of ICT on their accounting practice is the large storage capacity. Another 30.0% of respondents agree that ICT has enabled them to store large data easily. Again, 35.0% and 45.0% of respondents strongly agree and agree respectively that one effect of ICT on accounting practices is reduction of clerical work. Finally, 30.0% and 40.0% of respondents strongly agree and agree respectively that the effect of ICT on accounting is its cost effectiveness.

The benefits and effects of ICT on accounting practices identified here are similar to other studies. Mouelhi (2009) and Majumdar, Carare, and Chang, (2010) found the benefits of ICT for a firm includes saving inputs, general cost reductions, higher flexibility and improvement in product quality. Similarly, Arvanitis and Loukis (2009) advocated that the use of ICT for accounting purposes helps gather and disseminate information and quality control. Also, Krishnaveni and Meenakumari (2010) assert that ICT has played a major role in reducing operational inefficiency and improving decision-making in many areas of governance. Other studies such as Hengst and Sol (2001) and Ramsey, Ibbotson, Bell, & Gray, (2003) conclude that ICT in accounting enables organizations to decrease costs and increase organizational capabilities. Shanker (2008) ascertains the use of ICT in many organizations has assisted in reducing transactional cost and overcoming the constraints of distance. A hypothesis was tested to identify statistical significance of the variables. The results shows the variables were statistically insignificant.

The final objective of this study was to examine challenges emanating from the adoption of ICT in accounting practices in public institutions. This was achieved by the use of frequency tables with percentages. We found that 10.0% and 20.0% of respondents strongly disagree and disagree respectively that lack of IT expertise is a challenge to the adoption of IT in accounting practices. The results also show that 10.0% and 10.0% of the respondents agree and strongly agree respectively that the suitability of the accounting software is a challenge. On the contrary, 20.0% and 35.0% strongly disagree and disagree respectively that the suitability of the accounting software is a challenge. Similarly, the cost of purchase and implementation of accounting software is not a significant challenge to the respondents as 15.0% and 50.0% of them strongly disagree and disagree respectively that the cost of purchase and implementation of accounting software is a challenge to ICT and accounting practices. Also, it was found that 15.0% and 25.0% strongly disagree and disagree respectively that the instability of power is a challenge to the use of ICT in accounting practices while 15.0% and 20.0% of respondents agree and strongly agree respectively that instability in power system is a challenge to the use of ICT in accounting practices. The results show that, 10.0% and 50.0% strongly disagree and disagree respectively that security of data and financial information is a challenge to the use of ICT in accounting practices. On the other hand, 25.0% and 10.0% agree and strongly agree respectively that security of data and financial information is a challenge to the use of ICT in accounting practices. Finally, it was found that 20.0% and 45.0% strongly disagree and disagree respectively that frequent breakdown of the system is a challenge to ICT in accounting practices. Some studies such as Bolton and Hand (2002) found similar challenges of using ICT in accounting. They

found that, the learning cost and time of using and setting up the software as well as the cost of purchase, support and maintenance to some extent become challenges to the use of ICTs in accounting.

CONCLUSION

This study set out to examine the effects of ICT on accounting practices in Ghanaian Public Institutions. The study used questionnaires to collect primary data from respondents. Respondents for this study, who mainly work in the accounts department, were conveniently drawn from thirty (30) public institutions. Reports of public institutions and articles from journals were the main secondary sources of data for the research.

The major finding of the study was there is no significant effect of ICT on accounting practices in Ghanaian Public Institutions. However, there are some positive effects such as reduction in errors and timely delivery of financial statements. It must also be emphasized that issues such as data security and cost of accounting software pose a big challenge to the adoption of ICT in accounting practices in Ghanaian public institutions. We found that if managers provide constant training for employees and upgrade the software to meet current standards, public institutions in Ghana will be able to realize the full benefit of ICT in accounting practices. In future researchers may look at the adoption of ICT by privately owned institutions in Ghana and compare with public institutions. The analysis will bring out ICT adoption differences and similarities between public and private institutions in Ghana.

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