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CONTENTS

VALUE RELEVANCE OF BOOK AND TAX INCOME: A MACROECONOMIC CONDITIONS PERSPECTIVE

Mingjun Zhou, DePaul University

ABSTRACT

This paper tests how macroeconomic conditions affect the value relevance of book and tax income. Based on regression coefficient estimates, more than 8% in the value relevance of book income is dependent on the interaction with a proxy for the macroeconomy. For a possible policy change where tax rules have a greater influence on financial accounting, the erosion of earnings quality will be more pronounced during economic expansion than contraction. Under such policy change, investors may lose additional information for them to price earnings based on stages of the economy.

JEL: E30, H25, M41

KEYWORDS: book income, tax income, book-tax conformity, earnings quality, macroeconomic conditions

INTRODUCTION

The income reporting system in the U.S. has its distinct feature. The management of a public company prepares two income measures, one under the Generally Accepted Accounting Principles (book income) and the other according to tax accounting rules promulgated by the government (tax income). Proponents of book-tax conformity argue that closing this dual-reporting arrangement will mitigate information asymmetry and the opportunistic reporting behaviors of managers (Desai 2005, Joint Committee on Taxation 2006). Opponents argue that accounting quality will be undermined if book income is conformed to tax income. Specifically, Hanlon, Laplante and Shevlin (2005, hefereafter HLS) suggest that book income is more value relevant than tax income for U.S. capital market participants. This study provides detailed analysis on the underlying macroeconomic factor that contributes to book income's greater value relevance. The debate is still on-going (see Atwood et al 2010) about the costs and benefits of book-tax conformity and the resulting changes in accounting quality. The analyses here suggests that if the conformity were to be increased toward tax income, market participants would be handicapped to price accounting earnings based on state of the economy.

This paper follows the stream of literature considering value relevance among the fundamental characteristics of earnings quality (Francis and Schipper 1999, Barth et al 2008). Extant literature measures value relevance as the relation between accounting information (earnings) and the buy-and-hold stock returns into the following months that could be earned with foreknowledge of such information (returns). Building on this aspect of value relevance, HLS use book and tax income to predict buy-and-hold stock returns in the future. They document that book income exhibits significantly greater value relevance than tax income in the regression coefficients and the R-square measures. Since relevance is the foundation of earnings quality, the finding in HLS supports opponents' view that financial statements quality will be affected if book income conforms to tax income.

This paper, investigates the relation between the macroeconomic factor and the value relevance of book and tax income. Using a regression model where changing macroeconomic conditions interact with book and tax income, the results show that the value relevance of book income is an increasing function of the macroeconomy. The result indicates that book income exhibits more (less) value relevance during economic expansion (contraction); but the value relevance of tax income appears to be insensitive to the state of the economy. This probably is due to the higher conditional accounting conservatism that was inherent in financial reporting. Under conditional conservatism, firms delay the recognition of good news but report bad news timely. On the other hand, the computations of tax income tend to accelerate income

recognition and delay loss deduction. Most recent research by Kim and Pevzner (2010) find that conditional accounting conservatism has information benefits to shareholders, and stock market reacts stronger (weaker) to good (bad) earnings news. My research setting on the value relevance of book and tax income provides additional insights into the information benefits of conditional conservatism.

Overall, the empirical evidence in this study suggests that conditional conservatism is decision-useful to market participants as they price earnings based on macroeconomic conditions. The recognition of a firm's good result tends to be delayed under conditional conservatism and investors may place a positive premium on the book earnings already reported as they assess firm performance when the macroeconomy is booming. When the economy is contracting, however, conditional conservatism leads to lower verification requirements and more timely recognition for losses. Atwood et al (2011) find that there is less persistence in the loss reported under IFRS than that under U.S. GAAP, since losses may be recognized more timely under IFRS (Barth et al. 2008).

A timely recognition of losses will lead investors to attach lower weight on the current negative results and focus on firm performance in the future as the investment opportunity set improves with the recovery of general business conditions. Therefore, we would expect that the value-relevance of book income would be dependent on the external economic environment facing the firm. By comparing value relevance of book and tax income in the context of macroeconomic conditions, the paper provides additional evidence on the decision-usefulness of accounting income measures as they relate to conditional conservatism. This study also supplements the cross-country study in Atwood et al. (2010) where high book-tax conformity is shown to be associated with lower earnings persistence and a weaker relation between earnings and future cash flows. Different from Atwood et al's, this study focuses on the value-relevance aspect of earnings quality, and offers additional insights into the pricing of book and tax income by market participants based on macroeconomic conditions. At the policy level, Congress seems to be more willing to influence the accounting standard-setting process as it just did with mark-to-market accounting in recent memory. Ali and Hwang (2000) identify that the value relevance of accounting information is lower for countries where government bodies set accounting rules.

Amid the book-tax conformity debate, regulatory bodies could make computing taxable income a priority, especially under the current political rhetoric of U.S. federal budget deficit and closing corporate tax loopholes. In the current dual-reporting arrangement, managers have more freedom in exercising their discretions through financial reporting, and investors could have larger information set for decision-making based on such estimates. A possible conformity proposal where tax rules place a greater influence on financial accounting may weaken the ability of financial statements to reflect a firm's economic position and performance. The following section reviews the prior literature in the area of value relevance and conservatism. It is the followed by the hypothesis development. Section 3 and 4 describes empirical design and results. I conclude with a summary of findings and suggestions for future research

LITERATURE REVIEW

The distinct difference in financial and tax accounting in the U.S. illustrates the underlying objectives for each type of reporting. For tax purposes, corporations usually need to recognize revenue when cash is received, despite the use of accrual accounting method. This is consistent with the "wherewithal-to-pay" policy in the Internal Revenue Code (IRC). Under IRC corporations must "clearly reflect income" (IRC Section 446(b)) and, for example, they cannot defer revenue recognition by accounting for unearned revenue for tax purposes. Conservatism, in the sense of being prudent in revenue recognition, is not a consideration for the Treasury Department that promulgates tax accounting rules. On the contrary, conservatism has played an important role in financial reporting since the inception of the US GAAP (Watts, 2003). Specifically, the conditional conservatism documented in extant knowledge (Kim and Pevzner 2010) places a higher threshold in recognizing revenues (delaying the recognition good news) and a more timely recognition of bad news (lower recognition thresholds for losses).

The use of accruals in financial accounting is used to represent the underlying economic picture of a firm while facing a mandated reporting period (e.g. a fiscal year period). At the cut-off time by fiscal year end, managers need to use their own estimates in reporting firm revenues/expenses and gains/losses. In doing so, managers use accruals that signal to investors about the management's private information about firm performance (Dechow 1994, Bagnoli and Watts 2005). This financial reporting process is very different from the "clearly reflect income" requirement for tax purposes based on cash receipts.

Furthermore, conditional conservatism guides the estimates for accruals so that accounting numbers do not provide misleading information.Extant knowledge also documents the information benefits of conservatism. Conservatism in revenue recognition may reduce the extent to which earnings are manipulated (Chen et al., 2007). Using prudence in financial reporting also improves the information quality of financial statements (Fan and Zhang, 2007). In general, the literature indicates that conservatism in financial accounting improves the information quality, or value-relevance of accounting numbers to investors. Balachandran and Mohanram (2008) find that value relevance of firm book value declines after decreasing level of firm conservatism. Their results show that greater conservatism contributes to a stronger market response to accounting numbers. Policy-makers, in this respect, should therefore consider adopting conservative accounting policies (Barth et al. 2001).

Following the conservatism and value-relevance literature, Kim and Pevzner (2010) use conditional-conservatism measures and find that stock market reaction to good (bad) news earnings surprise is stronger for firms that are more conservative. This paper contributes to the book-tax conformity debate through the lens of conservatism and the resulting value-relevance of book and tax income. Proponents of book-tax conformity argue that the management estimates inherent in financial reporting leads to greater extent of earnings manipulation by managers (e.g. Desai 2005, Desai and Dhrmapla 2009). Opponents of book-tax conformity argue that conforming book income to tax income will make accounting numbers less relevant to market participants (e.g. Hanlon et al 2005). This paper focus on the value-relevance aspect of this debate, testing whether conditional conservatism in financial accounting would make book income more value relevant than tax income. Building on prior literature, my incremental contribution is to measure the impact of conditional conservatism through changing macro-economic conditions. The next section continues with the hypothesis development.

HYPOTHESIS DEVELOPMENT AND METHODOLOGY

Providing relevant information to financial statement users is one of the major objectives of financial reporting. To operationalize the measurement of relevance, Francis and Schipper (1999) use an earnings-returns approach where value-relevance is reflected by the relation between accounting income and the buy-and-hold stock returns into the future months that could be earned with foreknowledge of such accounting income. Following this value-relevance methodology, HLS find book income to exhibit greater relevance than tax income and suggest that, if accounting rules for book income conform closely to the laws and regulations for tax income, then financial statements available to public investors would be less relevant. Consequently, shareholders would have to incur additional costs to obtain relevant information by other means through other stakeholders.

Extant knowledge also documents that firms with large gaps between book and tax income have lower earnings quality in terms of earnings persistence (e.g. Lev and Nissim 2004, Hanlon 2005). One interpretation is that book income relies on accrual estimates and they are subject to manipulation by mangers for opportunistic reporting purposes. Tax income is generally less prone to such manipulations because less discretion is allowed in the reporting of revenues (income) and expenses (deductions).

A second interpretation, however, can also be made by emphasizing the role of accruals in reflecting a firm's economic position and performance (e.g. Dechow 1994). Book income prepared under GAAP is to provide a summary measure to investors, while tax income serves the main objective of collecting revenue for the government. The nature of these different objectives illustrates the potential loss of relevance under book-tax conformity. While the estimation of accruals in financial accounting is not

immune to human decision errors and opportunistic behavior, it may still have information benefits for market participants to assess firm value. For example, Ball et al (2000) find that market valuation is much less related to reported earnings in code-oriented countries where book and tax income are very closely linked. This paper examine whether the value-relevance of book and tax income varies with general business conditions. If at least part of the variations in the value-relevance can be attributed to the external economic environment facing a firm, then we may conclude that the information contained in book income is not entirely subjective and reflects the underlying economic performance to a certain extent. The application of timely recognition of bad news and delayed recognition of good news under conditional conservatism also implies that market participants would price book income accordingly to reflect the underlying economic performance of a firm. Under tax accounting rules, however, conditional conservatism is not widely applied as tax regulations generally accelerates the recognition of income and defer the deduction for losses. Therefore, I hypothesize that the value relevance of book income should be increasing with the level of economic activity as investors take into account the conditional accounting conservatism in financial reporting within the broad context of the macroeconomy. Tax income, on the other hand, serves the purpose of revenue collection for the government and this objective implies that it will not provide as much value relevance to capital market participants. Therefore, the prediction is:

H 1: The value relevance of book income increases with macroeconomic activities.

H 2: The value relevance of tax income does not vary with macroeconomic conditions.

To provide a more intuitive presentation, the Chicago Fed National Activity Index is used as a proxy for economic conditions. Its change over time is observed with the R^2s in the following regression models used HLS:

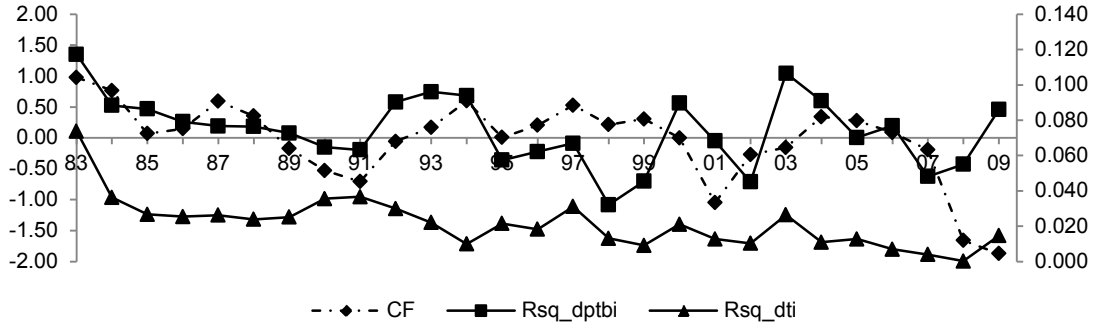
$$R_{j,t} = a_0 + a_1 \Delta PTBI_{jt} + e_{jt} \quad (1)$$

And

$$R_{j,t} = b_0 + b_1 \Delta TI_{jt} + e_{jt} \quad (2)$$

Where $R_{j,t}$ is the buy-and-hold market-adjusted return to security j over the 16-month return window starting at the beginning of the fiscal year; $\Delta PTBI$ is the yearly change of pre-tax book income and ΔTI is the change of tax income. Figure 1 shows the extension of HLS through 2009 from the initial 1983-2001 sample period. Sample selection and variable measurement are based on that of HLS. The respected data values can be found in Table 1.

Figure 1**:** The Explained Variances and Macroeconomic Conditions, 1983-2009



Rsq_dptbi, with its value charted on the right-hand vertical axis, is the explained variance in the annual regressions $R_{j,t} = a_0 + a_1 \Delta PTBI_{j,t} + e_{j,t}$*; Rsq_dti is the explained variance in the annual regressions of* $R_{j,t} = a_0 + a_1 \Delta TI_{j,t} + e_{j,t}$*, charted on the right-hand vertical axis; CF, with its value charted on the left-hand vertical axis, is the annual average of the Chicago Fed National Activity Index.*

Figure 1 suggests that, at a visual level, the R²s of ΔPTBI from the annual regressions correspond to the macroeconomic conditions indicated by *CF*. The variance in the market-adjusted returns explained by tax income, on the other hand, is more stable across time. The following sections proceed with further empirical evidence on the value relevance of book and tax income using Compustat/CRSP firm-year observations. The data item number is identified in italics to facilitate replication efforts.

RESULTS AND DISCUSSIONS

Pre-tax book income (*pi* minus *mii*) and income tax expense information are obtained from Compustat Xpressfeed. I start from the baseline year of 1983 in HLS and extend through fiscal year 2009. Financial and utility firms are excluded (SIC codes 6000-6999 and 4900-4999). Non-U.S corporations are dropped, so are firm-year observations in which fiscal year end changes. Based on the HLS, tax income is the "gross-up" amount of current tax expense times the top U.S. statutory tax rate on corporations applicable to that fiscal year, then subtracting the change in Net Operating Loss (NOL) carryforwards (*tlcf*). Current tax expense is measured as the sum of current federal income tax expense (*txfed*) and current foreign tax expense (*txfo*), or if the former is missing, then the difference between total income tax expense (*txt*) and deferred taxes (*txdi*).

Table 1: Explained variances (R^2) and the Chicago FED National Activity Index

		$R_{j,t} = a_0 + a_1 \Delta PTBI_{j,t} + e_{j,t}$		$R_{j,t} = b_0 + b_1 \Delta TI_{j,t} + e_{j,t}$		*CF*
Year	*N*	a_1	R^2	b_1	R^2	
1983	3110	0.929	0.117	0.753	0.074	0.98
1984	3393	0.814	0.088	0.463	0.036	0.76
1985	3271	0.984	0.086	0.498	0.027	0.07
1986	3256	0.768	0.079	0.398	0.025	0.15
1987	3525	0.676	0.077	0.349	0.026	0.59
1988	3571	0.776	0.076	0.336	0.024	0.35
1989	3456	0.751	0.073	0.353	0.025	-0.17
1990	3418	0.731	0.065	0.436	0.036	-0.53
1991	3274	0.853	0.063	0.557	0.037	-0.71
1992	3455	0.996	0.090	0.482	0.030	-0.06
1993	3730	1.095	0.096	0.381	0.022	0.17
1994	4109	1.063	0.094	0.255	0.010	0.60
1995	4164	0.999	0.057	0.561	0.022	0.01
1996	4391	0.871	0.062	0.447	0.018	0.20
1997	4491	1.021	0.067	0.660	0.031	0.53
1998	4407	0.642	0.032	0.383	0.013	0.22
1999	4050	0.943	0.045	0.410	0.009	0.30
2000	4018	1.118	0.090	0.519	0.021	0.00
2001	3724	0.827	0.068	0.349	0.013	-1.05
2002	3472	0.491	0.045	0.228	0.010	-0.27
2003	3152	1.197	0.107	0.483	0.026	-0.16
2004	3258	1.215	0.091	0.272	0.011	0.34
2005	3195	1.226	0.070	0.309	0.013	0.28
2006	3115	1.078	0.077	0.231	0.007	0.09
2007	3043	0.788	0.048	0.153	0.004	-0.20
2008	2962	0.440	0.055	0.027	0.000	-1.66
2009	2521	0.800	0.086	0.341	0.015	-1.87

Table 1 lists the ordinary-least-squares regression coefficient estimates for a_1 and b_1 in equation (1) and (2), as well as the R² for both equations based on annual cross-section regressions. Table 2 lists the summary statistics for the variables of changes in book (tax) income and stock returns, all of which are winsorized at the 1 and 99 percentile level to be consistent with HLS and mitigate the influence of extreme observations.

Table 2: Summary Statistics

Panel A: $R_{j,t}$,$\Delta PTBI$ and ΔTI (Extension of Hanlon et al 1983-2009)

Variable	Mean	Std Dev	Minimum	10th Pctl	50th Pctl	90th Pctl	Maximum
ΔPTBI	0.012	0.205	-0.922	-0.157	0.009	0.165	1.503
ΔTI	0.011	0.237	-1.452	-0.147	0.001	0.160	1.925
R_{jt}	-0.001	0.687	-1.120	-0.713	-0.116	0.796	4.004

Panel B: R, R_TAX and control variables (Extension of Lev and Nissim 1973-2008)

R*	0.178	0.501	-0.962	-0.304	0.108	0.691	11.377
B/P	0.776	0.579	0.057	0.240	0.617	1.518	4.035
E/P	0.105	0.088	0.002	0.029	0.080	0.207	0.705
BETA	1.033	0.563	-0.373	0.347	1.000	1.757	3.269
VOL	0.106	0.049	0.035	0.054	0.094	0.173	0.343
SIZE	5.570	2.059	1.182	2.843	5.543	8.295	11.211

In Panel A, R_{jt} is the buy-and-hold market adjusted return to security j over the 16-month window from the first month of the fiscal year to four months after the fiscal year-end. ΔPTBI is change in pretax book income ΔTI is change in tax income. In panel Be, R is the buy-and-hold return measured from May 1 of the subsequent year. B is book value at fiscal year-end (all sample firms have December fiscal year end). P is market value of common equity at fiscal year-end. E is earnings (income before extraordinary items). BETA (systematic risk) is estimated using monthly stock returns and the CRSPvalue-weighted returns (including all distributions) during the five years that end in April of the subsequent year. VOL (idiosyncratic volatility) is the root-mean-squarederror from the BETA regression. SIZE (logarithm of market value of equity) is measured at the end of April of the subsequent year. B/P, E/P, BETA , VOL and SIZE variables are winsorized at the 0.5 and 99.5 level.

Table 1 lists the ordinary-least-squares regression coefficient estimates for a_1 and b_1 in equation (1) and (2), as well as the R^2 for both equations based on annual cross-section regressions. Table 2 lists the summary statistics for the variables of changes in book (tax) income and stock returns, all of which are winsorized at the 1 and 99 percentile level to be consistent with HLS and mitigate the influence of extreme observations. To test the impact of economic activity on the value relevance of book and tax income, I design the empirical test using a pooled cross-section time-series regression model:

$$R_{j,t} = c_0 + c_1\Delta PTBI_{jt} + c_2\Delta TI_{jt} + c_3 CF_t + c_4\Delta PTBI_{jt}\cdot CF_t + c_5\Delta TI_{jt}\cdot CF_t + e_{jt} \quad (3)$$

$R_{j,t}$ is the buy-and-hold market-adjusted return (based on CRSP value-weighted return) to security *j* over the 16-month time-window. *CF*, The Chicago Fed National Activity Index takes the value of zero when the U.S. economy is growing at historical par and a standard deviation of one, with a positive reading indicating growth above historical average. Its use helps the researcher observe the time-series variation in the value relevance of book and tax income through a continuous and normalized proxy for the general economy. The coefficients c_4 and c_5 captures the extent to which the value relevance of book and tax income is a function of the macroeconomy. In terms of partial derivatives:

$$\frac{\partial R_{j,t}}{\partial \Delta PTBI_{j,t}} = c_1 + c_4\cdot CF_t$$

and

$$\frac{\partial R_{j,t}}{\partial \Delta TI_{j,t}} = c_2 + c_5\cdot CF_t$$

Most recent advancement in econometric techniques by Petersen (2009) and further featured by Gow et al. (2010) on its application in accounting research has made the unbiased estimation based on a pooled panel data set possible by allowing a two-dimensional clustering of the regression residuals. This two-dimensional clustering is applied in the regression model and test how macroeconomic conditions influence the structural relationship between expected returns and book/tax income.

Table 3: Value Relevance and Macroeconomic Conditions: 1983-2009, with Two-Dimensional Clustering (Firm and Year)

Panel A: Full Sample: (n=95531)			
	Coeff	**Std.Err**	**t**
Intercept	-0.014	0.025	-0.58
ΔPTBI	0.838	0.038	21.52***
ΔTI	0.137	0.018	7.41***
CF	-0.104	0.041	-2.53***
ΔPTBI*CF	0.078	0.027	2.91***
ΔTI*CF	0.035	0.035	1.02

Panel B: Partitions based on the sign of PTBI and TI

1) Positive PTBI, n=63643				**3) Nonpositive PTBI, n=31888**			
	Coeff	**Std.Err**	**t**		**Coeff**	**Std.Err**	**t**
Intercept	0.051	0.026	1.92**	Intercept	-0.214	0.035	-6.01***
ΔPTBI	1.162	0.054	21.46***	ΔPTBI	0.355	0.059	6.01***
ΔTI	0.198	0.028	6.97***	ΔTI	0.044	0.019	2.28***
CF	-0.117	0.049	-2.36***	CF	-0.139	0.044	-3.12***
ΔPTBI*CF	0.097	0.052	1.86*	ΔPTBI*CF	-0.081	0.044	-1.82*
ΔTI*CF	0.022	0.055	0.38	ΔTI*CF	0.009	0.025	0.35
2) Positive TI, n=63182				**4) Nonpositive TI, n=32349**			
	Coeff	**Std.Err**	**t**		**Coeff**	**Std.Err**	**t**
Intercept	0.041	0.025	1.59	Intercept	-0.214	0.035	-6.01***
ΔPTBI	1.140	0.039	28.93***	ΔPTBI	0.355	0.059	6.01***
ΔTI	0.148	0.037	3.92***	ΔTI	0.044	0.019	2.28***
CF	-0.103	0.044	-2.32***	CF	-0.139	0.044	-3.12***
ΔPTBI*CF	0.149	0.039	3.75***	ΔPTBI*CF	-0.081	0.044	-1.82*
ΔTI*CF	-0.013	0.071	-0.17	ΔTI*CF	0.009	0.025	0.35

$R_{j,t} = c_0 + c_1\Delta PTBI_{jt} + c_2\Delta TI_{jt} + c_3 CF_t + c_4\Delta PTBI_{jt} \cdot CF_t + c_5\Delta TI \cdot CF_t + e_{jt}$ *R_{jt} is the buy-and-hold market adjusted return to security j over the 16-month window from the first month of the fiscal year to four months after the fiscal year-end. ΔPTBI = change in pretax book income ΔTI=change in tax income. CF=Chicago Fed National Activity Index, take the value of zero when the economy is growing at historical average and a standard deviation of 1(positive value means above-average growth. *,**, *** indicates significance at 1%, 5% and 10% level.*

Table 3 has the main results. All t-statistics are based on two-dimensional clustering at the firm and year level. The results based on the full sample first confirms the finding by HLS that book income has greater value relevance ($c_1 = 0.838, t = 21.52$) than tax income ($c_2 = 0.137, t = 7.41$). But more importantly, c_4 is positive and significant ($c_4 = 0.078, t = 2.91$) whereas c_5 is not (t=1.02). These results suggest that investors' pricing of book income is a function of general economic conditions. The value relevance of tax income, however, seems to be inert to the level of macroeconomic activities. Comparing the regression coefficients when *CF*=1 versus *CF*=0, the results suggest that more than 8% $[0.078/(0.838 + 0.078)]$ in the value relevance of book income is dependent on the interaction with the Chicago Fed Index. If book income conforms to that of tax income, then investors will lose the additional value relevance to help them price accounting earnings based on the overall performance of the economy.

Following HLS and as a sensitivity test, I also estimate the difference in the value relevance between book income and tax income by partitioning the full sample into four partitions based on the sign of PTBI

and BI. Panel B of Table 3 has the detailed results based on the four partitions (Positive PTBI, Positive TI, Non-positive PTBI and Non-positive TI). The first two largest partitions (Positive PTBI and Positive TI) exhibit virtually identical results with that of the full sample. Similar to that in HLS, in the non-positive TI sub-sample the sign on ΔTI is negative, and the interaction between ΔTI and CF is insignificant. In the non-positive PTBI sub-sample the value relevance of ΔPTBI is still greater than that of ΔTI, but the effect of economic conditions on the relation between stock returns and ΔPTBI is reversed in comparison with the first two partitions.

Overall, the results in Table 3 indicate that macroeconomic conditions affect the value relevance of book and tax income differently. The value relevance of book income, as measured by $\frac{\partial R_{j,t}}{\partial \Delta PTBI_{j,t}}$, appears to be an increasing function of economic activity ($c_4 > 0, t = 2.91$). The value relevance of tax income, as measured by $\frac{\partial R_{j,t}}{\partial \Delta TI_{j,t}}$, does not seem to be affect by the level of economic activities (c_5 not significantly different from zero). Therefore both Hypothesis 1 and 2 are supported by the empirical evidence.

The Value Relevance Inference Under the Lev-Nissim Tax Fundamental

The main regression analysis section, extends the framework of HLS and find that macroeconomic conditions affect the value relevance of book and tax income. To investigate whether this research inference is applicable to a research framework other than that of HLS, I test the extent to which macroeconomic conditions affect the value relevance of the tax fundamental measure in Lev and Nissim (2004). The tax fundamental measure in Lev and Nissim (*R_TAX*) is a multinomial variable, taking the value of 1 through 5 for the quintiles of the tax-to-book income ratio for each year and two-digit SIC code. The tax-book income ratio is then constructed as:

$$TAX = \frac{Taxable\ Income \times (1-t)}{Net\ Income} \quad (4)$$

where tax income is measured by "grossing-up" income tax expense with the applicable top statutory rate t, then times $(1-t)$ to make it comparable with net income. For this testing, the sample period of 1973-2000 in the Lev-Nissim study is extended to 1973-2008 (adding 2009 data requires observations for fiscal year 2010, which is not yet available to the author through the data vendors). I follow the sample criteria, restricting the sample to firms with positive earnings in the current year, and since *TAX* is a ratio of tax income to net income, restricting *TAX* between zero and one. The test of how investors price the information within *R_TAX* in stock returns is expressed in the following model:

$$R = \alpha + \beta_1 SIZE + \beta_2 B/P + \beta_3 E/P + \beta_4 BETA + \beta_5 VOL + \beta_6 R\_TAX + \beta_7 R\_DEF + \beta_8 R\_CFO + e \quad (5)$$

R is the 12-month buy-and-hold return from May 1 following the end of fiscal year. All sample years have December fiscal year end. Firms with delisted returns on CRSP during the 12-months buy-and-hold period are removed from sample to prevent potential delisting biases (Schumway 1997). Firm *B* is book value at fiscal year-end. *P* is market value of common equity at fiscal year-end. *E* is earnings (income before extraordinary items). *BETA* is the systematic risk, estimated using monthly stock returns and the CRSP value-weighted returns (including all distributions) during the five years that end in April of the subsequent year. *VOL*, the idiosyncratic volatility, is the root-mean-squared error from the *BETA* regression. *SIZE* (logarithm of market value of equity) is measured at the end of April of the subsequent year. *R_DEF* and *R_CFO* are calculated similarly to that of *R_TAX*, except that *DEF* is equal to the negative of the ratio of deferred taxes to average total assets and *CFO* is the ratio of cash flow from operations to net income. Deferred tax is the sum of deferred federal taxes (*txdfed*) and foreign income

taxes (*txdfo*), or, when either one is missing, as total deferred taxes (*txdi*). Deferred taxes are deflated by average total assets. Cash flows are measured as the difference between income before extraordinary items (*ib*) and accruals, where

Accruals = (ΔCA-ΔCash)-(ΔCL-ΔSTD)- ΔDTL-Dep.
ΔCA=change in current assets (*act*)
ΔCash=change in cash and cash equivalents (*che*)
ΔCL=change in current liabilities (*lct*)
ΔSTD=change in debt included in current liabilities (*dlc*)
ΔDTL=change in the deferred tax liability (*txditc*)
Dep=depreciation and amortization expense (*dp*).

Lev and Nissim find that the coefficient on *R_TAX* is positive and significant in predicting the subsequent returns (R) in the early sample period (1973-1992), but not their late period (1992-2000). They also posit that during the 1990s investors seem to "became increasingly adept at using the forward-looking information in tax income" (p.1068). But as Lev and Nissim also point out, there may be as well the possibility that investors also price in the information that is "correlated with" the ratio of tax-to-book income. As Table 1 suggests, much of the years after 1992 and before 2000 has been under a protracted and above-historical-average economic growth in the U.S. To test the extent to which macroeconomic conditions influence the pricing of *R_TAX* by market participants, equation (5) is extended with the interaction term between *R_TAX* and *CF*:

$$R = \alpha + \beta_1 SIZE + \beta_2 B/P + \beta_3 E/P + \beta_4 BETA + \beta_5 VOL + \beta_6 R\_TAX + \beta_7 R\_DEF + \beta_8 R\_CFO + \beta_9 CF + \beta_{10} R\_TAX \cdot CF + \beta_{11} R\_DEF \cdot CF + \beta_{12} R\_CFO \cdot CF + e \quad (6)$$

Table 4: Cross-Section Time-Series Regression of One-Year Ahead Stock Return (May 1 - April 30) on Tax Fundamentals and Macroeconomic Conditions (CF): 1973-2008, with Two-Dimensional Clustering (Firm and Year).

	1973 - 2008 (excluding 1998)			**1973-2008 (including 1998)**		
	Coeff.	Std.Err	t-stat	Coeff.	Std.Err	t-stat
Intercept	0.114	0.101	1.13	0.086	0.102	0.841
SIZE	-0.014	0.011	-1.22	-0.012	0.011	-1.082
B/P	0.046	0.026	1.79**	0.048	0.026	1.878**
E/P	0.357	0.136	2.63**	0.319	0.137	2.318**
BETA	-0.025	0.033	-0.74	-0.016	0.034	-0.483
VOL	0.338	0.505	0.67	0.504	0.518	0.974
R_TAX	0.009	0.003	3.36***	0.008	0.003	2.934***
R_DEF	-0.004	0.001	-2.87***	-0.005	0.002	-3.080***
R_CFO	0.013	0.003	5.09***	0.014	0.003	5.380***
CF	0.016	0.059	0.27	0.021	0.059	0.354
*R_TAX*CF3*	-0.008	0.004	-2.06**	-0.009	0.004	-2.277**
*R_DEF*CF3*	0.003	0.002	1.35	0.003	0.002	1.146
*R_CFO*CF3*	0.000	0.003	-0.09	0.000	0.003	-0.099

*R is the 12-months buy-and-hold return measured from May 1 of the subsequent year. B is book value at fiscal year-end. P is market value of common equity at fiscal year-end. E is earnings (income before extraordinary items). BETA is the systematic risk, estimated using monthly stock returns and the CRSP value-weighted returns (including all distributions) during the five years that end in April of the subsequent year. VOL, the idiosyncratic volatility, is the root-mean-squared error from the BETA regression. SIZE (logarithm of market value of equity) is measured at the end of April of the subsequent year. R_TAX is a ranking quintile variable within each year and SIC two-digit industry between 1 and 5 based on the ratio of tax-to-net income. R_DEF and R_CFO (cash flow from operations) are calculated similarly, except that DEF is equal to the negative of the ratio of deferred taxes to average total assets. CF=Chicago Fed National Activity Index, take the value of zero when the economy is growing at historical average and a standard deviation of 1(positive value means above-average growth). All firm-year observations are December fiscal year end B/P, E/P, BETA, VOL and SIZE variables are winsorized at the 0.5 and 99.5 level as is the case in Lev and Nissim. *, **, *** indicate significance at 1%, 5% and 10% level.*

Table 4 has the results for model (6). The test is implemented in two parts. The first is without sample year 1998, as suggested by Lev and Nissim because the subsequent stock return period, from May 1999 to April 2000, covers the peak of the stock market bubble. The results including sample period 1998 are virtually the same. The interaction term *R_TAX*CF* is significant and suggest that macroeconomic conditions influence investors' pricing of tax fundamental. In contrast, consistent with prior literature on the persistence of cash flows, *R_CFO* exhibit no significant change in its relationship with subsequent stock returns across different macroeconomic environments.

Since I use the SAS code for two-dimensional clustering made available by Ian Gow, which does not allow modeling with many dummy variables such as the fixed effects model with two-digit SIC codes as dummies, a fix-effect industry regression model is applied in Table 5 using industry-fixed effect (two-digit SIC code) in Lev and Nissim. The results in Table 5 give similar inferences. In sum, the results in this section indicate that the value relevance of the tax fundamental in Lev and Nissim also appear to be a function of the macroeconomy.

Table 5: Cross-Section Time-Series Regression of One-Year Ahead Stock Return (May 1 - April 30) on Tax Fundamentals and Macroeconomic Conditions (CF): 1973-2008, with Industry Fixed Effects (SIC Two-Digit Industries)

	1973 - 2008 (excluding 1998)			**1973-2008 (including 1998)**		
	Coeff.	Std.Err	t-stat	Coeff.	Std.Err	t-stat
SIZE	-0.017	0.002	-8.79***	-0.014	0.002	-7.26***
B/P	0.054	0.007	7.55***	0.057	0.007	7.69***
E/P	0.357	0.042	8.59***	0.328	0.043	7.54***
BETA	-0.022	0.006	-3.96***	-0.015	0.006	-2.64***
VOL	0.327	0.072	4.54***	0.492	0.075	6.56***
R_TAX	0.009	0.002	4.03***	0.008	0.002	3.51***
R_DEF	-0.004	0.002	-1.9**	-0.004	0.002	-2.08**
R_CFO	0.013	0.002	6.18***	0.014	0.002	6.14***
CF	0.014	0.019	0.7	0.020	0.020	0.97
*R_TAX*CF3*	-0.008	0.003	-2.3**	-0.009	0.004	-2.42**
*R_DEF*CF3*	0.003	0.003	0.89	0.002	0.003	0.72
*R_CFO*CF3*	0.000	0.003	0.11	0.000	0.003	0.09

R is the 12-months buy-and-hold return measured from May 1 of the subsequent year. B is book value at fiscal year-end. P is market value of common equity at fiscal year-end. E is earnings (income before extraordinary items). BETA is the systematic risk, estimated using monthly stock returns and the CRSP value-weighted returns (including all distributions) during the five years that end in April of the subsequent year. VOL, the idiosyncratic volatility, is the root-mean-squared error from the BETA regression. SIZE (logarithm of market value of equity) is measured at the end of April of the subsequent year. R_TAX is a ranking quintile variable within each year and SIC two-digit industry between 1 and 5 based on the ratio of tax-to-net income. R_DEF and R_CFO (cash flow from operations) are calculated similarly, except that DEF is equal to the negative of the ratio of deferred taxes to average total assets. CF=Chicago Fed National Activity Index, take the value of zero when the economy is growing at historical average and a standard deviation of 1(positive value means above-average growth). All firm-year observations are December fiscal year end B/P, E/P, BETA , VOL and SIZE variables are winsorized at the 0.5 and 99.5 level as is the case in Lev and Nissim.

CONCLUSION

The objective of this study is to examine the underlying factor that makes book income more value-relevant than tax income. The analysis uses U.S. firm-year observations from 1983 to 2009 and, following prior literature, use the earnings-return relation to measure the extent to which accounting numbers are value relevant to market participants. Next, the paper investigates the relation between value relevance and macroeconomic conditions. The empirical results show that more than 8% in the value relevance of book income is dependent on its interaction with the macroeconomy. Considering value relevance an important characteristic of earnings quality, I suggest that earnings quality may be affected

when tax rules have more influence on financial accounting. It appears that the value relevance of book income is an increasing function of economic activities while that of tax income is not. This finding informs the current book-tax conformity debate, since the potential erosion of earnings quality from book-tax conformity will be more pronounced in macroeconomic expansion than contraction.

The theoretical construct in the study is the value relevance of accounting numbers. My research follows the stream of literature on how to operationalize the measurement of value relevance as a conceptual construct and, therefore, is subject to the criticism thereof (see Barth et al. 2001 for a summary of the value-relevance literature and its limitations). Finally, possible venues for future research would be to look at how accounting conservatism affects the value relevance of book and tax income on a country-by-country basis. Policy makers in different countries may draw from the future research findings that are specific to each country's background.

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BIOGRAPHY

Mingjun Zhou can be contacted at DePaul University. Email: mzhou4@depaul.edu

WHY HIGHER LEVELS OF AUDITOR-PROVIDED TAX SERVICES LOWER THE LIKELIHOOD OF RESTATEMENTS

Kevin A. Diehl, Western Illinois University

ABSTRACT

Kinney et al. (2004) ask in the Journal of Accounting Research: Why do higher levels of auditor-provided tax services lower the chances of restatements? In resolving this question, this paper investigates the relationship between auditor-provided tax services and restatements with proxies to represent the motivations of the audit committee and chief financial officers. Because Sarbanes-Oxley requires audit committee preapproval for these tax services, the necessity for including these variables is obvious. Logistic regression of seven specifications show that higher levels of auditor-provided tax services, financial experts, and long-term compensation are inversely and statistically significantly related to all restatements and (more strongly) to tax-influential restatements. The cash effective tax rate directly and statistically significantly relates to those specifications, showing that just increasing spending on these tax services cannot signal high-quality financial reporting in the absence of effective utilization.

JEL: H20

KEYWORDS: restatements, audit committees, tax

INTRODUCTION

This research seeks to answer the question that Kinney et al. (2004) ask in the *Journal of Accounting Research.* They seek to know why higher levels of auditor-provided tax services lower the chances of restatements. In the course of answering the posed research question, this paper is the first to investigate the relationship between auditor-provided tax services fees and restatements with proxies to represent the motivations of the audit committee of the board of directors and chief financial officers. Because Sarbanes-Oxley requires audit committee preapproval for all auditor-provided tax services that chief financial officers request, the reasons for including these variables are obvious. The question is timely as well.

Determining what conditions lower the chances for restatement can signal to investors which companies have higher-quality financial reporting. High-quality financial reporting is important to investors as companies, on average, lose 9.2 percent of market capitalization for each restatement (Srinivasan, 2005). Once investors consider these signals, perhaps surprisingly, tax services acquisition could become more efficient. Likewise, stronger corporate governance could emerge. While Kinney et al. (2004) mention that larger companies seem to exhibit the relationship between the extent of auditor-provided tax services fees and restatements, they leave the relationship between auditor-provided tax services fees and restatements largely unexplained and untested. In the intervening years, research has considered the relationship between audit fees and non-audit fees before and after the implementation of Sarbanes-Oxley (Omer et al., 2006; Bedard & Paquette, 2010). However, little to no extant research has sought to answer the 2004 *Journal of Accounting Research* implied question. This situation has less to do with the importance and continued currency of the question and potentially more to do with the lack of researchers with the necessary experience in tax and auditing to pursue this inquiry with sufficient vigor.

The sole specific inquiry has emerged from Seetharaman et al. (2010) relatively recently, showing the currency of the question. They consider whether Kinney et al.'s (2004) discovery with regard to auditor-

provided tax services fees relates to restatements in general or solely to restatements correcting errors involving FAS 109, deferred assets, deferred liabilities, tax contingencies, sales taxes, etc. Seetharaman et al. (2010) find that the ratio of auditor-provided tax services to the total fees is not related to restatements in general but only to restatements directly involving the previously mentioned specific tax errors. This research deserves congratulations for seeking to answer the important unresolved question. However, the results are limited in application as they include only the years 2003 through 2005 and consider only direct tax effect restatements. This research seeks to extend Seetharaman et al. (2010) by more-robust means and therein finally completely resolve Kinney et al.'s (2004) enduring question.

This research explores more years, 2004 through 2009, and utilizes the data set more in line with Kinney et al.'s (2004) original discovery than Seetharaman et al. (2010). Kinney et al. (2004) mention that larger companies tend to exhibit the strongest inverse relationship between the extent of auditor-provided tax service fees and restatements, so there is no data set more in line with exploiting this discovery than the 2010 Fortune 500. Besides properly following Kinney et al.'s (2004) original discovery, the Fortune 500 is the typical data set for compensation-based inquiries (Yermack, 2004).

This research also considers whether Seetharaman et al.'s (2010) finding that the ratio of tax fees over total fees remains unrelated to restatements in general for this better fitting group of the Fortune 500 and whether there are any other significant groupings separate from just directly tax related restatements. Seven logistic regressions are utilized involving filings of 10-K/As together for error corrections and restatements; error corrections; restatements; tax-influential restatements; non-tax-influential restatements; tax-influential restatements involving two or more such occurrences during the time period; and directly tax-influential restatements (Seetharaman et al.'s (2010) finding of significance).

The variables considered are the following: the ratio of auditor-provided tax service fees to total auditor-provided fees, the percentage change in the cash effective tax rate (CETR) over those years, the ln of total assets, the leverage (debt over total assets), the number of financial experts on the audit committee, the ratio of equity to the total compensation of board of directors members, and the ratio of equity to the total compensation of the chief financial officer (CFO). Interestingly enough, Seetharaman et al. (2010) find statistical significance in the broader company pool between the ratio of auditor-provided tax service fees to the total auditor compensation and the following: FAS 109, deferred tax changes, state tax changes, etc. types of restatements. With the Fortune 500 as the data set, no studied variable is significant under Seetharaman et al.'s (2010) specification. However, there is statistical significance between the variables studied and other specifications. The other results are that the ratio of total auditor-provided tax services fees over total auditor fees is statistically significant and inversely related to restatements in general and tax-influential restatements (close to statistical significance for error corrections and restatements and two or more tax-influential restatements). Similarly, the CETR and the number of financial experts on audit committees are statistically significant and inversely related to restatements in general and tax-influential restatements. (The CETR is close to being statistically significant for two or more tax-influential restatements.) Under the first four specifications, the ratio of equity to the total compensation of each director is statistically significant and inversely related to restatements. The ln of average total assets during the time period is statistically significant and directly related to tax-influential restatements.

The ratio of equity to the total compensation of each CFO is close to statistical significance with and inversely related to the error corrections and restatements category. Thus, the extent of the relationship is more comprehensive than Seetharaman et al.'s (2010) discuss. The following pages discuss the literature review, hypotheses, data set, methodology, results, and implications. If possible, these parts elevate the importance of this investigation.

LITERATURE REVIEW

The entire research inquiry emerges from the effects of Sarbanes-Oxley. This legislation denies audit firms the opportunity of supplying many non-audit services to their audit clients. In the wake of Enron and related high profile business failures where audits did not report material misstatements or omissions, the US government and regulators sought some reason for the auditors' decisions. They resorted to the potential quid pro quo of more favorable audit opinions being exchanged for increased client acquisition of non-audit services as the necessary loophole to close. The problem is that the auditor's provision of non-audit services can result in greater efficiencies from knowledge spillover. The concept of knowledge spillover originates with Simunic (1984). Sarbanes-Oxley does not deny companies the opportunity to receive tax services from their auditor, but this legislation does make this acquisition more difficult (Omer et al., 2006). Specifically, audit committees must give approval before any auditor-provided tax services fees. Thus, executives, including the proxy here of the CFO, face an extra hurdle to the pursuit of tax services from the auditor than they would in seeking tax services from any firm but their auditor.

Furthermore, all auditor-provided tax services fees must be separately identified in the proxy statement, giving investors and regulators greater opportunity to question the extent of auditor-provided tax services purchased. This hurdle similarly diminishes executives' and directors' pursuit of auditor-provided tax services. Some institutional investors do not want any non-audit services purchased from their auditor as some evidence of greater auditor objectivity and increased financial reporting quality without the possibility of quid pro quo entering the equation (Seetharaman et al., 2010). In the Fortune 500 sample for the current research, 12 companies do not purchase any auditor-provided tax services likely because of institutional investors pushing them to emphasize the perception of auditor objectivity over the presence of efficiencies from auditor-provided tax services. With this regulatory atmosphere, Omer et al. (2006) report decreases in auditor-provided tax services coincident with increasing audit fees.

From 2004 through 2009 for the Fortune 500 data set, average auditor-provided tax services fees have declined $501,339. The decrease over those years is 28 percent. However, from 2006 through 2008, auditor-provided tax services fees have actually increased. Thus, companies could be learning over time that there are knowledge spillover efficiencies from having the auditor provide tax services that counterbalance any potential impairment of objectivity in fact or in the investors' perception thereof (Simunic, 1984). There is not necessarily consensus on the effect of non-audit services fees in general on financial reporting quality (here represented with the proxy of no error corrections or true restatements). Larcker and Richardson (2004) find an inverse relationship between non-audit services fees in general and the extent of discretionary accruals. Still others find no significant relationship between non-audit services fees and discretionary accruals (Chung & Kallapur, 2003). Krishnan (2005) emphasizes the market's take on non-audit service fees, discovering that stock prices react inversely and statistically significantly to higher disclosed non-audit service fees.

To begin, the reason that CFOs and therein audit committees consider spending fees on auditor- provided tax services is knowledge spillover (Simunic, 1984). The information that auditors gather can be shared with tax professionals within the same accounting firm more readily and efficiently. Furthermore, CFOs consider tax minimization activities important as shareholders consider such activities value enhancing (Minnick & Noga, 2010).With regard to tax-specific non-audit fees, there is limited research.This research does extend Seetharaman et al. (2010) and Kinney et al. (2004). Nevertheless, finding more backing is sparse. Fortin and Pittman (2008) do show the quality of reporting as signaled to the debt market. They discover that companies investing more in auditor-provided tax services over audit fees generate lower yield spreads for new bond issues. The strength of corporate governance does influence the extent to which auditor-provided tax services are purchased. The proxy for the strength of corporate governance here is the number of financial experts. Sarbanes-Oxley requires at least one financial expert to be on the board of every publicly traded company. The presence of more financial experts on the audit

committee enhances each board's capability to pursue the shareholders' interests and therein to increase stock value (Defond et al., 2005). If the audit committee feels the auditor's objectivity would not be impaired through the company's simultaneous acquisition of tax services, then the extent of tax services receiving preapproval is likely to be higher. The quality of this audit committee judgment on objectivity improves as more financial experts are on the audit committee (Defond et al., 2005). Thus, the presence of more financial experts than necessary could signal the market of higher-quality financial reporting.

With an opposing result, Bedard and Paquette (2010) remark that audit committee financial experts are less likely to purchase auditor-provided tax services. Despite these varying opinions, this variable is included in the logistic regressions for each specification. Further discussion of this variable follows in the methodology area. Audit committee director compensation that is tied to long-term results in greater emphasis on tax minimization activities (Minnick & Noga, 2010). Thus, these researchers' discussion leads to the creation of the ratio of equity compensation (long-term emphasizing) over total director compensation as relevant to the level of auditor-provided tax services purchases that the audit committee supports. CFO compensation that is tied to the long term leads to increased tax minimization activities.

CFOs indirectly rely on the approval of shareholders to maintain their employment status through the shareholders' election of directors, who directly review CFOs' activities. Shareholders consider tax minimization activities to be value enhancing (Minnick & Noga, 2009). Thus, CFOs would be motivated to pursue tax minimization activities, especially where their compensation is more geared toward equity (long term) as they must then maintain their job over time to realize the full benefits of their compensation. Under their definition then, the ratio of equity compensation (long-term emphasizing) over total compensation should illustrate whether CFOs have sufficient motivation to pursue tax minimization objectives. To understand why the extent of auditor-provided tax services influences the likelihood of error correction or restatements requires examination of the signaling effects contained within the acquisition of these tax services. The background on signaling begins with finance research. Miller and Modigliani (1961) first bring this concept to consideration. Where there is incomplete information, they consider current dividends to signal future cash patterns (Miller & Modigliani, 1961).

Spence (1973) becomes the first to bring this concept to wider application.This researcher remarks that high-quality producers are motivated to incur higher costs to signal uninformed members of the market of their higher quality (Spence, 1973). Ball (2009) indicates that this signaling concept is directly applicable to accounting research as higher-quality financial reporting companies are motivated to incur higher signaling costs to indicate their higher-quality status to otherwise uninformed investors. For the specific situation, the extent of auditor-provided tax services signals reporting quality (here, the lack of error corrections or restatements). Members of audit committees could lose their directorships or have to pay damages if restatements occur. Thus, their primary emphasis would be on ensuring the quality of the financial statements. Inviting auditors to provide tax services as well could impair their objectivity on the audit. Thus, audit committees would be unlikely to approve any auditor-provided tax services unless they had confidence in the financial statements and the internal controls. Likewise, as the level of auditor-provided tax services increases, the chances of impairing the objectivity similarly increase. Therein, the extent to which they approve auditor-provided tax services signals the level of their confidence in the company's reporting quality.

DATA AND THE METHODOLOGY

Hypotheses

H1: Some relationship could exist between the auditor provision of tax services and the likelihood of error corrections and restatements.Seetharaman et al. (2010) seem to find no connection between just providing higher levels of audit services and the likelihood of error corrections and restatements. Thus, this

specification should not result in any statistically significant relationship. If it were to be shown, then knowledge spillover benefits would prevail over any concerns over impairment of auditor objectivity.

H2: Some relationship could exist between the auditor provision of tax services and the likelihood of true restatements involving the body of the financial statements. Seetharaman et al. (2010) do not investigate this potential relationship. If this hypothesis is established, then knowledge spillover benefits would prevail over any impairment issues.

H3: Greater auditor provision of tax services lowers the likelihood of error corrections. This uninvestigated hypothesis provides the background to check for the validity of any statistically significant relationship finding in H1. If H1 is statistically significant, it could be the result of significance from the true restatements involving the body of the financial statements investigated in H2. Thus, this hypothesis acts as the control on H1.

H4: Some relationship could exist between the auditor provision of tax services and the likelihood of true restatements that primarily or secondarily result in some tax effects. Seetharaman et al. (2010) do not specifically investigate this category. They only review primary tax effects. If this relationship is shown, then Seetharaman et al. (2010) restrict their category (where statistical significance is found) too much.

H5: Some relationship could exist between the auditor provision of tax services and the likelihood of true restatements that have no tax effect at all. By means of comparison, this hypothesis enables the identification of how significant any findings of significance in H4 are. Thus, its validity does relate to other specifications.

H6: Some relationship could exist between the auditor provision of tax services and the likelihood of companies having at least two tax-influential reasons for restatements during the years 2004 through 2009. This hypothesis investigates whether companies that continue to have tax-influential restatement errors have lower levels of auditor-provided tax services. Governance variables could prove important in this specification in particular.

H7: Finally, some relationship could exist between the auditor provision of tax services and the likelihood of true restatements having primary tax effects. Seetharaman et al. (2010) utilize this specification to find statistical significance. Thus, the same finding could be expected here. The involvement of the auditor's own tax professionals would provide knowledge spillover. The tax professionals would have greater access to the financial details of the company by means of the audit professionals' information sharing. Thus, the tax professionals should have the capability to help provide backing to limit the possibilities of restatements in at least the tax areas of the financial statements.

The data set is the Fortune 500 as of 2010. This set is chosen as Kinney et al. (2004) discover the statistical significance between auditor-provided tax services fees and restatements to be strongest in the set of larger companies. Thus, investigating this relationship is best pursued through studying the 500 largest revenue-producing companies in the US market. Also, other typical indicator variables for audit-related inquiries involve the presence or absence of the leading market share audit firms and the number of years of continued service from those audit firms (Seetharaman et al., 2010; Bedard & Paquette, 2010). Only 4 companies of the Fortune 500 have auditors other than the four leading audit firms. Only 39 have changed their auditors at any point during 2004 through 2009. As the result of logistic regression and matching pairs developed not involving differences in these variables, the methodology does not have to control for them. The Fortune 500 is typical as the data set for any compensation research, especially such as here where some hand collection of data is necessary and therein the entire set of US equities would be extremely costly to explore (Yermack, 2004). Compustat provides the cash paid for taxes, pretax income, and special items to determine the cash effective tax rate and therein the percentage changes in the CETR

under the formula from Dyreng et al. (2008) and Minnick and Noga (2010). It also gathers the total assets to ascertain the variable ln of total assets as Seetharaman et al. (2010) utilize. Compustat reports short-term and long-term debt and the previously mentioned total assets to develop the leverage variable of which Seetharaman et al. (2010) make use.

Audit Analytics usually becomes the premier vehicle for ascertaining various figures. However, for greater confidence in the numbers therein disclosed, hand collection of data has become necessary for the financial experts and the more specific disclosures of equity over total compensation of directors and chief financial officers. These numbers emerge from consulting each company's proxy statements contained within the EDGAR database. Likewise, error corrections and restatements are discovered through consulting all Fortune 500 companies' filings for the time period of 2004 through 2009 for 10-K/As. The 10-K/As involve only annual report error correction and restatements. Seetharaman et al. (2010) investigate quarterly restatements as well. However, even though quarterly restatements are important, significantly more importance resides within the relationship between the ratio of auditor-provided tax service fee over total auditor compensation and the annual reports.

This annual report error corrections and restatements are particularly important here for investigating the effects of the number of financial experts and equity compensation on the executive and board members in deciding the extent of tax fees to requisition from the auditor. From the Fortune 500, public companies without data for certain parts of the time period and private companies without publicly disclosed data are excised. This process leaves 445 Fortune 500 companies and 2,670 company years for identifying the error corrections and restatements. From this data then, 112 10-K/As have been filed during the time period for error corrections or actual restatements of the financial statements. Even though error corrections can sometimes be considered part and parcel of restatements, this research specifically separates error corrections of management discussion and analysis and financial statement notes from actual restatements within the body of the financial statements. The reason for this distinction involves the motivations studied. The variables of equity compensation over total compensation for directors and CFOs are more tied to striving to get the body of the financial statements correct.

The body is from where most securities damages result. Of the 112 10-K/As, 63 involve true restatements of the body of the financial statements. Of the 63 true restatements then, 45 have some tax effect. Of the 45 with some tax effect, 14 involve the type of tax related restatements that Seetharaman et al. (2010) separately investigated. Of the 45 with some tax effect, 20 have at least two different filings for correcting those errors. In each logistic regression, each error correcting or restating Fortune 500 company is matched with some other non-error correcting or restating Fortune 500 company that has at least the same first two numbers of the Standard Industrial Code (SIC). After this first matching test, the next search involves finding the closest combination of total assets and total revenues figures to match. Subsequent error corrections or restatements involving the same error are not counted as regressions. In separate unreported results, their inclusion is determined not to change the results.
To test H1, the following logistic regression is utilized:

$$ERRORCORRRESTATE = \alpha + \beta_1 \times TAXTO + \beta_2 \times \%CETR + \beta_3 \times LNTA + \beta_4 \times LEV + \beta_5 \times FINEXP + \beta_6 \times DIREQTO + \beta_7 \times CFOEQTO + \varepsilon. \quad (1)$$

To test H2, the following logistic regression is utilized:

$$RESTATE = \alpha + \beta_1 \times TAXTO + \beta_2 \times \%CETR + \beta_3 \times LNTA + \beta_4 \times LEV + \beta_5 \times FINEXP + \beta_6 \times DIREQTO + \beta_7 \times CFOEQTO + \varepsilon. \quad (2)$$

To test H3, the following logistic regression is utilized:

$$ERRORCORR = \alpha + \beta_1 \times TAXTO + \beta_2 \times \%CETR + \beta_3 \times LNTA + \beta_4 \times LEV + \beta_5 \times FINEXP + \beta_6 \times DIREQTO + \beta_7 \times CFOEQTO + \varepsilon. \quad (3)$$

To test H4, the following logistic regression is utilized:

$$PRIMSECTAXRESTATE = \alpha + \beta_1 \times TAXTO + \beta_2 \times \%CETR + \beta_3 \times LNTA + \beta_4 \times LEV + \beta_5 \times FINEXP + \beta_6 \times DIR\ EQ/TO + \beta_7 \times CFO\ EQ/TO + \varepsilon. \quad (4)$$

To test H5, the following logistic regression is utilized:

$$NONTAXRESTATE = \alpha + \beta_1 \times TAXTO + \beta_2 \times \%CETR + \beta_3 \times LNTA + \beta_4 \times LEV + \beta_5 \times FINEXP + \beta_6 \times DIREQTO + \beta_7 \times CFOEQTO + \varepsilon. \quad (5)$$

To test H6, the following logistic regression is utilized:

$$TWORESTATE = \alpha + \beta_1 \times TAXTO + \beta_2 \times \%CETR + \beta_3 \times LNTA + \beta_4 \times LEV + \beta_5 \times FINEXP + \beta_6 \times DIREQTO + \beta_7 \times CFOEQTO + \varepsilon. \quad (6)$$

To test H7, the following logistic regression is utilized:

$$PRIMTAXRESTATE = \alpha + \beta_1 \times TAXTO + \beta_2 \times \%CETR + \beta_3 \times LNTA + \beta_4 \times LEV + \beta_5 \times FINEXP + \beta_6 \times DIREQTO + \beta_7 \times CFOEQTO + \varepsilon. \quad (7)$$

The error correction or restatement variable specification constitutes the only difference in comparing equations (1) through (7). Thus, each error correction or restatement variable specification is discussed below with each equation's common variables explained thereafter. *ERRORCORRRESTATE* is an indicator variable with the value of one where the company files any 10-K/As to correct errors or make true restatements to the body of the financial statements in (1). *RESTATE* is an indicator variable with the value of one where the company files any 10-K/As to make true restatements in the body of the financial statements (2). *ERRORCORR* is an indicator variable with the value of one where the company files any 10-K/As to correct errors (3). *PRIMSECTAXRESTATE* is an indicator variable with the value of one where the company files any 10-K/As to make true restatements to the body of the financial statements that result directly or indirectly in changes to the income tax components of the financial statements (4).

NONTAXRESTATE is an indicator variable with the value of one where, within the category of true restatements to the body of the financial statements, tax-influential restatements are excluded to leave these components (5). They represent classification errors and other changes with no tax effects. *TWORESTATE* is an indicator variable with the value of one where, within the category of tax-influential restatements, there are more than two occurrences of tax issues for filing 10-K/As (6). *PRIMTAXRESTATE* is an indicator variable with the value of one where companies file any 10-K/As to make true restatements to the body of the financial statements for FAS 109, deferred tax, state tax, etc. changes (the specification with significance in Seetharaman et al. (2010)) (7). The primary variable here is the *TAXTO* as it represents the ratio of auditor-provided tax services fees to the total fees to the auditor's firm. Seetharaman et al. (2010) utilize the same specification of the variable of interest. If tax fees were not scaled (as Kinney et al. (2004) do), then some alternative specification would be necessary. As the *TAXTO* variable stands here, utilization of percentages of totals is sufficient to remove scaling or alternative specification requirements to adjust for larger companies.

Besides the fact that the selection of the Fortune 500 as the data set already controlling for it, there is still more reason for why the specifications do not have to control for complexity. Audit fees and other non-audit service fees would likely be similarly proportionally higher in the presence of increased complexity. Thus, as tax fees that increase from the influence of complexity is the numerator over the denominator of audit, audit related, tax, and other fees that experience increases from complexity as well, no specification of this control is necessary within the equations. The expectation would be that the *TAXTO* variable would be inversely related to the likelihood of error correction or restatement because of the knowledge spillover benefits from utilizing the auditor to provide more tax services.

The percentage change in the cash effective tax rate (*%CETR*) is included to help indicate effective spending of higher auditor-provided tax services fees that increase the *TAXTO* variable. Otherwise, companies could spend more on auditor-provided tax services without any actual benefits for the purpose of improperly signaling that they have high-quality financial reporting. As Dyreng et al. (2008) show, cash effective tax rates are best consulted over time periods rather than as an annual specification. The reason is that there can be incredible variation from year to year to the extent that effective tax minimization strategies only become discernible on consulting the CETR over longer time periods. The expectation would be for this variable to be inversely related to the likelihood of error correction or restatement as the true signal of higher auditor-provided tax services representing higher quality could not be as effective. Even though the matching process already controls for the effects of larger companies versus smaller companies, the inclusion of the total assets variable can represent this feature and provide means for comparing whether the expansiveness of the companies influences the results. The ln is taken of the total assets because this variable otherwise tends to be right skewed. This variable (*LNTA*) could be directly related with the likelihood of restatements based on Kinney et al. (2004) finding that larger companies exhibited stronger relationships between auditor-provided tax services and restatements. However, with the data set and ln already seeking to control for this influence, there potentially could be no directional component or significance to this variable.

The leverage variable (*LEV*) is included as there has been extensive research showing the extent of debt has significant influences on tax choices. The executive for more leveraged companies could tend toward reporting that supports continued satisfaction of debt covenants than toward any other pursuit. However, in this specific situation regarding restatements, there has been less evidence of significance. Thus, there could be no directional component or significance to this variable. As the audit committee must give approval before any auditor-provided tax services fees are incurred, the model's inclusion of some representation of the effectiveness of this body on the determination of the extent of these fees is important. An impressive candidate is the number of financial experts (*FINEXP*).

As there are more financial experts on the audit committee, the level of expertise is more likely to include an understanding of the spillover benefits from seeking tax services from the audit provider. Also, with more financial experts, the audit committee is more likely to have sufficient capability to determine the extent to which the financial statements are free of material misstatements or omissions and the internal controls are effective. This situation would give the audit committee more confidence in supporting higher levels of auditor-provided tax services because, without concerns with regard to the quality of the reporting system, the audit committee would then have less necessity to question whether the objectivity of the auditor were impaired with higher levels of tax services. This variable should be inversely related to the likelihood of error correction or restatement. The ln is not taken of the number of financial experts because, through unreported testing here, the financial experts do not evidence sufficient right skewing to adjust for that potentiality. The compensation literature already has shown that companies are more properly led and monitored if the executives' and directors' compensation places them closer to the position of the investors they are supposed to represent. Thus, the percentages of the directors' and CFOs' compensation as equity represent tests to this concept. The *DIREQTO* variable determines whether higher levels of long-term compensation as the percentage of total compensation motivate audit committee

directors to secure higher levels of auditor-provided tax services because of the efficiencies produced therein providing greater benefits to the company and them over the long run than any potential costs of the perception of impairing the auditor's objectivity. The *CFOEQTO* variable pursues the same inquiry. However, it does so for CFOs as the proxy for executives. This variable seeks to determine whether higher levels of long-term compensation as the percentage of total compensation motivate them to disregard the barriers created from the preapproval and separately stating of auditor-provided tax services fees requirements enough to purchase more auditor- provided tax service fees. Therein, they would seek to lower the likelihood of restatements through the long-run knowledge spillover benefits from utilizing the auditor more for tax services as more beneficial than any potential cost from the perception of impairing the objectivity of the auditor. Each of these variables should be inversely related to the likelihood of error correction or restatement.

RESULTS

The following part first discusses the trend in auditor-provided audit fees, audit-related fees, tax fees, other fees, and the average ratio of auditor-provided tax services fees over total auditor compensation. Then, descriptive statistics are presented to compare and contrast the means of the restating and non-restating companies for each of the seven specifications. Next, the results of the logistic regressions of the seven specifications are shown. As Table 1 indicates, audit fees and audit related fees are generally increasing from 2004 through 2009 whereas auditor-provided tax services fees and other fees are decreasing. This combination of factors makes for the average ratio of auditor-provided tax services fees over total auditor fees declining over the time period studied. However, the decline in the average actually is helpful as it improves the power of the signal for high-quality financial reporting companies that have higher ratios of auditor- provided tax services fees over total auditor compensation. This potentiality remains for investigation in subsequent paragraphs.

Table 1: Descriptive Statistics on Means of Auditor-Provided Audit Fees, Audit Related Fees, Tax Fees, Other Fees, Total Fees, and Ratio of Tax Fees over Total Fees (in millions of dollars)

Variables	Average	2009	2008	2007	2006	2005	2004
Audit	8.0956	8.8189	8.9141	8.5346	8.3688	7.9769	7.5431
Related	1.0609	1.2361	1.2686	1.2110	1.1201	1.0515	1.1373
Tax	1.1651	1.2687	1.2948	1.2902	1.2617	1.3535	1.7701
Other	0.0937	0.2080	0.1603	0.1463	0.1753	0.2919	0.4245
Total	10.3793	11.5318	11.6377	11.1824	10.9259	10.6739	10.8750
Ratio	0.0926	0.1100	0.1113	0.1154	0.1155	0.1268	0.1628

As Table 2 shows, there are significant differences in the descriptive statistics (means) for the restating companies and the non-restating companies. The largest contrast emerges from *%CETR*. Under all the specifications except for *ERRORCORR*, *%CETR* is positive for the restating companies and just the opposite for the non-restating companies. This situation could imply that the restating companies are so concerned with financial reporting issues that they have less time and resources to expend on their tax minimization activities (auditor-provided tax services).

This characterization of the situation receives further support from then considering *TAXTO*. The ratio of auditor-provided tax services fees over total auditor compensation is substantially lower for the restating companies compared to the non-restating companies under every specification save for *ERRORCORR*. This finding supports high-quality financial reporting being signaled through higher spending on auditor-provided tax services (as compared to the total auditor compensation). The significance of this signal remains to be explained through the subsequent logistic regressions. *DIREQTO* also seems to be explanatory of the differences between restating and non-restating companies. With reference to the means of the entire data set, the defining characteristic does not reside within the non-restating companies having higher means but instead resides within the restating companies having much lower means than

the data set. The exception to this trend is in specification seven where the smallest number of observations in any could have some bearing. Nevertheless, the significance of this explanatory power could lead to all compensation committees of boards of directors considering the extent of the equity compensation over total compensation to directors, especially audit committee members.

Table 2: Descriptive Statistics Involving the Means of All the Specifications as to Restatements v. Non-Restatements

Specification	*TAXTO*	*%CETR*	*LNTA*	*LEV*	*FINEXP*	*DIREQTO*	*CFOEQTO*
Fortune 500	0.0926	0.0131	9.5390	0.6539	2.5266	0.6116	0.3150
1							
Restate	0.0846	0.1184	9.6763	0.6539	2.2342	0.5740	0.3063
Non-restate	0.1041	-0.2996	9.6687	0.6909	2.4475	0.6129	0.3016
2							
Restate	0.0796	0.2318	9.7760	0.6819	2.3016	0.5721	0.2974
Non-restate	0.1060	-0.3395	9.7253	0.7071	2.8254	0.6346	0.2995
3							
Restate	0.0899	-0.0278	9.5297	0.6171	2.1633	0.5748	0.3167
Non-restate	0.0889	-0.3111	9.5075	0.6448	2.0612	0.6082	0.3069
4							
Restate	0.0807	0.3573	9.8437	0.6964	2.5111	0.5904	0.3242
Non-restate	0.1023	-0.5946	9.3720	0.6678	2.8222	0.6116	0.3073
5							
Restate	0.0847	-0.0772	10.0941	0.6913	1.8333	0.5821	0.2466
Non-restate	0.1074	0.2934	10.1215	0.7595	2.7778	0.6367	0.2639
6							
Restate	0.0769	0.3694	9.3443	0.6776	2.4500	0.6031	0.3046
Non-restate	0.0930	-1.2164	9.4112	0.6567	2.2500	0.6477	0.3233
7							
Restate	0.0748	0.3799	9.3522	0.6888	2.8462	0.6429	0.3224
Non-restate	0.0968	-1.9274	9.3425	0.6895	2.6923	0.6273	0.2965

ERRORCORRRESTATE involves companies filing any 10-K/As to correct errors or make true restatements to the body of the financial statements in (1). RESTATE considers companies filing any 10-K/As to make true restatements in the body of the financial statements (2). ERRORCORR involves companies filing any 10-K/As to correct errors (3). PRIMSECTAXRESTATE considers companies filing any 10-K/As to make true restatements to the body of the financial statements that result directly or indirectly in changes to the income tax components of the financial statements (4). NONTAXRESTATE involves excluding tax-influential restatements within the category of true restatements to the body of the financial statements (5). TWORESTATE considers situations within the category of tax-influential restatements where there are more than two occurrences of tax issues for filing 10-K/As (6). PRIMTAXRESTATE involves companies filing any 10-K/As to make true restatements to the body of the financial statements for FAS 109, deferred tax, state tax, etc. changes (7). TAXTO represents the auditor-provided tax services fees over total auditor fees (audit, audit related, tax, and other) for the years 2004 through 2009. %CETR stands for the percentage change in the cash effective tax rate from 2004 through 2009. LNTA represents the ln of total assets. LEV stands for the average of the combination of short-term and long-term debt over total assets for the years. FINEXP represents the number of financial experts on the audit committee. DIREQTO stands for the ratio of equity compensation over total compensation for members of the audit committee of the board of directors. CFOEQTO represents the ratio of equity compensation over total compensation for the chief financial officer.

Tying long-term results, which most shareholders seek, with the directors' compensation through more equity and less cash compensation could motivate directors to improve their level of governance over the reporting process. More specifically, this changed compensation ratio could empower them to seek more auditor-provided tax services, especially considering the long-term efficiencies from knowledge spillover as evidenced in the previously mentioned significant reductions in CETRs seemingly through higher spending on auditor-provided tax services. *FINEXP* also indicates restating and non-restating companies to some level. Contrary to the finding from Bedard and Paquette (2010), this fact could evidence that more financial experts could result in better governance of the financial reporting process and therein reductions in the likelihood of restatements. Audit committees have certain limits on the number of times all the members can meet to review the financial reporting process. Some are on other committees, are on other boards, have jobs that sometimes conflict, or generally not capable of communicating so often as necessary. The presence of more financial experts could then enable delegation of tasks to the extent necessary without jeopardizing the quality of the governance. Also, even in the absence of any delegation, less time is necessary to explain what is under consideration to the extent more members already have that necessary financial expert status. That situation would leave more time actually to consider the pressing reporting issues. There is also the signaling explanation for why higher numbers of financial experts relate to higher-quality reporting companies. With audit committee members potentially at higher risk of director liability for any financial reporting issues that emerge than any other directors, candidates

for audit committees would seek opportunities to govern high-quality financial reporting companies and decline to be considered for low-quality reporting companies.

Specifically with regard to tax services, more financial experts on the audit committee could empower higher levels of auditor-provided tax services to be sought. With more financial experts present on the audit committee, the confidence in the capability to govern the reporting process increases. Also, as previously mentioned here, less time would be wasted on educating non-financial experts of the background to any particular decision. Thus, more time would be present to pursue the encouragement and governance of tax minimization activities. This level of financial expertise on the committee would also increase the likelihood of understanding the importance of knowledge spillover efficiencies from auditor-provided tax services. All these factors could lead to the greater acquisition of auditor-provided tax services. Surprisingly, no powerful signal emerges from the *CFOEQTO* variable.

To some extent here, the market for Fortune 500 CFOs could be so competitive that companies are forced to match compensation structures without regard to their influence on the motivations of CFOs. This situation would leave compensation structures similar between high-quality reporting and low-quality reporting companies. *LNTA* and *LEV* seem the least explanatory of restating and non-restating companies because these variables' means under each specification differ only slightly for each category. This result for *LNTA* is somewhat expected as the selection of the Fortune 500 data set controls for large companies. However, some could consider higher leverage companies to have different reporting trends to make it easier to satisfy their debt contracts. This fact in of itself would seem to imply differences in restating and non-restating companies with regard to this variable. For each of the logistic regressions, the predicted signs for each variable are indicated in the tables.

The results of the descriptive statistics help inform these predictions save for the *CFOEQTO*. This variable could easily receive the "?" designation that *LNTA* and *LEV* receive as it fits into their category of not being that explanatory. Nevertheless, the extent of long-term compensation (equity) and the tying that it produces between the interests of the each CFO and each company's shareholders still would seem to be related to the quality of financial reporting. The direct relationship between *%CETR* and restatements is predicted for the following reasons.

As the *%CETR* increases, lower-quality tax minimization is occurring. Thus, more time is probably being spent on taking care of financial reporting matters as the area of primary importance. This increased emphasis on reporting to the exclusion of tax minimization then could indicate lower-quality financial reporting. The inverse relationships between *TAXTO*, *FINEXP*, and *DIREQTO* and restatements all follow from what has been discussed already under the descriptive statistics. In Table 3, all the predicted signs are as expected except for the *CFOEQTO* variable. Only the *DIREQTO* variable is statistically significant with its inverse relationship with the possibility of error corrections or restatements. In fact, *DIREQTO* is powerful at the .05 significance level. Even though *TAXTO* is not statistically significant, it is essentially the next most explanatory variable. *TAXTO* inversely relates to the likelihood of error corrections or restatements. However, nothing too powerful otherwise can be extracted from this first specification. Thus, deconstructing this specification into the true restatement component could lead to stronger relationships.

In Table 4, all the predicted signs follow through save for the *CFOEQTO* variable once more. In this specification of the explanatory power of the variables to the likelihood of true restatements, four variables are shown to be statistically significant. This result is extraordinarily important as Seetharaman et al. (2010) consider there to be no significance between auditor-provided tax services and any general restatement category. This result also helps explain for what Kinney et al. (2004) have been searching.

Table 3: H1: Determinants of Error Corrections or Restatements

variables		Estimated Coefficients (x^2)
intercept		1.433
		(1.176)
taxto	−	-2.255
		(1.886)
%cetr	+	0.114
		(1.162)
lnta	?	0.080
		(0.528)
lev	?	-0.905
		(1.667)
finexp	−	-0.133
		(1.907)
direqto	−	-2.269**
		(5.030)
cfoeqto	−	1.160
		(0.462)
observations		224
likelihood ratio x^2		256.867
pseudo R^2		0.089

*$ERRORCORRRESTATE = \alpha + \beta_1 \times TAXTO + \beta_2 \times \%CETR + \beta_3 \times LNTA + \beta_4 \times LEV + \beta_5 \times FINEXP + \beta_6 \times DIREQTO + \beta_7 \times CFOEQTO + \varepsilon$. ***, **, and * indicate significance at the .01, .05, and .10 levels. Statistics are computed based on robust standard errors clustered at the company level. ERRORCORRRESTATE is an indicator variable with the value of one where the company files any 10-K/As to correct errors or make true restatements to the body of the financial statements. TAXTO represents the auditor-provided tax services fees over total auditor fees (audit, audit related, tax, and other) for the years 2004 through 2009. %CETR stands for the percentage change in the cash effective tax rate from 2004 through 2009. LNTA represents the ln of total assets. LEV stands for the average of the combination of short-term and long-term debt over total assets for the years. FINEXP represents the number of financial experts on the audit committee. DIREQTO stands for the ratio of equity compensation over total compensation for members of the audit committee of the board of directors. CFOEQTO represents the ratio of equity compensation over total compensation for the chief financial officer.*

Table 4: H2: Determinants of True Restatements to the Body of the Financial Statements

variables		estimated coefficients (x^2)
intercept		0.680
		(0.172)
taxto	−	-5.058**
		(4.641)
%cetr	+	0.546**
		(3.609)
lnta	?	0.158
		(1.318)
lev	?	-0.304
		(0.096)
finexp	−	-0.229*
		(3.223)
direqto	−	-2.360*
		(2.794)
cfoeqto	−	1.437
		(0.454)
observations		126
likelihood ratio x^2		145.82
pseudo R^2		0.160

*$RESTATE = \alpha + \beta_1 \times TAXTO + \beta_2 \times \%CETR + \beta_3 \times LNTA + \beta_4 \times LEV + \beta_5 \times FINEXP + \beta_6 \times DIREQTO + \beta_7 \times CFOEQTO + \varepsilon$. ***, **, and * indicate significance at the .01, .05, and .10 levels. Statistics are computed based on robust standard errors clustered at the company level. RESTATE is an indicator variable with the value of one where the company files any 10-K/As to make true restatements in the body of the financial statements. TAXTO represents the auditor-provided tax services fees over total auditor fees (audit, audit related, tax, and other) for the years 2004 through 2009. %CETR stands for the percentage change in the cash effective tax rate from 2004 through 2009. LNTA represents the ln of total assets. LEV stands for the average of the combination of short-term and long-term debt over total assets for the years. FINEXP represents the number of financial experts on the audit committee. DIREQTO stands for the ratio of equity compensation over total compensation for members of the audit committee of the board of directors. CFOEQTO represents the ratio of equity compensation over total compensation for the chief financial officer.*

At the .05 significance level reside the variables of *TAXTO* and *%CETR*. As the level of auditor-provided tax services over the total auditor compensation increases, the likelihood of true restatements decreases. Thus, *TAXTO* can signal high-quality financial reporting. Instead of detracting from the signaling quality of *TAXTO*, the significance of *%CETR* actually enhances it. With the significance of *TAXTO* considered in isolation, companies could increase their spending on auditor-provided tax services relative to the total auditor compensation and improperly signal reporting quality where none exists. The combination of the two variables illustrates that the CFO request for auditor-provided tax services from the audit committee

and the audit committee's subsequent preapproval of those fees have efficient results. The reason is that knowledge spillover occurs with the auditors themselves being willing to share information with their tax professionals to enable them in turn better to provide their tax services to the client than any outside provider could without access to that information.

FINEXP and *DIREQTO* are explanatory at the .10 significance level. The fact that *TAXTO* and *%CETR* exhibit stronger statistical significance is important. Even though *FINEXP* and *DIREQTO* can easily be explained within the context of the influence of *TAXTO* and *%CETR* (previously discussed), they could also be determined to be distinct from these influences. In Table 5, the research returns mostly more of the same results as from specification one. The signs continue to be as predicted except for now including *TAXTO* with *CFOEQTO* as variants from expectations. *DIREQTO* is the only variable with statistical significance and is at the .10 level. Now, the lack of explanatory power of the variables with regard to the error corrections or restatements in specification one seems understandable. The explanatory power of the variables with regard to error corrections, which are defined as having nothing to do with the body of the financial statements but as still requiring 10-K/As to be filed, is close to the lowest of any specification save for possibly the last one.

Table 5: H3: Determinants of Error Corrections

Variables		Estimated Coefficients (x^2)
Intercept		2.468
		(0.933)
TAXTO	−	1.907
		(0.393)
%CETR	+	0.065
		(0.303)
LNTA	?	0.009
		(0.002)
LEV	?	-0.864
		(0.672)
FINEXP	−	-0.085
		(0.231)
DIREQTO	−	-3.271*
		(3.392)
CFOEQTO	−	0.439
		(0.016)
Observations		98
Likelihood ratio x^2		106.111
Pseudo R^2		0.096

$ERRORCORR = \alpha + \beta_1 \times TAXTO + \beta_2 \times \%CETR + \beta_3 \times LNTA + \beta_4 \times LEV + \beta_5 \times FINEXP + \beta_6 \times DIREQTO + \beta_7 \times CFOEQTO + \varepsilon.$
****, **, and * indicate significance at the .01, .05, and .10 levels. Statistics are computed based on robust standard errors clustered at the company level. ERRORCORR is an indicator variable with the value of one where the company files any 10-K/As to correct errors. TAXTO represents the auditor-provided tax services fees over total auditor fees (audit, audit related, tax, and other) for the years 2004 through 2009. %CETR stands for the percentage change in the cash effective tax rate from 2004 through 2009. LNTA represents the ln of total assets. LEV stands for the average of the combination of short-term and long-term debt over total assets for the years. FINEXP represents the number of financial experts on the audit committee. DIREQTO stands for the ratio of equity compensation over total compensation for members of the audit committee of the board of directors. CFOEQTO represents the ratio of equity compensation over total compensation for the chief financial officer.*

In Table 6, an equally important discovery is found as in Table 4. Just as the essential variables *TAXTO* and *%CETR* are significantly explanatory of the likelihood of true restatements to the body of the financial statements, they are even more significantly explanatory of the likelihood of true restatements with primary or secondary effects on taxes. Primary are defined (discussed previously) in the same way Seetharaman et al. (2010) do. However, they intentionally removed secondary tax from consideration. Thus, this finding also differs from what Seetharaman et al. (2010) show and demonstrates the sources of the significance that Kinney et al. (2004) left as part of their unresolved question.

Here, *TAXTO* and *%CETR* are explanatory at the .01 significance level and have the same reinforcing relationship discussed previously under Table 4. *FINEXP* is significant at the .05 level whereas *DIREQTO* is significant at the .10 level. *LNTA* is finally significant here at the .10 level. This combination of larger companies with more restatements follows what Kinney et al. (2004) find.

Table 6: H4: Determinants of Primarily or Secondarily Tax-Influential True Restatements to the Body of the Financial Statements

Variables		Estimated Coefficients (x^2)
intercept		-1.600
		(0.494)
taxto	−	-9.537***
		(6.196)
%cetr	+	1.790***
		(7.552)
lnta	?	0.386*
		(3.179)
lev	?	0.142
		(0.016)
finexp	−	-0.402**
		(5.327)
direqto	−	-2.704*
		(2.650)
cfoeqto	−	3.764
		(1.613)
observations		90
likelihood ratio x^2		95.013
pseudo R^2		0.314

*$PRIMSECTAXRESTATE = \alpha + \beta_1 \times TAXTO + \beta_2 \times \%CETR + \beta_3 \times LNTA + \beta_4 \times LEV + \beta_5 \times FINEXP + \beta_6 \times DIREQTO + \beta_7 \times CFOEQTO + \varepsilon$. ***, **, and * indicate significance at the .01, .05, and .10 levels. Statistics are computed based on robust standard errors clustered at the company level. PRIMSECTAXRESTATE is an indicator variable with the value of one where the company files any 10-K/As to make true restatements to the body of the financial statements that result directly or indirectly in changes to the income tax components of the financial statements. TAXTO represents the auditor-provided tax services fees over total auditor fees (audit, audit related, tax, and other) for the years 2004 through 2009. %CETR stands for the percentage change in the cash effective tax rate from 2004 through 2009. LNTA represents the ln of total assets. LEV stands for the average of the combination of short-term and long-term debt over total assets for the years. FINEXP represents the number of financial experts on the audit committee. DIREQTO stands for the ratio of equity compensation over total compensation for members of the audit committee of the board of directors. CFOEQTO represents the ratio of equity compensation over total compensation for the chief financial officer.*

In Table 7, the findings of Table 4 under specification two are diminished slightly. In specification two, the relationship between *TAXTO* and true restatements in general is shown.

Table 7: H5: Determinants of Non-Tax-Influential True Restatements to the Body of the Financial Statements

Variables		Estimated Coefficients (x^2)
intercept		2.703
		(0.513)
taxto	−	0.045
		(0.000)
%cetr	+	-0.650
		(0.989)
lnta	?	0.310
		(1.370)
lev	?	-3.937
		(1.381)
finexp	−	-0.279
		(1.118)
direqto	−	-2.640
		(0.389)
cfoeqto	−	-2.148
		(0.292)
observations		36.00
likelihood ratio x^2		37.645
pseudo R^2		0.210

*$NONTAXRESTATE = \alpha + \beta_1 \times TAXTO + \beta_2 \times \%CETR + \beta_3 \times LNTA + \beta_4 \times LEV + \beta_5 \times FINEXP + \beta_6 \times DIREQTO + \beta_7 \times CFOEQTO + \varepsilon$. ***, **, and * indicate significance at the .01, .05, and .10 levels. Statistics are computed based on robust standard errors clustered at the company level. NONTAXRESTATE is an indicator variable with the value of one where, within the category of true restatements to the body of the financial statements, tax-influential restatements are excluded to leave these components. TAXTO represents the auditor-provided tax services fees over total auditor fees (audit, audit related, tax, and other) for the years 2004 through 2009. %CETR stands for the percentage change in the cash effective tax rate from 2004 through 2009. LNTA represents the ln of total assets. LEV stands for the average of the combination of short-term and long-term debt over total assets for the years. FINEXP represents the number of financial experts on the audit committee. DIREQTO stands for the ratio of equity compensation over total compensation for members of the audit committee of the board of directors. CFOEQTO represents the ratio of equity compensation over total compensation for the chief financial officer.*

However, this investigation of the relationship with non-tax-influential restatements shows no significance for *TAXTO* or any other variable in fact. For once, *CFOEQTO* follows the predicted sign. *TAXTO* does not follow the predicted sign but is so ineffective in explanatory power that it does not even matter.

In Table 8, specification six investigates how the variables' relationships with the likelihood of restatements change in the context of second occurrences of different tax issues within the 10-K/As for any company. Only *FINEXP* varies from the expected sign. There is no statistically significant variable, but *TAXTO* and *%CETR* are extremely powerful explanatory variables. Thus, the documented combined effect of those two is present to some extent in this specification. *DIREQTO* is the other variable with explanatory power here as has become the usual case in this series of investigations.

Table 8: H6: Determinants of Two or More Occurrences of Primarily or Secondarily Tax-influential True Restatements to the Body of the Financial Statements

Variables		**Estimated Coefficients (x^2)**
intercept		1.792
		(0.204)
taxto	−	-9.624
		(2.089)
%cetr	+	1.913
		(2.169)
lnta	?	0.041
		(0.009)
lev	?	0.806
		(0.237)
finexp	−	0.102
		(0.089)
direqto	−	-3.759
		(1.676)
cfoeqto	−	-0.930
		(0.047)
observations		40
likelihood ratio x^2		41.461
pseudo R^2		0.310

$TWORESTATE = \alpha + \beta_1 \times TAXTO + \beta_2 \times \%CETR + \beta_3 \times LNTA + \beta_4 \times LEV + \beta_5 \times FINEXP + \beta_6 \times DIREQTO + \beta_7 \times CFOEQTO + \varepsilon$.
****, **, and * indicate significance at the .01, .05, and .10 levels. Statistics are computed based on robust standard errors clustered at the company level. TWORESTATE is an indicator variable with the value of one where, within the category of tax-influential restatements, there are more than two occurrences of tax issues for filing 10-K/As. TAXTO represents the auditor-provided tax services fees over total auditor fees (audit, audit related, tax, and other) for the years 2004 through 2009. %CETR stands for the percentage change in the cash effective tax rate from 2004 through 2009. LNTA represents the ln of total assets. LEV stands for the average of the combination of short-term and long-term debt over total assets for the years. FINEXP represents the number of financial experts on the audit committee. DIREQTO stands for the ratio of equity compensation over total compensation for members of the audit committee of the board of directors. CFOEQTO represents the ratio of equity compensation over total compensation for the chief financial officer.*

In Table 9, the lead finding of Seetharaman et al. (2010) is tested. However, this specification produces no variables with statistical significance. Two factors should be considered. This specification has the smallest number of observations, and this research does involve the different data set. Nevertheless, the relationship between *TAXTO* and the likelihood of primary tax effect restatements is not statistically significant. However, just as in specification six documented in Table 8, *TAXTO* and *%CETR* are powerfully explanatory of the indicator variable.

Implications

Based on specifications two and four in particular, the implications are that companies cannot just spend more on auditor-provided tax fees to signal the market place of quality where there is none. Indeed, the quality reporting companies do spend more on auditor-provided tax fees as the percentage of total auditor fees. However, this spending is effective to signal quality only where the increased percentage of tax fees has tangible results in actually reducing the CETR and only where there are sufficient financial experts on the audit committees (who must pre approve tax fees from the auditors). Essentially, audit committee members have to be efficient in their utilization of higher percentages of tax services from their auditor and not just approve higher payments for the typical auditor-provided tax services as some process toward paying more for the same services to elicit better audit opinions. Directors are substantially more likely to

be penalized with the loss of their post and subsequent damages for not sufficiently guiding their companies toward presenting financial statements free of material misstatements than they are for not adequately guiding their companies toward lowering their CETRs.

Table 9: H7: Determinants of Primarily Tax-Influential True Restatements to the Body of the Financial Statements

Variables		**Estimated Coefficients (x^2)**
intercept		-14.933
		(1.489)
taxto	−	-6.370
		(0.715)
%cetr	+	0.956
		(0.714)
lnta	?	0.923
		(0.714)
lev	?	4.680
		(1.829)
finexp	−	0.080
		(0.046)
direqto	−	-1.284
		(0.070)
cfoeqto	−	12.263
		(1.512)
observations		26
likelihood ratio x^2		27.313
pseudo R^2		0.339

*$PRIMTAXRESTATE = \alpha + \beta_1 \times TAXTO + \beta_2 \times \%CETR + \beta_3 \times LNTA + \beta_4 \times LEV + \beta_5 \times FINEXP + \beta_6 \times DIREQTO + \beta_7 \times CFOEQTO + \varepsilon$. ***, **, and * indicate significance at the .01, .05, and .10 levels. Statistics are computed based on robust standard errors clustered at the company level. PRIMTAXRESTATE is an indicator variable with the value of one where companies file any 10-K/As to make true restatements to the body of the financial statements for FAS 109, deferred tax, state tax, etc. changes (the specification with significance in Seetharaman et al. [2010]). TAXTO represents the auditor-provided tax services fees over total auditor fees (audit, audit related, tax, and other) for the years 2004 through 2009. %CETR stands for the percentage change in the cash effective tax rate from 2004 through 2009. LNTA represents the ln of total assets. LEV stands for the average of the combination of short-term and long-term debt over total assets for the years. FINEXP represents the number of financial experts on the audit committee. DIREQTO stands for the ratio of equity compensation over total compensation for members of the audit committee of the board of directors. CFOEQTO represents the ratio of equity compensation over total compensation for the chief financial officer.*

Thus, where audit committees give their approval for higher tax fees as percentages of the total fees paid to their auditors, they are signaling their confidence in the financial statements and therein the low possibility of restatements. They would not spend an extra moment considering whether to approve any tax fees if not for expressing belief in the financial statements and internal controls as they stand with the penalties they would otherwise experience. Even with belief in the quality of the financial statements to move on to consider tax minimization, audit committee members would only do so with confidence in their comprehension of the process. Financial experts have the qualifications or experience to understand the audit process and the financial statements. As there are more financial experts on the audit committee, the audit committee's confidence in the quality of the financial statements that are of high quality is sufficient for them to move on to consider tax minimization.

Furthermore, as the percent of their compensation moves toward the long term (equity rather than cash), these audit committee members would even less likely chance the possibility of restatements from not spending an extra moment on the review of the financial statements rather than considering tax minimization opportunities from their auditors. In general, compensation for directors should be geared more toward equity than cash as the chances of restatement decrease with that situation in play. Just as Kinney et al. (2004) discover the relationship between auditor-provided tax services fees and restatements as their secondary finding left for someone else to develop, this paper's discovery of the importance of moving toward the greater proportion of equity as director compensation in the context of these error corrections and restatements is left for others to pursue.

CONCLUSION

This paper finally resolves the implicit question left from Kinney et al.'s (2004) *Journal of Accounting Research* with regard to why higher levels of auditor-provided tax services lower the chances of restatements. In resolving this question, this paper becomes the first to investigate the relationship between auditor-provided tax services and restatements with proxies to represent the motivations of the audit committee and chief financial officers. After logistic regression of seven specifications, higher levels of auditor-provided tax services, financial experts, and long-term director compensation are shown to be inversely and statistically significantly related to all restatements and (more strongly) to tax-influential restatements. The cash effective tax rate directly and statistically significantly relates to those specifications, showing that just increasing spending on these tax services cannot signal high-quality financial reporting in the absence of effective utilization.

There are limitations to the results as hundreds of thousands of company years are not utilized in the logistic regressions. However, as Wilson (2010) shows, the data set of only 30 matched pairs is sufficient not only to show evidence of specific relationships in logistic regression but also more impressively to establish models for future research. Furthermore, the extraordinary number of specifications should provide sufficient robustness to find confidence in these results. The unreported results that are mentioned throughout the discussion of this research should further bolster these findings. As disclosure requirements become more comprehensive, future research can examine what types of auditor-provided tax services fees in particular relate to restatements. For instance, whether higher tax compliance fees or higher tax planning fees relate to the incidence of restatement could then be tested. Also, future research can look at these effects in the International Financial Reporting Standard (IFRS) context. The UK market would be the likely target.

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BIOGRAPHY

Kevin A. Diehl, JD, CPA, is an assistant professor of accounting at Western Illinois University. He can be reached at KA-Diehl@wiu.edu.

IS THE IRS A SORE LOSER?

Laura Lee Mannino, St. John's University

ABSTRACT

Like all administrative agencies, the Internal Revenue Service is given a fair amount of authority to enforce the laws enacted by Congress. Taxpayers often question the amount of authority granted to the Internal Revenue Service, and whether such authority is abused. In some situations this questioning of authority leads to litigation, resulting in both wins and losses for the Internal Revenue Service. From time to time, the Internal Revenue Service will respond to losses by creating a new rule or amending an existing one. Recent examples in the judicial system highlight the issue of administrative authority, and beg the question: Is the Internal Revenue Service a sore loser?

JEL: H24, H26, H32, M42, M48

KEYWORDS: Administrative authority, Internal Revenue Service, response to litigation

INTRODUCTION

Congress delegates certain authority to the Treasury Department through the Internal Revenue Code (Code). For example, Congress states that "the administration and enforcement of [the Code] shall be performed by or under the supervision of the Secretary of the Treasury" (26 USC § 7801). In addition, "the Secretary shall prescribe all needful rules and regulations for the enforcement" of the Code (26 USC § 7805). It is pursuant to these grants of power from Congress that the Treasury Department and the Internal Revenue Service (IRS) issue regulations. Taxpayers have questioned the IRS's powers in a series of recent cases, and the IRS has responded by exercising even more authority.

The issue addressed in this paper is whether the Treasury Department and IRS are permitted to change regulations following a loss in court. Prior literature has addressed issues relating to deference, conflict between administrative rules and judicial decisions, proper rulemaking procedures and policy aspects of tax litigation. This paper adds to the literature by describing how courts are responding to regulations that are issued or changed in direct response to adverse litigation. Although the particular issues in these cases relate to taxation, the outcomes relating to the authority of the Treasury Department are wide reaching in that the holdings are not limited to the Treasury Department, but rather are applicable to all administrative agencies.

The next section summarizes previous literature related to the topic. The Recent Cases section describes the facts and outcomes of two judicial proceedings that the Treasury Department directly responded to by issuing or amending regulations. The next sections, Discussion and Unresolved Issues, describe how the courts are responding to these regulations, followed by Concluding Comments.

LITERATURE REVIEW

Much of the literature relates to the deference given by courts to the rules and regulations of administrative agencies. Gans (2002) tracked how the deference standard changed over time in the context of tax law, noting that *Chevron v. U.S.* had a "transformative impact" on administrative authority. His discussion of deference centered on two cases decided by circuit courts of appeals in the 1990s, both having similar generation-skipping tax issues. Although the government had been successful in one of the cases, it had lost the other. Following the loss, it amended the relevant regulation to conform to the arguments that had resulted in success, an act that Gans described as "the government declar[ing] victory

by regulation." The article does not indicate whether a taxpayer sought invalidation of the amended regulation in the court system, but rather the author himself questioned whether the amended regulation was valid given changes to the deference landscape, including the Supreme Court's decision in *Chevron*. Berg (2008) provided a more recent review of judicial deference.

Before the Supreme Court handed down its 2011 decision in *Mayo Foundation*, Pruitt (2011) argued that *National Muffler* rather than *Chevron* provided the correct standard of deference for interpreting Code section 7805(b). In reaching this conclusion he suggested that attempts by the Internal Revenue Service (IRS) "to overturn court decisions through the agency rulemaking process do not warrant heightened deference." Given the ambiguity surrounding the proper deference standard, the American Bar Association Section of Taxation formed the Task Force on Judicial Deference in 2000. The Task Force ultimately recommended that the proper deference standard with regard to regulations should turn on whether the regulation in question was legislative or interpretive in nature. (Salem et al. 2004).

Conflict between Treasury Regulations and court decisions has also been examined. Polsky (2004) argued that the check-the-box regulations are invalid because they conflict with a prior interpretation of the relevant statutory language by the Supreme Court in a decision that was handed down approximately 60 year earlier. He also suggested that the Treasury Department often "attempts to 'fix' a Supreme Court interpretation" that it does not agree with. However, Geyser (2006) argued that an agency could never overrule a judicial decision because agencies act within boundaries that are defined by the judicial system.

Other literature has addressed the requirements for agency rulemaking, which are found in the Administrative Procedure Act of 1946 (APA). Hickman (2007) concluded that the Treasury Department often fails to comply with the APA. She later examined why more taxpayers do not seek to invalidate regulations on procedural grounds (Hickman 2008).

The policy implications of tax litigation were addressed by Howard (2002). He argued that the IRS changes its rules as a response to expensive litigation and adverse decisions, thereby making the tax system more efficient and equitable. Another aspect of litigation was covered by Lavoie (2008), who examined the factors that should be considered when developing the IRS's controversy position standards. He described the dual roles of the IRS – to collect revenue through enforcement of the Internal Revenue Code while maintaining an efficient and fair tax system – and noted the link between taxpayer compliance and perceptions as to whether the tax system is fair.

RECENT CASES

FICA and Medical Residents

In recent years the Internal Revenue Service (IRS) has been battling with hospitals over whether stipends paid to medical residents are subject to Federal Insurance Contributions Act (FICA) taxes. A "student" that works for a "school, college, or university" is exempt from FICA under an exception in the Internal Revenue Code (Code), and many hospitals have claimed that their residents are students and are therefore eligible for the exemption (26 USC § 3121(b)(10)). The argument rests on the fact that the purpose of a residency program is to train new doctors and provide them with the experience necessary to obtain their licenses to practice medicine.

Regulations previously in effect expanded on the statutory language. The prior regulation stated that the determination of whether an employee was a student would be based on "the relationship of [the] employee with the organization for which services are performed." Further, an individual who performed services "in the employ of a school, college, or university, as an incident to and for the purpose of pursuing a course of study at such school, college, or university" would be considered a student (26 CFR

§ 31.3121(b)(10)-2(c)(2003)). In addition, the prior regulation held that the term "school, college, or university" should be "taken in its commonly or generally accepted sense" (26 CFR § 31.3121(b)(10)-2(d)(2003)).

Mayo Foundation is a not-for-profit organization having medical education and scientific research as its charitable purposes. Under the umbrella of Mayo Foundation is the Mayo Graduate School of Medicine, which operates roughly 150 residency programs. Approximately 1,000 residents participate in the programs at any given time, with a typical residency lasting from three to seven years. Residents are required to attend lectures, read and take examinations, however the bulk of their learning is clinical in nature and occurs from doing rounds with attending physicians. Residents spend anywhere from fifty to eighty hours each week doing rounds. They are not hired or fired, but rather must apply and be admitted into the program. Further, there is no expectation of continued employment after the residency program is completed. Residents do not pay tuition but instead receive a stipend, which for the years at issue ranged from $40,000 to $60,000. The taxation of these stipends was the issue in *Mayo Foundation v. U.S.* (131 S.Ct. 704, 2011).

Both Mayo Foundation and the IRS agreed that the stipends were subject to income tax. However, they disagreed as to whether the stipends were subject to FICA. Mayo Foundation believed that the residents were within the student exception and the stipends were not subject to FICA. Mayo Foundation argued that it was a "school, college, or university" and that its residents were "students," as those terms are used in the Code and interpreted by Treasury Regulations then in effect. Since the regulations provided that the term "school, college, or university" should be taken in its generally accepted sense, Mayo Foundation provided dictionary definitions to show that it easily fell within the terms. It also provided credible testimony from residents that the only reason they enrolled in the residency program was to learn.

The government argued, on the other hand, that a "primary purpose" test should be applied in order to determine whether an organization is a school, college or university. Since Mayo Foundation's primary purpose was patient care, argued the government, it should not be treated as a school, college or university. With regard to whether residents could be considered students, the government argued in the negative because the services performed by the residents were not "incident to learning" as the regulation required. The government argued that the opposite was true; because the residents worked between fifty and eighty hours per week, the learning was incident to the services, and therefore the statutory exception was not satisfied.

The Federal District Court for the District of Minnesota held for the taxpayer (*Mayo Foundation*, 282 F.Supp. 2d 997, 2003). Mayo Foundation was considered by the court to be a school, college or university and the residents were considered to be students. Therefore, the stipends paid to them were not subject to FICA. In its opinion, the court specifically rejected the arguments put forth by the government. First, the district court pointed out that a "primary purpose" test shouldn't be read into the regulation because it did not in fact contain such requirement. The court further note that *even if* a "primary purpose" test applied, the taxpayer would satisfy the test because the taxpayer is a non-profit institution having medical education and scientific research as its charitable purposes. With regard to the government's argument as to why residents could not be considered students, the district court stated that "[t]ime alone cannot be the sole measure of the relationship between services performed and a course of study" (*Mayo Foundation*, 282 F.Supp. 2d 997, 2003).

Within a few months of its loss in *Mayo Foundation*, the Treasury Department and IRS issued amended regulations. Pursuant to the amended regulation, an organization is a school, college or university as that term is used in the Code "if its primary function is the presentation of formal instruction, it normally maintains a regular faculty and curriculum, and it normally has a regularly enrolled body of students in

attendance at the place where its educational activities are regularly carried on" (26 CFR § 31.3121(b)(10)-2(c)).

The amended regulation also changed the definition of student. Although the regulation still states that an employee shall be treated as a student if the services provided are incident to and for the purpose of pursing a course of study, it now says that the educational aspect of the relationship between the employer and employee must be "predominant." The regulation expands on this predominance factor, stating that "[t]he evaluation of the service aspect of the relationship is not affected by the fact that the services performed by the employee may have an educational, instructional, or training aspect" (26 CFR § 31.3121(b)(10)-2(d)(3)). Further, the regulation states that a full-time employee – defined as someone who regularly works forty hours or more per week – cannot be considered a student because the services of a full-time employee are not incident to education (26 CFR § 31.3121(b)(10)-2(d)(3)(iii)).

It is interesting to note that the Treasury Department and IRS's new interpretations of the terms "school, college, and university" and "student" were those specifically rejected by the Federal district court in *Mayo Foundation*.

Statute of Limitations

The IRS is currently litigating an issue relating to the statute of limitations for audits. Generally, the IRS has three years from the filing of a Federal income tax return to assess an additional tax (26 USC § 6501(a)). However, the Code provides that the statute of limitations is extended to six years when a taxpayer "omits from gross income an amount properly includible therein which is in excess of 25 percent of the amount of gross income stated in the return" (26 USC § 6501(e)(1)(A)). If a taxpayer improperly overstates the tax basis of an asset, the result is an understatement of income from the sale of the asset. The issue in these cases is whether the understatement of income that results from an overstatement of basis is considered an omission of income, thereby triggering the six-year statute of limitations.

The U.S. Supreme Court addressed this issue in 1958 in *Colony v. Commissioner* (357 U.S. 28, 1958). *Colony* involved a corporation in the real estate business that overstated the basis of land it sold. The result was an understatement of gross income that was more than twenty-five percent of the gross income shown on the return. The IRS argued that the extended statute of limitations applied, and the Court of Appeals for the Sixth Circuit agreed (*Colony*, 244 F.2d 75, 1957). However, the U.S. Supreme Court reversed on appeal. The Court examined the legislative history of the statutory language and determined that Congress intended the extended statute of limitations to apply only in situations where a taxpayer "actually omitted" an item of income and not when there are "errors in computation arising from other causes" (*Colony*, 357 U.S. 28, 1958). The Court further explained:

> Congress manifested no broader purpose than to give the Commissioner an additional [number of] years to investigate tax returns in cases where, because of a taxpayer's omission to report some taxable item, the Commissioner is at a special disadvantage in detecting errors. In such instances the return on its face provides no clue to the existence of the omitted item. On the other hand, when, as here, the understatement of a tax arises from an error in reporting an item disclosed on the face of the return the Commissioner is at no such disadvantage. And this would seem to be so whether the error be one affecting "gross income" or one, such as overstated deductions, affecting other parts of the return (*Colony*, 357 U.S. 28, 1958).

Accordingly, the Court held that the extended statute of limitations does not apply to understatements of gross income due to overstatements of basis.

In 2007, the U.S. Tax Court addressed whether *Colony* applies outside the context of a trade or business in *Bakersfield v. Commissioner* (128 T.C. 207, 2007). *Bakersfield* involved a limited partnership that overstated its basis in oil and gas property. The IRS claimed that *Colony* only applied in the context of a trade or business, and since *Bakersfield* involved an investment the six-year statute of limitations should apply because the taxpayer's basis error resulted in a substantial omission of gross income. However, the Tax Court held against the IRS on the basis that it was bound by *Colony* and therefore the three-year statute of limitations applied (*Bakersfield*, 128 T.C. 207, 2007). The IRS appealed to the Court of Appeals for the Ninth Circuit, which affirmed the Tax Court (*Bakersfield*, 568 F.3d 767, 2009). In so holding, the Ninth Circuit noted that the Supreme Court in *Colony* "did not even hint that its interpretation of [the Code] was limited to cases in which the taxpayer was engaged in a 'trade or business.' There is no ground for suggesting the Court intended the same language…to apply differently to taxpayers in a trade or business than to other taxpayers" (*Bakersfield*, 568 F.3d 767, 2009).

The IRS didn't give up, however. In 2009, the IRS asked the Tax Court to reconsider its *Bakersfield* holding in *Intermountain v. Commissioner* (98 TCM 144, 2009). The taxpayer in *Intermountain*, a partnership, filed its 1999 Federal income tax return on September 15, 2000, which contained a loss that was overstated due to an overstated basis. On September 14, 2006, just one day less than six years later, the IRS issued a notice of Final Partnership Administrative Adjustment (FPAA). The taxpayer claimed that the FPAA was untimely because the three-year statute of limitations had long expired. Further, the taxpayer cited *Bakersfield* for the proposition that an overstatement of basis does not trigger the six-year statute of limitations. The IRS, however, claimed that the Tax Court had incorrectly decided *Bakersfield*.

The Tax Court disagreed with the IRS, stating that *Bakersfield* "is directly on point" (*Intermountain*, 98 TCM 144, 2009). Expressly declining the IRS's "invitation to overrule it," the Tax Court reaffirmed its holding in *Bakersfield*, which had since been affirmed by the Ninth Circuit (568 F.3d 767, 2009), and held once again that the six-year statute of limitations is not triggered by an overstatement of basis.

The IRS issued temporary regulations in September 2009, less than a month after the Tax Court ruled against it in *Intermountain*. The temporary regulations state that "an understated amount of gross income resulting from an overstatement of unrecovered cost or other basis constitutes an omission from gross income" for purposes of the extended statute of limitations (26 CFR §§ 301.6229(c)(2)-1T and 301.6501(e)-1T). These regulations have since been finalized.

These cases present interesting questions. Specifically, is the IRS permitted to create or change a rule following a loss in the judicial system? If so, can the new rule reflect a position that contradicts a court's previous interpretation of a statute?

DISCUSSION

The U.S. Supreme Court recently answered the first question with a resounding "yes" (*Mayo Foundation*, 131 S.Ct. 704, 2011). The Court was not troubled at all in *Mayo Foundation v. U.S.* by the fact that the Treasury Department changed the regulations relating to the student exception to Federal Insurance Contributions Act (FICA) as a response to adverse litigation. To the contrary, the Court stated that it "found it immaterial to [its] analysis that a 'regulation was prompted by litigation'" (*Mayo Foundation*, 131 S.Ct. 704, 2011). The Court amplified the point by noting that in the past it has "expressly invited the Treasury Department to 'amend its regulations' if troubled by the consequences of [its] resolution of the case" (*Mayo Foundation*, 131 S.Ct. 704, 2011).

The Supreme Court has stated that an administrative agency's interpretation will be upheld if Congress did not speak directly to the question at issue and if the regulation is a permissible interpretation of the statute (*Chevron*, 467 U.S. 837, 1984). It has been noted, however, that more than one permissible

interpretation can exist (*Mayo Foundation*, 568 F.3d 675, 2009). Accordingly, the Treasury Department can amend an otherwise reasonable regulation in response to adverse litigation as long as the amended regulation is also a permissible, albeit different, interpretation (*Mayo Foundation*, 568 F.3d 675, 2009). Ultimately, *Mayo Foundation* was resolved by the Supreme Court in favor of the government (131 S.Ct. 704, 2011). The Court concluded that the amended regulation is a reasonable interpretation of the statutory language. The result is that medical residents are not students, and the stipends they receive are subject to FICA.

The current status of *Intermountain* also favors the government. Reversing the Tax Court opinion, the Court of Appeals for the District of Columbia recently upheld the current regulation which states that an overstatement of basis triggers the six-year statute of limitations (*Intermountain*, 650 F.3d 691, 2011). However, that result may change once the Supreme Court hands down its decision in a similar case described below.

UNRESOLVED ISSUE

What if the court that had previously interpreted the statutory language was the Supreme Court of the United States, and it had held that the statutory language is clear and unambiguous such that an administrative interpretation is unnecessary? Can the Treasury Department still issue a regulation in response to the adverse litigation? Such was the situation in *Intermountain*. The current regulation appears to conflict with the Supreme Court's holding in *Colony* (357 U.S. 28, 1958). The government argues that no conflict exists because *Colony* involved an overstatement of basis within the context of a trade or business, whereas *Intermountain* occurred outside of such context.

This statute of limitations issue has arisen in other factually similar cases in several circuits with varying results. In February 2011 the Fourth Circuit Court of Appeals held for the taxpayer in one such case, *Home Concrete & Supply, LLC v. Commissioner* (634 F.3d 249, 2011). Following its loss, the government filed a Petition for a Writ of Certiorari with the U.S. Supreme Court, which was granted on September 27, 2011 (S.Ct., Docket #11-139, 2011). Oral arguments were heard on January 17, 2012 and a decision is expected by the end of June 2012.

CONCLUDING COMMENTS

The Supreme Court has recently reiterated that the Treasury Department is permitted to create or amend a regulation following a loss in court. As long as the regulation is a reasonable interpretation of the statute, it is not inappropriate for the new regulation to conflict with a court's previous holding. Whether that also applies to holdings of the High Court remains to be seen as the Supreme Court's imminent decision in *Home Concrete* will finally resolve the issue for all circuits. Future research may address how the Supreme Court's holdings in *Mayo Foundation* and *Home Concrete* will affect areas of law outside of taxation, where agencies other than the Treasury Department interpret federal statutory law.

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BIOGRAPHY

Laura Lee Mannino is an Associate Professor in the Department of Accounting and Taxation at St. John's University. She can be reached at St. John's University, 8000 Utopia Parkway, Queens, NY 11439, or by email at manninol@stjohns.edu.

DISTANCES AND NETWORKS: THE CASE OF MEXICO

Linda Margarita Medina Herrera, Tecnológico de Monterrey
Ernesto Armando Pacheco Velázquez, Tecnológico de Monterrey

ABSTRACT

The influence of six different distances on the structure of minimum spanning trees is presented in this paper. Measures of complex networks are built based on the closing prices of stocks of the main companies traded on the Mexican Stock Market. We find that the City block and Chi distances not only match, but also determine more precisely the central vertex, the level of the tree and the clusters formed by the economic sector. The trees formed using Minkowski distances have similar structures and show a disadvantage when classifying the vertices. The construction and telecommunication sectors are most important within the trees, regardless of the distance used.

JEL: C02, C22, C38, C45, C61, C8, D85

KEYWORDS: Stock market network. Econophysics. Distances. Minimum spanning tree.

INTRODUCTION

In 1926 the Czech scientist Otakar Boruvka developed an algorithm that allowed creation of an electrical network in Moravia using a minimal amount of cable. The idea of joining the vertices with cables more efficiently, has been studied extensively in graph theory by spanning trees, which is a plot of N objects (vertices or nodes) connected by N-1 arcs. Among all the spanning trees, the minimum spanning tree is the one that minimizes the weight of the tree (the sum of its arcs).

Minimum spanning trees have been widely used to analyze financial assets behavior. In this type of financial trees the nodes or vertices are assets and the arcs are distances, constructed from the correlation coefficient. One of the most interesting applications of the minimum spanning tree is portfolio optimization. By using special measures in the tree, the central vertex (the center of mass or the vertex with the greatest influence) is selected, vertices are classified according to their distance to the central vertex and finally a function that minimizes portfolio risk is established. Minimum risk assets are located in the outer branches of the tree, while higher returns assets are near the central vertex. Minimum spanning trees have been also used to analyze financial assets behavior at different points in time allowing for extraction of information in times of crisis.

The Euclidean distance has usually been used to build the trees, since the distances are obtained from the correlation matrix in a very simple way. However, there is no evidence that Euclidean distance is the most suitable. One contribution of this paper is that there are distances that distinguish more adequately the central vertex and other important characteristics of minimum spanning trees. An empirical result is obtained from the construction and analysis of six spanning trees whose vertices are the main companies in the Mexican Stock Market (Bolsa Mexicana de Valores).

The Mexican stock market is one of the most important in Latin America and one of the ten big emerging markets. Recently, an a number of Mexican companies have been involved worldwide in mergers and acquisitions.

The main objective of this paper is twofold. First, it is relevant to study the influence of different distances in the structure of minimum spanning trees. Second, the measures of complex networks that are built based on the closing prices of stocks of the main companies traded at the Mexican Stock Market.

LITERATURE REVIEW

Fundamental work in financial networks appears in the late eighties. Mategna and Bonano introduced the concept of graphs in the financial market environment as a method for finding hierarchical arrangements of stocks through the study of clusters of companies; see Mantegna and Stanley (2000), Bonano et all (2000).

Notions of minimal spanning trees as random matrix theory have been of interest in the study of financial correlation matrices. The properties of random matrices combined with the power of minimum spanning trees have made it possible to examine the movements of major stock markets (Bonano et all (2003) in America, Jung et all (2006) in Korea, Medina (2007) in Mexico, Eom et all (2009) in Japan, and Tabak et all (2010) Brazil). Minimal spanning trees also allowed us to analyze global financial indices (Tumminello (2010) and Medina (2012) and other financial assets; Miccichè et all (2003)).

Modeling the correlation matrix of a complex system with tools of hierarchical clustering has been useful in multivariate characterization of stock return time series (Mantegna, 1999; Bonanno et all, 2001, 2003), market index returns of worldwide stock exchanges (Bonanno et all, 2000). The estimation of statistically reliable properties of the correlation matrix is important for several financial decision processes such as asset allocation, portfolio optimization (Tola et all, 2008), derivative pricing, etc. Bonano et all, Medina (2011) and Tabak et all (2010), employ a dynamic approach using complex network measures and find that the relative importance of different sectors within the network varies. Miccichè et all (2003) found that minimum spanning trees of asset returns is characterized by stock degree values, which are more stable in time than those obtained by analyzing a minimum spanning tree computed starting from volatility time series.

Tumminello et all (2010) discuss how to define and obtain hierarchical trees, correlation based trees and networks from a correlation matrix. Tola et all (2008) show that the use of clustering algorithms can improve the reliability of the portfolio in terms of the ratio between predicted and realized risk.

A review of the main topological measures is found in Barthélemy et all (2005), for instance the central vertex, the most strongly connected node of the tree and the Mean Occupation Layer. Onnela et all (2003) show that during crashes, due to the strong global correlation in the market, the tree shrinks topologically, and this is shown by a low value of the mean occupation layer. Another central measure in complex network theory is the clustering coefficient. A large number of networks show a tendency to link formation between neighboring vertices. This tendency is called clustering. Clustering around a vertex is quantified by the clustering coefficient. Ledoit and Wolf (2003) present various generalizations of the clustering coefficient and a comparative study of the several suggestions introduced in the literature.

The empirical tree has features of a complex network that cannot be reproduced, even as a first approximation, by a random market model or by the one-factor model. Several papers have shown that the use of these tools may help in the design of portfolio strategies and risk assessment. Ledoit and Wolf (2003), Tola (2008), Eom (2009). Onnela et all (2003) analyze dynamic trees, that is, with windows in time, to show that the assets of the Markowitz optimal portfolio are virtually all the time in the external branches of the tree. The correlation matrix can be used to extract information about aspects of the hierarchical organization of such a system; Mantegna (1999), Saramaki (2007). The clustering procedure is done by using correlation between pairs of elements as a similarity measure and by applying a clustering algorithm to the correlation matrix (Cukur et all, 2007).

The statistical reliability of hierarchical trees and networks is depending on the statistical reliability of the sample correlation matrix, a bootstrap approach has been used to quantify the statistical reliability of both hierarchical trees and correlation based networks (Tumminello et all, 2007). Ledoit ang Wolf (2003) developed a method to estimate the covariance matrix of stock returns by an optimally weighted average of two existing estimators, the sample covariance matrix and single-index covariance matrix. Tumminello et all (2007) studied topological properties such as the average length of shortest paths, the betweenness and the degree are computed on different planar maximally filtered graphs generated by sampling the returns at different time horizons. Their empirical results show the effect is varying with the sampling time horizon. The more structured network is observed for the intraday time horizon.

In this article we use the correlation matrix to construct a minimum spanning tree on the Mexican Stock Market, calculating the main measures and conglomerates, which will be compared with those obtained using other distances. This article contributes to the literature in at least two ways. First showing that there are distances as Chi Square and City Block that distinguish in clear, clusters and hierarchies as well as building a more suitable Mean Occupation Layer for use in portfolio optimization. Secondly, it shows an empirical study of minimal spanning trees on the Mexican Stock Market that expands the understanding of stock market movements and determines the economic sectors that dominate the Mexican market over time.

The remainder of the paper is organized as follows. Section three deals with distances. The main measures are calculated in order to analyze the structure of the trees. In section four data and methodology are presented, in section five the empirical results are examined. The last section presents conclusions and final considerations.

DISTANCES AND MINIMAL SPANNING TREES

Let N be the number of stocks with price $P_i(t)$ for asset i over time, with $t = 0, 1, \ldots T$. Taking $S_i(t)$ as the log of asset returns. $S_i(t) = \ln P_i(t) - \ln P_i(t-1)$ and standardizing the series $Z_i(t) = Z_{it}$ is obtained. The used distances are as follows.

Euclidean distance: The Euclidean distance between two points A and B is the magnitude of the vector connecting A with B, i.e.

$$d^2(Z_i, Z_j) = \sum_{k=1}^{T} \left(Z_{ik} - Z_{jk}\right)^2 = 2 - 2\,p_{ij}$$

Where ρ_{ij} is the coefficient of correlation between Z_i and Z_j.

Manhattan distance or City Block distance

.

$$d_M(Z_i, Z_j) = \sum_{k=1}^{T} |Z_{ik} - Z_{jk}|$$

$$d_M(Z_i, Z_j) = \sum_{k=1}^{T} |Z_{ik} - Z_{jk}|$$

Minkowski distance

$$d_m(Z_i, Z_j) = \left(\sum_{k=1}^{T} |Z_{ik} - Z_{jk}|^m \right)^{1/m}$$

In this article we use m = 3 and m = 4. The Euclidean distance corresponds to m = 2.

Chi-square distance: Chi-square distance between Z_i and Z_j with weights w_i, $i = 1, 2, 3, \ldots, T$ is

$$d_{\chi^2}(Z_i, Z_j) = \sum_{k=1}^{T} w_k (Z_{ik} - Z_{jk})^2$$

The chi-square distance can standardize the distances in terms of ranges or standard deviations. The weights are found in two ways:

Firstly $w_i = \frac{1}{S_i}$ where S_i is the standard deviation of the stock prices of day i and $i = 1, 2, 3, \ldots, T$.
Secondly, $w_i = \frac{1}{R_i}$ where R_i is the range of the stock prices of day i and $i = 1, 2, 3, \ldots, T$.

A spanning tree is a graph of N objects (vertices or nodes) connected by N-1 arcs that allow jumps from one vertex to any other. If each arc represents a distance or cost, or in general if each arc is associated with a weight (a real number), the sum of the weights of all sides of a tree will be the total weight of the tree. A minimum spanning tree is a spanning tree that minimizes the total weight of the tree. Let´s briefly review the different measures and parameters that allow a first statistical characterization of trees.

Let a_{ij} the adjacency matrix whose elements take the value of 1 if an edge connects vertex *i* to vertex *j* and 0 otherwise. Weighted trees are usually described by a matrix w_{ij} specifying the weight on the edge connecting the vertices *j and i*. If the nodes *i* and *j* are not connected then $w_{ij} = 0$.

The degree of vertex *i*, k_i, is the number of nodes directly connected to node i, that is, the number of elements that comprise the neighborhood of *i*, *V(i)*. Along with the degree of the vertex, a significant property of trees in terms of their weights is obtained by analyzing the strength of the vertex defined as

$$s_j = \sum_{j \in V(i)} w_{ij}$$

The strength of the chosen vertex considers the connectivity information and the importance of the weights of the connected vertices. The level v_{ij} is the sum of the arches on the tree in order to go from vertex *i* to vertex *j*. If *i=j* then $v_{ij} = 0$. It is important to characterize the way the nodes are extended in the tree. To this end "mean occupation layer, $l(v_i)$" is defined as:

$$l(v_i) = \frac{1}{N} \sum_{j=1}^{N} v_j$$

The node with the lowest mean occupation layer v_m is the center of mass of the tree. A high value of $l(v_m)$ reflects a thin market structure, while at the other end low values are associated with market crisis.

The central vertex is considered the father of all vertices of the tree or as the root of it. It is used as a reference point in the tree; the position of the other vertices is relative with respect to the root tree. There is some arbitrariness in the choice of the central vertex, however the following criteria can help choosing the best candidate: (1) the vertex of higher degree, (2) the heaviest vertex, (3) the center of mass.

Weighted clustering combines the topological information with the weight distribution of the network considering the fact that some neighbors are more important than others. The weighted clustering coefficient is defined as

$$c^w(i) = \frac{1}{s_i(k_i - 1)} \sum_{j,k} \frac{(w_{ij} + w_{ih})}{2} a_{ij} a_{ih} a_{jk}$$

This measure is the counting for each triple formed in the neighborhood of vertex *i*; the weight of the two participating edges of vertex *i*. s_i is the vertex strength, k_i is the degree of vertex *i* and $a_{ij} = 1$ if there is an edge between *i* and *j*. The former measure considers not only the number of closed triplets in the neighborhood of a node but also their total relative weight with respect to the strength of the node.

DATA AND METHODOLOGY

The database for this study are time series of daily closing prices of 31 companies traded on the BMV, in the period between 01/03/01 and 2/22/11. To select companies and the length of the series liquidity, capitalization and maintaining were taken into account. The final length of the series is 2553. Among the 31 companies selected for the study all economic sectors are represented. The chosen companies have the highest trading volume in each sector and together represent over 90% stake in the Mexican IPC index (Indice de Precios y Cotizaciones), a capitalization weighted index of the leading stocks traded on the Mexican Stock Exchange. The included stocks were active in the period selected for the study.

The correlation matrix of asset returns is used to construct the Euclidean Distance Matrix. Kruskal's algorithm; Kruskal (1956) is used for joining the vertices (asset) minimizing the total length of the tree, that is, forming a minimum spanning tree. This way we get the "Euclidean tree".

To analyze the topological and hierarchical characteristics of the tree, we calculate the measures of weighted networks, finding the vertex to simulate the center of mass of the tree, the Mean Occupation Layer and the Weighted clustering. These measures help identify clusters by economic sector, shares of major influence on the market and the size of the tree. Similarly, the remaining five distances, distances matrices and corresponding spanning trees are constructed. The last step is to analyze similarities and differences in the measurements obtained in each tree, finding advantages and disadvantages of working with any of these distances.

EMPIRICAL RESULTS

According to the measures Weight, Strength and Mean Occupation Layer, TELMEX, GEO, AMX, CEMEX and TLEVISA are the top five companies in all distances as shown in Table 1. The central vertex was selected between them. These firms belong to the communication and construction sectors.

The Mean Occupation Layer obtained by the Euclidean tree is the largest among all the trees as shown in Figure 1. This is reflected in the extent of the branches of the tree. Due to the characteristics of the Mexican market, lack of diversification and crises, a tree "shrunk" with a minor Mean Occupation Layer, could be more representative. This is the case of trees Chi and City Block.

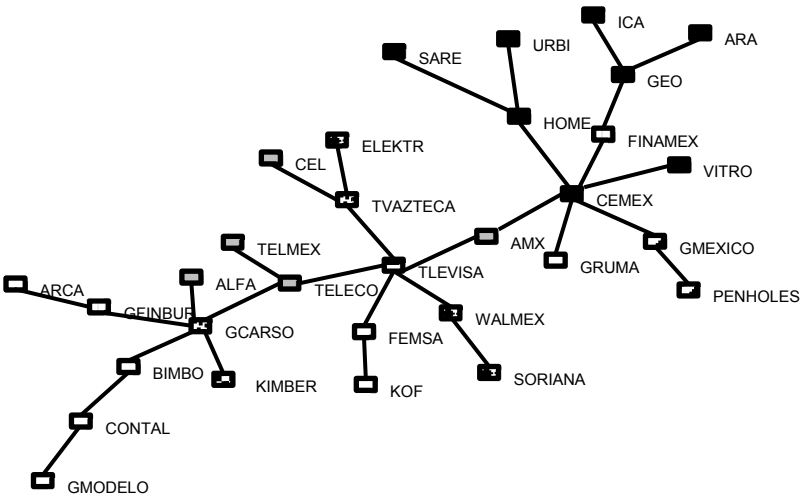
Table 1: Central Vertex

	Weight	Strength	Mean Occupation Layer		Weight	Strength	Mean Occupation Layer
Euclídean				**Chi with standar desviation**			
CEMEX	6	6.541	3.388	TELMEX	20	19.336	1.306
GCARSO	5	5.462	3.881	TELECOM	4	3.383	1.701
TLEVISA	5	4.976	2.979	CEMEX	3	2.485	1.795
TELMEX	3	3.161	3.368	**Minkowski m=3**			
City- Block				AMX	5	3.258	1.801
TELMEX	23	19.499	1.138	TLEVISA	4	2.228	1.704
HOMEX	5	4.113	2.177	CEMEX	3	1.918	3.012
CEMEX	3	2.488	1.593	GEO	4	2.532	2.107
				TELMEX	3	1.756	1.948
Chi with ranges				**Minkowski m=4**			
TELMEX	22	21.427	1.234	AMX	6	2.651	1.068
CEMEX	3	2.600	1.731	TLEVISA	4	1.424	1.260
HOMEX	3	2.723	2.466	GEO	4	1.645	1.288
TELECOM	3	2.303	1.654	TELMEX	3	1.108	1.081

This table Show the estimation obtained for the center of mass, weight and strength of the companies that obtained the best parameters for each distance.

At first sight, the constructed tree using the Euclidean distance cannot distinguish clusters of economic sectors. After analyzing the weighted clustering coefficients it is seen that the most important clusters are construction and telecommunications. The construction coefficient is three times larger than the next cluster, telecommunications. In this tree, CEMEX leads the list of candidates for central vertex. CEMEX is a leading global construction industry with a high share in the IPC and high marketability.

Figure 1: Euclidean Tree

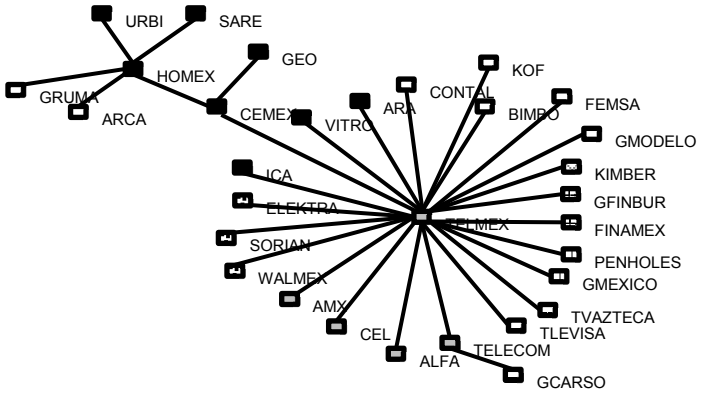


This figure shows the Euclidean Tree. The Mean Occupation Layer is the largest of all trees, therefore the tree appears widespread. A fine look shows the construction conglomerate, led by CEMEX and telecommunications conglomerate led by TELMEX.

Televisa (TLVISA), a Mexican multimedia conglomerate, the largest mass media company in Latin America and in the Spanish-speaking world, has the lowest mean occupation layer. Its mean occupation layer is 2.9, obtained with the Euclidean distance, so it can be compared with that obtained from other countries. In the years researched, the American financial exchanges showed a mean occupation layer between 3 and 9.8, most of the time remaining above 4. The average occupancy of the BMV (2.9) is an indication of the homogeneity of the market and the economic contraction.

City-Block and Chi distances shown in Figure 3, create parameters that separate the stock with greater degree, weight and strength. Moreover the three parameters point towards the same central vertex of the tree. According to these three distances the central vertex is TELMEX, the leading telecommunications company in Latin America and one of the companies with the highest and fastest growth of worldwide audience. This pair of distances separates the stocks of the BMV in two large clusters, one led by TELMEX and the telecommunications companies, and the other led by CEMEX and the construction cluster. No other economic sectors form clusters. This fact suggests the Mexican market is still a developing market, where the behavior of the system is still homogeneous.

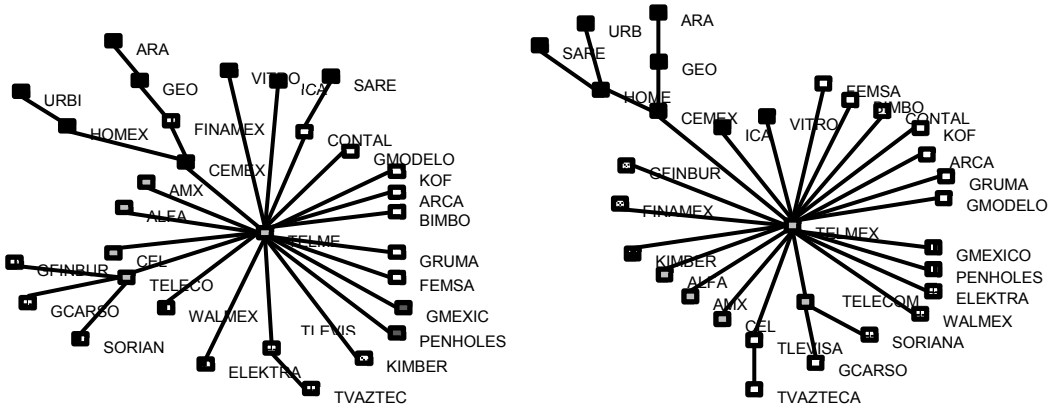
Figure 2: City Block Tree.



This figure shows the City Block Tree. By having Mean Occupation Layer less than Euclidean tree, this tree looks compressed. Clearly identified two clusters: the construction and telecommunications.

The advantage of City Block and Chi distances is that the central vertex is evident. It can easily be located at first sight. All measurements coincide when the central vertex is selected. In addition, they separate the vertices into two major clusters, led by construction and telecommunications sectors. America Movil (AMX) has the lowest mean occupation layer of all trees and also receives the Minkowski distance score required for central vertex.

Figure 3: The Chi Trees

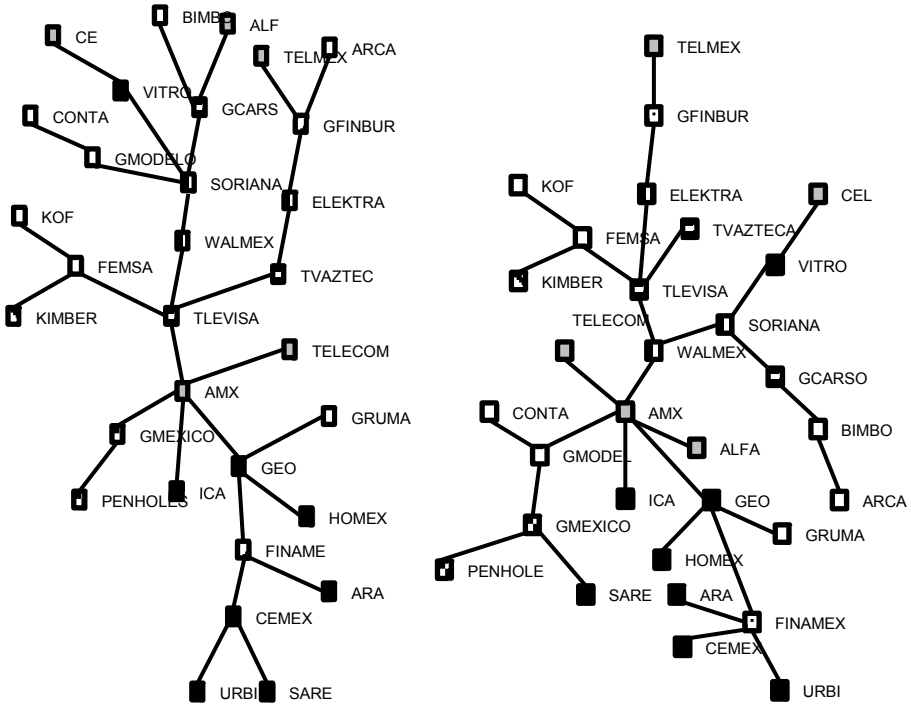


Left tree is Chi with standard deviation tree; right tree is Chi with range. The trees are shrunk. Two clusters are clearly visible: construction and telecommunications.

AMX is the leading provider of cellular telecommunications services in Mexico. It has subsidiaries and joint investments in the communications sector in Latin America, Spain and the United States. It is the

station with more weight in the IPC. Companies linked to this vertex have high correlations, remain very close to the central vertex and have high returns. With the results obtained by Telmex and AMX, it is not surprising that the telecommunications conglomerate is one of the two major clusters distinguished in all trees. Euclidean tree (Minkowski with m = 2) and Minkowski trees presented in Figure 4 (m = 3 and m = 4) present similar characteristic: spread and not very visible clusters.

Figure 4: The Minkowski Trees



Left: Minkowski tree with m=3. Right: Minkowski tree with m=4. The trees are spread and look similar to the Euclidean tree. The construction and telecommunications conglomerates are hardly visible. More clusters are indistinguishable.

CONCLUSIONS

We have studied the influence of different distances in the structure of minimum spanning trees. Six trees were constructed to study its topological and hierarchical properties. The vertices of the trees are 31 stocks of the Mexican Stock Market and the arcs are distances constructed with historical data (time series of length 2553). The results show City Block and Chi trees better reflect the behavior of the Mexican Market in a much better way than the Euclidean tree. The evidence shows that the Mexican Stock Market form clusters in the construction and telecommunications sectors. The five top rated companies are independent of the selected distances.

The Euclidean tree obtained has the highest Mean Occupation Layer, since this measure shows how extending the branch of the tree, the Euclidean tree is the most widespread of all. Clusters by economic sectors are not evident until the weighted-clustering measure is calculated and two clusters are identified. Construction, with a coefficient three times larger than the next cluster and telecommunications. Minkowski ´s Trees have the same characteristics as the Euclidean tree. This is surprising since Euclidean Tree is a Minkowski tree too (m=2).

The City Block and Chi distances distinguish in a radical way the central vertex and clusters with greater weight. These distances are the most representative of the Mexican market: the average occupancy rate is

lower than that obtained with the Euclidean distance, showing a homogeneous market with almost no diversification. The two clusters that remain invariant in all the trees are clearly identifiable.

The network measures suggest that the construction and the telecommunications sectors are the most important sectors in the trees, with a great influence on other sectors. The fact that other economic sectors show very low weighted clustering coefficients suggests that the Mexican market is still a developing market, where the behavior of a system is still very homogeneous and contracted.

Topological characteristics of minimum spanning trees are useful in the theoretical description of financial markets and in the search of economic clusters of stocks. The topology and the hierarchical structure of trees, is obtained by using information present in the time series of stock prices only. This result shows that time series of stock prices have precious and traceable economic information.

Further research could focus on the behavior of measures of the trees in years of crisis, index construction based on Mean Occupation Layer or similar measures to be discovered. Although we focused on networks of stocks prices, this methodology should be similarly insightful for multivariate time series of other asset classes.

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BIOGRAPHY

Linda Margarita Medina Herrera. Department of Physics and Mathematics.Tecnológico de Monterrey, CCM. Del puente 222 Col. Ejidos de Huipulco Tlalpan, 14380, México, D.F. México. Phone (55) 54832190. Fax +52(55) 54832163. linda.medina@itesm.mx

Ernesto Armando Pacheco Velázquez. Industrial Engineering Department. Tecnológico de Monterrey CCM. Del puente 222 Col. Ejidos de Huipulco Tlalpan, 14380, México, D.F. México. Phone (55) 54832190. Fax +52(55) 54832163. epacheco@itesm.mx

FACTORS ASSOCIATED WITH FIRM PERFORMANCE: EMPIRICAL EVIDENCE FROM THE KINGDOM OF SAUDI ARABIA

Abdullah Mohammed Alzharani, Universiti Utara Malaysia
Ayoib Che-Ahmad, Universiti Utara Malaysia
Khaled Salmen Aljaaidi, Universiti Utara Malaysia

ABSTRACT

This study investigates the relations between agency cost variables (firm size, leverage and auditor type) and the firm performance of 392 listed companies in the Saudi Stock Exchange (Tadawul) during 2007-2010. This study identifies two measurements of the firm performance: (1) ROA and (2) ROE. Using the multiple regression, the results of this study show that the likelihood a firm performance (ROA) is significantly affected increases with the firm size. On the other hand, leverage and auditor type have no influence on the firm performance. Interestingly, the explanatory power of firm performance (ROA) model is high. Somewhat surprisingly, model (2)'s explanatory power is insignificant indicating to the inability of the proposed variables (firm size, leverage and auditor type) in explaining the expected effect on firm performance (ROE).

JEL: M41

KEYWORDS: ROA, ROE, Kingdom of Saudi Arabia

INTRODUCTION

There are increasing openness and integration of Saudi Arabia with the global economy which, in turn, has created push-and-pull factors that are contributing to changing the institutional framework environment which, consequently, are aiming in enhancing companies values in the Saudi marketplace. Subsequently, after these recent developments, Saudi Arabia is found to be a profitable business environment for local, regional, and foreign investors (Bley & Chen, 2006; Al-Hussaini & Al-Sultan, 2008; Al-Shammari, Brown & Tarca, 2008; Gulf Base, 2009). There has been a surge of interest in Saudi Arabia about the firm performance issues. Several studies have been conducted in different contexts other than Saudi Arabia (Han, Lee & Suk, 1999; Kang & Zardkoohi, 2005; Haniffa & Hudaib, 2006; Aljifri & Moustafa, 2007). Therefore, the conflicting and inconclusive results evidenced by the prior studies on firm performance, the paucity of firm Performance research in Kingdom of Saudi Arabia, the recent incremental developments that have been implying to Saudi market derive the motivation for investigating the firm performance in the setting of Kingdom of Saudi Arabia. In particular, little is known and many questions remain unanswered about firm performance in Kingdom of Saudi Arabia.

Yet, to the best of the researchers' knowledge, no empirical evidence exists that allows conclusive determinations to be made of how companies incorporating in Kingdom of Saudi Arabia perform. With support for this, Meyer (1977) argues that management research should pay more attention to specific cultures, legal frameworks, geographies, and industry structures (Meyer & Rowan, 1977). "Management theories" based on western firms may be unsuitable and irrelevant to other countries and, consequently, previous studies' findings might not be applicable in the context of Kingdom of Saudi Arabia. Therefore, the objective of this study is to provide empirically evidence on the determinants influencing companies' performance in Kingdom of Saudi Arabia. The remainder of the paper is organized as follows. Section 2 discusses the literature review and the hypotheses development. Section 3 describes the research

methodology. The results and discussions have been highlighted in section 4. The final section provides conclusions and implications.

LITERATURE REVIEW

Banz (1981) reports that as firms grow up, it becomes more difficult for them to sustain impressive performance (Banz, 1981). Therefore, smaller firms are more creative, innovative and change more readily to enhance their values (Hannan & Freeman, 1989). In consistent with these arguments, Hudaib and Haniffa (2006) empirically document a significant negative association between firm size and firm performance (Haniffa & Hudaib, 2006). On the other hand, it is indicated that large firms have a direct effect on firm performance (Aljifri & Moustafa, 2007). Kumar (2004) reports that large firms are more efficient than small firms because of economies of scale, skilled employees and market power (Kumar, 2004). In the same line Kumar (2004), Ghosh (1998) indicates that larger firms are better performers than smaller firms due to their ability to diversify their risk (Ghosh, 1998). Haniffa and Hudaib (2006) report that large firms have more analysts who concern about firms' performance and as such they will be under more pressure to perform well (Haniffa & Hudaib, 2006). In consistent with this debate, Aljifri and Moustafa (2007) empirically report a positive association between firm size and the firm performance (Aljifri & Moustafa, 2007). Thus, the expected sign for the effect of firm size on firm performance in the context of Saudi Arabia is positive. The testable hypothesis of firm performance is stated in a direct form:

H_1: Ceteris paribus, there is a positive association between firm size and firm performance.

Agency theory conjectures that debt financing is more effective than equity (Jensen & Meckling, 1976). It is believed that it controls managers' incentive from wasting free cash flows and, consequently, it enhances the managers' motivation in improving the firm performance (Myers, 1990). Furthermore, debt financing applies aggressive market monitoring on managers actions. For instance, Grossman and Hart (1982) document that debt financing makes managers aware of consuming fewer perks and become more efficient to avoid bankruptcy; the loss of control as well as loss of reputation (Grossman & Hart, 1982). In contrary, Stiglitz and Weiss (1981) predict that as a firm is financed with large debts, it is more likely that its equity holders with limited liability may prefer to undertake highly risky projects and this might inverse with the firm performance (Stiglitz & Weiss, 1981). Previous studies on firm performance have resulted in contradictory results. For example, Dowen (1995), McConnell and Servaes (1995), Short and Keasey (1999), Weir et al. (2002), Haniffa and Hudaib (2006) and Aljifri and Moustafa (2007) report a significant negative relationship between leverage and firm performance (McConnell & Servaes, 1990; Dowen, 1995; Short & Keasey, 1999; Weir, Laing & McKnight, 2002; Haniffa & Hudaib, 2006; Aljifri & Moustafa, 2007). However, Hurdle (1974) documents a positive association of the leverage with firm performance (Hurdle, 1974). Therefore, the expected sign for the effect of leverage on firm performance in the context of Saudi Arabia is negative. The testable hypothesis of firm performance is stated in a direct form:

H_2: Ceteris paribus, there is a negative association between leverage and firm performance.

Agency theory and information suppression hypothesis conjecture that there is a relationship between auditor type and firm performance (Jensen & Meckling, 1976; (Wallace, 1980; Fama & Jensen, 1983). It is suggested that the higher audit quality may control opportunistic management behaviors, reduce agency costs and, consequently, increase the firm value in the marketplace (Grayson, 1999). In consistent with this conjunction, Aljifiri and Moustafa (2007) find empirically a significant positive relationship between auditor type and firm performance (Al-Hussaini & Al-Sultan, 2008). Thus, the expected sign for the effect of external auditor type on firm performance in the context of Saudi Arabia is positive. The testable hypothesis of firm performance is stated in a direct form:

H_3: Ceteris paribus, there is a positive association between auditor type and firm performance.

DATA AND METHODOLOGY

Data is obtained from the World scope database for the periods 2007-2010 to assure the availability of recent data. The boom of Kingdom of Saudi Arabia clearly emerged in early 2005 (Chahine & Tohmé, 2009). In addition to economic solidity, at the end of 2006, Kingdom of Saudi Arabia has a high economic and political stability. For the study, the population of interest comprises companies listed on the Kingdom of Saudi Arabia stock exchange. Samples selected for the four years from 2007 to 2010 are depicted in Table 1.

Table 1: Sample Selection during 2007-2010

	Total Observation
Total listed companies	146 company
Period of study (2007-2010)	4 year
Total observations	586 observations
Missing and Incomplete data	(194 observations)
Total observations selected	392 observations

This table shows the sample composition.

The economic model is used to develop a model of firm performance (which was in line with what is mostly found in the literature). The variables proposed for inclusion in the model capture differences in the costs of agency relationships. The dependent variables are continuous measurements. To estimate this model, Multivariate Analysis is applied using Multiple regression model because the dependent variables are continuous nature. The multiple regression is estimated using cross-sectional data to capture if there is a significant impact of the following determinants: the firm size (SIZE), the leverage (LEV) and the external auditor (AUD) on firm performance (ROA and ROE). The functional equation of the multiple regression model is utilized to determine the extent of the influence of each of the independent variables on the firm performance:

$$Firm\ performance\ (ROA) = \beta_0 + \beta_1 SIZE + \beta_2 LEV + \beta_3 AUD + e \quad (1)$$

$$Firm\ performance\ (ROE) = \beta_0 + \beta_1 SIZE + \beta_2 LEV + \beta_3 AUD + e \quad (2)$$

Where the dependent variable is:
Firm performance (ROA) = return on assets
Firm performance (ROE) = return on equity
Where the independent variables are:
SIZE = $\log_{10}$ of the total assets,
LEV = total debt to total assets,
AUD = "1" big 4, "0" others,
e Error term.

RESULTS

Table 2 predicts the mean, standard deviation, minimum and maximum of each variable in the sample data set. Table 2 shows that there is a significant range of variation among the considered sample of this study. The range of firm size is from 4.88 to 8.50 with a mean of 6.42 and standard deviation of 0.8. Further, the range of leverage is from 0.07 to 62.21 with a mean of 20.11 and standard deviation of 14.60. Using the Mann-Whitney test, the results of this study also show that there are significant differences in terms of the ROA of firms audited by Big 4 and firms audited by Non-Big 4. In contrary, no differences have been reported in the ROE between firms audited by Big 4 and firms audited by Non-Big 4. Further, to examine the correlation between independent variables, a Pearson product correlation (r) was computed as shown in Table 3.

Table 2: Descriptive Statistics and Univariate Test Results of Continuous Variables 2007-2010

Variables	N	Mean	Std. Deviation	Minimum	Maximum
Firm Size	392	6.42	0.8	4.88	8.50
Leverage	392	20.11	14.60	0.07	62.21
Auditor Type	392	0.52	0.50	0.00	1.00
Big 4 – ROA	203	8.60	7.84	0.01	47.54
Non-Big 4 – ROA	189	9.67	7.32	0.05	31.39
Big 4 – ROE	203	16.51	12.90	0.01	83.67
Non-Big 4 – ROE	189	15.12	11.29	0.08	50.43

This table shows summary statistics.

Table 3: Pearson Correlation Analysis of Dependent and Independent Variables on 392 observations for 2007-2010

	ROA	ROE	SIZE	LEV	AUD
ROA	1.00	N/A			
ROE	N/A	1.00			
SIZE	- 0.193**	0.061	1.00		
LEV	- 0.104	0.047	0.175**	1.00	
AUD	- 0.070	0.057	0.279**	0.244**	1.00

This table shows correlation analysis of the dependent and independent variables. The sample includes 392 observations from 2007-2010. ***, ** and * indicate significance at the 1, 5 and 10% levels respectively. All tests are two-tailed. N/A: Not applicable

As illustrated in Table 3, firm size (SIZE) is statistically correlated with firm performance (ROA) at 1 per cent significant level. In contrary, no statistically relationship has been found between firm size (SIZE) and firm performance (ROE). Further, it is interesting to note that there is a positive statistically correlation between leverage (LEV) and auditor type (AUD) with firm size (SIZE) at 1 per cent significant level indicating that the larger the firm size is, the higher its debt and the more likely it hires a differentiated audit quality. Moreover, the results suggest that there is a significant positive association between auditor type (AUD) and leverage at 1 per cent significant level indicating that the higher the debts, the more likely the firm chooses a differentiated-audit quality. With respect to the correlation among variables, the correlation matrix confirms that no multicollinearity exists between the variables as the tolerance values are all above 0.10 as shown in Table 5 (Menard, 1995). In addition, none of the variables correlates above 0.80 or 0.90 all variables have a correlation of less than 0.279 (Myers, 1990).

The descriptive and univariate analysis support the conjecture that there is a significant range of variation in terms of firm performance, firm size, leverage and audit type among listed companies in the kingdom of Saudi Arabia. Further, the descriptive analysis considers three interrelationship among the independent variables.

Table 4: Summary of the Models 1 & 2

Models	R	R Square	Adjusted R Square	F	Sig.
Model 1	0.205	0.042	0.035	5.692	0.001
Model 2	0.080	0.006	- 0.001	0.824	0.481

This table shows a summary of the results for Models 1 and 2.

Table 4 shows that the coefficient of determination (R^2) for ROA is equal to 4.2 per cent and the adjusted R^2 is equal to 3.5 per cent which is quite low level compared with the previous studies such as Aljifri and Moustafa (2007) which is 45 per cent (Aljifri & Moustafa, 2007). This can attributed to the limited number of the independent variables included into the model. In terms of the coefficient of determination

(R^2) for ROE, it is surprisingly to be equal to 0.6 percent and the adjusted R^2 is equal to – 0.1 per cent which is quite very low compared with the previous studies. The table also depicts that the ROA model is a statistically significant where the F test statistic = 5.692 with 3 and 388 degrees of freedom with a p-value < 0.001. With regard to the ROE model, it is a statistically insignificant where the F = 0.824 with 3 and 388 degrees of freedom with a p-value < 0.481.

Table 5: The results of the regression of Models 1 & 2

ROA						
Variables	**Expected sign**	**Coeff.**	***T***	**p-value**	**Tolerance**	**VIF**
(Constant)		20.879	6.723	0.000		
Firm Size	+	-1.710	-3.443	0.001	0.910	1.099
Leverage	-	-0.37	-1.389	0.165	0.928	1.077
Auditor Type	+	-0.042	-0.052	0.959	0.883	1.133
ROE						
(Constant)		10.412	2.058	0.040		
Firm Size	+	0.693	0.856	0.393	0.910	1.099
Leverage	-	0.025	0.579	0.563	0.928	1.077
Auditor Type	+	0.902	0.689	0.491	0.883	1.133

This table shows the regression results of Model 1 and Model 2.

Table 5 shows that the beta coefficients for the independent variables. The largest *t* statistics is -3.443 (p-value < 0.001) which is the firm size. This indicates that firm size has a degree of importance in the model 1 referring to the strongest unique contribution in explaining firm performance (ROA). Firm size has a significant negative effect on firm performance. Therefore, this result makes us reject hypothesis 1. This result is similar to that found by Hudaib and Haniffa (2006). One possible explanation is that as it has been indicated by Hannan and Freeman (1989) which is in the context of Saudi Arabia, smaller firms are more creative, innovative and change more readily to enhance their values (Hannan & Freeman, 1989). However, the multiple regression estimations of leverage and auditor type are unable to report a significant contribution in explaining firm performance (ROA). Therefore, we reject hypotheses 2 and 3. Somewhat surprisingly, model (2)'s explanatory power is insignificant indicating to the inability of the proposed variables (firm size, leverage and auditor type) in explaining the expected effect on firm performance (ROE).

CONCLUDING REMARKS

The main objective of this study is to examine the relations between firm size, leverage and auditor type and firm performance, using two proxies (ROA and ROE). A sample of 392 listed companies on Saudi stock exchange (Tadawul) for the periods expanding from 2007 to 2010 is used. Using the Multiple regression, this study finds a significant negative association between firm size and firm performance (ROA) at a 1 per cent significant level. However, a significant association between leverage and auditor type with firm performance is enable to be empirically evidenced by this study. Somewhat surprisingly, model (2)'s explanatory power is insignificant indicating to the inability of the proposed variables (firm size, leverage and auditor type) in explaining the expected effect on firm performance (ROE).

Limitations of the study lie on the firm performance models where the models are developed focusing on establishing a relationship between firm size, leverage and auditor type with firm performance from accounting perspective (ROA and ROE) in the setting of Saudi Arabia. One important implication of these findings relates to the issue of firm performance in Kingdom of Saudi Arabia. Saudi government, stock market, companies and accounting and auditing regulators would gain some new insights from this study in terms of the understanding the determinants influencing companies' performance. The results of this study would benefit banks in the way that they can assess the creditworthiness of incorporating companies in Kingdom of Saudi Arabia. The numbers incurred in the audited financial statements are

based on to mandate bond covenants. Moreover, credit decisions made by lenders are determined based on audited financial statements. Therefore, firm performance issues are of the utmost important for any lending institution. Investors and financial analysts depend on audited financial statements to make decisions related to bonds, bond rating, interest rate, and all other decisions related to investments in Kingdom of Saudi Arabia market. Accordingly, increased understanding and prediction of companies' events is important to this user group. Further, the results of this study will be of interest to the researchers and academic community due to a lack of formal research body addressing the issues of firm performance in Kingdom of Saudi Arabia and, therefore, this study will provide with substantial information about issues in the markets of Saudi Arabia to count on, in the future, as premise data. Regarding future line of research, efforts should be put at introducing the market measurement of firm performance (Tobin's Q) at first place and increasing the number of independent variables particularly the inclusion of corporate governance mechanisms. Further research should replicate this model to determine its validity in different contexts of GCC countries, in different time periods, and with different sample size. These limitations may motivate more future research in the GCC market.

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BIOGRAPHY

Abdullah Mohammed Alzharani is PhD candidate in College of Business at University Utara Malaysia
Email: zahrain1422@yahoo.com

Prof Madya Dr. Ayoib Che-Ahmad is a professor of accounting in College of Business at University Utara Malaysia, Tel (o): +604-928 4196, Fax (o): +604-928 2248
Email: ayoib@uum.edu.my

Khaled Salmen Aljaaidi is a PhD candidate in College of Business at University Utara Malaysia
Email: aljaydi_khaled@yahoo.com

RESIDUAL INCOME VERSUS DISCOUNTED CASH FLOW VALUATION MODELS: AN EMPIRICAL STUDY

Ali Atilla Perek, Marmara University
Seda Perek, Istanbul Bilgi University

ABSTRACT

Valuation plays a central role in the financing, investing and operating decisions of companies and many methods are employed to approximate the true value of a company. Although these techniques are based on similar theory, they may generate different results in application. This study incorporates an empirical approach to compare the outcomes of two different methods: residual income and discounted cash flow valuation models. The aim of this study is to test whether these methods result in different values and to contribute to the understanding of why these two valuation techniques, although similar in theory, may generate different results when applied to real life companies. There are a number of studies that compare these two methods theoretically. Some studies claim the superiority of one method over the other and some argue that these two methods should yield the same results when applied properly. In this study, the residual income and discounted cash flow models are applied to nine Turkish companies and the results are compared. We have obtained the data for the study with site visits to the companies and with the help of the managements of the companies.

JEL: G32

KEYWORDS: Valuation, Residual Income Model, Discounted Cash Flow Model, Accounting Based Valuation, Case Study, Turkey

INTRODUCTION

Valuation has been an important topic of finance research for a long time. The estimation of the true value of a business firm challenged academicians as well as practitioners, company owners, managers, and consulting firms in the past and it will most likely continue be a challenging issue in the future. Companies need their equities valued for various reasons such as borrowing, initial public offering, and merging or being acquired. Valuation is of growing importance especially in emerging countries, such as Turkey, which is a country with a growing economy and with a lot of attraction for foreign investments.

The valuation models can be classified into three categories, which can be associated with the income, market, and cost approaches, respectively: discounted cash flow valuation, relative valuation, and contingent claim valuation. There is also a fourth category usually added to these three categories, accounting based valuation (Bertoncel, 2006). Each approach embodies different models and these models often produce significantly different values (Damodaran, 2002). The most widely used model among these is the discounted cash flow valuation model.

The aim of the discounted cash flow models is to approximate intrinsic value and the main principle of the models is to find the present value of the future expected cash flows on an asset. To find the present value of an asset the models require the knowledge of the life of the asset, expected annual cash flows over the life of the asset, and an appropriate discount rate as inputs. Based on empirical evidence, these models can be found to work best when the cash flows produced by an asset is positive (Damodaran, 2002). Relative valuation depends on finding similar assets that are priced in a market, determining a standardized price through multiples, and controlling for the differences between the asset being valued

and the similar assets (Damodaran, 2005). Contingent claim valuation is based on option pricing, which regards the asset subject to valuation as a real option and uses option pricing techniques to find the value of it. This model is found to be most useful for the companies in trouble or companies with intensive research and development but with no cash inflows. Accounting based valuation focuses on asset based valuation, and the emphasis is on book value (Damodaran, 2005).

The two methods that are compared in this study are the discounted cash flow valuation model and the residual income model, which is a model of a hybrid approach including insights from both the income approach and the cost approach. The residual income model includes in the value of a company not only the discounted future abnormal earnings but also the book value of the company as of the valuation day. These two models are the most examined and compared models to one another. The strength of the discounted cash flow models lies in its corporate finance roots, emphasizing cash flows. Moreover, practical books on valuation assert that cash flows dominate accounting earnings and, therefore, the discounted cash flow valuation model is preferred over accounting based models (AAA FASC, 2001). However, there is also evidence that support the accuracy of the residual income model.

Ohlson (1995) develops a residual income model where he provides a framework of how market value is related to three accounting data: earnings, book value, and dividends. The model developed in his paper relies on the clean surplus relationship: The change in the book value equals earnings minus dividends net of capital contributions. The first paper to mention this relation was Preinreich (1938) where the author states that "capital value equals book value plus the excess profits." Lundholm (1995) claims that this notion was largely ignored in the literature since then and its revival is a major contribution to financial accounting literature.

The objective of this paper is to study the reasons behind the different results obtained by two different valuation models by applying the discounted cash flow and residual income models to real life companies. In the next section, we review the empirical literature on the discounted cash flow and residual income methods. The data and methodology of the paper are explained in the section that follows. We present our research results in the section titled "empirical findings." The last section concludes the paper.

REVIEW OF RELATED LITERATURE

The literature is rich in papers examining the accuracy of the residual income model and questioning the superiority of the discounted cash flow model over the residual income model. One of the earliest empirical studies on accounting based valuation models is by Bernard (1995). He estimates the intrinsic value for a large sample of firms during the 1978-1993 period to demonstrate the validity of the model over short horizons. The study states that the model explains, on average, 68 percent of the cross-sectional variation in share prices. The author prefers the model for its accuracy and for its reliance on earnings and book value predictions over relatively short time periods as compared with the longer time periods needed in the discounted cash flow models (AAA FASC, 2001). Another study by Lee et al. (1999) estimates the intrinsic value of the Dow Jones Industrial Average over the period from 1963 to 1996 using the residual income model. The estimates of intrinsic value in the study predict both the future value of the index and the future stock returns to the index. Based on the results of the study, the authors support the use of the residual income model over other valuation models.

One of the papers that support the superiority of accounting earnings over cash flows is a study by Penman and Sougiannis (1998). The authors claim that accrual accounting overcomes a shortcoming of the discounted cash flow models. The shortcoming is that the discounted cash flow models subtract capital investments from operating cash flows to estimate free cash flows, and for some companies this may cause negative free cash flows for many years. Accounting-based valuation models do not fall prone

to this shortcoming because they place these investments on the statement of financial position and match the cost of these investments against inflows generated from them through depreciation allocations. However, Lundholm and O'Keefe (2001) state that these two models are derived from the same underlying assumption and the differences in their outcomes imply the difficulty of applying the same input assumptions to different models and conclude that neither of the models is superior to one another.) In response to this paper Penman and Sougiannis (1998) state that "the empirical papers dismissed by Lundholm and O'Keefe provide evidence that GAAP accrual accounting has advantages over cash accounting" and "…the partitioning in Penman and Sougiannis (1998) identifies cases where GAAP accounting performs relatively better (and worse)."

Another advantage of the residual income model, and accounting based valuation models in general, is that the discounted cash flow valuation models require burdensome efforts to convert accounting measures into cash flows, whereas, different accounting choices on conservatism, expensing or capitalizing research and development costs, and different depreciation methods, do not affect the computation of value as long as the clean surplus relationship applies (AAA FASC, 2001).

Penman and Sougiannis (1998) compare the dividend discount, discounted cash flow, and residual income models using actual realizations of dividends, free cash flows, and earnings. They report that the residual income model yields smaller valuation errors, as measured against current stock prices, than either of the other two models.

Francis et al. (2000) state that the greater accuracy of the residual income model can be due to the sufficiency of book value of equity as a measure of intrinsic value and also because the predictability and precision of abnormal earnings are greater. In their paper, the authors compare the accuracy of the dividend discount model, the residual income model, and the discounted cash flow valuation model and find that the residual income model explains about 71 percent of the cross-sectional variation in stock prices. According to the tests, the residual income model significantly outperforms the dividend discount and the discounted cash flow valuation models.

There are other studies in the literature that claim that the residual income model is not superior in explanatory power over other models. Dechow et al. (1999) test the residual income model on a large sample of firms using analysts' earnings forecasts. They show that a simple valuation model, which capitalizes analysts' short-term earnings forecasts in perpetuity, provides greater explanatory power for current stock prices than does the residual income model. The authors do not advocate the superiority of earnings capitalization approach to other valuation models, but they only state that this simple benchmark model outperforms the residual income model in explaining current stock prices.

Most of the studies conducted use large samples of firms and provide average results across firms or through time. Kaplan and Ruback (1995) examine the accuracy of the models at the firm level. In their study, the authors compare the accuracy of the discounted cash flow model with the method of multiples in valuing 51 highly leveraged transactions during the 1983-1989 period and conclude that the discounted cash flow valuations based on management forecasts of cash flows are within 10 percent of the realized transaction value and superior to the multiples approach.

Accounting academicians mostly prefer residual income methodology because of its direct relation to earnings and book values that are central concepts in accrual accounting whereas discounted cash flow valuation has its roots in finance theory (AAA FASC, 2001).

The studies mentioned above, and many others, claim either the superiority of the residual income model over the other valuation models such as the dividend discount model, and the discounted cash flow model, or vice versa, in explaining stock prices and stock returns. The issue is still controversial. Most

studies that claim that the residual income model is a better alternative than the other valuation models use sample firms with multiyear security analysts' forecasts of both earnings and dividends. Most studies use current stock price as the benchmark to evaluate the explanatory power of the valuation models assuming that stock prices reflect intrinsic value (AAA FASC, 2001).

The goal of this study is to contribute to the understanding of the differing outcomes observed under the residual income and discounted cash flow valuation models by applying them to nine Turkish companies.

DATA AND METHODOLOGY

In order to compare the discounted cash flow and residual income models on an empirical basis, nine Turkish companies from different sectors are valued using the two models. Some descriptive information for the companies is provided in Table 1. Each valuation process included an industry analysis and a general examination of the company. Information about the operating procedures of the companies is obtained through site visits and meetings with company officials. The forecasts regarding future sales and working capital requirements, used in the valuation process, are discussed with the managements of the companies. Information about future capital investment projects, capital structure and dividend policies are the most realistic estimations made by the managers. The companies were provided with a valuation report at the end of the process. The details about the valuation process are held confidential since the companies did not grant permission for their being published.

Table 1 below provides descriptive information about the companies that were included in the study. The companies are from various different sectors such as energy, textile, construction, hygienic products, metal products and chemical products. Five of the nine companies are manufacturing companies, three are merchandising companies and one is a service company. The book value of shareholders' equity for the nine companies vary from 0.16 million to 254.88 million U.S. dollars and their sales revenues for the last fiscal period varies from 0.72 million to 61.19 million U.S. dollars.

Table 1: Descriptive Information for the Nine Companies Included in the Study

No.	Company (Sector)	Company (Type)	Shareholders' Equity as of Last Year (million U.S. dollars)	Total Sales Revenue for the Last Year (million U.S. dollars)
1	Textile Retailer	Merchandising	0.25	16.17
2	Hygienic Products Manufacturer	Manufacturing	6.04	5.57
3	Textile Manufacturer	Manufacturing	15.19	13.30
4	Energy Manufacturer	Manufacturing	254.88	54.42
5	Metal Products Manufacturer	Manufacturing	25.60	61.19
6	Metal Products Wholesaler	Merchandising	7.89	23.81
7	Construction Material Assembler	Manufacturing	0.68	3.73
8	Construction Project Designer	Service	0.16	0.72
9	Chemical Products Retailer	Merchandising	2.84	1.90

This table presents some descriptive information for the nine companies included in the study.

Table 2 below summarizes the descriptive statistics of the data set, which consists of eighteen data gathered from the two different valuation methods applied to nine different companies.

Table 2: Descriptive Statistics of the Data Set

Method	N	Range	Minimum	Maximum	Mean	Standard Deviation
DCF	9	1,144.43	5.57	1,150.00	153.24	374.67
RIM	9	467.24	4.6	471.84	69.00	151.75

This table presents the descriptive statistics of the data set, which consist of the results of two different valuation methods applied to nine different companies.

Table 3 presents the discount rates used under the discounted cash flow and residual income models. Since the discounted cash flow model uses free cash flows to firm, the appropriate discount rate is the firm's weighted average cost of capital. Since the residual income model uses net income to calculate excess returns, the appropriate discount rate is the firms' cost of equity.

Table 3: Cost of Equity and Weighted Average Cost of Capital Statistics for the Nine Companies Included in the Study

Company	Cost of Equity	Weighted Average Cost of Capital
Textile Retailer	16.00%	15.00%
Hygienic Products Manufacturer	9.00%	9.00%
Textile Manufacturer	15.00%	15.00%
Energy Manufacturer	12.60%	11.00%
Metal Products Manufacturer	13.14%	11.99%
Metal Products Wholesaler	13.16%	12.00%
Construction Material Assembler	15.74%	15.74%
Construction Project Designer	15.60%	14.30%
Chemical Products Retailer	15.00%	11.00%

This table presents the cost of equity and weighted average cost of capital statistics for the nine companies included in the study.

The Discounted Cash Flow Model

The assumption on which the discounted cash flow models are based is that the reason behind the purchase of an asset is the anticipation of collecting cash inflows from that asset in the future. Thus, in discounted cash flow valuation, the value of an asset is determined by discounting the future expected cash flows to that asset at an appropriate discount rate that reflects the riskiness involved in the cash flows (Damadoran, 2005). The discounted cash flow model can be applied in different ways. The model applied in this study values the company as a whole by discounting the free cash flows of the company using the weighted average cost of capital as the discount rate and then subtracting the value of non-equity stake from the value of the company to reach the value of equity. The value of the company can be expressed as the sum of the expected cash flows from year one to infinity discounted at the weighted average cost of capital employed in the company.

The expected free cash flow to a firm in a given year is calculated by using the following formula:

Free cash flow to firm = After-tax operating income − (Capital expenditures − Depreciation) – Change in non-cash working capital.

For each of the nine companies, a forecast period is selected, after consulting with the company managers, and detailed cash flow forecasts are made for that period. After the forecast period, a steady growth is assumed to perpetuity. The discount rate used is the weighted average cost of capital. The cost of equity component of the discount rate is calculated using the market model.

The Residual Income Model

Ohlson (1995) develops a residual income model. The model relies on capital budgeting techniques and the net present value rule. The model assumes that a project has value only if it has a net present value meaning that the return on capital invested must exceed the cost of capital invested. Excess return models, in general, use this principle and they state the value of a company in two components: the book value of the capital invested and the present value of the excess returns on the capital invested. The model used in this study can be stated as follows:

Value of Equity = Book Value of Equity + Sum of the expected residual incomes in perpetuity discounted at the cost of equity capital employed in the company

Residual income is expressed as the net income minus the capital charge for each year. Discounting the residual incomes with the cost of equity and adding it to the book value of current equity gives the value of equity according to the residual income model. The book value of equity for each of the years in forecast period is estimated depending on the clean surplus relationship, that is, book value of equity changes depend on the net income of the period and the dividends distributed during the period.

As is the case for the discounted cash flow methodology, the forecasts in the residual income model are divided between a forecast period and a terminal value, where the terminal value is calculated based on last year's residual income growing at a constant rate in perpetuity.

The results of the two valuation methods for the nine companies constitute the data set for the statistical test. Since the data set consists of a small sample, a nonparametric test is applied. The test applied is the Wilcoxon for related samples.

EMPIRICAL FINDINGS

Table 4 summarizes the empirical results of the valuation models, the differences between the model outcomes, and the percentage difference. Of the nine company valuations, eight are higher with the discounted cash flow (DCF) valuation method. Only one company in the sample has a higher value with the residual income model (RIM) than with the discounted cash flow method. The percentage differences between the findings with the two valuation methods appear to be quite large.

Table 4: The Valuation Results with the Discounted Cash Flow and Residual Income Models

Company	DCF Valuation (millions of U.S. $)	RIM Valuation (millions of U.S. $)	Difference (millions of U.S. $)	Difference as a % of DCF Valuation
Textile Retail Company	8.62	12.64	-4.02	-46.67%
Hygienic Products Manufacturer	45.98	23.56	22.41	48.75%
Textile Manufacturer	30.46	13.22	17.24	56.60%
Energy Manufacturer	1,150.00	471.84	678.16	59.00%
Metal Products Manufacturer	87.36	52.87	34.48	39.47%
Metal Products Wholesaler	26.44	21.26	5.17	19.57%
Construction Material Assembler	18.39	15.52	2.87	15.63%
Construction Project Designer	6.32	4.60	1.72	27.27%
Chemical Products Retailer	5.57	5.46	0.11	2.06%

This table presents the results of the valuation methods applied to nine companies and differences between the valuation results in U.S. dollars and as a percentage.

The Wilcoxon nonparametric related samples test is applied to the results. The test statistic is 0.028, which is significant at the 5% level. This test indicates that the valuation results with the two methods are significantly different.

CONCLUDING COMMENTS

Comparing the valuation models has been a controversial issue in the literature. The residual income method is generally preferred by academicians in the accounting field, whereas the discounted cash flow method is the method of choice in the finance field. Empirical studies have reached conflicting results and failed to prove the superiority of one method over the other.

In this study, the residual income and discounting cash flow methods are applied to nine Turkish companies and the results are compared. Unlike most previous empirical studies on the issue that use

large samples, this study uses a case study approach with data from nine Turkish companies with the forecasts of future operations and cash flows being generated with the help of the managements of the companies.

We find that the residual income model results in lower company valuation compared with the discounted cash flow model. This finding may be due to certain specific characteristics of Turkish companies. For example, due to positive expectations as a result of the political stability and the geopolitical advantages of the country, Turkish companies have made substantial fixed asset investment in recent years. Therefore, the depreciation expense is quite high for most companies. The high depreciation expense decreases the net income (an input in the residual income method) and it increases the cash flow (a main input in the discounted cash flow method).

Partly because of limited competition among firms, the cost of equity is quite high in Turkey. Since the cost of equity is used as the discount rate in the residual income method, it results in low valuation figures. Since equity capital is only one of the capital components, it only has a partial effect on the weighted average cost of capital, which is used as the discount rate in the discounted cash flow method.

In emerging economies, it is a common practice for employers to employ relatives in the company with eligible expenses that reduce the company's residual income and would result in a relatively low valuation with the residual income method. These expenses may not affect the company's cash flows. Therefore, we believe that the discounted cash flow method may give a better valuation result compared with the residual income method in emerging economies.

This paper should be regarded as a preliminary study with data from an emerging economy. The companies were not randomly chosen and only the companies that agreed to be included in the study were chosen. As a result, the research sample includes only nine companies. Therefore, the results cannot provide statistically meaningful evidence. Yet the aim of the study is to help understand why the two models would yield different results by spending a substantial amount of time with each of the companies to get a thorough understanding. Further studies might be conducted on emerging economies by concentrating on sectors and by using larger samples.

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BIOGRAPHY

Dr. Ali Atilla Perek is a lecturer at Marmara University. He can be contacted at: Department of Business Administration, Faculty of Economics and Administrative Sciences, Marmara University, Anadoluhisari, Istanbul, Turkey. Email: atillaperek@marmara.edu.tr.

Seda Perek is a Ph.D. candidate at Marmara University. She can be contacted at: Department of Business Administration, Faculty of Economics and Administrative Sciences, Istanbul Bilgi University, Eyup, Istanbul, Turkey. Email: seda.perek@bilgi.edu.tr.

COMPREHENSIVE INCOME DISCLOSURES: EVIDENCE FROM ITALY

Olga Ferraro, University of Calabria

ABSTRACT

International Accounting Standard No. 1 was released in 2007. The standard required publicly traded companies to separately report comprehensive income in the financial statements. International Accounting Standard No. 1 prescribed two alternative formats for the presentation without mandating any one specific format. It also provides other options such as the criterion for classification of expenses and the presentation of Other Comprehensive Income items at net or gross of tax. The present study examined the presentation of comprehensive income by a sample of companies listed on the Italian Stock Exchange. The goal is to define the degree of homogeneity of the income statements and to explore current correlation between the direction and size of the Other Comprehensive Income and to identify the prescribed method to present Comprehensive Income. The results show substantial uniformity across Italian companies, with regard to how company accountants present Other Comprehensive Income in their financial statement. Also, the results lead us to believe that the choice of two separate statements may be linked to the greater relative size of the Net income.

JEL: M41

KEY WORDS: IAS 1, reporting format, comprehensive income, consolidated financial statement

INTRODUCTION

International Accounting Standards No.1 (IAS 1), ‘‘Presentation of Financial Statement’’ allows two format choices for reporting comprehensive income (CI): a single statement or two separate statements. Furthermore, for the income statement there are other options such as the criterion for classification of expenses and the presentation of other comprehensive income (OCI) items at net or gross of tax.

In this context, the present study has a dual aim: to define the degree of homogeneity of the financial statements for CI, after the introduction of the revised version of IAS 1, and to explore the current correlation, between the direction and size of the items of OCI and the presentation of CI in one of the two prescribed formats. The first objective is based on the belief that the presence of different options can affect the homogeneity of financial statements. In the past, the directive 78/660/EC (IV directive) and 83/349/EC (VII directive) brought about a partial harmonization that then led to the adoption of IAS/ IFRS in Europe. The second objective is linked to the strong grounding, for Italian companies, in the criterion of historical cost for the preparation of financial statements. Consequently, it is estimated that in Italy the choice of one statement rather than another depends both on the contribution the components of OCI have on total income and the relative strength of the OCI on the Net Income (NI).

Data were examined for all companies listed on the Italian Stock Exchange in 2009, excluding companies in the financial sector. This sample of firms provides a unique setting in which to inform Italian policy makers on the value relevance of the additional information included in the new accounting standards. Oour study contributes to the ongoing debate on the format of CI. This study it is the first known empirical research to investigate the Italian context after the adoption of the revised version of IAS 1.

The paper is structured as follows. In section two, the main accounting novelties regarding CI according to the 2007 revised version of IAS 1 are illustrated. Section three develops a review of the main existing studies related to CI reporting modes through observation of financial statements. The fourth section illustrates the research design, while section five outlines the methodology used. Section 6 describes the sample selection process, while section 7 reports the main results of the reporting format used, the other options and the influence of the characteristics of OCI and NI for the format of the income statement. The study concludes with discussion of the main results and perspectives for future research.

COMPREHENSIVE INCOME DISCLOSURE IN IAS 1 (REVISED 2007)

In September 2007, the International Accounting Standards Board-IASB issued *Statement of International Accounting Standard* No. 1 (IAS 1), ''Presentation of Financial Statement''. This standard, effective for fiscal years beginning after December 31 2008, requires that CI and its components be reported in the financial statements in the period in which they are recognized, consistently with what is already used in the U.S. context (Bragg, 1997; Carlson *et al.*, 1999; Fitzsimmons e Thomson, 1996; Luecke e Meeting, 1998; Stevens, 1997).

As a result, listed Italian companies have been obliged, for the fiscal years beginning after 31 December 2008, to disclose the CI in an *ad hoc* statement that reports the NI figure, the OCI items and the CI figure. In particular, a company can report its CI in two alternative *ad hoc* documents: a Separate Statement of Comprehensive Income (hereafter SS) or in a Combined Statement of Net Income and Comprehensive Income (hereafter CS). The IASB leaves it to the company to decide whether to present all items concerning revenue and costs in a single statement or in two statements. This is a compromise solution that the IASB accepted as transitory until such time as other aspects involved in the presentation of the comprehensive income statement have been resolved (Basis for conclusions-BC51, BC52, BC53, BC54).

With regard to definitions of these new types of income, IAS 1 revised 2007 defines CI as the change in equity during a period resulting from transactions and other events, other than those changes resulting from transactions with owners. OCI consists of revenues, expenses, gains and losses that are excluded from net income and are consistent with one of five classifications: (1) changes in revaluation surplus (IAS 16 and IAS 38); (2) actuarial gains and losses on defined benefit plans (IAS 19); (3) gains and losses arising from translating the financial statements of a foreign operation (IAS 21); (4) gains and losses on available-for-sale financial assets (hereafter IAS 39a); (5) the effective portion of gains and losses on hedging instruments in a cash flow hedge (hereafter IAS 39b). According to the revised IAS 1, the OCI items can be presented either before tax or at net of tax. Also, expenses recognized as regarding profit or loss should be analyzed either by nature (raw materials, staffing costs, depreciation, etc.) or by function (cost of sales, selling, administrative, etc). If an entity categorizes by function, additional information on the nature of expenses – at a minimum depreciation, amortization and employee benefits expenses must be disclosed.

To reiterate, we note that options in the revised version of IAS 1 regarding the income statement are the following: the format for CI, the criteria for classification of expenses and the presentation of OCI items at net or gross of tax.

LITERATURE REVIEW

This paragraph presents a review of the main existing studies addressing the question of CI mode of reporting through observation of financial statement. We considered only those studies that have verified the existence of a relationship between method of reporting OCI and CI and some of their characteristics.

The review starts with studies conducted in the United States following the introduction of SFAS 130 (Table 1) and, subsequently, those conducted in the Italian context with the introduction of the revised version of IAS 1 (Table 2).

Table 1: Main USA Existing Studies on Format Selected for CI

Study	Sample	Format Selected for CI	Research questions	Findings
Campbell *et al.* (1999)	Financial statements of 73 firms that chose early adoption of SFAS 130	39 companies choose SCSE 22 companies choose SS 12 companies choose CS	Analysis the choices of format selected for CI. Explore the current correlation, if any, between the sign of the OCI and the presentation of CI in one of the three prescribed formats.	The majority of companies chose to disclose CI in SSE. For this group, OCI was, on average, immaterial or negative. The companies that opted to use the FASB's recommended reporting formats tended to have material and positive amounts of OCI.
Bhamornsiri and Wiggins (2001)	Financial statements of S&P 100 companies for fiscal year 1997-1999	76 companies choose SCSE 15 companies choose SSI 4 companies choose CS 5 not reported	Analysis the choices of format selected for CI. Analysis the impact of OCI on EPS.	The majority of companies report CI as part of their SSE disclosures. On average, CI differs significantly from NI for most companies, varying by as much as 12% over the three-year period. In each year studied, the number of companies negatively affected by OCI was significantly greater than those positively affected. The impact on EPS can be explosive: some companies EPS would change by more than 100%.
Jordan and Clark (2002)	Financial statement of 100 financial service firms for fiscal year 1998	63 companies choose SSE 15 companies choose SS 12 companies choose CS	Examine whether an association exists between direction and size of OCI and the reporting format chosen	The study find that a strong association exists between both the direction and size of the items of OCI and the reporting format chosen. Firms with negative or relatively small amounts of total OCI tend to choose a SCSE format, probably because this format does not relate the OCI items to financial performance of the firm. The reporting format decision, however, does not appear to be significantly related to company size.
Pandit and Phillips (2004)	Financial statements of 100 NYSE-listed companies for fiscal year 2002	89 companies choose SSE 9 companies choose SS 2 companies choose CS	Exam the presentation of OCI and total CI in the financial statements to determine which format predominates five years after the release of SFAS 130. Exam if the reporting of OCI and total CI in one of the three prescribed formats was highly correlated with a positive or negative OCI.	The study showed that of the 89 companies that used a SCSE to report OCI, only 31 companies reported overall positive OCI, while the remaining 58 companies reported overall negative OCI. Companies with negative OCI were almost twice as likely to present it in the SCSE, despite FASB's preference that these items be shown either in the CS or SS. Both companies that used the CS format had negative OCI, whereas, of the nine companies that used the SS, six had negative OCI and three had positive OCI.
Pandit *et al.* (2006)	Financial statements of 100 NASDAQ-listed companies for fiscal year 2002	87 companies choose SSE 8 companies choose SS 5 companies choose CS	Explore the current correlation, if any, between the sign of the OCI and the presentation of CI. In addition the study also investigated other aspect of CI (ex: "Which component of OCI was dominant for the year of study among the companies sampled?").	On the first research question the study find that it is not possible to conclude that it is more "convenient" to present the comprehensive income in the Statement of Stockholders' Equity in order to make its negative character. In case of the sampled companies in the current study, a significant number of the companies that used the third format actually had reported positive OCI for the year of study.

CI = Comprehensive Income; NI = Net Income; OCI= Other Comprehensive Income, SCSE= Statement of Changes in Stockholder's Equity; SS = Separate Statement of Comprehensive Income; CS = Combined Statement of NI and CI. This table shows the main studies on comprehensive income (CI) reporting format and direction of OCI and N in the USA post SFAS 130. For each study we report the sample, the format chosen for the representation of the CI, the research hypothesis and the main findings.

The first empirical evidence on comprehensive income came from a study by Campbell et al. (1999) on those American companies that applied the SFAS N.130 a year early, that is, in 1997 rather than in 1998. They found that 39 of early adopters examined reported CI in a Statement of changes in Stockholders'equity (hereafter SCSE); 22 reported CI in a Separate Statement of Comprehensive Income (SS), and the remaining 12 in a "Combined Statement of Net Income and Comprehensive Income (CS). Their results also indicated that firms that choose the CS or the SS format tend to have items of OCI that are material and positive. In contrast, firms opting for the SCSE format generally have items of OCI that are material and negative.

The results obtained by Campbell et al., however, are not confirmed by later research carried out by Bhamornsiri and Wiggins (2001) on the financial statement of S&P 100 companies for fiscal years 1997 through 1999. With regards the comprehensive income presentation format, the authors show that, although companies show a preference for representing CI in a SCSE, this does not depend on the income results and, above all, it does not depend on their direction. Thus, Bhamornsiri and Wiggins (2001) found no evidence of a relationship between the positive or negative direction of CI and its ultimate presentation the financial statements.

Jordan and Clark (2002) aimed to verify the results of the study by Campbell et al. (1999) through an examination of the financial statements for the year 1998 on a sample of 100 financial service firms. In particular, the authors wanted to ascertain whether there was any correlation between the direction and the size of the OCI components, the size of the company and the chosen format for presenting the comprehensive income. The authors show that firms with negative or relatively small amounts of total OCI tend to choose a SCSE, probably because this format does relate the OCI items to financial performance of the firm.

Pandit and Phillips (2004; 2006) find that 89 of 100 companies used the third format, which included OCI and total comprehensive income in the Statement of changes in stockholders' equity. Only nine sample companies chose the second format and presented a Separate Statement of Comprehensive Income. The remaining two companies chose the first format and presented comprehensive income as a component of their income statement. This finding is largely consistent with that of Campbell et al. (1999) in that a significant percentage (65%) of the companies in the current sample that chose the third reporting format had negative OCI.

To sum up, empirical investigations conducted at the international level on the search for correlation between the direction of OCI and the format for presenting OCI in financial statements have been inconclusive. The work of Campbell et al. (1999) and Jordon and Clark (2002) find that when, as is the case for most of their sample, the components of OCI are presented in the statement of net equity, the OCI has a negative influence on company performance; Bhamornsiri and Wiggins (2001) and Pandit and Phillips (2004), on the other hand, have been unable to find any correlation between direction and accounting format.

In Italy, with the introduction of IAS 1, some authors have examined choices made by companies on the various options contained in the international standard. In one study, the authors tested the possible correlation between the choice of CI size and direction of the OCI, with particular attention paid to CI. However, the selected sample is composed of only of a few companies and intermediate data.

Fellagara and D'Este (2009) study the impacts of disclosure of the first application of the 2007 revised version of IAS 1 on interim financial statements (at June and September) of 110 listed groups at the Italian Stock Exchange for fiscal year 2009. The study analyses format choice selected for CI and other CI aspects. The study finds the majority (95%) of companies chose to disclose CI in a Separate Statement of Comprehensive Income, while only a small grop opted for a Combined Statement of NI and CI.

Table 2: Main Italy Existing Studies on Format Selected for CI

Study	Sample	Format Selected for CI	Research questions	Findings
D'Este and Fellagara (2009)	Interim Financial statements of 110 company groups that listed on the Italian Stock Exchange for 2009.	Financial Statements at June 2009: 97 companies choose SS 7 companies choose CS 6 not reported Financial Statements at September 2009: 61 companies choose SS 3 companies choose CS 46 not reported.	Format selected for CI. Identification of the items of OCI. Effect on the tax. Reclassification of OCI items. Quantitative impacts.	On the first research question the study find that the majority (95%) of companies chose to disclose CI in a Separate Statement of Comprehensive Income, while only a small part of the company has opted for a Combined Statement of NI and CI.
De Cristofaro and Falzago (2010)	Interim Financial statements of 15 power companies listed on the Italian Stock Exchange for 2009.	Financial Statements at September 2009: 14 companies choose SS 1 companies choose CS	Analysis the choices of format selected for CI; Explore the correlation between the sign and size of the items of OCI and the presentation of CI.	All companies chose to disclose CI in SS. The study find that a weak association exists between the direction and size of the items of OCI and the reporting format chosen.

CI = Comprehensive Income; NI = Net Income; OCI= Other Comprehensive Income, SCSE= Statement of Changes in Stockholder's Equity; SS = Separate Statement of Comprehensive Income; CS = Combined Statement of NI and CI. This table shows the main studies on the CI reporting format and direction of OCI and NI in Italy post IAS 1. For each study we report the sample, the format chosen for the representation of the CI, the research hypothesis and the main findings.

The study by De Cristofaro and Falzago (2010) is based on interim semi-annual financial statements of 15 power companies listed on the Italian Stock Exchange. The authors explore current eventual correlation between sign and size of the OCI items and the presentation of CI in one of the two prescribed formats. All companies (14) chose to disclose CI in Separate Statement of Comprehensive Income. The study finds that a weak association exists between the direction and size of the OCI items and the reporting format chosen. The reasons behind the choice of the prospectus can be attributed to a cultural attitude of the traditional type. In other words, companies appear to have chosen the option closest to traditional national accounting procedures. Based on the literature review presented, this study intends to focus on choices carried out during preparation of the 2009 income statement with the revised version of IAS 1. We test the joint contribution of OCI and NI on format choice based on typical characteristics of the national accounting system.

RESEARCH HYPOTHESES

This study forms part of investigations aimed at identifying the behaviors effectively put into practice by companies in the application of IAS/IFRS on the CI. We analyze choices made by Italian companies on the various options contained in the revised version of IAS 1 with regard to the statement of CI, as well as the role played by the OCI in the newly introduced figure of income (CI).

Consequently, the present study has a dual aim: to define the degree of homogeneity of the financial statements on CI, after the introduction of the revised version of IAS 1 and explore the current eventual correlation between the direction and size of the items of OCI and the presentation of CI in one of the two prescribed formats (a single statement or two statements).

The first objective is based on the belief that the presence of different options can affect the homogeneity of the financial statements. In the past, the directive 78/660/EC (IV directive) and 83/349/EC (VII directive) brought about a partial harmonization that then led to the adoption of IAS / IFRS in Europe.
The second objective is linked to the strong roots in historical cost for the preparation of financial statements of Italian companies. Consequently, it is estimated that in Italy the choice of one statement

rather than another depends both on the contribution that the components of OCI have on total income and the relative strength of the OCI on the NI. Following these convictions the research hypotheses are as follows:

H1. The options contained in the revised version of IAS 1 for the CI reduce homogeneity of the Statement of comprehensive income.

H2. The characteristics (direction, size and relative size) of OCI influence the choice of reporting format for the representation of the CI.

METHODOLOGY AND ECONOMETRIC MODEL

The methodology used to test the research hypothesis is divided into two phases. In the first, we examined choices made by Italian companies regarding options in IAS 1 with regard to CI, i.e. the format for CI, the criteria for classification of revenues and costs and, finally, the presentation of OCI items at net or gross of tax. In this phase the data emerging from the observation of variables forming the income (NI, OCI and CI) were described and summarized. The second step measures the probability that the direction and the size of the OCI and the NI may influence the choice of format.

In the first phase, we used simple statistical indicators such as average, median, standard deviation and variance. To measure the probability of a resulting occurrence between two alternatives, we used a logistic regression model. We define "p" as the probability of choosing the format, with "X" the vector of independent variables (direction, size and "relative strength" of the OCI and NI) and "α" and "β" the constant term and the coefficients of the model the following relationship is obtained:

$$p(Y = 1) = F(\alpha + \beta X) \quad (1)$$

where "F" denotes the cumulative standard logistic function. Starting from the equation (1), the model estimated in the research is as follows:

$$Y = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \varepsilon_{i,t} \quad (2)$$

where the variable Y is coded "1" when companies choose to represent the income statement with two separate statements, and "0" otherwise:

$$Y = \begin{cases} 1 \text{ with format = two separate statement (SS)} \\ 0 \text{ with format = single statement (CS)} \end{cases}$$

The independent variables are defined as follows: X_1 is the direction of OCI coded "0" when the OCI is negative, "1" otherwise and; X_2 and X_3 measure the "relative strength" of the NI with OCI <NI and OCI> NI. Finally, X4 is the "relative size" of the OCI on the NI.

DATA AND SAMPLE

Our sample includes all listed firms on the Italian Stock Exchange, excluding the financial sector for the period 2009 as shown in Table 3. The decision to use the data is linked to the fact that this is the first period in which listed companies in Italy have been requested to present comprehensive income. In accordance with previous studies, we excluded banks, insurance companies and other financial firms from

our industry sample because disclosure requirement accounting rules reflect on the annual account content and would not allow for comparison of companies (Devalle, 2010). Moreover, selection criteria for the sample excluded other categories including companies that do not present a consolidated account, non-listed companies and, companies whose closing date for their financial statements was different from 31/12/2009 (for example, 30/9) and thus were not obliged to adopt the revised version of IAS 1. This selection procedure yields 160 Italian firms. For each of the companies, data was hand collected from the consolidated financial statements and transferred to a spread-sheet as the basis for further analysis.

Table 3: Industrial Classifications of Sample Firms

Sectors	No. Society	%
FTSE Italia All-Share Oil and Gas	5	3%
FTSE Italia All-Share Basic Materials	1	1%
FTSE Italia All-Share Industrials	52	31%
FTSE Italia All-Share Consumer Goods	38	26%
FTSE Italia All-Share Health Care	5	3%
FTSE Italia All-Share Consumer Services	23	14%
FTSE Italia All-Share Telecommunications	6	3%
FTSE Italia All-Share Utilities	16	10%
FTSE Italia All-Share Technology	14	9%
Total	160	100%

This table shows the distribution of observations by industry, in line with the classification adopted by the Italian Stock Exchange. The firs column shows the number of companies included in each sector; the second column shows the distribution of the sample in percent.

MAIN RESULTS

Reporting Format Used and the Other Options

Table 4 provides information on the reporting format used. Regarding the accounting format adopted for CI by Italian companies in the first application of the revised of IAS 1, 86% of the sample opted to present components of OCI in a Separate Statement of Comprehensive Income. Only a small proportion of companies (14%) chose to represent comprehensive income in a Combined Statement of NI and CI.

Table 4: Comprehensive Income Presentation Formats, 2009

Format Selected for CI	No.	%
Combined Statement of NI and CI	22	14%
Separate Statement of Comprehensive Income	138	86%
Total	160	100%

This table shows the distribution of Italian companies on the format chosen for the representation of the CI.

In the first column values are expressed in absolute terms, while in the second column as a percentage.
This is hardly surprising in a context such as that of Italy, where traditional criteria and practices for dealing with income are firmly rooted in the accountancy culture. In fact, only through the separation of the two results can the earnings and costs related to the operating cycles be identifiable and, at the same time, different from those results set out in the single statement of changes in stockholders' equity. The latter are actually seen as complementary information and not a substitute for traditional income statements. Moreover, representation in a single document can lead to excessive focus on the bottom line of the statement (total comprehensive income for the year) without explaining its make-up. Uncertainty due to the lack of adequate guidelines from the IASB on what categories outlined in the statement of

comprehensive income should be and which items should be included in each category has certainly encouraged companies to opt for presenting their OCI in two separate statements.
In order to identify other possible reasons why companies choose one format rather than another, we examined the notes to the financial statements. From this study it was found that, although the choice of accounting format is indicated in the majority of the accounts analysed, in very few cases do accountants make explicit the reasons for their choice. Where this is the case, the choices are connected with a particular sector and international praxis. Indeed, the formula generally adopted is as follows: the choice is in line with the mode of presentation of our major competitors and with international praxis. The lack of additional information regarding the choice of format for representing comprehensive income does not allow the user to evaluate the results through an examination of the direction and size in OCI or to identify motivations other than those connected with the desire for as little change as possible in the format for representing the company budget.

Regarding the other options, IAS 1 states that expenses recognized in profit or loss should be analyzed either by nature (raw materials, staffing costs, depreciation, etc.) or by function (cost of sales, selling, administrative, etc.). In Table 5, we report the results of the analysis of the sample consolidated financial statements.

Table 5: Classification of Expenses in Income Statement, 2009

Number of Observation	Classification for expenses by:			
	Natur		Function	
160 Consolidate Financial Statements	115	72%	45	28%

This table shows the number of companies have adopted the classification by nature or by function for their expenses. The results are reported both in absolute and percentage terms.

The results show a clear preference for the classification of expenses by nature (72%), while a smaller percentage of companies opt for classification by function (28%). This examination did not allow a comparison between the various income statements. Table 6 shows the choice made regarding the possibility of representing OCI components at gross or net of related tax effects. In this context the analysis shows a strong predominance towards one of two possible alternatives, namely the representation of OCI items already at net of taxes.

Table 6: Presentation of OCI Items at Gross or Net of Tax in Consolidate Financial Statements, 2009

Number of Observation	OCI Items:			
	To net of tax		To gross of tax	
160 Consolidate Financial Statements	101	63%	59	37%

This table shows the number of companies have adopted the presentation of OCI items to net or gross consolidated financial statement for the year 2009. The results are reported both in absolute and percentage terms.

A joint reading of the results obtained shows that there is a prevailing attitude for each IAS 1 option for the income statement representation. However, since there are a number of companies that differentiate in this sense, this leads us to conclude that the presence of options leads to a non comparability of prospects immediately, thus reducing their homogeneity.

Direction, Size and Relative Size of OCI and NI

Through the use of statistical analysis the composition of OCI was defined as well as the distribution, average, median and direction of NI and OCI during 2009 as shown in Table 7. In addition, we studied the impact of OCI on final income figure with the results presented in Table 8.

Table 7: OCI and NI in Consolidated Financial Statements, 2009

€/000	IAS 16	IAS 19	IAS 21	IAS 39a	IAS 39b	Tax	Other	Total
OCI items	-24,337	-197,008	2,232,123	188,566	-1,850,765	482,467	-34,349	796,698
Relative size of total OCI %	-3.05%	-24.73%	280.17%	23.67%	-232.30%	60.56%	-4.31%	100%
Range of OCI				**Average of OCI**			**Median of OCI**	
Min OCI -1,145,000	Max OCI 822,000			4,958			0.00	
OCI direction								
Positive OCI 41%				Negative OCI 43%			OCI = 0 16%	
Range of NI				**Average of NI**			**Median of NI**	
Min NI -848,000	Max NI 6,390,000			122,074			3.637	
NI direction								
Positive NI 60%				Negative NI 40%			NI = 0 0%	

This table shows the distribution of OCI items and the main statistical quantities (range, average and median) calculated for OCI and NI.

As Table 7 shows, minimum and maximum values of OCI in the aggregate has both positive and negative direction. Furthermore, analysis of positive, negative and zero OCI, shows an almost equal distribution between the groups with positive OCI (41%) and negative OCI (43%). Finally, if we consider the median calculated to be zero it is clear that as the distribution of OCI is divided into two masses of values, those below the median are negative, while subsequent ones are positive. For NI, the data highlights the high prevalence of positive values and a significant average weight compared to the OCI.

Table 8: Impact of OCI on Net Operating Income

Negative variation:	**70**
From profit to loss	1
Reduction of profit	42
Increase in loss	27
No Variation	**24**
Positive variation	**66**
From loss to profit	3
Increase in profit	41
Reduction of loss	22
Total	**160**

This table shows that, through the calculation of the variation in company income after the inclusion of OCI, it was possible to identify the number of cases where company income recorded a gain or a loss, as well as the number of cases where profit turned into loss or vice versa

Finally, as we can see in table 8, for 136 companies (70+66), the inclusion of OCI generated a positive (or negative) impact in the calculation of company earnings, increasing (or decreasing) net income or losses, reversing, in certain cases, the direction from profit to loss and vice versa. The results of Tables 7 and 8, however, are based on absolute values of NI and OCI, which represent only a starting point for an overview of the effects of the revised version of IAS 1 on CI. The analysis continues, therefore, on the relative size index as OCI/NI, OCI/CI and NI/CI.

Table 9 shows, values obtained confirm a higher incidence of NI with respect to OCI on CI. The results and considerations on which we base our H2 lead us to believe that even in cases where OCI is positive, the choice of two separate statements may be linked to the greater relative size of NI compared to OCI and, therefore, does not deserve the role of intermediate result which would be used in the case of a single statement.

Table 9: The Relative Size Index OCI/NI, OCI/CI e NI/CI

Index	Range Min	Range Max	Average	Median	Dev. Std.	Variance
OCI/NI	-3.41	7.45	0.05	0,00	0,793	0,628
OCI/CI	-31.62	1.99	-0,20	0,00	2,555	6,528
NI/CI	-0.99	32.62	1,20	1,00	2,555	6,528

The table shows the statistical analysis conducted on OCI/NI, OCI/CI e NI/CI. The calculation of standard deviation and variance was necessary to cancel the effect of the direction (positive or negative) of the two quantities under comparison.

The influence of the characteristics of the OCI and NI for the format of the income statement

This section examines whether the characteristics (direction, size and relative size) of the OCI influence the choice of reporting format for the representation of the C. The results of equation 2, which has tested the research hypothesis H2, are presented in table 10.

Table 10– Logistic regression model

Variables	Equation (2)	
	Coeff	z-stat
X_1	3.01	4.48***
X_2	0.03	1.34
X_3	0.08	2.83***
X4	2.18	2.79***
Pseduo-R^2	0.20	
Chi-test	35.62	
	0.00	

(*), (**), (***) denote statistical significance at the 10, 5 and 1% level, respectively. This table shows regression coefficients, the value of the z-statistic. In the bottom of the table shows, in addition to the value of the Pseudo-R^2, the value of chi-square and its probability assuming that the regression coefficients are jointly equal to zero.

The results show the direction of the estimated coefficients (beta) is positive and statistical significance is high, except for X_2 that measures the "relative size" of the NI with OCI <NI. The results show that when the OCI, both positive and negative, has a relative strength greater than the NI (to improve the overall result) there is a greater probability of choosing the single statement for the representation of economic performance. However, although the percentage of correct classifications by the model is very high (89%) it should be noted that the value of the pseudo-R^2 is very low (20%). This means that the choice of format for the CI involved other factors not strictly related to the characteristics of the NI and OCI.

CONCLUSIONS

In this study we examined the means of representing and the impact generated by CI on listed companies in Italy that have, for the first time, drawn up their financial statements according to the specifications in the revised version of IAS 1. In particular, we analyze choices made by the Italian companies on various options contained in the revised version of IAS 1 with regard to the statement of CI, as well as the role played by the OCI in the new figure of income (CI).

The purpose of this study has been to evaluate the degree of homogeneity in the presentation of income statements with the revised version of IAS 1, and to explore the correlation between the direction and size of the items of OCI and the presentation of CI in one of the two prescribed formats (a single statement or two statements). The results show substantial uniformity across Italian companies, with regard to how OCI presentation in their financial statement and for the other options provided by IAS 1.

In all of the analyzed sample there is evidence of a prevalent tendency, for each of the different options in the IAS 1, towards the income statement representation. However, there are a number of companies that

differentiate, leading us to conclude that the presence of options leads to no immediate comparability of prospects, thus reducing their homogeneity.

With regard to the second objective, we examine the characteristics (direction, size and relative size) of the OCI items. The minimum (€ -1,145,000) and maximum (€ 822,000) values of OCI in the sample show that this aggregate has both positive and negative direction. Furthermore, analysis of OCI positive, negative and zero values shows an almost equal distribution between the groups with positive OCI (41%) and negative OCI (43%). Finally, we note the median calculated to be zero is understood as the distribution of OCI divided into two masses of values: those below the median are negative, while subsequent ones are positive. For the NI, the data highlights the high prevalence of positive values and a significant average weight compared to the OCI. Also, we verify that for 136 companies (70+66), the inclusion of OCI generated a positive (or negative) impact in the calculation of company earnings, increasing (or decreasing) net income or losses, reversing, in certain cases, the direction from profit to loss and vice versa.

Finally, the analysis on the relative size index (OCI/NI, OCI/CI and NI/CI) confirms a higher incidence of NI with respect to OCI on CI. In conclusion, the results and considerations on which we base our H2 lead us to believe that even in cases where the OCI is positive, the choice of two separate statements may be linked to the greater relative size of NI compared to OCI and, therefore, does not deserve the role of intermediate result which would be used in the case of the single statement.

To measure the probability that characteristics (direction, size and relative size) of the OCI influence the reporting choice for the representation of the CI, we used a logistic regression model. The results show the direction of estimated coefficients (beta) is positive and that statistical significance is high, except for X_2 that measures the "relative size" of the NI with OCI <NI. In other words, the results show that when the OCI, both positive and negative, has a relative strength greater than NI (to improve the overall result) there is a greater probability of choosing the single statement for representation of economic performance.

However, although the percentage of correct classification of the model is very high (89%) it should be noted that the pseudo-R^2 value is very low (20%). This means the choice of format for CI involved other factors not strictly related to the characteristics of NI and OCI. The findings of this work can be a useful starting point for future research aimed at assessing significance of the notion of income in accounting. Based on international experience, a study of predictive values, in terms of future earnings and turnover, of comprehensive income and traditional income, could shed light on the question of which of the two notions should be adopted as a measure of company performance.

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BIOGRAPHY

Olga Ferraro is a Researcher in Business Economics within the Faculty of Economics of University of Calabria. Her main research interests are related to value relevance analysis, the performance of companies and International Accounting Standards. On these research themes, she has published books, book chapters, journal articles and presented papers to national and international congresses. She can be reached at University of Calabria, Department of Business Administration, Cubo 3C, Via P. Bucci, Arcavacata di Rende (CS) 87036, Calabria, Italy, o.ferraro@unical.it.

COULD PEER-TO-PEER LOANS SUBSTITUTE FOR PAYDAY LOANS?

Lynda S. Livingston, University of Puget Sound and 4 Horsemen Investments

ABSTRACT

Many consumer advocates consider payday loans—short-term, uncollateralized loans with high interest rates—to be predatory. The demand for short-term funding has spurred the quest for a substitute, an effort encouraged and supported by regulators like the Federal Deposit Insurance Corporation. In this paper, we evaluate the potential for online peer-to-peer markets to provide this alternative. We conclude that while certain features of peer-to-peer loans would be well suited (such as their longer terms, larger amounts, and multiple payments), the longer time to fund and the required minimum credit scores for borrowers present meaningful hurdles.

JEL: G18, G21, G28

KEYWORDS: Fringe Lending, Payday Loans, Peer-to-Peer Loans

INTRODUCTION

Payday loans have been called "one of the most expensive forms of credit in the world" (Skiba and Tobacman, 2008). A typical two-week payday loan costs $15 per $100 borrowed—a 391.07% APR, or 3,724% effective annual rate. Opponents accuse these extremely high-interest loans of drawing borrowers into a "debt trap." The industry counters that its rapid growth proves that it is providing a necessary, welfare-enhancing service to its customers.

The fact that customers use payday loans does not imply that these loans are the optimal short-term product. In this paper, we evaluate a potential alternative, peer-to-peer (P2P) loans. In a P2P marketplace, potential borrowers post requests for loans, and potential lenders bid on those that interest them. A lender can bid as little as $25 per loan, so it may take many lenders to fund a successful loan request. This more "democratic" process may lead to a more efficient outcome than can a payday transaction.

To evaluate the potential for the P2P market to provide short-term, unsecured, payday-like credit, we consider both the Prosper platform (the oldest P2P network in the United States, opened in 2006) and its highest-profile competitor, Lending Club. We find that, as the P2P market has evolved, its minimum loan sizes, bids per loan, and terms have all fallen, making it a more viable payday alternative. The biggest hurdles left are access, funding speed, and required credit score. However, we argue some payday customers nonetheless may be better off in the P2P market.

The paper proceeds as follows. In the next two sections, we review and evaluate the literature on payday loans and the payday borrower; this review allows us to characterize the market to which we want to apply the P2P approach. Given this characterization, we then evaluate the potential for P2P loans to serve the typical payday customer. The final section highlights the primary hurdles for short-term borrowers in the peer-to-peer market, suggests areas for future research, and concludes.

LITERATURE REVIEW

P2P loans cannot substitute for payday loans if they do not meet the needs of the payday customer. There is a significant literature describing the payday borrower, although much of it is primarily advocacy—written either by industry apologists or by consumer activists. In this section, we review the (smaller) literature from academics and regulators that more objectively characterizes the payday market. We concentrate on the demographics of the typical payday customer, the costs they incur, the number of loans they use, and the alternatives they have. We will see that payday customers are often lower-income minorities who use multiple short-term loans per year. If peer-to-peer loans are to be a viable substitute, they must meet the needs of this typical payday-loan customer.

One of the earliest studies of the payday market was Elliehausen and Lawrence's 2001 survey, which polled over half of the payday shops in the United States. They found customers who were Goldilocks borrowers, falling in the middle of many demographic categories. These borrowers were neither extremely well- nor poorly educated: almost three-fourths had a high-school diploma or some college. They were neither very old nor very young. Most were 25 to 49, making them older than the customers of pawnshop or finance companies, but younger than people who primarily use credit cards. (Pawnshops and finance companies are two types of "fringe" lenders, a category that also includes rent-to-own businesses, check cashers, refund anticipation lenders, auto-title lenders, and, most importantly for us, payday lenders.) Finally, their incomes were neither very high nor very low: just over half earned between $25,000 and $49,999, again between pawn and credit card borrowers.

Not all payday borrowers' incomes are this high, of course. Results of more recent studies, while broadly consistent with Elliehausen and Lawrence, suggest that many payday borrowers are lower-income. For example, Melzer (2009) asserts that the "vast majority" of payday borrowers have incomes between $15,000 and $50,000. Thus, his upper bound is comparable to Elliehausen and Lawrence's, but his lower bound—encompassing all borrowers, not just the majority—is much lower. Similarly, the average income in Skiba and Tobacman's (2005) sample was between $18,000 and $24,000; in Stegman (2007), it was between $20,000 and $30,000. These absolute income levels demonstrate that payday borrowers are not living in poverty, but they are certainly not "the 1%," either.

As for Lawrence and Elliehausen's findings on relative incomes, recent studies confirm that payday customers fall between pawn users and credit-card borrowers. At the upper end, Agarwal, Skiba, and Tobacman (2009) use a matched-sample study of payday and credit-card borrowers, finding that the average incomes for payday borrowers are "much lower" than those for their credit card group. In contrast, Buckland and Martin (2005) employ a sample that included several types of fringe activity, including pawning. They find that employed fringe borrowers have average annual incomes of between CD10,000 and CD20,000—levels consistent with the "notion that low income is a determinant in fringe bank use." However, by including pawn users, they included "lower-tier" customers whose incomes (usually below $15,000) would generally screen them out of the payday market (Melzer, 2009). The average income in Buckland and Martin's sample therefore is lower than it would have been had they studied only payday borrowers. Thus, we can infer that the payday borrowers' incomes, as in Elliehausen and Lawrence, lie between those of credit card users and pawn users: lower income, but not poor.

Having placed payday borrowers in the middle categories for income, age, and education, we now turn to race as our final demographic descriptor. Temkin and Sawyer (2004) assert that it is "well established" that minority families are the primary clientele for payday lenders. Their survey evidence strongly supports this conventional wisdom. They studied eight urban counties to characterize the demographics of the residents and the availability of lending services. In seven of their eight counties, payday lenders were more concentrated in high-minority neighborhoods. (See also Skiba and Tobacman, 2009.) In particular, they were more prevalent in Hispanic neighborhoods: in all eight of the studied counties,

alternative providers clustered in neighborhoods where the proportion of Hispanic residents was higher than for the county as a whole. This was true for African-Americans in only two of the counties, and was not true at all for Asian-Americans. They conclude that "alternative financial providers [such as payday lenders] tend to cluster in neighborhoods that are disproportionately Hispanic." Therefore, if peer-to-peer loans are to substitute for payday loans, it will be important to ensure proper outreach to this community.

Having reviewed the evidence on the demographics of payday customers, we now consider the supply side of the market. Here, the available data shows that payday borrowers have access to traditional banking products, but that they nonetheless repeatedly turn to expensive payday credit. This reliance on payday credit can aggravate the cashflow problems that led to the loans in the first place.

Most payday borrowers have traditional banks in their neighborhoods. According to Temkin and Sawyer (2004), fringe providers almost always share their neighborhoods with at least one bank, usually closer than seven blocks away. In fact, for all of their study areas with less than 75% minority population, banks *outnumbered* alternative providers. This was true regardless of a state's regulatory environment; climates friendlier to alternative lending did not have higher concentrations of fringe lenders (although they might have a different mix). Thus, the "spatial void" hypothesis, which suggests that fringe lenders gravitate to areas with no other loan supply, appears false; wherever they live, payday customers probably have access to banks and their services.

Despite this access, payday customers turn to payday lenders, often many times per year. Although payday loans are marketed as short-term credit, critics charge that borrowers' problems often are not resolved during one payday term, so that they end up rolling loans over multiple times. Indeed, the evidence for multiple rollovers is overwhelming. We summarize some of this evidence in Table 1. (See also Stegman, 2007.) This data clearly supports Flannery and Samolyk's (2005) conclusion that "a substantial subset of [payday] borrowers appear to use the product chronically."

Table 1: Evidence on Payday Loan Rollovers

Reference	Loans Per Yr.	Sample %	Notes
Skiba & Tobacman, 2005	8.4		average for borrowers paid biweekly
Skiba & Tobacman, 2005	9.6		average for borrowers in highest income quintile
Skiba & Tobacman, 2009	5.2		average number of additional loans taken out by first-time borrowers
Stegman, 2007		50%	% of payday borrowers who already have a payday loan outstanding
Stegman, 2007		75%	% of payday borrowers who cannot pay their loans when due (Oregon)
Freedman & Jin, 2008	6+	70%	(Wisconsin)
Elliehausen & Lawrence, 2001	7+	48%	
Skiba & Tobacman, 2008	10+	25%	
Flannery & Samolyk, 2005	13+	25%	
Melzer, 2009	13+	30%	
Skiba & Tobacman, 2008	20+	10%	
Freedman & Jin, 2008	20+	18%	(Wisconsin)

This table summarizes evidence from prior studies on payday loan rollovers. In the bottom half of the table, the "Sample %" column gives the proportion of surveyed borrowers who took out the number of loans specified in the "Loans Per Yr." column. For example, 48% of Elliehausen and Lawrence's (2001) sample took out at least 7 loans per year.

This chronic use is a concern for regulators. The FDIC's (2005) examination and compliance guidelines for payday lending state that "[a]lthough the contractual term of each payday loan may be short, institutions' methodologies for estimating credit losses on these loans should take into account the fact that many payday loans remain continuously outstanding for longer periods because of renewals and

rollovers." They direct examiners to ensure that institutions issuing these loans establish policies that prohibit lending to customers who have had payday loans *from any lender* for three of the last twelve months. In 2005, the FDIC prohibited regulated institutions from making more than six loans per year to any borrower (Stegman, 2007). The industry also addresses rollovers in their (nonbinding) best practices, asking that lenders limit rollovers to four per year, at most.

However, chronic borrowers are critical for the profits of the payday loan industry. Data from North Carolina show that 85% of their payday lenders' revenue comes from customers who take out more than six loans per year; 50% comes from those with more than 13 loans per year (CRA-NC, 2010). Stegman (2007) reports that the most important determinant of a payday store's success, after the number of customers, is the percentage of customers who take out a new loan or roll over a loan at least once a month. Similarly, Flannery and Samolyk (2005) find that "high-frequency borrowers account for a disproportionate share of a payday store's loans and profits." While the latter authors are unwilling to assert that the profitable high-frequency borrowers necessarily are rolling over loans, they do note that the industry's "current size…and prospects for future growth do reflect the activity of the frequent borrower."

Of course, if payday loans were innocuous and inexpensive credit, critics would not worry about customers' taking out multiple loans per year. However, research strongly links payday loans to borrowers' financial distress.

The average payday borrower who defaults has already repaid or serviced five payday loans within the year, making total interest payments of 90% of the principal of his first loan (Skiba and Tobacman, 2008). Credit card customers who have taken out a payday loan are 92% more likely to become seriously delinquent—over 90 days late—than are those customers who have not (Agarwal, Skiba, and Tobacman, 2009). Payday loans clearly do not *solve* financial distress; in fact, Melzer (2009) finds "no evidence that payday loans alleviate economic hardship."

Worse, they may exacerbate it. Payday loan access makes it more likely that households will pay rent and utility bills late or delay medical care (Melzer, 2009). For Air Force personnel, "payday loan access causes financial distress and severe misbehavior for relatively young, inexperienced, and financial[ly] unsophisticated airmen" (Carrell and Zinman, 2008). Skiba and Tobacman (2009) find that payday borrowers are over twice as likely as the general population to file Chapter 13 bankruptcy. These authors blame interest payments on rolled-over payday loans—accruing at very high rates and after very short terms—for being the straws that tip financially stressed borrowers into bankruptcy.

THE PAYDAY MARKET: ANALYSIS

In the previous section, we characterized the payday loan market. In this section, we evaluate that market by drawing on other strains of research, particularly the behavioral finance literature. Our goal is to determine if there are behavioral features of demanders and/or structural features of suppliers that—despite the potential drawbacks—make the payday loan optimal for certain borrowers.

First, we will consider the demand side of the market. Are there possible behavioral explanations for the clustering of payday lenders in Hispanic neighborhoods? More broadly, is there a behavioral rationale for the demand for high-rate, short-term credit?

While there is widespread recognition of the concentration of fringe lenders in minority neighborhoods, there is little evidence explaining it. The Hispanic Institute, in a paper supportive of payday access for Hispanics, makes several conjectures (Hispanic Institute, 2010). For example, they suggest that many recent Hispanic immigrants come from countries where banks are distrusted. Even if these immigrants trusted banks, the banks might not trust them, since traditional lenders often discriminate against

Hispanics. Banks usually do not locate in Hispanic neighborhoods (note that this assertion is contrary to the evidence in Temkin and Sawyer, 2004), and those few that do have hours that are inconvenient for shift workers. On the other hand, unbanked Hispanics who need to cash their paychecks, and perhaps to send money back to their home countries, will quickly become familiar with the payday lenders who also perform these services.

Buckland and Martin (2005) provide some evidence consistent with these conjectures. In their survey of fringe banking customers in inner-city Winnipeg, they find that lack of identification and desire for anonymity fuel demand for fringe banking services. Some of their respondents reported feeling discriminated against by mainstream banks if they were unable or unwilling to provide acceptable forms of identification; these customers preferred the "no questions asked" approach of fringe providers. Similarly, Washington (2006) cites a survey in which 18% of respondents report that they are "not comfortable dealing with banks," and 9% of Elliehausen and Lawrence's (2001) sample identified "privacy or a lack of credit reporting" as the primary reason for choosing a payday loan. Buckland and Martin (2005) conclude that these attitudes imply that some customers "are so often questioned about their identity, and not always for legitimate reasons, that they are ready to pay a higher price for a service that will treat them as regular and trusted clients." If such attitudes are most common in Hispanic communities, they might help explain payday-lender clustering in Hispanic neighborhoods.

The behavioral finance literature also offers an (oblique) insight. Thaler and Shefrin (1981) suggest that families and role models often pass down their self-control mitigation rules—personal standards that allow people to manage the tension between their desire for current consumption and their need to save for future consumption. The authors predict that different groups would use different rules, where age, social class, and education might be valuable predictors. If different ethnic groups follow different norms, this might account for the concentrations of fringe lenders in certain neighborhoods. In fact, the Hispanic Institute (2010) makes a point of describing its community in terms of age, occupation, and education, contrasting the Hispanic community with the demographic coveted by traditional lenders; perhaps, then, we can posit that the Hispanic community follows norms amenable to payday lending. If so, then peer lenders would need to account for any such norms if P2P loans are to be a viable substitute.

The behavioral link between Hispanic culture and payday borrowing has not been fully explored in the literature. However, in their seminal study, Elliehausen and Lawrence (2001) tried a broader application of behavioral finance to payday lending in general, arguing that—for certain borrowers—use of extremely high-cost loans can be rational. Since their defense of the payday industry has framed the debate ever since, it is important to examine their arguments carefully.

Elliehausen and Lawrence first defend payday lending by invoking Juster and Shay's (1964) model of consumer credit use. This model predicts that "rationed" borrowers with "relatively high-return investment opportunities, low current income, and strong preferences for current consumption" may rationally choose to borrow at high rates. Elliehausen and Lawrence suggest that such borrowers might be in early stages of their family life cycles (young parents) with low or moderate income and little savings. These borrowers would be more concerned with the term of a loan than with its stated rate.

However the types of loans envisioned by Juster and Shay were for household durables that provided a valuable stream of services over time. ("This monograph is concerned with the use of survey data on consumer anticipations as an aid to prediction of durable goods purchases": Juster and Shay, 1964, p. 3.) These assets offer high rates of return, considering the opportunity cost. (For example, buying a washing machine can be immensely rewarding compared to the hassle of using a public laundry.) However, this rationale does not apply to payday borrowing, since borrowers are unlikely to use payday loans to buy household durables. Instead, these loans are "small short-term loans intended to carry a borrower through a temporary cash deficiency" (Flannery and Samolyk, 2005). In fact, in their report on use by Hispanic

borrowers, the Hispanic Institute (2010) bases its defense of the industry on the fact that payday loans are used for "basic living expenses and emergencies, and…normal bills." Similarly, Buckland and Martin (2005) find the top uses for payday loans were school supplies, childcare expenses, expenses for travel to visit sick relatives, and presents for birthdays and Christmas. Elliehausen and Lawrence assert that over half of their respondents had a payday loan outstanding because their survey was taken around Christmas. They summarize: the "[u]se of payday loans is determined more by unplanned events than by the characteristics of the consumer or the consumer's financial circumstances… nearly two-thirds of customers reported unexpected expenses or shortfalls in income as the reason for their most recent payday loan sequence." Given the consensus on the uses of short-term loans, Elliehausen and Lawrence's appeal to household durable purchases to justify the high rates charged by payday lenders does not work.

The authors then turn more directly to behavioral economics to defend payday lending, specifically to the "precautionary motive for saving" and "precommitment." The precautionary motive for saving supposes that consumers want to preserve valuable liquidity for future emergencies, and are reluctant to draw down their liquid assets even for large expenditures. These customers would rather borrow at high rates than deplete their cash cushion—implying that the "subjective" yield they earn on their liquid assets can be higher than the rates on payday loans. However, for the precautionary savings motive to be relevant, a borrower must have liquid assets to protect. In Elliehausen and Lawrence's own survey, "payday customers have very limited liquid assets": only 16% of the respondents had sufficient funds in checking and savings to cover their most recent advance. The argument has theoretical difficulties as well; for example, in Skiba and Tobacman's (2005) model, the income shock necessary to induce rational borrowers to resort to payday loans is *larger* when they allow a precautionary motive for saving.

Precommitment also seems an unlikely justification for payday borrowing. The precommitment motive for borrowing implies that consumers appreciate the discipline imposed by a loan. These consumers worry that, without a contractual obligation, they may be unwilling to save for large purchases, repay depleted assets, or restore utilized credit lines. However, payday borrowing may not be the best way to combat these fears. In Thaler and Shefrin's (1981) model of self-control, precommitment is the most extreme form of rule-setting: it is a way of altering the opportunity set of an actor such that all of his discretion is eliminated. Such restrictive rule-setting can be rational in their model only if the outcome is comparable with what would obtain if the actor had no self-control problems. Using this standard, it is difficult to interpret a payday loan to be a rational precommitment mechanism. If payday loans are used for their advertised purpose—bridging short-term income gaps—then they are too short to engender meaningful savings discipline. On the other hand, if the loans are rolled over (as we know they often are), then payday loans still are not optimal; borrowers who need this type of credit, and who had no self-control problems, would be much better off with lower-rate revolving debt.

Skiba and Tobacman (2008) propose another application of precommitment, linking it to default. Default can serve as a type of discipline, since defaulters must stop borrowing. Perhaps borrowers take out a payday loan planning to default, so that they cannot borrow again. However, this proposed strategy does not fit the facts. In reality, payday borrowers wait *too long* to default, rolling through five loans—paying in interest 90% of the original loan's value—before defaulting. This is more consistent with the characterization (from Elliehausen and Lawrence themselves) that payday borrowers "may lack self-control or have poor financial management skills that cause them to live from paycheck to paycheck for extended periods of time" than it is with the idea that these borrowers choose payday loans to enforce self-discipline.

These demand-side defenses for payday lending are not convincing. Consumers use payday loans, but the behavioral explanations advanced so far do not imply that these loans are the *best* type of short-term credit to meet their needs. We now turn instead to some supply-side considerations: the alternatives

available to borrowers, and the costs of payday lending. Perhaps customers choose payday loans because they have no choice; perhaps those loans have high fees simply because they are so expensive to make.

We noted earlier that payday customers probably have banks in their neighborhoods. In fact, by definition, payday borrowers must access at least one bank service, since a payday loan requires a post-dated check. Therefore, bank overdrafts are a logical alternative to payday loans, and many authors have identified protected overdrafts as the closest payday substitute. (See, for example, Carrell and Zinman, 2008; Morse, 2009; De Young and Phillips, 2009; Flannery and Samolyk, 2005; Elliehausen and Lawrence, 2001; and Morgan and Strain, 2008.) However, overdrafts are expensive, and may be especially so for customers in areas served by payday lenders. Melzer (2009) shows that, in these areas, banks charge higher fees for bounced checks and overdrafts, and customers are more liable to have their checking accounts closed involuntarily. And, as noted earlier, banks may not keep the convenient hours that payday shops do, and may require more intimidating processes and interactions than payday lenders (Elliehausen and Lawrence, 2001; Buckland and Martin, 2005). Thus, bank overdrafts, while accessible, may not be viable substitutes for payday loans for some customers.

Credit cards may be another alternative. Most payday borrowers do have credit cards (Elliehausen and Lawrence, 2001; Agarwal, Skiba and Tobacman, 2009). However, 61% of Elliehausen and Lawrence's sample could not use their cards because they were too close to their credit limits. In contrast, two-thirds of borrowers in Agarwal, Skiba and Tobacman's (2009) matched sample still had had at least $1,000 in unused credit on their cards when they took out their first payday loan. However, their liquidity was deteriorating quickly: their available card credit had shrunk by almost $550 in the prior year, with the most dramatic decline in the most recent five months. Thus, having a credit card, even one with available credit, may not be sufficient to protect a payday borrower from financial distress.

Payday borrowers, while nominally having alternatives, may nonetheless face credit constraints. There could still be room for a new product to alleviate those constraints, but there would be no reason to create one if it could not be more affordable. Thus, if we are to propose P2P loans as an alternative, we must first consider the industry's defense of its seemingly high fees.

The payday industry justifies its fees by noting that payday lending is expensive. There is a substantial fixed cost to lending; smaller loan amounts mean this cost is relatively higher. In addition, payday default rates are high (13.7% of gross revenues in Elliehausen and Lawrence's 2001 sample, compared to about 8.7% for consumer finance companies).

However, if fees simply reflect costs, then, for example, we would have expected them to fall in our current low interest-rate environment. But payday fees are sticky. De Young and Phillips (2009) find that payday fees are set near the regulatory maximum. (See also Flannery and Samolyk, 2005.) When a state maximum is imposed, fees rise and cluster at that maximum. Pricing behavior becomes less competitive, and strategic pricing patterns emerge: lenders began to charge higher fees in areas with less elastic demand (minority and military neighborhoods), and to charge higher fees to repeat borrowers.
Any remaining price differences are small and insignificant. For example, while Morgan (2007) found that adding 50 stores to an area with 100,000 people lowers fees by 50¢ per loan, his result is strongly influenced by one outlier; without it, his statistical significance disappears. (As for the economic significance, decreasing the mean fee of $17.10 per $100 borrowed by 50¢ lowers the APR from 446% to 433%, and the effective annual rate from 6,029% to 5,382%.)

(Buckland and Martin (2005), in contrast, find that there is great variation among the payday lender fees charged by providers in Winnipeg's inner city. However, their lenders include transactions fees, such as check-cashing and processing fees, that are not mentioned by other authors. There also are fees

associated with some of the innovations in payday lending. For example, in the "Credit Services Organization" model being used in Texas to circumvent usury laws, Advance America charges a referral fee of $20 per $100 borrowed, an application fee of $10, and interest of $10 (Stegman, 2007).)

Thus, payday loan fees are set systematically near the highest allowed rate. Flannery and Samolyk (2005) interpret this as reflecting inelastic demand, so that the payday industry naturally competes on the convenience of its locations, not on price. However, there is another explanation. De Young and Phillips (2009) note that the patterns they observe in payday prices are consistent with implicit collusion. Consider how similar the payday situation is to another anticompetitive pricing scheme that caused a much greater scandal. In 1994, Christie and Schultz (1994) showed that Nasdaq dealers were able to collude implicitly to double their spreads, given the established practice in the market of avoiding odd-eighth quotes. Like these dealers, payday lenders operate in markets where prices are public, and they make repeated transactions. Thus, we can consider payday lending an infinitely repeated game of perfect and complete information, where the regulatory maximum price acts as the focal point. Collusion is therefore possible, and the immediate gains for lenders who deviate are lower than their foregone future benefits. This potential for collusion undermines the industry's argument that fees simply reflect their costs.

High fees matter. Customers may need short-term loans, but they do not need expensive payday loans *per se*. As one of Buckland and Martin's (2005) respondents reported: "I guess I am only satisfied that there is a service available for me to use—I am not really satisfied with fringe banking." Given the demand for small loans, the "healthy" profits of the payday industry, and the potential for abuse, there is room for a new product. Flannery and Samolyk (2005) suggest multi-period, amortizing loans, which would allow borrowers more time to remedy financial problems. In the next section, we consider one such possibility: the peer-to-peer loan.

COULD P2P LOANS SUBSTITUTE FOR PAYDAY LOANS?

The peer-to-peer loan market, an outgrowth of the microfinance movement, started in the United States in 2006 with the opening of the Prosper marketplace. In a peer-to-peer (P2P) market, potential borrowers use an online forum to post listings requesting loans. Listings contain certain objective information verified by the P2P platform (such as the debt-to-income ratio), as well as any additional information volunteered by the borrower (perhaps pictures or a description of the loan's purpose). Lenders browse listings and bid on those they like. Bids can be as low as $25. Most loans are funded by multiple lenders, and most lenders build diversified portfolios of loans. Only about 10% of listings are funded (see, for example, Herzenstein, *et al.*, 2008; Freedman and Jin, 2008b). Although there are now multiple P2P platforms, we focus on two: Prosper, the oldest U.S. platform, and Lending Club, probably its best-known direct competitor. Basic features of loans on these platforms are outlined in Table 2. In this section, we consider both the loan-specific features and the structural features of this market to evaluate the potential for P2P loans to substitute for payday loans.

P2P loans differ from payday loans in size, term, and maturity structure: P2P loans are larger, longer, and repaid in installments. All of these features could make P2P loans attractive alternatives for payday borrowers.

P2P loans are larger than payday loans. The minimum Lending Club loan is $1,000; on Prosper, it is $2,000. In contrast, the *maximum* payday loans is around $700, and 80% of them are for less than $300 (Stegman, 2007). The size mismatch may not be as large as it appears, however. As noted earlier, there is extensive evidence that payday borrowers frequently roll over their loans multiple times per year. Smaller initial loans do not meet the needs of these customers—they just end up turning into much bigger

loans. Having a larger loans, especially ones with a substantially lower interest rate and with dollar costs that vary with the term of the loan, may be a better solution to these serial borrowers' cashflow problems.

Table 2: Comparison of Loan Characteristics at Lending Club and Prosper

Loan Characteristic	Lending Club	Prosper
rate: fixed/variable	fixed	fixed
Payments	equal, monthly	equal, monthly
prepayment penalty?	no	no
maximum posting term for listing	14 days	14 days
late fee if	> 15 days late	> 15 days late
default if	> 120 days late	> 120 days late
minimum loan amount per lender	$25	$25
minimum FICO score	660	640
minimum loan size	$1,000	$2,000
maximum loan size	$35,000	$25,000
loan term	3 or 5 years	1, 3, or 5 years
Fee	1.11%-5%	0.5-4.5%
loan credit-grade factors	# recent credit inquiries	# of inquiries
	credit utilization	bankcard utilization
	open # of accounts	# of recently opened trade accounts
	total # of accounts	# of trade accounts
	length of credit history	# of delinquent accounts
	loan amount	amount of available credit on bankcards
	desired term	

This table outlines the characteristics of two major peer-to-peer lending platforms. Lending Club sorts loan applications into 35 "risk buckets" based on the criteria listed as loan credit-grade factors; Prosper assigns seven ratings grades and ten "Prosper scores" based on its criteria. This data was compiled from guidelines specified on the firms' websites, LendingClub.com and Prosper.com, respectively.

Dobbie and Skiba (2011) show that relaxing the credit constraints on payday borrowers actually does reduce the risk of default. In their sample, loans are lumpy—they come in increments of $50, and are limited to half a borrower's net pay. This creates discontinuities in the loan schedule, where the jumps in maximum loan size constrain borrowers with paychecks just below the cutoffs. The authors show that relaxing these constraints—allowing borrowers to increase their loan size—decreases the default rate. It also mitigates the potential moral hazard of borrowers' being more likely to default on larger loans. Thus, the greater flexibility and availability of larger loans in the P2P market could improve default rates for some constrained borrowers. Since lower-income borrowers may be more credit constrained, P2P loans may be of the most use for just the people who might otherwise turn to payday lenders.

Lengthening the term of a loan can also relax credit constraints. Adams, *et al.* (2009) find that subprime borrowers' demand for loans is much more sensitive to the loans' terms than to their rates. The rollover evidence underscores this—even Elliehausen and Lawrence (2001) believe that customers roll over their payday loans because they really want longer-term loans. Regulators agree. The FDIC's small-dollar loan pilot program—a project designed to help banks find profitable ways to provide short-term credit—found that 90 days was the minimum time necessary for repaying a small loan. Applying this lesson, regulators are moving toward requiring that payday lenders allow their customers to extend the term of at least one loan per year. For example, a recent Washington state law gives payday borrowers the right to opt into a no-fee payment plan, as long as they are current on their loans. Borrowers with loan balances of less than $400 may take up to 90 days to pay; those with larger loans have up to 180 days. (Perversely, this move toward longer terms may actually stimulate demand for payday loans, since Skiba and Tobacman, 2005, find that allowing the option for multi-period repayment decreases the income shock

necessary to induce payday borrowing.) In any case, a longer payday loan is still a payday loan. P2P loans—with their one- to five-year terms—are longer loans that are truly different from payday loans.

Term and size are not the only differences. Another important distinction is that P2P loans are repaid in installments. This makes P2P loans a better vehicle for the savings discipline that Lawrence and Elliehausen (2008) ascribe to payday loans (referencing Juster and Shay, 1964). In addition, because payment is automatic and systematic, loan performance should improve (FDIC, 2005).

We turn to structural features that may affect loan suitability for payday borrowers. We consider supply and demand effects: first, lenders' ability to screen in the P2P market, then borrowers' ability to access the market and to meet its required credit scores.

Supply in the P2P market depends upon the willing participation of many, probably amateur, individual lenders. Freedman and Jin (2008b) identify two possible information problems for these lenders. First, they cannot see borrowers' exact credit scores, so they face the potential for adverse selection. Second, because they need not be professional lenders, they may not be able to screen loans effectively. Of course, the two problems are related: if lenders are somehow able to screen, they can mitigate any adverse selection. In fact, there is evidence that borrowers can screen. This ability, plus efforts by the platforms to improve information available to lenders, enhances the potential of P2P markets to serve payday borrowers despite the possible information problems.

Professional lenders in the payday market use a streamlined screening process, to cut costs. ("An applicant with a bank account, a pay stub, a telephone, and an adequate—albeit subprime—credit history can usually get a payday loan"—Flannery and Samolyk, 2005). Eligible borrowers whose credit score is above a threshold are approved; those below are not (Skiba and Tobacman, 2009). This thumbs up/thumbs down threshold does not exist in the P2P market. In fact, P2P lenders do not even see the borrowers' credit scores. Instead, P2P platforms separate applicants into risk groups based on their credit characteristics, and lenders are told only this risk assignment. Since higher- and lower-quality borrowers in a given risk group look the same, there is a "lemons" problem. This problem is not just hypothetical; adverse selection in these markets is real. Freedman and Jin (2008b) find that listings within credit grades in fact have migrated toward the lower end of the credit-score range. The platforms address this problem using both loan caps—which they have always had—and disclosure, providing consistently more borrower information as they have aged. However, the platforms cannot unilaterally mitigate the second problem identified by Freedman and Jin: if lenders are poor screeners, all the information disclosure in the world will not lead to a viable market. P2P lenders, though, are not poor screeners.

Several factors facilitate their effective screening. First, peer lenders are using their own money. This gives them a strong incentive to make careful decisions. As an example, consider the SOES "bandits." These traders operated at the fringes of the Nasdaq market, exploiting its Small Order Execution System. Using their own money, they "hit" professional dealers after carefully watching quote movements. Many of these proprietary traders were able to profit at the expense of the professionals. Nonetheless, the dealers did not hire anyone to protect them from the bandits, since they knew that a hired hand could not match the diligence of someone trading for himself (Harris and Schultz, 1998).

Second, lenders learn. Freedman and Jin (2008a) conclude that loan performance on Prosper indicates that lenders exhibit dynamic learning—making better loan selections over time—and that new lenders benefit from that accumulated knowledge. Third, P2P lenders turn out to be quite adept at interpreting the "soft data" in borrowers' listings, perhaps even more skilled than traditional bankers, who instead rely heavily on collateral (Iyer, *et al.*, 2009).

This last point is critical. Lenders on Prosper are able to use the pictures, descriptions, social network information (such as "friend" endorsements), and other data voluntarily provided by potential borrowers to elicit about one-third of the incremental information that could be gleaned from the exact credit score (Iyer, *et al*., 2009; see also Freedman and Jin, 2008b). They are able to evaluate "trustworthiness" (the borrowers' willingness to repay a loan) from pictures alone, forecasting default even after financial variables are controlled (Duarte, *et al.*, 2009). While the screening is better for higher credit grades, the soft information is especially relevant at the lower grades (Iyer, *et al.*, 2009). Thus, P2P lenders have demonstrated the ability to interpret just the type of information that would be most relevant for payday borrowers.

There are still some structural features inhibiting screening. The small minimum bid per loan may lead lenders to substitute diversification for screening. Lenders also now have an "out," since both Prosper and Lending Club have introduced platforms for secondary-market trading. (Iyer, *et al.*, 2009, imply that P2P lenders would screen less carefully if they had a securitization market; the secondary platform is a step in that direction.) However, the most significant change affecting screening has been Prosper's elimination of the borrower's posted maximum rate. Borrowers used to list the highest rate they were willing to pay for a loan. Iyer, *et al.* (2009) found that this rate was the most informative soft indicator available to lenders, since it was a credible and costly signal of borrower quality. (See also Herzenstein, *et al.*, 2008.) Higher quality borrowers could afford to set a lower rate, since they had better alternatives if their loans were not funded. However, now that Prosper simply assigns rates based on loan characteristics (as Lending Club always has), borrowers can no longer send this signal. This change has probably diminished the quality of screening in the P2P market.

Despite these challenges, peer screening is still possible, so the P2P market is a viable payday alternative from the loan-supply side. On the demand side, however, there are bigger hurdles.

If borrowers are to use the P2P market, they must be able to access it. Payday borrowers highly value the long hours, convenient locations, and personal service they receive at payday shops (Buckland and Martin, 2005; Washington, 2006; Hispanic Institute, 2010). The internet-based P2P platforms may be poor substitutes. However, as Buckland, Hamilton, and Reimer (2006) note, internet access is becoming increasingly available to lower-income borrowers (through community organizations and libraries, for example). In rural areas, internet access actually may be much more convenient for small-dollar borrowers, since fringe lenders are less common outside of cities (FDIC, 2005). In addition, the increasing push by payday lenders into online lending suggests that an internet platform need not automatically preclude payday borrowers from P2P markets. Carrell and Zinman (2008) cite estimates that 12% of payday loans in 2006 were internet loans, and that web-based volume was growing 40% per year. (In fact, one payday lender believes that "[i]nternet-savvy borrowers who are more educated are better risks than retail customers"; Stegman, 2007.) In addition, P2P platforms have offered borrowers and lenders the opportunity to communicate with borrowers, so peer borrowing is not a completely asocial experience. Thus, access and interactions need not be deal-breakers for the P2P market.

Of course, internet access does not guarantee a timely—or any—loan. Payday borrowers leave the store with their money. P2P borrowers must create a listing, go through screening by the platform (for example, credit verification), then wait for bids. If there are not enough bids, there is no loan. Even if the loan receives enough lender interest to be funded, there is still a delay before the borrower gets her cash. Prosper describes its process this way:

> If you've created a borrower listing, you've created a request for a loan which lenders can invest in. First, enough lenders will need to invest in the listing for it to be 100% funded. At that point, you can either let the auction continue for its full 14 days, or you can end it early. Prosper must complete the loan review process before Prosper can transfer loan

> proceeds to your account. The loan review process itself will last no longer than seven business days. Loan proceeds should be available to you one to three business days after your listing is approved for funding.

Payday borrowers may not be the types who generally plan this far ahead. Agarwal, Skiba and Tobacman (2009) attribute payday use to "impatience, general financial mismanagement, or persistent shocks"; Carrell and Zinman (2008) cite youth, "lack of financial experience and…sophistication." These sorts of borrowers may require significant education before being able to use P2P loans effectively. Of course, they undoubtedly would require that education for *any* payday alternative. In addition, after the first loan, the longer term and amortizing nature of the P2P loan may make funding speed a less urgent concern for these borrowers.

Another potential barrier between payday borrowers and the P2P market is credit score. Both Prosper and Lending Club require minimum FICO scores for borrowers. Prosper, in particular, is becoming more stringent (as Lending Club always was); so much so, in fact, that Freedman and Jin (2008a) assert that Prosper is moving from being a "comprehensive" market toward being one that simply serves traditional borrowers. If payday borrowers' credit scores are too low, they are shut out of the P2P market.

As noted earlier, payday borrowers are more traditional than the fringe borrowers of pawn or rent-to-own shops. At least half of the payday borrowers in Elliehausen and Lawrence's (2001) survey made more than $25,000, were over age 35, were married, had children, and had at least some college. The vast majority used closed-end consumer credit (like car loans) and credit cards. 42% had a mortgage. Although they were credit constrained to some degree, these were the sorts of borrowers—banked, independent, with stable income—who, for a given credit category, are less likely to default (Adams, *et al.*, 2009).

Whether they are traditional enough for the P2P platforms, though, depends on their FICO scores. FICO credit scores range from 350-800; the national median is between 700 and 750 (Adams *et al.*, 2009). Only 27% of Americans have FICO scores below 650 (Curry, 2006). In February of 2007, after a year in business, Prosper raised its FICO cutoffs for its lowest two credit grades, E and HR, by 20 points each, while prohibiting borrowers with no credit or with credit scores below 520 from borrowing. In July of 2009, "to improve and optimize returns," they raised the minimum credit score for all borrowers to 640 (Larsen, 2009).

Lending Club's 660 minimum FICO is even more stringent. However, Lending Club's typical borrower also seems less like a payday borrower. Paravisini, Rappoport, and Ravina (2010), in their sample of 1,661 Lending Club borrowers, find an average FICO score of just below 700; debt-to-income of approximately 13%; monthly income of $5,400; and an average loan size of $9,200. In contrast, the average Prosper listing in Iyer, *et al.*'s (2009) sample is from a borrower with a 54% debt-to-income ratio (although the DTI for *funded* loans is only 33%). Duarte *et al.* (2009) find that the average Prosper borrower has a lower credit score and less education than the national average. Prosper therefore may be a better option for a payday borrower.

It is not straightforward to determine if payday borrowers can meet even Prosper's FICO minimum. The difficulty is that fringe lenders use a different credit score—the Teletrack score—when making loans. Teletrack scores incorporate information from subprime loans, and are eight times more effective in predicting payday loan default than are FICO scores. However, the two scores are not highly correlated (only 0.26 in a matched sample; Agarwal, *et al.*, 2009). Therefore, it is not obvious whether the typical payday borrower can meet the P2P market's FICO thresholds.

We do have some information on the FICO scores of fringe borrowers. In Adams, *et al.*'s (2009) study of subprime auto lending, half of their borrowers' FICO scores were less than 500. These fringe borrowers were low-income; they rented or lived with their parents; one-third had neither a checking nor savings account; and more than half had a delinquency less than six months before their auto loans. Their credit scores suggested "sparse or checkered" credit histories, and they had "problematic" access to credit. Over half of those loans ended in default; only 39% were paid in full. These, then, were not like the typical payday borrowers—and we would not expect them to be, since subprime auto lending attracts "fringier" borrowers than payday lending. We can conclude, however, that payday borrowers should have higher FICO scores than Adams, *et al.*'s auto borrowers.

Additional evidence comes from Agarwal, *et al.*'s (2009) study of a sample of borrowers who have both credit cards and payday loans. The average FICO score for this group is 673, high enough for both Prosper and Lending Club (although the standard deviation is 68 points). 89% of the borrowers in their sample have FICO scores greater than 600; 62% are above 650. The average Teletrack score for this group is 425 (s = 283). In a more recent study of payday borrowers, Dobbie and Skiba (2011) find an even higher mean Teletrack score of 550. These values suggest that at least some payday borrowers would be able to use the P2P markets.

As a rough check of this conclusion, we used FICO's score estimator to provide score ranges that might apply to a payday borrower. (http://www.myfico.com/ficocreditscoreestimator/; accessed 10/17/11.) The score estimator is based on the ten questions listed in Table 3. As discussed above, the literature on payday borrowers characterizes the typical borrower, and we used this information to guide our answers. (The relevant sources are noted next to the associated questions.) For questions for which there was no guidance, we chose conservative responses. The resulting estimate for the answers listed in Table 3 was 525-575—too low for a P2P loan.

However, note that our choices for this baseline are not necessarily internally consistent. For example, if the last missed payment was 3-6 months ago, it is probably more likely that none—not 2 or more—of the credit cards is currently past due. To explore the sensitivity of the estimator to our choices, we tested numerous alternatives. All else equal, increasing to "6 or more" (from 2) the number of loans or credit cards applied for in the last year dropped the score by 20 points. Maximizing the number of credit cards (from "2-4" to "5 or more") had no effect; neither did decreasing the amount of balances on loans and credit cards to from $5,000-$9,999 to $1,000-$4,999. Decreasing credit card utilization from 70-89% to 40-49% raised the score by only 15 points; surprisingly, eliminating the bankruptcy by only 10. None of these changes gets the upper score limit above 600. However, decreasing the maximum delinquency to 30 days raised the upper score limit to 600, and having no credit cards currently late raised it to 620. These impacts are consistent with FICO's guideline that 35% of the score—the largest proportion—is based on credit history. Given this emphasis on credit history, it is not surprising that we get much larger score increases when we combine the "delinquency" and "number of credit cards currently late" questions into scenarios. Having the last delinquency 1-2 years ago (instead of 3-6 months ago), with no currently late cards, raises the maximum score to 640—high enough for P2P. (In Elliehausen and Lawrence's 2001 sample, only 25% of respondents had payments at least 60 days late in the prior year.) If we also remove the bankruptcy, the maximum score is 650. If we have never had a delinquency, or a bankruptcy, the score range becomes 665-715. These credit history adjustments are not overly optimistic, given the FDIC found default risk for small-dollar borrowers comparable to that for the general population (FDIC, 2005).

These results reinforce the expectation that at least some borrowers who currently use payday loans could instead access the peer-to-peer market. This potential is not merely hypothetical: Freedman and Jin (2008a) find that 6% of listings in their P2P sample were for loans to pay off payday loans. In fact, while lenders on Prosper tend to shy away from riskier loans, they are apparently more forgiving when it comes to loans mentioning payday borrowing, perhaps because of an underlying charitable motivation.

Table 3: Results of the FICO Score Estimator

	Question	Answer	Reference	Score	History	Amts.	Other
1	How many credit cards do you have?	2-4	EL (2001), Table 5-16; Agarwal, *et al.* (2009) Table A1	X			X
	How long ago did you get your first credit card?	4-5 years ago	62 months: Agarwal, *et al,* Table A1				X
2	How long ago did you get your first loan?	5-10 years ago					X
3	How many loans or credit cards have you applied for in the past year?	2		X			X
4	How recently have you opened a new loan or credit card?	3-6 months ago	see rollover data	X			X
5	How many of your loans and/or credit cards currently have a balance?	0-4	2.63: Agarwal, *et al.*, Table A1	X		X	
6	Besides any mortgage loans, what are your total balances on all other loans and credit cards combined?	$5,000-$9,999	Agarwal, *et al.*, Table A1	X		X	
7	When did you last miss a loan or credit card payment?	3-6 months ago	Morgan (2007)		X		
	What is the most delinquent you have ever been on a loan or credit card?	> 90 days	Agarwal, *et al.*		X		
8	How many of your loans and/or credit cards are currently past due?	2 or more	13.85%: Agarwal, *et al.*	X	X		
	What are your total balances on all currently past due accounts?	$500-$4,999			X		
9	What percent of your total credit card limits do your credit card balances represent?	70-89%		X		X	
10	Please indicate if you have ever gone through any of the following negative financial events in the last 10 years: bankruptcy, tax lien, foreclosure, repossession, or account referred to a collection agency.	Yes	Payday customers 4x as likely as general population to have filed for bankruptcy (Stegman, 2007). For Ch. 13, 2x as likely (Skiba and Tobacman, 2008b).		X		
	If so, how long ago did the most recent negative event occur?	1-3 years ago			X		

This table lists the questions from the "FICO Estimator." The "Answer" column gives the baseline response; these responses are informed by the payday research cited in the "Reference" column. Note that some answers were chosen to be conservative, and may not be internally consistent with other baseline responses. The baseline FICO estimate was 525-575, too low for the P2P platforms. The last four columns in the table associate questions with components of the "Prosper scorecard" (the inputs to the Prosper score) and of the FICO score (last 3 columns). For the FICO score, 35% is based on payment history ("History"); 30% on current amounts owed ("Amts."); and 30% on the length of the history, new credit activity, and the types of credit used ("Other").

CONCLUSION

In this paper, we draw on the growing literature on peer-to-peer lending to evaluate the potential for P2P markets to serve payday borrowers. The dramatic, public, and ongoing conflict between payday apologists and consumer advocates has focused primarily on whether or not payday shops should be allowed to exist, not on what alternatives there might be. We hope to stimulate that latter conversation.

There is a demand for some type of relatively short-term credit. 92% of Elliehausen and Lawrence's (2001) payday customers agree that "payday advance companies provide a useful service to consumers." The authors conclude that "The overwhelmingly favorable response…strongly suggests that payday advance companies serve a real economic need for their customers." The extraordinary growth of the industry seems to corroborate this interpretation. However, acknowledging the need for short-term, uncollateralized credit is not the same as asserting that payday loans are the best way to provide it.

The consumer advocates who accuse payday lenders of being "predatory" purveyors of "debt traps" obviously think we need an alternative, as do regulators:

> Payday loans to individuals who do not have the ability to repay, or that may result in repeated renewals or extensions and fee payments over a relatively short span of weeks, do not help to meet credit needs in a responsive manner (FDIC, 2005).
>
> The payday advance as presently structured is unlikely to help people regain control of their finances if they start with serious problems (Flannery and Samolyk, 2005).
>
> The rise of fringe banks will not assist low-income people towards better financial security (Buckland and Martin, 2005).

Herzenstein, *et al.* (2008) agree that payday loans are "extremely detrimental" to consumers. They also suggest that P2P lending can improve payday borrowers' welfare. So do Iyer, *et al.* (2009), who say, "The uncollateralized nature of lending and the ability to lenders to partly screen suggests that peer-to-peer markets can indeed complement and add value to the existing lending models and improve access to credit, particularly for small individual borrowers who may otherwise be limited to costly sources of finance like payday lenders." Despite this recognition, there has not yet been a systematic evaluation of the P2P markets' ability to provide fringe credit.

We have reconsidered the young P2P literature to assess this ability. In some ways, the peer markets appear well suited for payday borrowers. P2P loans are longer-term, which is a critical difference according to consumer advocates and regulators. They are accessible anywhere, around the clock, by internet. Their rates are magnitudes lower. Nonetheless, there are hurdles. One potential—though not insurmountable—hurdle is the required minimum FICO credit score of at least 640. The biggest problem, however, is probably the time to fund: P2P loans take as long to fund as a payday loan does to mature! Consumer advocates who wish to use the promising peer-to-peer platforms to offer alternatives to payday loans therefore should focus their efforts on speeding up the funding process. Harnessing the social network potential of P2P "groups" may be one way to shorten the actual bidding process (for example, if groups bid on members' loans, facilitating funding). The verification and actual funding are the purview of the platforms; creating efficiencies there would require coordination between consumer advocates and the platforms.

Consumer advocates should also focus on the use of payday loans by Hispanic borrowers. Payday shops are highly concentrated in Hispanic neighborhoods, and loan pricing in those neighborhoods reflects a

highly inelastic demand. Outreach and education about alternatives for this demographic may require unique strategies, especially if cultural norms are pushing Hispanics away from traditional banks.

This paper reviews extant literature, with a new focus. However, given the potential, we need surveys of payday borrowers explicitly evaluating the possibility for their use of peer-to-peer markets, and pilot projects to assess the practical suitability of peer loans to meet their needs. Even if P2P markets turn out not to be a viable substitute for payday loans, we at least hope to change the conversation from banning fringe loans toward finding a substitute.

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BIOGRAPHY

Lynda S. Livingston is the Nat S. and Marian W. Professor of Finance in the School of Business and Leadership at the University of Puget Sound. She is also a founder of Four Horsemen Investments (4HI), a not-for-profit that combines finance education and philanthropy through experience, research, and outreach. 4HI runs the only student-managed peer-to-peer debt portfolio in the world. Livingston can be reached at U.P.S., 1500 North Warner #1032, Tacoma, WA, 98416, llivingston@pugetsound.edu.

AN ALGORITHM FOR THE DETECTION OF REVENUE AND RETAINED EARNINGS MANIPULATION

Igor Pustylnick, SMC University

ABSTRACT

This paper presents a statistical analysis confirming the former empirical findings that positive differences between the growth rates of P-Score and Z-score appears in financial statement data of companies involved in major financial fraud. The paper examines firms that engaged in fraud in the late 1990's through early 2000's. The paper reports the results of regression analysis, using ratios, from financial statement data used in the calculations of P-Score and Z-Score. The results show that positive values of the difference between the growth rates of P-Score and Z-Score correlate with Net Income, Revenue, Retained Earnings and Total Equity ratios. Both ratios represent the financial statement areas where most identified fraud occurred. The findings imply that positive differences between the rates of growth suggest financial statement manipulation. The standard error of the estimate shows the early linear regression to be coarse. The final part of the paper optimizes the linear regression formula and discusses its limits. The paper shows the potential uses of Extensible Business Reporting Language (XLRB) for getting the necessary values for algorithm calculations.

JEL: M41, M42, M48

KEYWORDS: Financial statements, fraud, manipulation, Z-Score, P-Score, revenue, retained earnings, XBRL

INTRODUCTION

According to 2008 ACFE Report to the Nation (ACFE, 2008) over 41% of all material misstatements in financial reporting results from altering the accounting records connected to revenue generation. Investment brokers and investors make important investment decisions using these revenue figures. According to (Summers & Sweeney, 1998) the knowledge of such misstatements can become a basis for insider trading in any affected company. Many financial scandals, which took place at the turn of the 21st century, were the result of improper revenue recognition and altering existing revenue figures to prove that company had achieved its financial targets (Agrawal & Chadha, 2005).

Despite efforts to automate the discovery of financial statement manipulation, most discoveries of manipulation, which lead to fraud charges later in court, still come from non-accounting sources, such as internal tips and unrelated police work. According to (ACFE, 2008) around 60% of all fraud charges were not a result of audit or accounting work. Because of this, the use of the computerized means of manipulation prediction becomes important.

Recently, there were several notable efforts to create criteria of prediction of the financial state of the enterprise. Altman, created a Z-Score designed to predict bankruptcy (Altman, 1968) . Beneish, 1999 designed several ratios, which showed statistically different results for known manipulators with the financial statements as opposed to non-manipulators. Combining these ratios into one regression formula was largely unsuccessful and produced slightly over 50% success in detecting manipulators.

The AAER statements issued by Security Exchange Commission in the USA shows the character of financial statement manipulations differs from one infraction to the next. The character of infractions, committed be the companies are listed in Appendix. The study described in (Pustylnick, 2009) shows it is

nearly impossible to create any statistical solution, which would be equally suitable for all statement manipulation techniques. Pustylnick (2009) created the complementary score named P-Score (Pustylnick, 2009). The study found that for the companies convicted of revenue manipulation $\Delta P > \Delta Z$ when:

$\Delta P = \frac{P_t - P_{t-1}}{|P_{t-1}|}$, the rate of change of P-Score

$\Delta Z = \frac{Z_t - Z_{t-1}}{|Z_{t-1}|}$, the rate of change of Z-Score

This paper is organized as follows. After the introduction, the paper reviews the latest literature on financial statement manipulation and existing attempts to discover manipulations. In the next section, the paper introduces the main hypothesis. The following sections describe the method of research, the gained results and their optimization. The paper finishes with a discussion of the results and the place of XBRL in the proposed manipulation discovery.

LITERATURE REVIEW

Most journal articles on financial reporting fraud describe and classify existing cases of fraud. Rezaee, (2002) was the first large work following the financial scandals. It is the first comprehensive effort to itemize fraud cases. Rezaee, (2005) concentrated on recommendations of how to prevent the cases of fraud. James 2003) tries to connect the deterrence of fraud with internal financial controls (James, 2003). Other authors find similar fraudulent trends in Europe while exploring the financial practices of the Austrian government (Stalebrink & Sacco, 2007).

An older paper by (Lee, Ingram, & Howard, 1999) shows inconsistency existing between Earnings in the Income Statement and Cash Flow in the Statement of Cash flow is a potential indicator of manipulation. (Grazioli, Johnson, & Jamal, 2006) build a cognitive theory of successful fraud detection. They claim that setting up patterns of enterprise inner workings and managerial behaviour helps identify deviations from set patterns, which in turn lead to financial fraud. (Skousen & Wright, 2008) try to create a manipulation detection mechanism to detect tampering with financial statements. However, they use several variables, which are not publically available thus limiting the usefullness to internal audit. (Dechow, Ge, Larson, & Sloan, 2010) undertook a comprehensive research, which involved over 2000 AAER statements from SEC. The analysis used over 100 variables many of which may not be available to the general public.

The study by (Kirkos, Spathis, & Manopoulos, 2007) shows that use of data mining of financial information over a prolonged period can reveal patterns of manipulation. These findings echo the works of (Beneish, 2001). The ratios set ip in (Beneish, 1999) were observed over the period of two years. (Lenard & Alam, 2009) make a connection between corporate bankruptcy and financial statements, which in turn proves that Altman Z-Score (Altman, 1968) is suitable as a sign of financial statement manipulation. Detecting financial statement manipulation requires working with large amounts of financial data. (Debreceny & Gray, 2001) argue that XBRL provides a statement presentation mechanism. (Debreceny et. al., 2005) evaluate the practice of using XBRL in SEC EDGAR reporting. (Pinsker, 2003) offers a theory that XBRL can be a tool successfully used in auditing procedures. (Li & Pinsker, 2008) evaluate the effectiveness of the use of XBRL in distribution of financial data and imply that this low-cost method of assembling financial reports is useful for companies and shareholders alike.

The review of the literature suggests the following conclusions. There is theoretical support for the notion that researchers can discover financial statement manipulations by examining data from the same

corporation over a period of time. XBRL rapidly becomes a standard of financial statement filing. The processing of the XBRL based statements is a viable option for extracting data, which becomes a base of manipulation detection algorithms.

METHODOLOGY

The data for this research exists in the SEC EDGAR database for the period of five consecutive years for each company (where it was available). The original data collecting effort is described in (Pustylnick, 2009). The sample included 29 companies charged with financial statement fraud. The data, collected for each company, exists in the public year-end financial statements of each company (10-K) for the five years preceding the fraud charges. For a number of companies, such as Enron, the data existed in fewer statements as the company did not operate for five full years preceding the charges.

We obtained three sets of results: (1) the result for the whole sample of 145 observations; (2) the sample of 59 positive values each greater than 0.1; (3) 63 "negative" scores each less than 0.1. We deleted the abnormal scores of +/- 5 or above as they represent the known aberrations which do not exist for a mature company in full operation.

Validation of the described data required a sample obtained from companies considered free from statement manipulations. The authors assume companies convicted of financial statement fraud underwent a thorough financial statement audit in the years preceding the charge. Examination of subsequent AAERs showed that auditors did not discover fraud in the years preceding the year of charges. Therefore, these years can comprise a so-called "clean pool". Due to this assumption, the authors divided data into two samples: (1) with values of $(\Delta P - \Delta Z) > 0.1$ for a pool with the potential for manipulation, (2) the rest of the data for the years when the authors considered the data free from manipulations.

The difference between P-Score and Z-Score calculations revealed four potential variables, which influenced the value of the difference between the rate of change of P-Score and the rate of change of Z-Score, namely: Net Income, Current Assets, Current Liability and Retained Earnings. Realizing that these variables differ from one company to another we created a set of the following ratios:

$$X1 = \frac{Current\ Assets}{Total\ Assets},$$

$$X2 = \frac{Net\ Income}{Revenue},$$

$$X3 = \frac{Current\ Liabilities}{Total\ Liabilities},$$

$$X4 = \frac{Retained\ Earnings}{Total\ Equity}$$

And constructed the following linear regression formula:

$$(\Delta P - \Delta Z) = \alpha + \beta_1 X1 + \beta_2 X2 + \beta_3 X3 + \beta_4 X4 \quad (1)$$

The main hypothesis for the study became: There exists a solution for this regression line when $(\Delta P - \Delta Z)$ is positive. The statistically significant values of the coefficients β_i confirm the existence of the solution.

As the study was exploratory by nature and did not include a significanly large population we considered that all results have significance levels of 95%. According to (Pustylnik, 1968) this level of significance is enough to discover statistical trends. The study attempts to find the best possible regression line solution by using least squares method and the calculation of Pearson Correlation coefficients between the result and the variables involved in the analysis.

RESULTS

The results, gained in this study, belong to three categories: 1) The results for the full set of data, containing all values (145 in total), selected for the analysis 2) The results for the set of data, containing values of (ΔP-ΔZ) > 0.1 and 3) The results for the set of data, containing values of (ΔP-ΔZ) < 0.1

Table 1 shows the combined results for the full data set. The only variable with any significant statistical correlation is X2, which represents Net Income/Revenue. This means that Net Income and Revenue are the only two values which influence the final result slightly. The negative sign of the coefficient means that the result value increases when the ratio decreases. T-value used for n=120 is 1.98. This implies that for any T with absolute value of less than 1.98 we must accept the Null Hypothesis and infer that coefficients are not statistically significant. The only statistically significant coefficient is the one representing Net Income/Revenue Ratio.

Table 1: Combined Results for the Full Set of Data

	Panel A				Panel B	
	ΔP-ΔZ	X1	X2	X3	Coef. Value	T-value
X1	-0.099				-1.01	-0.85
X2	-0.359***	0.129			-3.66	-4.19***
X3	-0.064*	0.540***	0.155*		0.31	0.29
X4	-0.046**	0.314***	0.246***	0.183**	0.033	0.73
Const.					0.682	1.44

*This table shows the results gained for the full data set. Panel A shows Pearson correlation values for the variables used in Formula (1). Panel B shows regression estimates for the Formula (1). ***, ** and * shows significance at the 1, 5 and 10 percent levels respectively for correlation coefficients and T-values*

We note stronger negative correlation between the result value and Net Income/Revenue ratio. There is also a degree of correlation between the result value and the ratio of Retained Earnings/Total Equity The T-value used for n=60 is 2.00. This implies that for any T with absolute value of less than 2.00 we must accept the Null Hypothesis and infer that coefficients are not statistically significant. Based on the results, summarized in Table 2, coefficients for X2, X3 and X4 as well as the constant are statistically significant and the Null Hypothesis must be rejected for all values except for the value of coefficient related to X1. This allows us to cut out X1 as non-significant and to construct the regression equation for three remaining variables

$$\Delta P - \Delta Z = 0.426 - 2.84 * X2 + 0.598\, X3 - 0.233\, X4 \qquad (2)$$

All coefficients of the linear regression function are statistically significant with at least 95% probability and that Null Hypothesis can be successfully rejected for all of them. The linear regression formula can be accepted for the tested sample of (ΔP-ΔZ) > 0.1

The data presented in Table 3 clearly shows that there is no significant correlation between the negative values of ΔP-ΔZ and any of the four variables selected for this research. We also constructed a linear regression function for the sample with negative values of ΔP-ΔZ. The analysis had a sample of sixty. The T-value allowing rejection of the Null Hypothesis is 2.00. Based on this none of the coefficients in

the regression formula are statistically significant. This implies that a statistically significant linear regression formula does not exist for this sample.

Table 2. Combined Results for the Set of Data with (ΔP-ΔZ) > 0.1

	Panel A				Panel B		Panel C	
	ΔP-ΔZ	X1	X2	X3	Coef. Value	T-value	Coef. Value	T-value
X1	-0.080				*-0.352*	*-0.90*		
X2	-0.566***	0.108			-2.80	-6.75***	-2.84	-6.89***
X3	-0.141	0.574***	0.100		0.743	2.58**	0.598	2.52**
X4	-0.282**	0.174	-0.207	0.080	-0.225	-4.24***	-0.233	-4.48***
Const.					0.454	3.63***	0.426	3.53***

This table shows the results gained for the set of data with (ΔP-ΔZ) *>0.1. Panel A shows Pearson correlation values for the variables used in Formula (1). Panel B shows regression estimates for the Formula (1). Panel C shows regression estimates for the formula* (ΔP-ΔZ) $=\alpha + \beta_1 X2+\beta_2 X3+\beta_3 X4$. ****, ** and * shows significance at the 1, 5 and 10 percent levels respectively for correlation coefficients and T-values*

The analysis of the samples shows that linear regression formula (2) is the only fully statistically significant formula which can predict the value of ΔP-ΔZ. Since the sample of the positive values matches the values existing in years when the companies were charged with manipulation it is possible to reject a Null Hypothesis and accept the main hypothesis stated earlier**.** Formula (2) is the result of splitting the sample into two parts based on the criterion of ΔP-ΔZ > 0.1. The results presented in Table 2 (Panel C) allow to create a fully statistically significant regression equation. The results presented in Table 3 (Panel B) do not allow to create a statistically significant regression equation. Therefore based on the terminology from (Nalimov & Chernova, 1965), the first set of results represents the information part and the second represents the noize part of the sample. This also means that only one part of the sample (used to construct formula(2)) is statistically significant which proves the main hypothesis.

Table 3. Combined Results for the Set of Data with (ΔP-ΔZ) < 0.1

	Panel A				Panel B	
	ΔP-ΔZ	X1	X2	X3	Coef. Value	T-value
X1	-0.001				-16.58	-0.68
X2	-0.070	0.121			2.71	0.13
X3	-0.146	0.532***	0.321***		31.80	1.23
X4	-0.020	0.364***	0.342***	0.248**	0.0220	0.03
Const.					-13.32	-1.22

This table shows the results gained for the set of data with (ΔP-ΔZ) *>0.1 . Panel A shows Pearson correlation values for the variables used in Formula (1). Panel B shows regression estimates for the Formula (1). ***, ** and * shows significance at the 1, 5 and 10 percent levels respectively for correlation coefficients and T-values*

The linear regression formula (2) has a few drawbacks: (1) the standard error of estimate S = 0.39. Since many observed cases lie in the area of 0.1 – 0.5, it would be practically impossible to suggest the formula can predict positive ΔP-ΔZ for many cases. (2) $R^2 = 0.55$ shows that slightly over half the error is the result of the regression, making prediction using formula (2) practically impossible. Removal of the variable representing the asset ratio produces better statistical results. However, this approach is not acceptable from the fraud investigation perspective.

Enhancements for Regression Equation for (ΔP-ΔZ)>0.1

The following non-linear polynomial formula represents the improvements to the original regression formula (2).

$$Y = 1.93 - 0.654 * X1 + 1.22 * X2 - 6.33 * X3 - 16.4 * X4 + 1.46 * X2^2 + 6.47 * X3^2 - 3.97 * X4^2 - 2.94 * X1 * X2 - 2.75 * X2 * X4 + 67.4 * X3 * X4 - 57.1 * X3^2 * X4 - 4.12 * X2^3 \quad (3)$$

The values of the variables underwent normalization. The original values of the variables are:

$$X1_{Orig} = X1 * 0.756126$$
$$X2_{Orig} = X2 * 0.487894$$
$$X3_{Orig} = X3 * 0.972419$$
$$X4_{Orig} = X4 * 5.54826$$

The results are presented in Table 4. The following formula originates from the method, described in (Nalimov & Chernova, 1965), which prescribes the use of the new members representing original variables in square and cubic forms as well as the products of multiplication of the original variables. The formula (3) is the product of elimination of the members, the absence of which does not deteriorate R^2 and does not increase S. The goal of optimization is to obtain the regression equation, which has the minimal number of members. Formula (3) has S=0.23 and R^2=0.87, which is an improvement over the original. All coefficients in the final formula are 95% significant.

The study mentioned formula (3) for the scaled data. The values of each variable were divided by the highest value for this variable existing in the original sample. By using this scaling mechanism we can better estimate the influence of each formula member on the product of the equation as they all remain in the interval [0…1].

Table 4. Statistical Analysis of Regression Coefficients

Predictor	Coef. Value	T-value
Constant	1.93	7.87***
X1	0.654	-3.24***
X2	1.22	2.59**
X3	-6.33	-6.49***
X4	-16.4	-4.92***
$X2^2$	1.46	2.91***
$X3^2$	6.47	7.32***
$X4^2$	-3.97	-3.20***
X1*X2	-2.94	-3.89***
X2*X4	-2.75	-2.72***
X3*X4	67.4	5.25***
$X3^2$*X4	-57.1	-5.31***
$X2^3$	-4.12	-4.48***

This table shows the regression coefficients obtained for the set of data with (ΔP-ΔZ) *>0.1 . It presents regression estimates for the Formula (3). ***, ** and * show significance at the 1, 5 and 10 percent levels respectively for correlation coefficients and T-values*

DISCUSSION OF RESULTS

The main objective of the paper was to prove whether the observed phenomenon of positive ΔP-ΔZ is not a statistical fluctuation and it has a significant likelihood of reoccurrence. The results show that the positive values of the observed ΔP-ΔZ have a distinct negative correlation with the variable X2, which represents a ratio of net income to revenue. Decreases in this ratio do not always constitute manipulation. However, a few fraud cases involving energy trading companies OneOk, Reliant, Nicor, etc. involved profitless revenue (Maize, 2003), which is a result of round-trip trading. Financial statements, existing for the years the described fraud was committed, yield both low X2 and positive ΔP-ΔZ.

Decrease in the values of X4, which has noticeable negative correlation with the value of ΔP-ΔZ, also leads to increases in the value of the equation product. A few companies in the sample, such as Adelphia were carrying heavy losses, which resulted in negative retained earnings. This would increase the influence of X4 by reversing the equation sign. When X4 decreases, which means that retained earnings make up a small part of the total equity, the value of ΔP-ΔZ also grows. Inflated share prices may also inflate the goodwill noted as one of the manifestations of fraud by (Colloff, 2005).

Neither current liabilities nor current assets bear information used in the discovery of fraud cases. The studies of major fraud events (Hogan, Rezaee, Riley Jr., & Velury, 2008) confirm this. From the practical perspective, both current liabilities and current assets contain items with tangible information, which are also part of other sources: books, receipts, warehouse declarations, bank statements, etc.

The variables defined for this research contain values, which are part of the financial statements. (KPMG, 2004) gives a good explanation of how to place and locate these variables in the XBRL based reports. XBRL has become a standard for electronic financial reporting in some countries including the USA. The use of it can increase by providing XBRL outbound data streams in addition to the web based reports. This will allow financial analysts and researchers quick unobstructed access to financial data similar to that used in this study.

Although the XBRL standard has a clear and concise definition, it works best in collecting data. The authors of this paper investigated US-GAAP taxonomy, which is one of the oldest and most developed XBRL taxonomies. The concept (value) items, mentioned in the taxonomy roughly match the company General Ledger entries. Certain values, such as Net Income appear in XBRL, as concept items bearing values, others, such as total revenue require a computational arc around all potential revenue items, appearing in the inbound feed.

The authors envision two equally suitable ways of extracting the values necessary to comprise the outbound feed. The first solution would mandate the computation arcs for items used in variables X1-X4, such as Total Revenue, Total Assets, Total Liabilities, etc. If these arcs are in place at the time of filing, the information extractors can use them to produce necessary values. The second solution prescribes the creation of the outbound feed, using XSLT on the existing documents. This approach will allow government agencies to create and sell ready-made feed to the companies, which would look for potential manipulations.

The authors prefer the first approach to the second. XBRL concept items are not compulsory and do not exist in their entirety in all reports. In order to mark the borders of the revenue or AR areas the authors of the report will have to create definition arcs. Since the areas are already clearly marked, creation of the calculation arc should not be a significant burden on the reporting company. It will also allow the company preparing the XBRL statements to be in charge of any calculations required to produce the previously mentioned totals and ensure that they correspond to the business situation.

CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH

The authors conducted this study with the purpose of supporting or rebutting findings obtained in (Pustylnick, 2009). We confirm correlation between the decrease in the net income to revenue ratio and the increase of the target predictor. However, the high standard error of estimate, even in the best of regression formulae (0.24), places uncertainty over the number of observed cases.

At the beginning of the paper, the authors stated that the described mechanism is not relevant in cases of formal audit as the auditors have access to proprietary data, not available to external observers. In the view of the previously mentioned, we conclude that the usefulness of this method is limited to researchers with no access to internal data, such as financial analysts, investors and members of general public. These users do not need precise measurement of the degree of manipulation. They want to be aware of the manipulation potential of statements under review. In this case, any value of the predictor in excess of 0.5 should become a cause for a concern.

We also limit this study to cases where manipulations occur in the areas of general revenue and retained earnings. The literature describes a number of fraud cases which this algorithm cannot detect, such as embezzlement, false statements, etc. In some cases, such as the cases of Merck or HealthSouth, the authors noted difficulty in detecting manipulations. This happens when manipulations are on a smaller scale compared to total revenue and assets. The coarseness of the detection mechanism is one drawback of the proposed solution.

In the future, it is necessary to massage the variables so that we can reduce the standard error of estimate and increase the R-square 90%. The presented study carried exploratory task. The size of the sample is another limitation of this study. The authors gradually increased the size of the sample over the course of data collection when the knowledge of modern cases, such as GM came to life. However, the study would benefit from a containing over 100 positive values, matching known fraud cases.

In the discussion section of the paper, the authors touched on the number of the potential limitations of using XBRL. Now, companies use XBRL to create inbound reports used for viewing corporate data. The matching outbound feed, which contains the values, needed to execute the described algorithm, does not exist. Creation of this feed may require creating an alternative outbound feed taxonomy (schema). The financial values, serving as input for the algorithm must become the part of the future outbound schema.

APPENDIX

The list of the major cases used in the analysis

Company	Year of Charge	Detection Year	$\Delta P > \Delta Z$
Adelphia	2001	1999	X
American Electric	2002	1999	X
AOL	2001	1998	X
Brystol Myers Squibb	2001	-	-
Cendant	2000	1998	X
Coca-Cola	2002	2001	-
CMS	2002	2000	X
Computer Associates	2001	2001	X
Duke	2002	2000	X
Dynegy	2002	2002	X
Enron	2001	1998	-
ElPaso	2002	2000	X
Global Crossing	2001	1999	X
Halliburton	2002	1998	X
Health South	2002	1999	X
Kellogg	2002	2001	-
Kmart	2002	2000	X
Merck*	2002	2001	X
Microstrategy	2003	1999	X
Nicor	2002	2000	X
Oneok	2002	2000	X
Peregrine	2002	1999	X
Quest	2002	1998	X
Reliant	2002	1998	X
Tyco	2002	2000	-
Unify	2002	1999	X
Waste Management	1999	1995	X
WorldCom	2002	1997	X
Xerox	2001	1998	X

This table shows the list of the major cases of fraud, discovered and investigated in the late 1990s – early 2000s. Each company in this list carries financial statement fraud charges. The second column shows the year when the auditors discovered the fraud. The third column shows the year when the first year in the selected five when the indicator of manipulation (ΔP-ΔZ) was positive

Figure 1: American Electric P-Score and Z-Score

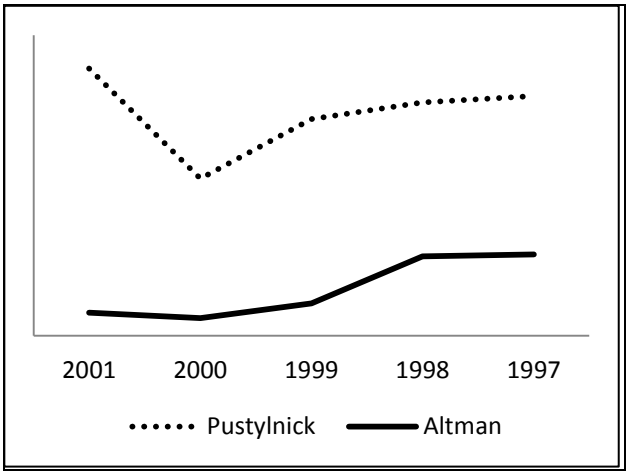
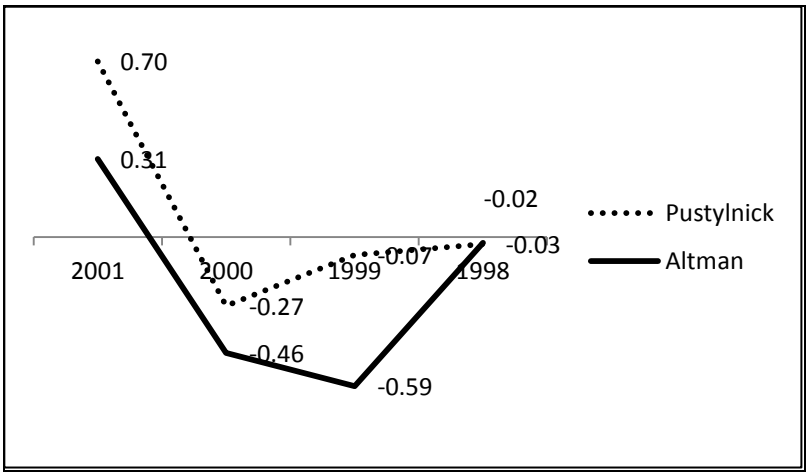


Figure 2: American Electric rates of growth for P-Score and Z-Score



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BIOGRAPHY

Dr. Igor Pustylnick is a Professor of Finance and Management Information Systems in SMC University. He can be contacted at SMC University, Balz Zimmermannstrasse 7, 8302 Zurich-Kloten, Switzerland. Email: i.pustylnick@swissmc.ch

THE IMPACT OF IFRS FOR SMES ON THE ACCOUNTING PROFESSION: EVIDENCE FROM FIJI

Fazeena Fazneen Hussain, The University of the South Pacific
Priyashni Vandana Chand, The University of the South Pacific
Prena Rani, The University of the South Pacific

ABSTRACT

At the turn of the millennium, the many corporate collapses and fraudulent financial reporting practices tarnished the reputation of accountants and resulted in a credibility crisis for the accounting profession. The profession responded by developing IFRS and IFRS for SMEs that would assist in achieving a more transparent and principles-based financial reporting framework. Fiji is not far behind from other developed countries when it comes to adoption of international reporting standards as this is evidenced by the early adoption of IFRS by large reporting entities beginning January, 2007 and IFRS for SMEs by small and medium-sized entities from January, 2011. Unlike the non-big 4 accountancy firms (local firms) in Fiji, the big 4 firms (PricewaterhouseCoopers, KPMG, Ernst and Young and G.Lal) have necessary resources and expertise to assist in adoption of international reporting standards like IFRS and IFRS for SMEs. This study therefore, examines the preparedness, capacity and challenges faced by big 4 and non-big 4 accounting firms in dealing with IFRS for SMEs in Fiji through in depth interviews. The results show the big 4 have a competitive advantage over the non-big 4 as they have substantial resources, expertise and receive training support from their global network.

JEL: M41

KEYWORDS: IFRS for SMEs, Profession, Emerging Economies

INTRODUCTION

At the turn of the millennium, the many corporate collapses, business failures and fraudulent financial reporting scandals tarnished the reputation of accountants and resulted in a credibility crisis for the accounting profession. The profession struggled to rebuild its reputation and desperately searched for a solution. At the same time, the international orientation of businesses and the growth of financial markets increased investment opportunities in capital markets. This created the need for a common reporting framework, which would provide reliable and comparable accounting information across borders. The constantly changing information needs of users of financial reports and the increase in the use of fair value added to the many challenges facing the accounting profession. All this resulted in a major restructure in the financial reporting framework leading to the development of the International Financial Reporting Standards (IFRS) and the International Financial Reporting Standard for Small and Medium-sized Entities (IFRS for SMEs) by the International Accounting Standards Board (IASB). Almost 66 jurisdictions around the globe, including Fiji, have already adopted or plan to adopt IFRS for SMEs as their principal financial reporting standard for small and medium sized reporting entities, with or without revisions (IFRS, 2010).

While many prior studies have examined the impact of international accounting standards on reporting entities, few have tried to analyze the impact of such standards on the accounting profession. Understanding the impact of adopting globalized accounting standards in emerging economies would help us identify the benefits and limitations of such adoption as well as identify the potential factors that are necessary for a successful transition. This in turn would allow practitioners to better prepare themselves

for the adoption. Therefore, the purpose of the current study is to examine the impact of the adoption of IFRS for SMEs on the accounting profession in Fiji. We intend to gather data through interviews of practitioners from the big 4 and the non-big 4 accounting firms in Fiji. The results show the big 4 have a competitive advantage over the non-big 4 in adopting international standards as they have substantial resources and expertise and receive training support from their global network.

This paper has four sections. The first section provides a brief background on the development of IFRS for SMEs and discusses the accounting profession in Fiji. It also discusses the likely challenges facing the profession in adopting IFRS for SMEs. The second and third sections describe the research methodology and discuss the findings of the study. The fourth section concludes the paper and provides limitations for the current study and recommendations for future research.

LITERATURE REVIEW

Background on the development of IFRS for SMEs

The globalization of businesses and the rapid growth in capital markets triggered the need for a globally accepted financial reporting framework as stated by Campbell and Howard (2008). The accounting profession faced the challenge of restructuring its financial reporting framework to deal with prevalent financial reporting issues; rebuild its reputation; and improve its professional competency levels. In responding to this demand, the International Accounting Standard Board and the Financial Accounting Standard Board signed the Norwalk agreement in 2002, the purpose of which was to facilitate the convergence of existing accounting standards and to create various major joint projects. There are various benefits of having a single set of internationally recognized accounting standards. One such benefit is the positive impact such standards have on the capital markets of developing economies. In a case study of Zimbabwe, Chamisa (2000), cited in Zeghal and Mhedhbi (2006), found that global accounting standards play a vital role in the growth of financial markets in developing countries. Similarly, Tarca (2008); Zeghal and Mhedhbi (2006) found that developing economies striving for development and growth should quickly restructure their accounting systems and robustly encourage the adoption of global accounting standards. In addition, Downes (2006) suggested that global standards help in building confidence in financial markets.

Thus, in 2005, IASB developed IFRS in an attempt to achieve globally accepted financial reporting standards for all reporting entities. While IFRS deals with a wide range of financial reporting issues, it mainly serves the information needs of equity investors in public capital markets. IFRS was suitable for large publicly listed companies rather than small publicly listed companies for many reasons. These include complexity, size, satisfaction of user needs and many others. As a result, in 2007, IASB developed the International Financial Reporting Standards for Small and Medium sized Entities, with the aim of meeting the information needs of non-publicly accountable entities that produce general-purpose financial reports. IFRS for SMEs reduces choices for accounting treatments and simplifies presentation and disclosure requirements. It also removed topics and detailed implementation guidance which were irrelevant to SMEs and therefore is far simpler than IFRS. The adoption of IFRS for SMEs by SMEs in emerging economies is likely to have a positive impact on the accounting profession and reporting entities there. This is because such economies largely consist of small and medium sized entities. This development in financial reporting will in the near future improve the financial reporting in emerging economies and at the same time, result in more transparent reporting. However, the costs of adopting IFRS for SMEs, for instance, costs incurred in changing accounting information systems, hiring experts and training employees, may outweigh the benefits from compliance in some economies for years. The adoption of IFRS for SMEs standard is not without challenges. What now lies ahead is whether practitioners and SMEs in emerging economies like Fiji would benefit from adopting the standard?

However, before discussing the matter in detail, it is important to consider the financial reporting environment in Fiji and the likely challenges facing the accounting profession in adopting IFRS for SMEs. As a result, the following paragraphs deal with these issues.

The Accountancy Profession and Financial Reporting in Fiji

The Fiji Institute of Accountants (FIA) regulates the accountancy profession in Fiji. It is responsible for registering accountants and regulating financial reporting in Fiji. The institute came into existence in 1972 under the FIA Act and became a member of the International Accounting Standards Committee in 1973 and a member of IFAC in 1974. The institute's membership with IFAC needs it to comply with all reporting and professional development obligations set by the IFAC Board.

Britain and other British Commonwealth countries, particularly Australia and New Zealand directly influence the accounting and auditing arrangements in Fiji. Until 1999, all reporting entities in Fiji reported their financial performance in compliance with Fiji Accounting Standards (FAS). However, in 2006, FIA decided to adopt IFRS to achieve an internationally recognized accountability system. Thus, in 2009, FIA decided to adopt IFRS for SMEs for all incorporated small and medium sized reporting entities in Fiji. Although the adoption of this reporting framework may not have a huge impact on the big 4 accounting firms in Fiji, it may however affect the non-big 4 firms, as they have only been familiar with Fiji Accounting Standards. Unlike the big 4 firms, the non-big 4 usually do not have expertise and personnel needed to assist them with transition to international standards nor do they have global networks or counterparts to provide them with educational resources and training support. Thus, we feel that the non-big 4 firms face more challenges than the big 4 firms in adopting IFRS for SMEs.

The challenges faced by the Accounting Profession in adopting IFRS for SMEs

The biggest challenge that exists in adopting IFRS for SMEs is in providing adequate training to equip practitioners with the necessary skills before the first set of financials are prepared. The IASB board commented that accountants would need adequate training to understand the implications of using IFRS for SME's in preparing financial statements IASB (2004). Bukics *et al.,* (2009) stated that professional regulatory bodies and their members should engage in robust and thoughtful discussions before deciding to adopt IFRS for SMEs. To understand the major differences that exist between full IFRS, IFRS for SMEs and FAS, accountants in Fiji need to undergo adequate training. Training and education are significant elements for successful transition to IFRS for SMEs and they are necessary to ensure the potential benefits from adoption are realized in the near future. The big 4 firms have already provided extensive training to their employees on IFRS and therefore the adoption of IFRS for SMEs would not need much training. The practitioners in the big 4 may need to understand the differences that exist between IFRS and IFRS for SMEs and consider them accordingly. The challenge lies for those practitioners in the non-big 4 accounting firms, as they have only been familiar with the local standard and have never prepared reports in compliance with IFRS. Therefore, it is essential that accountants in the non-big four firms receive proper education and training to be able to successfully understand and apply the standard. Christie *et al*., (2010) commented that it is still unclear whether accountants in local accounting firms would find IFRS for SME's desirable. The non-big 4 firms will be challenged to develop IFRS related skills to help ensure compliance, transparency and to provide opinion on SME financial statements. They may also face difficulties in recruiting individuals with adequate IFRS background. In addition, these firms lack the necessary resources and expertise to conduct in-house training for their employees and therefore rely on FIA to provide training and educational support. However, FIA relies on IASB for educational and training materials, as it does not have enough funding and expertise to develop them by itself.

Moreover, the profession also faces the challenge of setting the criteria for defining 'small and medium sized entities' and outlining its boundaries. The issue particularly lies in setting the boundaries to determine firms that ought to be classified as SME's. The IASB has not set any specific boundary to determine which entities should be classified as small and medium, but rather left the decision to regulatory authorities and standard setters in individual jurisdictions. Until now, FIA has not set any specific criteria for defining small and medium sized entities. White (2010) suggests that a 'small and medium sized' entity in Fiji is defined as one that does not fall in the category of a 'large' reporting entity (see White (2010) for the definition of a 'large' entity).

Additionally, the IASB board stated that the adoption of any new reporting framework would at first cost huge amounts, both to the profession and the reporting entities IASB (2004). These costs are usually a hindrance to adoption of international standards by emerging economies. While the profession would incur costs in disseminating the standards and providing training and educational support to its members, small and medium sized entities would also incur costs. These include costs for training employees, updating information systems and meeting increased auditing costs, as audit fees is likely to increase after the adoption. Further costs can also necessitate like legal and professional fees to address the impacts on existing contracts and agreements. The lack of capacity of SMEs to implement IFRS for SMEs as their financial reporting framework and the inability of their auditors (small or non-big 4 firms) to provide them with support and guidance may pose challenges for the accounting profession in Fiji.

Unlike FAS, IFRS for SMEs provides more opportunities for application of professional judgment, as it is more flexible and less rules specific, thereby hindering the comparability of reports (Fitzpatrick and Frank, 2009). Because of the principles based nature of IFRS for SMEs, the accounting profession faces the challenge of applying judgment in using the standard (Tomaszewski and Showerman, (2011). Preparers may have to take a critical look at their accounting policies to ensure that the economic substance of transactions is faithfully represented (Tomaszewski and Showerman, 2011). There would also be concerns about the degree to which regulators and courts will respect reasonable and good faith judgments by preparers and auditors (Fitzpatrick and Frank, 2009). Similarly, practitioners in Fiji would need to make considerable amounts of judgments in preparing reports, which would certainly be an issue given the 'uncertainty avoidance' preference of Fiji accountants (Chand and White, 2006). Practitioners in the non-big 4 firms or sole practitioners and those working for small and medium sized entities may find difficulties in applying and interpreting the standard.

The success of any set of accounting standards is contingent on future accountants and auditors having sufficient educational background (Miller and Becker, 2010). Practitioners henceforth, face an ever-growing challenge of keeping abreast with changing accounting standards, through continuous professional education programs. The availability of experienced and trained workforce will be limited until educational programs can catch up to the need. There is a need for universities to update their curriculum by incorporating newer standards like IFRS for SMEs in their degree programs. Universities in Fiji have already incorporated IFRS into their programs and are most likely to include IFRS for SMEs in their programs in a few years.

In addition, wider consultations with all relevant stakeholders are necessary when deciding to mandate any new standard in any jurisdiction. The availability of sufficient time to undertake necessary training and to understand the likely implications of the standard is an important factor that requires equal consideration. It would have been wise to allow practitioners more time to consider the implications of the standard and to organize training for all practitioners in Fiji.

Although IFRS for SMEs reduces the burden of financial reporting on SMEs by simplifying disclosures and providing relief on certain issues, this relief already applies to the operating context of SMEs in Fiji.

For instance, the removal of the available for sale, held to maturity and fair value option for financial instruments may be an issue to SMEs operating overseas but it has no impact on SMEs in Fiji. This is because SMEs in Fiji do not engage in transactions dealing with financial instruments. While the objective behind modifying IFRS was to create a simpler set of IFRS for smaller companies, IFRS for SMEs is still regarded as unproductive and unsuccessful. This was obvious in the study carried out by Simon (2010), where he examined IFRS for SMEs in European countries. His study inferred that although IFRS for SMEs is a vast improvement from full IFRS, it is still not ideal for small and medium sized entities.

Prior literature has mostly examined the impact of IFRS for SMEs on small and medium sized entities (see, for example, Eierle and Haller, 2009; Alp and Ustundag, 2009; Paseková et al., 2010), but so far, there has been no published work examining the impact of the standard on the accounting profession. The decision by the Fiji Institute of Accountants to adopt IFRS for SMEs so early since its establishment will obviously bring about many challenges to the accounting profession in Fiji and affect the future of the profession in many ways. Although accountants in Fiji have demonstrated that they can deal with the full suite of IFRS, the adoption of IFRS for SMEs, a much simpler form of reporting, will pose a set of challenges that the profession did not face when dealing with IFRS. This study therefore aims to examine the likely challenges facing the accounting profession in Fiji in adopting IFRS for SMEs in terms of benefits, limitations, preparedness, capacity, educational resources, training support and overall transition to the new reporting framework.

METHODOLOGY

All small and medium sized reporting entities in Fiji are required by law to report their financial performance in compliance with IFRS for SMEs for reporting periods beginning on or after 1st January 2011. While it is too early to comment on the actual impact of this new reporting framework on the accounting profession in Fiji, it is still worthwhile to consider the perceptions of practitioners on the likely impact of IFRS for SMEs on their practice.

We conducted in-depth interviews in order to get insights into the perceptions of practitioners on the issue. We designed a set of 12 interview questions and distributed them to the interviewees before the interview. We did not opt for a questionnaire survey as we felt that such a methodology might not provide appropriate feedback on the questions. While questionnaires offer easily quantifiable results they often miss the underlying meaning of the responses obtained. Interviews are more interactive and provide opportunities to get in-depth and detailed feedback.

The sample of practitioners for this study was randomly selected from 10 chartered accountancy firms in Fiji. From the 10 practitioners interviewed, 4 represented the Big 4 accounting firms (PricewaterhouseCoopers, Ernst & Young, KPMG and G. Lal), while the other 6 represented the non-big 4 (small local) accounting firms. The sample consisted of 7 males and 3 female firm partners and/or sole practitioners. Because of time constraints and unavailability of practitioners, we selected only one practitioner from each firm.

We tabulated the responses of practitioners and analyzed them accordingly under each of the major themes. The themes include Benefits to Economy, Limitation, Cost, Benefit to Profession, Information needs of Users, Training and Education, Assistance from FIA and Complications from adoption. They have also been quoted in the results discussion, wherever necessary. To preserve the anonymity of the interviewees, we assigned codes to the sample of practitioners interviewed. The codes were labeled P1, P2 … up to P10, representing Practitioner 1, Practitioner 2 and so forth.

RESULTS AND DISCUSSION

Summary statistics for the Data are presented in Table 1. The adoption of IFRS for SMEs is likely to pose many challenges for practitioners in the big 4 and the non-big 4 accounting firms in Fiji. The big 4 firms are usually dominated by large sized clients and the non-big 4 are dominated by small and medium sized clients. Therefore, the big 4 have already adopted IFRS as their principal reporting framework for their large clients and have been practicing reporting with FAS for their smaller clients. The non-big 4, however, have only been familiar in reporting with FAS. We therefore, perceive that the transition to IFRS for SMEs would be less difficult and complicated for the big 4, as they merely need to identify the differences that exist between IFRS and IFRS for SMEs. Conversely, the adoption of IFRS for SMEs is likely to result in significant challenges for the non-big 4 accounting firms. The responses of practitioners interviewed on issues concerning adoption of IFRS for SMEs for all incorporated small and medium sized reporting entities in Fiji is discussed below.

The adoption of international reporting standards by reporting entities in emerging economies is likely to benefit such economies in many aspects. The biggest advantage would be having an internationally recognized financial reporting framework for small and medium sized reporting entities. Moreover, such a reporting framework should improve SME's access to credit and equity capital, upgrade the profession's competency levels through education and training, reduce audit inefficiencies and ease the burden of financial reporting on small and medium entities in countries where full IFRS is now required. This was confirmed by the response of P1 as quoted below:

"Fiji is surely to benefit from adoption of IFRS for SMEs. We will now have an updated set of internationally recognized standards for SMEs. Our current standards have never been updated as FIA did not have the necessary resources to do so."

However, emerging economies like Fiji face enormous difficulties in developing its own financial reporting standards, as the process requires substantial amounts of funds, resources and expertise. These economies therefore, depend on the International Accounting Standards Board to develop standards for them. The adoption of a single set of reporting standards will help achieve a consistent and comparable financial reporting framework. The improved comparability is likely to result in quality investment decisions, attract foreign investors thereby increasing the SMEs ability to access funds, and secure investment from overseas investors. Although this seems theoretically sound, it may not be the case in Fiji, as argued by P5 from the non-big 4 firms:

"It is too early to comment on the benefits. The requirements of the standard are such that much of it would not be applicable to SMEs in Fiji. The nature and operating context of small firms in Fiji is such that they have a limited scope abroad. For many small and medium sized firms, financial reporting is for meeting statutory obligations like tax requirements."

The financial reporting requirements under IFRS for SMEs may still be complex for smaller reporting entities in Fiji as they have a simple business structure. While benefits of IFRS for SMEs to smaller firms may not be easily realized, medium sized entities may benefit from the adoption, particularly if they are reporting overseas or are growing into a large sized firm. This is because a shift from a medium sized entity to a large sized entity would require a transition from IFRS for SMEs to IFRS, which does not require major modifications compared to a shift from FAS to IFRS. While improvements in financial reporting is preferred by all stakeholders, few stakeholders are only willing to take on board such improvements if they are likely to meet their information needs and be less costly to them.

The cost of transitioning to a new reporting framework is often a concern for reporting entities and practitioners alike. A reporting entity, in adopting IFRS for SMEs, will incur costs in training employees, updating their information and financial reporting system and hiring experts to assist in the transition. The adoption may also result in increased audit fees in the future. For this reason, many SMEs in Fiji are reluctant to adopt IFRS for SMEs. They are concerned about costs as opposed to the benefits of reporting under IFRS for SMEs, as commented by few of the practitioners. While practitioners from the big 4 have already advised their clients of the conversion and effects of the new standard, practitioners from the non-big 4 are more concerned about clients' ignorance of the standard as commented by P5 below:

"All my clients are required to report their financial performance in compliance with IFRS for SMEs from 1st January, 2011 and onwards. It is however surprising to see that none of them so far have shown any interests in adopting the standard. Even after it was announced that it is compulsory for all reporting entities to comply with IFRS for SMEs, clients are still not bothered. They are anxious about the extra costs associated with the adoption."

Additionally, we perceive that the accounting profession in Fiji may also benefit from adopting an internationally recognized reporting framework. By adopting IFRS and IFRS for SMEs, the profession now has an updated set of financial reporting standards. The local profession also has freely available training materials, guidelines and interpretations when they adopt standards developed by IASB. The availability of such provisions facilitates the training process for practitioners. The transition would also assist the local profession in achieving an international recognition, possibly increasing migration opportunities and job prospects of local accountants. The mobility of practitioners, especially those in the non-big 4 firms, is likely to increase as well, allowing them to secure jobs elsewhere with an IFRS background. The results of the study also indicate that some practitioners have reservations on the decision by FIA to mandate IFRS for SMEs. They feel that wider consultations with relevant stakeholders were necessary in deciding on the matter. The interviewees also expressed concerns on whether practitioners from the big 4 or the non-big 4 were most likely to benefit from the adoption. This is evident from the comments of P6 as quoted below:

"The big 4 is surely to benefit and benefits to the non-big 4 is not that apparent. The big 4 firms usually have a tendency to promote complex regulation as it will enable them to exaggerate and increase their already exorbitant fees, resulting in even deeper pockets".

The primary purpose of preparing financial reports is to meet the information needs of users. In achieving this objective, accounting standards play a pivotal role. Standard setters therefore must ensure that standards developed facilitate the achievement of this objective rather than result in a set of standards that serve no purpose and cease to be useful to the local reporting environment. In Fiji, users of SME financial reports, especially owners and the tax authority, have not so far requested financial reports to be prepared in compliance with IFRS for SMEs and hence seem content with the status quo. Similarly, Fiji based commercial banks have not insisted for IFRS for SMEs compliant financial reports for appraising lending applications. While some practitioners have argued the need for chartered accountants and advisors to assess the benefit of any new financial reporting framework to their clients, others have suggested that IASB should have considered the information needs of users in emerging economies and more importantly the specific reporting needs of micro entities.

"Even if it is not clearly stated, IFRS for SMEs is more appropriate for large unlisted entities rather than for small-unlisted enterprises. The interest of micro-entities in adopting IFRS for SMEs and the possibility of them doing so is quite low," commented P6

Training and education are necessary elements for the successful implementation and application of a set of newly developed reporting standards. Although IASB freely provides all the necessary guidelines and interpretations for the standards that it develops, there is still a need for local practitioners to undergo face-to-face training, as our local reporting environment is significantly different from the environment in which the standards were developed. Practitioners need to understand the differences that exist between the two environments and the implications of the standard in the local context. Training and educational support are also important in enhancing the professional competency and marketability status of practitioners.

The practitioners in the big 4 firms do not require substantial training, as they only need to identify and understand the differences that exist between IFRS for SMEs, IFRS and FAS. They have the advantage of acquiring training from their respective international bodies and therefore are in a much better position to take on board IFRS for SMEs. The non-big 4 firms however, solely rely on FIA for training and educational support. While the big 4 usually have a large number of staff and conduct in-house training, the non-big 4 do not have the capacity to do so as they have few qualified accountants and lack the necessary resources. Accordingly, a few of the practitioners from the non-big 4 firms commented that since they have one or two principle auditors in the firm, in-house training was not that necessary as these auditors usually attended seminars and workshops organized by FIA.

"For now, we have put away the matter of training and any further attention will only be given to the issue if an assignment is accepted that requires financials to be prepared in compliance with IFRS for SMEs" commented P6.

To ease the burden of training on accounting firms, FIA had organized seminars and workshops on IFRS for SMEs for all practitioners in Fiji. However, almost 60% of the practitioners interviewed suggested that a two or three hour workshop and/or seminar on IFRS were not that effective. Practitioners have requested for more workshops and seminars, particularly after the first set of financials have been prepared. This will provide them with an opportunity to discuss and solve issues that arose in interpreting and applying the standards on a more consistent basis. As stated by P5,

"Accounting is more about practice than theory. Even if we attend workshops and seminars, we will still not be able to adequately grasp the concepts if we do not have any SME clients to practise the standard on."

Despite these efforts by FIA and with just a few months left for the first set of financial statements to be prepared by SMEs, the responses of practitioners suggest that they are ill prepared for the transition. Practitioners from the big 4 commented that they were the process of organizing in-house training for their staff and should be ready to go ahead with the new framework by the end of the year. However, non-big 4 firms have decided to delay training for their staff as they lack necessary funding and expertise. They would only provide training, if they have sufficient number of clients willing to adopt the standard.

"Individual practitioners have not shown much interest in the new standard and their efforts in understanding it is almost zero. The reaction has not been the same for IFRS for SMEs as it was for IFRS back in 2007. IFRS was a big thing and CA firms were excited about the adoption. In many firms, the readiness is still not there yet," suggested P3.

"We are still awaiting client response on the matter. The firm partner and managers have attended seminars and workshops organized by FIA on IFRS for SMEs. Any further attention will only be given to the issue if an engagement is accepted that requires financial reports in compliance with IFRS for SMEs," commented P9.

Table 1: Summary statistics for the data

	Yes (No of respondents)	**No** (No. of respondents)
Will the adoption of IFRS for SMEs benefit emerging economies?	8	2
How will IFRS for SMEs benefit Fiji?		
Improve financial reporting	7	3
Attract foreign investors	4	6
What are the likely problems in adopting IFRS for SMEs?		
Additional cost of reporting	7	3
Client reluctance to adopt IFRS for SMEs	4	6
Inadequate training and skills	8	2
Satisfaction of users information needs	6	4
Complexity and suitability of the standard	7	3
Will the profession benefit from the adoption?	8	2
How is the profession likely to benefit?		
By having International best practice and quality reporting	8	2
Increased mobility of local accountants	6	4
Is IFRS for SMEs likely to enhance financial reporting?	7	3
The adoption of IFRS for SMEs requires additional training. Will this training enhance professional competency levels and marketability status?	6	4
Are Chartered Accounting firms in Fiji prepared for the adoption?	3	7
Has FIA provided adequate training and educational support to its members?	5	5
Are seminars and workshops organized by FIA helpful?	4	6
Are CA firms anticipating any major complications from the adoption?	3	7

This table provides a summary of the responses of practitioners from the interviews conducted.

Further, the adoption of any new reporting framework is likely to bring about complications and challenges in financial reporting for practitioners. In Fiji, the big 4 firms are not anticipating any major complications in adopting IFRS for SMEs and plan to review financial reporting issues that arise from the standard on a continuous basis with firm partners and managers. Similarly, the non-big 4 firms have also planned to address issues arising from the standard on a case-by-case basis, within the framework of IFRS. While the application of IFRS for SMEs is far simpler than IFRS, the best time to comment on the complications arising from the standard would be after the first year of adoption. A number of practitioners have also pointed out that the title of the standard may give practitioners an incorrect firsthand impression about the overall complexity of the standard.

"IFRS for SMEs is a far simpler reporting framework. Because it is IFRS, people say it is difficult. The first hand impression left by the title of the standard gives an incorrect picture of the level of difficulty and complexity associated with the standard. If we give them some time to familiarize themselves with it, they will surely come around," mentioned P8.

Therefore, the results indicate that the adoption of international reporting standards by emerging economies are important decisions, which require considerable thought by standard setters and regulatory bodies. While benefits from adoption of such reporting frameworks are imminent in developed countries, it is still too soon to comment on whether such benefits would be realized in emerging economies like Fiji. The institutional and regulatory frameworks in developed economies is significantly different from that in emerging economies and for that reason, reporting standards developed in these economies may still be complex for firms in emerging economies. Thus, adequate revisions are necessary to ensure that the requirements of the standard are applicable and suitable to our reporting environment.

The transition to IFRS for SMEs from Fiji Accounting Standards is likely to pose a number of challenges for practitioners in Fiji, including meeting training and educational requirements, information needs of SMEs as well as justifying to SMEs the need for a globalised reporting framework among many others. Small and medium sized reporting entities, however, are more concerned about the costs associated with the transition rather than the perceived benefits from such an adoption. While the results merely

summarize the views of accountants on the issue concerned, it may not be advisable to draw conclusions on the matter so early in the transition. Consequently, our results are in line with the challenges identified in the literature in adopting international reporting standards.

CONCLUSION

The accounting profession has struggled to rebuild its reputation and restore confidence after the renowned corporate collapses of the new millennium and the demise of Arthur Anderson. The development of globalized principles-based reporting framework may be the only legitimate means of achieving this objective. A single set of reporting standards for all small and medium sized reporting entities should result in a more transparent principles-based reporting that improves comparability and consistency. While SMEs in many jurisdictions have been subject to reporting under national accounting standards, such standards deter comparability of financial statements and are usually outdated. Many jurisdictions around the globe have already adopted IFRS for SMEs and in doing so; have faced several challenges. These challenges have particularly affected the accounting profession in such jurisdictions. While the profession, particularly, the big 4 accounting firms may benefit from globalized reporting standards, local practitioners in emerging economies are likely to remain in the position they were before the adoption. This is because many of their small and medium sized clients are constantly concerned about the extra costs of reporting and may justify noncompliance to the standards based on increased reporting costs.

Further, the reporting requirements under IFRS for SMEs are such that most of them may still not be applicable to SMEs in emerging economies like Fiji. This suggests that wherever guidance has not been provided under the new reporting framework or is provided but not applicable to the current reporting environment, practitioners may refer to the old set of standards for guidance. In other words, careful consideration must be given in deciding whether the full set of IFRS for SMEs should be adopted by emerging economies, or should they use IFRS for SMEs as a reference point in developing their own standards or should such economies adopt IFRS for SMEs with modifications to suit their reporting needs. For that reason, it is advisable for regulatory bodies in emerging economies to give considerable thought to the adoption of IFRS for SMEs and engage in wider consultations before deciding on the matter.

A major limitation with the current study is the small sample size, which makes it difficult to generalize the findings of the research to other emerging economies. In addition, there is always the possibility of practitioners from the same firm having different views on the issue. However, it should be noted that majority of the participants in the interview identified similar themes and issues, therefore it could be suggested that the sample is sufficient for an initial enquiry into the matter. Future research should consider increasing the sample size in order to confirm the findings of the current study. It may also be advisable to consider the implications of adopting IFRS for SMEs on the accounting profession in emerging economies once the first set of financial statements have already been prepared.

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BIOGRAPHY

Fazeena Hussain is a teaching assistant at the University of the South Pacific. Her research interest lies in the areas of financial accounting and auditing. She can be reached at the University of the South Pacific, Laucala campus, Suva, hussain_f@usp.ac.fj.

Priyashni Chand is also a teaching assistant at the University of the South Pacific. Her research interest includes corporate governance and financial reporting. She can be contacted at the University of the South Pacific, Laucala campus, Suva, chand_pi@usp.ac.fj.

Prena Rani is also a teaching assistant at the University of the South Pacific. Her research interest includes earnings management, gender and SME reporting. She can be reached at the University of the South Pacific, Laucala campus, Suva, rani_p@usp.ac.fj.

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