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LETTER FROM THE EDITOR

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As has been the case with the previous issues of the *AAFSJ*, the articles contained in this volume have been double blind refereed. The acceptance rate for manuscripts in this issue, 25%, conforms to our editorial policies.

The Editor works to foster a supportive, mentoring effort on the part of the referees which will result in encouraging and supporting writers. He will continue to welcome different viewpoints because in differences we find learning; in differences we develop understanding; in differences we gain knowledge and in differences we develop the discipline into a more comprehensive, less esoteric, and dynamic metier.

Information about the Allied Academies, the *AAFSJ*, and our other journals is published on our web site. In addition, we keep the web site updated with the latest activities of the organization. Please visit our site and know that we welcome hearing from you at any time.

Mahmut Yardimcioglu
Kahramanmaras Sutcu Imam University

DOES THE WEIGHTED COST OF CAPITAL ASSOCIATE WITH RETURNS ON OPERATION AND FINANCIAL ASSETS WITH INVESTOR ANTICIPATION OR REACTION? [AND DO OPERATING AND FINANCIAL ASSETS HAVE SYNERGY?] 2010

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ABSTRACT

The relation of firm accounting information and investor decision-making is a key financial accounting issue for the proposed FASB/IASB financial accounting presentation standard. Firm accounting information is a result of management's decisions. This study focuses on the investors' perspective of the consequences of management's actions with respect to the cost of firm capital and the returns on assets. Conventional thought hypothesizes management to maximize the return on asset investments within the rubric of minimizing the firm weighted average cost of capital. Within this framework, we investigate financial statement relevance with regard to whether investors anticipate or react to firm asset investment returns. The study also examines the existence of synergy between firm operating and financial asset returns. Because leverage is a central capital structure factor, we also investigate the leverage impact on the relation between investor supplied fund costs and asset returns.

INTRODUCTION

The equation (i.e., Assets = Liabilities + Equity) originating from Paciolo (Brown and Johnston, 1963) is the most well-known identity in accounting and is a basis of financial statements. An understanding of financial statement information is critical to investor decision making, which is an objective of the accounting conceptual framework (Financial Accounting Standards Board, 1978). This study analyzes the accounting equation from a return perspective by investigating the relation between the return on assets and the weighted average cost of capital. Specifically, we are interested in whether the funding returns demanded by investors lead or lag the return supplied by the firm's assets. This research questions whether the market economy behaves like "smart" investors who choose winning future investments (Gruber, 1996) (Zheng, 1999) and/or "momentum" investors who follow winners (Sapp & Tiwari, 2004).

This research investigates the value of firm accounting information for investor decisions from a holistic approach that includes debt holders and stockholders (Swanson, Srinidhi, & Seetharaman, 2003). A large body of accounting market research literature, from its inception (Ball & Brown, 1968), has examined the earnings / return relation from the equity-holder decision maker point of view, but comparatively little research has looked at firm behavior with respect to how management makes firm decisions to generate asset returns that will exceed the weighted average cost of capital as textbooks (e.g., Block & Hirt, 2008) present the issue.

Another motivation for this study stems from an increased interest over time in "fair value" accounting which stresses the value of the balance sheet. In the current study, the return on assets measures the asset side of the balance sheet while the weighted cost of capital measures long-term liability/equity aspects of the other side of the balance sheet. This formulation prompts the question: What is the connection between the fair value of the assets and the investment vehicles that supply the funds for those assets? And, will the proposed financial accounting standard have distinct components?

In analyzing the relation between asset returns and the returns demanded by investors, the current study performs a decomposition of assets into two categories which the firm manages. Specifically, this study differentiates "operating" assets from "financial" assets because the management decision of how assets are employed should be an important one from the point of view of investors. The study reports that operating and financial asset returns have a positive association with the weight-average cost of capital. Within this framework, a negative interaction between operating and financial asset returns suggests that a substitution effect occurs between the components. There is evidence that investors both anticipate and respond to accounting asset return information. But, there is no preponderance of evidence in favor of either investor anticipation or reaction of accounting asset return data.

The remainder of the study is organized as follows. The next section reviews relevant literature. Then, Section 3 formally states the hypotheses and specifies the statistical approach. Section 4 gives descriptive statistics and reports the results. The final Section 5 provides a summary.

LITERATURE REVIEW

The literature review covers several lines of research relevant to the research question. They include: 1) the aggregate market study, 2) earnings and return studies, 3) residual income and EVA analyses and 4) ratio analyses.

Aggregate Market Study

Fama and French (1999) provide information on the relation of cost of capital and return on investment from a general market perspective. They examine nonfinancial firms'

performance from 1950 through 1996 and 1973 through 1996. They compute an internal rate of return (IRR) as their aggregate cost of capital for the market. As specified, the return on investment exceeds the cost of capital over that period for the market. Our current research looks at the issue from an individual firm framework. We take a shorter five year window approach (*ex ante* and *ex post* of the financial statement year) in contrast to the long window Fama and French methodology. As such, we are less vulnerable to a survivorship bias than Fama and French.

Earnings and Returns Studies

By the way of a frame of reference for the current study, research of Collins and Kothari (1989) and Ball, Kothari, Shanken (2000) indicates that returns lead earnings. The focus of this research is upon the point that accounting earnings effects incorporate historical price information. One of the implications for the current study is that investors analyze in advance of a firm investments' potential value.

A parallel issue with returns leading earnings is the identification of expected returns from accounting information. Easton and Monahan (2005) create proxies for expected returns. Their empirical findings do not support proxies based on accounting measures as being effective statistics for expected returns.

Other literature (e.g., Shroff, 2002) addresses the question of whether earnings lead returns. Some of the effect is attributed to a post earnings drift or a lack of impounding of information (Abarbanell & Bushee, 1997). Shroff (2002) finds that the lag effect of earnings information becomes less important as the window increases. In this respect, the R square increases as well as the earnings response coefficient. The conclusion is that earnings leads returns with lessening information content as the measurement period increases. This current study provides a different perspective upon the issue of whether earnings lead returns or vice versa by focusing upon the cost of capital and the returns of firm assets.

Residual Income and EVA Analyses

Ali, Hwang, and Trombley (2003) formulate a residual-income valuation model and test its ability to predict future returns. They present evidence that mispricing and not firm risk is a source of abnormal returns.

All business majors take management accounting courses where the ROI concept is emphasized, but the extent to which management practices this principle is a matter of conjecture (Ryan & Ryan, 2002). Ryan and Ryan survey management practices at Fortune 1000 firms. The authors find that net present value (NPV) and internal rate of return are used frequently for investment decisions but not exclusively. Ryan and Ryan report that Economic Value Added (EVA) is used, at least rarely, by three quarters of the firms, but empirical research on EVA has

had conflicting results (e.g., Palliam, 2006). However, the current analysis is not focused on whether EVA or a model such as traditional clean surplus theory (Feltham & Ohlson, 1995) provides the best empirical model in the current period. Rather, we focus our research on the firm accounting information link between the investment and the financing of assets.

Ratios

Gebhardt, Lee, and Swaminathan (2001) study industry effects on cost of capital. Their research provides evidence that industry effect is a dominant factor in explaining cross sectional differences. Therefore, the current study uses industry breakouts as part of the independent variable structure in the regressions on the weighted cost of capital.

It has been argued that as leverage increases the weighted average cost of capital will decrease (Block and Hirt, 2008) down to the point where bankruptcy risk starts to cause the weighted average cost of capital to increase. There is empirical evidence to support this proposition. Fama & French (1992), in their study, find a positive association between leverage measured using market value of equity and ex-post stock returns. Gode and Mohanram (2003) confirm this finding. Their study shows a positive association between cost of capital and the ratio of the book value of a firm's long-term debt and the market value of its equity. Our current study independent variables are based on this argument.

RESEARCH DESIGN AND ANALYSES

Data and Hypotheses

The study covers the period from 1992 to 2001. This period has some different macro-economic conditions and therefore provides the opportunity to view the robustness of the analyses. In order for a firm to be included in the analyses, all of the data for ratios and market model calculations must be present (The data requirement does have the limitation of a survivorship bias and does present the opportunity for future research to further examine the delisting implications with respect to anticipation or reaction to firms' prospects of firms that are in distress or disappear in mergers.).

A hypothesis articulates each of the following research questions: 1) What is the relation of the weighted average cost of capital (WACC) with firm asset returns; 2) Does leverage impact this relation; 3) Do investors anticipate or react to firm asset returns; and 4) Are operating asset returns different from financial asset returns? To address these hypotheses, this study analyzes a set of relations between the weighted average cost of capital as the dependent variable, and various independent variable formulations of returns from firm asset investments. The analyses investigate returns of: 1) total assets, 2) operating asset and financial asset components, 3) industry sector operating assets and financial asset components, 4) industry sector operating

assets, financial asset and an interaction between operating and financial assets. In each of the four questions, we perform further analysis with an additional leverage weighted operating asset return. The analyses are performed for each year of the period under review. The intent is to thoroughly investigate the relation of the WACC with asset returns and assess the robustness of the findings.

A general financial proposition is that risk associates with return. Higher firm asset returns are going to be associated with higher investor risk which means that investors demand higher rates of return. Therefore, Hypothesis One is:

H1a: Returns on assets positively associate with WACC.

With respect to Hypothesis One, it should be anticipated that evidence should support the proposition that firm asset returns will associate with the weighted cost of capital. The prior literature suggests this result and certainly it is a basis of investor thinking to allocate scarce resources where the best returns will occur.

With regards to the research question of whether investors anticipate or react to firm asset returns, both reaction (past) and anticipation (future) formulations of weighted-cost of capital will be run as dependent variables for regressions of firm asset returns. This hypothesis addresses the research question: Do investors pick winners or does a firm's asset return performance generate a momentum effect that investors follow? This issue is an open question in the literature and no prediction is made. The presented formulation was chosen on proposition that investors allocate scarce resources. Hypothesis Two is:

H2a: Investors anticipate asset returns more strongly than they react to asset return information.

Firms are in the business to make money from their operating assets and therefore a positive return should be generated from them consistent with H1a. The returns from the use and impact of financial assets do not have obvious effect. One may presume that financial assets generate positive returns because of their character and the prospect that firms will eliminate losers not consistent with the firm's mission. This is the perspective of investors (i.e. the firm) holding a portfolio of investments (Block and Hirt 2008). According to the portfolio view, a firm invests in assets which have different return correlations and there is a diversification effect. From another point of view, it is proposed here that the returns that financial assets generate reduce the required rate demanded by investors. In that perspective, the financial assets could be considered as an offset against the WACC. In which case, the financial asset returns would have a negative association with WACC. There also may be an interaction between operating and financial assets. This possibility is analyzed in one of the regressions. Therefore, the impact of

financial assets is an open empirical question which the study investigates and no prediction is made. Hypotheses Three and Four are:

H3a: Returns on operating assets positively associate with WACC.

H4a: Returns on financial assets impact WACC.

Previous ratio analyses indicate that leverage tends to concentrate around industry means. Why? The reason is that businesses in an industry have similar risks and therefore the investor clientele effect will lead to similar debt-to-equity mixes. Firm leverage is expected to be similar for each firm within an industry and firm asset investments are funded according to investor preferences. Due to the length of the analysis and survivorship bias, only the first order leverage effect will be considered and the prediction is that it will be significant. We hypothesize that:

H5a: Leverage affects the association of returns on assets with WACC.

If the funding side of the balance sheet is to be investigated for leverage sensitivity, then the logical decision is also to investigate the operating and financial asset mix. This study only looks at firms that make a product or provide a service in the context of a firm as a value chain. There is no obvious reason that WACC should be sensitive to the operating financial asset mix. However, serious consideration needs to given to the proposition that firms which essentially supply financing to customers will be more subject to financial market volatility by depending on those financial asset returns. Therefore, Hypothesis Six is:

H6a: Higher levels of financial assets will reduce the association of returns on assets with WACC.

Regression Equations

The following set of regression equations addresses the aforementioned list of hypotheses from the previous section. In order to examine hypothesis two, the past and future cases of the WACC variable are considered for each regression. The marginal after tax rate is from Graham's web site (Graham and Mills 2007). A version of the analysis was run without taxes and the key findings are that the tax rate version generally had significant results for financial asset returns whereas the version without taxes did not. Accordingly, this study does not report the version without taxes. The implication is that taxes matter and further investigation of this point is potentially worth further research. If the WACC is less than zero, then the observation is deleted because of the indication of a distressed firm. Because leverage is known to be a major factor in the determination of a firm's WACC, the leverage difference LevDif from the mean by

industry [as defined by SIC code after regression (6)] is investigated in each of the following three regression frameworks. For Hypothesis One, the relation (No intercept is required (Kennedy 2003) in regressions because in this case the year dummies act as a set of multiple intercepts.) of WACC with total assets is as follows:

$$WACC = b1*RA + c1*Y93 + c2*Y94 + c3*Y95 + c4*Y96 + c5*Y97 + c6*Y98 + c7*Y99 + c8*Y00 + c9*Y01 + e \quad (1)$$

And

$$WACC = b1*RA + c0*Levdif + c1*Y93 + c2*Y94 + c3*Y95 + c4*Y96 + c5*Y97 + c6*Y98 + c7*Y99 + c8*Y00 + c9*Y01 + e \quad (2)$$

where

WCap =wd*rd*(1-mtra)+we*re,
re=rf+mret*(rm-rf),
rm=((1+rm(t))*(1+rm(t+1))*(1+rm(t+2))*(1+rm(t+3))*(1+rm(t+4))**(1/5)-1,
rf=risk free=1 yr T-bill rate,
rd=1+xint/(dltt),
mtra=marginal after tax rate,
mret=beta (calculated from past 5 yr monthly returns for reaction or 5 yr monthly returns for anticipation),
wd=(dltt)/(dltt+ceq),
we=(ceq)/(dltt+ceq),
dltt=long term debt,
ceq=common stockholders' equity,
lev=(ceq)/(dltt+ceq),
LevDif=lev - industry average mean,
RA=1+((oi+fi)/(oa+fa)),
oa=at-che-ivaeq-ivao,
fa=at-oa,
oi=oancf-esubc-iint,
fi=iint+msa+esubc+ivstch,
che= Cash & equivalents,
ivao= Other investments,
ivaeq= Investments at equity,
msa= Marketable Securities Adjustment,
ivstch= Short-Term Investments (Change),

xint= Interest Expense,
Y93=1 if year is 1993 and zero otherwise,
Y94=1 if year is 1994 and zero otherwise,
Y95=1 if year is 1995 and zero otherwise,
Y96=1 if year is 1996 and zero otherwise,
Y97=1 if year is 1997 and zero otherwise,
Y98=1 if year is 1998 and zero otherwise,
Y99=1 if year is 1999 and zero otherwise,
Y00=1 if year is 2000 and zero otherwise,
Y01=1 if year is 2001 and zero otherwise, and
e= error.

Equations (3) and (4) analyze the relation WACC with the return on operating assets and financial assets. Both equations also incorporate an interaction term between operating assets and financial assets.

$$WACC = b1*Roa + b2*Rfa + b3*Roafa + c1*Y93 + c2*Y94 + c3*Y95 + c4*Y96 + c5*Y97 + c6*Y98 + c7*Y99 + c8*Y00 + c9*Y01 + e \quad (3)$$

and

$$WACC = b1*Roa + b2*Rfa + b3*Roafa + c0*LevDif + c1*Y93 + c2*Y94 + c3*Y95 + c4*Y96 + c5*Y97 + c6*Y98 + c7*Y99 + c8*Y00 + c9*Y01 + e \quad (4)$$

where

Roa=1+(oi/oa),
Rfa=1+(fi/fa), and
Roafa= Roa*Rfa.

Equations (3) and (4) introduce industry effects where the operating asset returns are identified with a specific industry by two digit SIC.

$$WACC = b1*Roa1 + b2*Roa2 + b3*Roa3 + b4*Roa4 + b5*Roa5 + b6*Rfa + b7*Roafa + c1*Y93 + c2*Y94 + c3*Y95 + c4*Y96 + c5*Y97 + c6*Y98 + c7*Y99 + c8*Y00 + c9*Y01 + e \quad (5)$$

and

$$WACC = b1*Roa1 + b2*Roa2 + b3*Roa3 + b4*Roa4 + b5*Roa5 + b6*Rfa + b7*Roafa + c0*LevDif + c1*Y93 + c2*Y94 + c3*Y95 + c4*Y96 + c5*Y97 + c6*Y98 + c7*Y99 + c8*Y00 + c9*Y01 + e \quad (6)$$

where

Roa1 =roa(t) if 20 =< sic <= 39,
Roa2 =roa(t) if 40 =< sic <= 48,
Roa3 =roa(t) if 50 =< sic <= 51,
Roa4 =roa(t) if 52 =< sic <= 59, and
Roa5 =roa(t) if 70 =< sic <= 89.

EMPIRICAL RESULTS

Simple descriptive statistics are in Table 1. Panel A reports data when the WACC is reported from the prior five years. The data in Panel B presents sample information when the WACC is computed from a future five year period. The variable definitions were given in the prior section. No large standard deviations appear that might influence or skew results. The differences in means between the two collection approaches do not seem very different given the differences in sample sizes.

Table 1 Descriptive statistics

Panel A: Past Descriptive statistics for 7009 firm-years for the period 1992-2001

Variable	Mean	Std. Dev.	Min.	Max.
Wacc	0.3984	0.207	0.0029	7.1406
Ra	0.8316	0.1997	-2.1524	2.3007
Roa	0.978	0.7398	-23.786	3.6902
Rfa	0.9159	0.744	-10.989	26.5874
Roafa	0.8451	1.1816	-36.991	24.5616

Panel B: Future Descriptive statistics for 7938 firm-years for the period 1992-2001

Variable	Mean	Std. Dev.	Min.	Max.
Wacc	0.3919	0.1919	0.0008	1.8336
RA	0.8269	0.2046	-2.1524	2.3007
Roa	0.9546	0.7284	-23.786	3.6902
Rfa	0.929	0.9683	-10.989	38.9802
Roafa	0.8345	1.3328	-36.991	34.1286

Table 2 presents simple correlations. Most of the correlations are as expected and are similar for the past and future sample sets. It should be noted that the operating/financial interaction has relatively high correlations with the individual components. The only correlation that is different from expectations is the Roa variable in the past sample which has a negative correlation with WACC. However, later regression results do not contradict the expected proposition of a positive association between WACC and Roa.

Table 2 Pearson Correlation Coefficients				
Past Panel A, (N = 7009)				
	Wacc	RA	Roa	Rfa
Ra	0.2201*			
Roa	-0.0876*	0.3154*		
Rfa	0.1172*	0.2380*	-0.0920*	
Roafa	0.0207&	0.2845*	0.6911*	0.4495*
Panel B, (N = 7938)				
	Wacc	RA	Roa	Rfa
Ra	0.2552*			
Roa	-0.0427*	0.3517*		
Rfa	0.0945*	0.1859*	-0.0742*	
Roafa	0.0474*	0.2821*	0.5912*	0.6208*
*=.01 and &=.1 significance				

Table 3 presents the regression results for equations (1), (2),(3),(4),(5) and (6). None had excessive multicollinearity with respect to variance inflation factors as per Kennedy (2003). The results for equation (1) and (2) support the alternative of Hypothesis One that a positive association exists between WACC and the return on assets RA. The return on asset RA coefficients are positive and significant as predicted. Panel A presents the dependent variable WACC where the past information is utilized. In Table 3 Panel B the dependent variable is the future information about the weighted cost of capital WACC. By inspection there appears to be no preponderance of evidence that favors the past or future WACC formulation for Hypothesis Two. A comparison between Panels A and B suggests that investors both react to and anticipate firm asset returns. When the leverage variable LevDif is introduced, the results remain robust. LevDif is significant with the anticipated negative sign and this result also supports the proposition that leverage matters to WACC.

In regressions (3) and (4) the operating and financial asset returns are also positive which suggests that firms have a portfolio of assets in which each component associates with WACC. These findings support the alternatives of Hypotheses Three and Four. However, the interaction

coefficient between the operating and financial asset returns is negative and significant. The implication is that operating and financial asset returns substitute for each other and that no synergy exists between them. When the return on operating assets Roa by industry is considered in regressions (5) and (6), the results continue to show similar significant coefficients and present a picture of robust results. The leverage variable LevDif is always significant and negative in equations (4) and (6) and the other variables do not change in their implications. Comparisons between WACC formulated from past information in Panel A or from future information in Panel B do not seem markedly different by inspection. Thus, it appears that investors impact on WACC does both anticipate and react to asset returns. Thus, Hypothesis Two cannot be rejected.

Table 3 Regressions of Past Panel A (N=7009)

	Without Leverage			With Leverage		
	Equation	Equation	Equation	Equation	Equation	Equation
Variable	-1	-3	-5	-2	-4	-6
RA	0.3635*			0.3442*		
Roa		0.0861*			0.0889*	
Roa1			0.0599*			0.0550*
Roa2			0.1472*			0.1515*
Roa3			0.0918*			0.0959*
Roa4			0.0624*			0.0631*
Roa5			0.0497*			0.0530*
Rfa		0.1117*	0.1013*		0.1167*	0.1040*
Roafa		-0.0517*	-0.0351*		-0.0605*	-0.0405*
LevDif				-0.6536*	-0.6773*	-0.6759*
Y93	0.0843*	0.2455*	0.2654*	0.1103*	0.2564*	0.2805*
Y94	0.0857*	0.2406*	0.2601*	0.1103*	0.2502*	0.2738*
Y95	0.1019*	0.2541*	0.2739*	0.1220*	0.2591*	0.2829*
Y96	0.1032*	0.2645*	0.2830*	0.1313*	0.2772*	0.2993*
Y97	0.0891*	0.2397*	0.2593*	0.1137*	0.2480*	0.2716*
Y98	0.1076*	0.2668*	0.2846*	0.1326*	0.2755*	0.2969*
Y99	0.0971*	0.2574*	0.2757*	0.1248*	0.2694*	0.2910*
Y00	0.1154*	0.2712*	0.2888*	0.1398*	0.2804*	0.3010*
Y01	0.1032*	0.2746*	0.2908*	0.1288*	0.2838*	0.3030*
RsqAdj	0.7925	0.7503	0.7497	0.8951	0.8604	0.8593
F	2677.86*	1756.51*	1313.19*	5436.67*	3324.50*	2519.14*

*=.01 significance

Table 3 Regressions of Future Panel B (N=7938)						
	Without Leverage			With Leverage		
	Equation	Equation	Equation	Equation	Equation	Equation
Variable	-1	-3	-5	-2	-4	-6
RA	0.3572*			0.3340*		
Roa		0.0925*			0.0884*	
Roa1			0.0571*			0.0482*
Roa2			0.1605*			0.1577*
Roa3			0.0775*			0.0724*
Roa4			0.0551*			0.0523*
Roa5			0.0883*			0.0775*
Rfa		0.0818*	0.0677*		0.0883*	0.0721*
Roafa		-0.0502*	-0.0322*		-0.0580*	-0.0375*
LevDif				-0.6338*	-0.6575*	-0.6570*
Y93	0.0852*	0.2574*	0.2840*	0.1143*	0.2729*	0.3027*
Y94	0.0759*	0.2443*	0.2695*	0.1037*	0.2587*	0.2871*
Y95	0.0838*	0.2468*	0.2736*	0.1065*	0.2557*	0.2859*
Y96	0.0872*	0.2632*	0.2856*	0.1137*	0.2753*	0.3008*
Y97	0.0886*	0.2529*	0.2741*	0.1140*	0.2632*	0.2874*
Y98	0.1090*	0.2817*	0.3033*	0.1386*	0.2959*	0.3204*
Y99	0.1185*	0.2929*	0.3134*	0.1501*	0.3097*	0.3329*
Y00	0.1241*	0.2962*	0.3161*	0.1591*	0.3167*	0.3392*
Y01	0.1061*	0.2942*	0.3153*	0.1386*	0.3110*	0.3346*
RsqAdj	0.8148	0.7714	0.7716	0.9184	0.8825	0.8824
F	3494.38*	2233.25*	1676.61*	8118.57*	4585.68*	3503.32*
*=.01 significance						

Table 4 provides results of regressions (1) when the sample is divided into eight portfolios by the leverage variable LevDif. The rank order of the return on asset RA coefficients indicates that leverage has an impact upon the relation between asset returns and WACC. The regression coefficient RA is higher for firms with lower leverage. The implications are that firms with lower leverage in their capital structure have a WACC that is more sensitive to management decisions for the investment in firm assets. One may confirm this conclusion by the way of anecdotal thinking in a contrast of market systematic risk characteristics (e.g. Beta) of high tech (low debt) firms with utility (high debt) firms. The alternative of Hypothesis 5 is supported.

Table 4 Leverage Sensitivity Regressions: Past Panel A													
Levdif Octals	RA	Y93	Y94	Y95	Y96	Y97	Y98	Y99	Y00	Y01	Adj. R Square	F	OBS
1 (Low)	0.5847*	0.1463*	0.1504*	0.2055*	0.2156*	0.1755*	0.2228*	0.2180*	0.2346*	0.2103*	0.9312	1180.51*	871
2	0.4634*	0.1178*	0.1326*	0.1266*	0.1607*	0.1564*	0.1316*	0.1255*	0.1608*	0.1468*	0.9352	1267.18*	877
3	0.4487*	0.0582	0.051	0.0599	0.0509	0.0496	0.1406*	0.0781#	0.0769#	0.0432	0.7732	299.93*	877
4	0.3694*	0.0660*	0.0743*	0.0881*	0.0502*	0.0506*	0.0628*	0.0810*	0.0903*	0.0836*	0.9484	1613.55*	877
5	0.3272*	0.0533*	0.0619*	0.0559*	0.0596*	0.0738*	0.0744*	0.0714*	0.0732*	0.0610*	0.9167	966.78*	878
6	0.2262*	0.0984*	0.0941*	0.1002*	0.1202*	0.1087*	0.1119*	0.1120*	0.1090*	0.1234*	0.8668	571.25*	876
7	0.1856*	0.1114*	0.1161*	0.1320*	0.1476*	0.1073*	0.1014*	0.1100*	0.1292*	0.1150*	0.8501	498.76*	878
8(High)	0.1053*	0.1622*	0.1492*	0.1832*	0.1925*	0.1397*	0.1476*	0.1296*	0.1647*	0.1679*	0.8153	387.12*	875
Table 4 Leverage Sensitivity Regressions: Future Panel B													
Levdif Octals	RA	Y93	Y94	Y95	Y96	Y97	Y98	Y99	Y00	Y01	Adj. R Square	F	OBS
1 (Low)	0.5893*	0.1538*	0.1467*	0.1413*	0.2012*	0.1852*	0.2214*	0.2145*	0.2134*	0.1768*	0.9374	1481.88*	989
2	0.4828*	0.0914*	0.0894*	0.0940*	0.1338*	0.1254*	0.1196*	0.1145*	0.1192*	0.1305*	0.9501	1890.61*	992
3	0.4572*	0.0371#	0.0368*	0.0521*	0.0358*	0.0392*	0.0622*	0.0709*	0.06361*	0.0373*	0.9493	1865.92*	995
4	0.3379*	0.0936*	0.0936*	0.0867*	0.0628*	0.0815*	0.0884*	0.0985*	0.1290*	0.1066*	0.9156	1076.40*	991
5	0.3051*	0.0543*	0.0618*	0.0573*	0.0571*	0.0610*	0.0889*	0.1078*	0.1123*	0.0823*	0.9087	989.77*	994
6	0.2245*	0.0737*	0.0734*	0.0661*	0.0783*	0.0836*	0.1153*	0.1228*	0.1369*	0.1213*	0.8637	630.13*	993
7	0.1601*	0.1212*	0.1003*	0.1287*	0.1065*	0.1214*	0.1346*	0.1465*	0.1625*	0.1484*	0.8195	452.27*	994
8(High)	0.1109*	0.1760*	0.1335*	0.1436*	0.1441*	0.1278*	0.1602*	0.1899*	0.2030*	0.1831*	0.7951	385.10*	990
*=.01 and #=.05 significance													

Table 5 provides results of regressions (1) when the sample is divided into eight portfolios by the operating/financing asset mix variable OaDif. This ranking variable OaDif is constructed in the same manner as LevDif by computing a difference of the proportion of operating assets to total assets minus an industry mean of the percentage. The rank order of the return on asset RA coefficients indicates some operating/financial asset impact upon the relation between asset returns and WACC. The regression coefficient RA is higher for firms with a higher operating asset component. However the RA coefficients do not display the same linear effect as with LevDif. The implications are that firms with higher financial assets leverage in their capital structure have a higher volatility which reduces the relation between WACC and the investment in firm assets. In the final analysis by inspection, there is no clear support for or against Hypothesis 6.

Table 5 Operating/Financial Asset Sensitivity Regressions: Past Panel A													
OAdif Octals	RA	Y93	Y94	Y95	Y96	Y97	Y98	Y99	Y00	Y01	Adj. R Square	F	OBS
1 (Low)	0.1080*	0.2664*	0.2726*	0.2723*	0.3114*	0.2642*	0.2950*	0.2589*	0.2950*	0.3319*	0.7235	228.86*	871
2	0.3329*	0.0623*	0.0897*	0.0806*	0.1040*	0.0846	0.0524#	0.0796*	0.0544#	0.0862*	0.8202	401.01*	877
3	0.3737*	0.0417&	0.0299	0.0718*	0.0405&	0.0591#	0.0576#	0.0561#	0.0740*	0.0353	0.8195	399.18*	877
4	0.3774*	0.0286	0.0798*	0.0753*	0.0953*	0.0673*	0.0804*	0.0670*	0.0984*	0.0652*	0.8451	479.30*	877
5	0.4281*	0.0338	0.0201	0.0646	0.0379	0.0484	0.1215*	0.0434	0.0648&	0.0345	0.6763	184.46*	878
6	0.4286*	0.0718#	0.0583#	0.0770*	0.0469&	0.0521&	0.0531#	0.0862*	0.0549#	0.0577#	0.8327	437.15*	876
7	0.4983*	0.0122	0.0079	0.0263	0.0236	0.0105	0.0187	0.006	0.0339	0.0067	0.8747	613.89*	878
8(High)	0.4966*	0.0287	0.0496	0.14	0.0121	0.0053	0.0457&	0.0413	0.0858*	0.0178	0.8669	570.85*	875
Table 5 Operating/Financial Asset Sensitivity Regressions: Future Panel B													
OAdif Octals	RA	Y93	Y94	Y95	Y96	Y97	Y98	Y99	Y00	Y01	Adj. R Square	F	OBS
1 (Low)	0.1231*	0.2209*	0.2368	0.2544	0.2528	0.2491	0.305	0.3023	0.3183	0.279	0.7371	278.30*	989
2	0.2753*	0.1138	0.1169	0.107	0.121	0.1187	0.1217	0.1649	0.1439	0.1572	0.7917	378.13*	992
3	0.3676*	0.0299	0.0181	0.0289	0.0407	0.0536#	0.0617*	0.0573#	0.0728*	0.0424&	0.7997	398.30*	995
4	0.4266*	0.0141	0.0111	0.0194	0.0221	0.0132	0.0487#	0.0477#	0.0639*	0.0254	0.835	502.67*	991
5	0.4208*	0.0378	0.0177	0.0521#	0.0304	0.0504#	0.0509#	0.0774*	0.0555#	0.0369	0.8252	470.30*	994
6	0.4538*	0.0518#	0.0287	0.0322	0.0226	0.0054	0.0459&	0.0395	0.0405	0.021	0.851	567.96*	993
7	0.4539*	0.0509#	0.0371&	0.0848#	0.0351&	0.0262	0.0478#	0.0553#	0.0572#	0.0639#	0.8606	614.80*	994
8(High)	0.5070*	0.0051	0.0152	-0.0697	0.0081	0.0067	0.0141	0.0172	0.0319	0.0109	0.8673	648.28*	990
*=.01, #=.05 and &=.1 significance													

SUMMARY

There has been a gradual shift from historical cost to fair value accounting. This study examines the relevance of the relation between the investor determined cost of capital and the firm's investment from return on assets both in total and decomposed into operating and financial components. This study's findings provide evidence of a significant positive association between the return on total assets and the firm's cost of capital. When total asset returns are decomposed into operating and financial asset returns, both the operating and financial assets have a positive significant relation with the cost of capital. A negative interaction between operating and financial asset returns indicates a substitution effect and that synergy does not occur between them. There is a significant leverage interaction impact upon relation of the return on assets and WACC. There is some indication of an impact from the operating/financial asset mix upon the relation between WACC and the return on firm assets. This research indicates potential interaction areas of concern for FASB/IASB proposed presentation standard which emphasizes an operating and financing component approach.

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MUTUAL FUND PERFORMANCE AND BOARD CHARACTERISTICS RELATING TO MANAGER TERMINATIONS

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ABSTRACT

This study examines mutual fund performance around fund manager replacement and the timing of the decision to replace mutual fund managers. Fund manager replacement timing is explored to test whether quick actions by boards of directors mitigate the negative fund performance characteristics usually associated with manager replacement. The study includes data from 507 instances of replacement of an individual fund manager or the entire management team. While results match previous findings that returns improve and standard deviation falls following a manager change, several important new findings are also presented. In using a unique control sample of funds matched on prior period performance, net assets, and investment objective, it is shown that poorly performing managers who retain their positions actually improve fund performance to as great a degree as the new managers hired after a termination. Both groups experience improved returns and lower standard deviation of monthly return after the replacement date.

Further, evidence indicates that for boards which decide to replace poorly performing managers, stronger boards are more likely to complete the replacement early in a period of underperformance. That is, boards which have a larger percentage of independent directors and which are smaller tend to be associated with early terminations.

INTRODUCTION

Mutual funds experiencing poor performance often replace the fund manager in an effort to improve returns. Managers who are underperforming are therefore motivated to increase performance in order to retain their position. While this may initially appear to align managers' goals with those of shareholders, a deeper examination is required. Fund managers who are underperforming may feel a need to focus exclusively on short-term results, and therefore increase risk in a gamble to boost returns (Chevalier and Ellison (1997), Brown, Harlow, and Starks (1996)). If the gamble pays off, the manager may keep his position, while if the gamble fails, he only loses a position which he was destined to lose anyway. An underperforming manager who remains in place for several years may compound the severity of the problem, resulting in a trend of increasing risk, lower performance, and lower asset flows.

Prior research has shown that performance and flows generally increase and risk decreases following a manager replacement (Chevalier and Ellison (1999), Khorana (1996) Khorana (2001)). The improvement is usually credited to the new manager. However, in this paper I compare funds which have changed managers to a matched set of funds which have not replaced managers in order to determine whether poorly performing funds which retain their managers also experience improved performance. This study is unique in determining a control group of funds with similar performance rather than comparing the "change" funds to a much broader control group based solely on investment objective. Therefore, the first question addressed in this paper is whether credit should be given the new manager or if there is a general mean reversion that occurs in underperforming funds over time.

Results indicate that after the manger replacement date, performance, asset flows, and risk are very similar for the funds which replaced their managers and the control group. Excess objective returns approach 0 for both groups in the post-replacement period, a significant increase from negative excess objective returns prior to the manager change. Flows, which appear to follow lagged return, fall during the pre-replacement period, then also increase after the replacement date.

Secondly, since prior studies have shown that a manager replacement is a positive event for a struggling fund, the timing of the decision to replace mutual fund managers is examined. I test whether more timely reactions by boards of directors mitigate the negative fund performance characteristics usually associated with manager replacement. I find no significant reaction of flows to an early manager change. Fund returns appear to be the more likely driver of flows, and flows improve with performance, regardless of the timing of the manager change.

Finally, I test whether an early replacement decision is associated with stronger board governance characteristics. If directors assume that changing a manager can boost performance, then stronger boards may be more likely to replace a manager early. I find that boards of directors with a greater percentage of independent members, fewer members, and an older chair are associated with early manger changes.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The relation of mutual fund flows to performance has been the focus of several studies. Chevalier and Ellison (1997) find that underperforming fund managers attempt to gamble by increasing risk in an effort to boost returns. A successful gamble may result in the manager retaining his position, while a loss may simply result in the manager losing the job he was likely to lose anyway. Further, Sirri and Tufano (1998) report that the sensitivity of flows to performance is high during superior performance, but low during under performance. Consumers base mutual fund investment decisions at least in part on past performance, putting more money into funds that perform very well in the prior period, but they do not divest of poor performers. If outflows are similar for under-performers regardless of the severity of poor

returns, there appears to be little incentive for managers to avoid steeper losses in already underperforming funds. A poorly performing manager may increase risk in order to move up in rankings at the risk of damaging return even more.

Similar results are found by Brown, Harlow, and Starks (1996) who describe the mutual fund market as a tournament in which all funds compete for new assets based on relative performance. They report mid-year underperformers tend to increase fund volatility in the latter part of an annual assessment period to a greater extent than mid-year winners.

Given the reasons to replace the manager of a poorly performing fund, I next examine fund performance around a manager change. Chevalier and Ellison (1999) find that firing a manager who has performed poorly may reduce outflows by 45% compared to a control group. Khorana (1996) provides additional evidence of improvement after manager replacement. He finds that departing managers tend to have higher fund turnover and higher expenses. Growth is also much slower for funds before a manager replacement compared to a control group, and risk increases as termination approaches. This market reaction of investors provides support for the replacement of poorly performing managers as soon as they are identified.

In a later study, Khorana (2001) finds that after a manager replacement, underperforming funds experience significant improvement in returns relative to past performance, and that changes are preceded by decreasing net flows. Underperforming fund risk is higher pre-replacement, then declines. In a study of Australian equity mergers from 1994 to 2000, Gallagher, Nadarajay, and Pinnuck (2006) find that after replacement, poorly performing funds improve performance, but not because of better stock selection. Performance is enhanced primarily through decreased momentum investment strategies and decreased portfolio concentration.

If performance is affected by the replacement of the fund manager, then the timing of the replacement may also be important. While the timing of mutual fund manager replacement has not been previously examined, Ertugrul and Krishnan (2007) study the timing of CEO dismissal, and find that late CEO terminations result in worse ex-post performance, more bankruptcies, and more de-listings than do early replacements. Stock market reactions are negative for early replacement, while there is no reaction to late, suggesting that the market has already adjusted for poor performance of the CEO in office longer. They also find that more effective boards replace lagging CEOs earlier, before stock performance suffers. Less effective boards rely on a history of poor performance rather than internal indications of potential declines in management ability.

Mutual fund governing bodies are similar to corporate boards of directors. Mutual fund governance consists of a board of directors (trustees) who are elected by shareholders (fund owners) and have specific responsibilities, including employing the fund advisor. The fund advisor controls the management of the fund and hires the fund manager, who is responsible for investment decisions.

There have been few studies into the effectiveness of mutual fund boards. Khorana, Tufano, and Wedge (2007) find that fund mergers are more likely when the board is composed of a higher percentage of independent directors, and mergers are less likely when relatively higher paid boards govern the merger target. Tufano and Sevick (1997) find that shareholder fees are lower when boards are smaller and have a greater fraction of independent directors. They also find some evidence of better paid directors setting higher fund fees.

I first examine performance around a fund manager change. Manager replacements are classified as either forced or voluntary, where forced replacements are those instances in which a fund manager leaves a fund and is not reported as a manager of a fund with greater assets within two years. Further, since a main reason for increased performance after a manager change may be prior-period underperformance, I also test post-turnover performance to a matched sample of funds without a manager change. The control sample is matched based on investment objective, excess objective returns prior to the replacement date, and net assets.

H1: Following a forced turnover a fund will demonstrate: 1) increased performance, 2) reduced risk, and 3) increased net flows.

I next examine the timing of the replacement decision. If fund directors can determine at an early stage that performance is deteriorating or that other factors indicate a fund manager needs to be replaced, they will attempt to replace the manager as early as the decision can be correctly made. The sample of forced turnovers is divided into two additional subsets: those which replace early and those which replace late. I calculate the mean number of months during the two years prior to the manager change that the sample funds posted negative excess objective returns. Those replacements which are preceded by more than the mean are classified as late. Early replacements include those with the same or a fewer number of months of negative return.

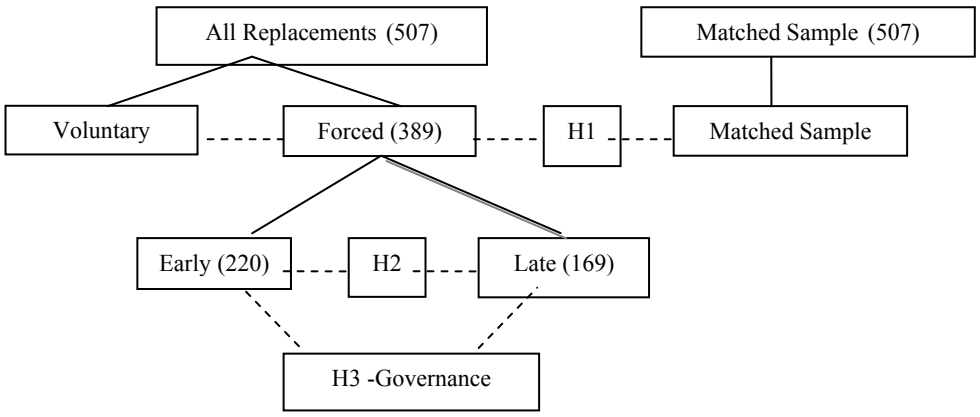
H2: Post replacement performance, risk, and net flows are different for late and early replacements.

Finally, it has been shown in corporate finance that certain board characteristics are associated with "better" boards. I test this for mutual fund boards, and expect that boards which are smaller, more independent, and have an independent chair will be associated with a greater likelihood of early replacement.

H3: The probability of an early termination increases with stronger board governance characteristics.

An overview of the relation of the hypotheses is shown in figure 1.

Figure 1: Hypothesis Overview and Relation



SAMPLE AND METHODOLOGY

To construct the sample, I examine the CRSP mutual fund database to identify all changes of a sole manager or the replacement of an entire management team for domestic equity funds for the period of January 2002 through December 2005. To be included in the sample, a fund must have at least two years of pre- and post-turnover performance data and only one manager change during the sample period. The sample includes 507 funds meeting the selection criteria. The replacement date (t = 0) is set to the six month period during which CRSP reports the change in manager.

I compare this "change sample" to a matched control group. Fund matches are determined by using logistic regression, run separately for each period and for each investment category, to estimate the probability of manager replacement. The independent variables are return and net flow during the pre-replacement period. The match is the fund with an identical two-decimal probability of replacement with the asset size nearest the target fund. If a two-decimal match is not found, then the next closest probability is used. Each fund in the matched sample is used only once. For the control funds, the replacement date is set to the replacement date of their matched funds.

Three areas of fund performance are examined: return, net flows, and risk. Risk is defined as the standard deviation of monthly returns for 12 month periods surrounding replacement. Return is measured using fund excess objective return. Objective return is determined by first dividing all domestic equity funds in CRSP into the seven CRSP classifications of large growth, aggressive growth, income and growth, growth and income, mid cap, small cap, and S&P index. The mean return for each category is calculated for each month. That mean is subtracted from the actual return for each fund within the category to result in the excess objective return, as shown below.

EXCESS OBJECTIVE RETURN$_{i,t}$ = $(R_{i,t}) - (R_{o,t})$

Where $R_{i,t}$ is the return of fund *i* for period *t*, and $R_{o,t}$ is the mean return of all funds with the same investment category for period *t*.

Net flow is defined as follows:

PERCENT NETFLOW $_{i,t} = [ASSETS_{i,t} - ASSETS_{i,t-1} * (1 + R_{i,t})]/ASSETS_{i,t-1}$

Where $ASSETS_{i,t}$ is total assets in fund *i* at the end of period *t*, and $R_{i,t}$ is the return of fund *i* during period *t*. PERCENT NETFLOW measures the growth in assets over and above the change in value of fund assets at the beginning of the period.

To test hypothesis 2, the sample is divided into early and late terminations as described earlier. I use the same methodology as in hypothesis 1 above, but here the sample is divided into the groups of early vs. late replacement rather than the sample vs. the control group. The reason for this is to examine the economic impact to a fund, if any, of allowing poorly performing fund managers to remain in charge longer.

To test hypothesis 3, I examine the board characteristics of the sample funds. While the board does not have direct control over the fund manager replacement decision (the fund advisor technically makes that decision), it is assumed that this is an important enough matter that the board would exude influence. Also, the culture or environment established by the board may dictate the actions taken in employing the manager. Data concerning the boards of directors are collected from the SEC for all the funds in the sample. This is published in forms 485APOA and 485BPOS, and is available on the SEC website at www.sec.gov.

I estimate the probability of early replacement using logistic regression and board governance characteristics in the model below:

P (early replacement) = f {board governance characteristics}
Where board governance characteristics include:

* Board size: the number of directors on the board of the fund
* Compensation: the annual compensation earned by a board member from the fund
* Independent board: the percentage of the board composed of unaffiliated directors
* Independent chair: a dummy variable equal to one if the chair is unaffiliated with the fund
* Retirement: dummy variable equal to one if the board members receive pension benefits after retirement
* Director Age: the average age of fund board members
* Chair Age: age of the Board Chairman

RESULTS

Table 1 reports the excess objective return for each 6 month period surrounding the manager change, as well as the return for each full 24 month period before and after replacement. Both the control group and the sample exhibit poor performance before the manager change, as expected. Both groups also exhibit performance not significantly different from the mean of the fund objective after the replacement date, except for a return of -0.63% for the change group in the 6 to 12 moth period after the change. While one may expect a new manager to be able to improve performance, it appears that those managers who remained at their funds also improved performance – at least up to the mean for their fund objective. The only significant difference in performance between the funds which changed managers and those which didn't was in months 6 to 12 post-replacement, in which the funds with a change actually performed worse.

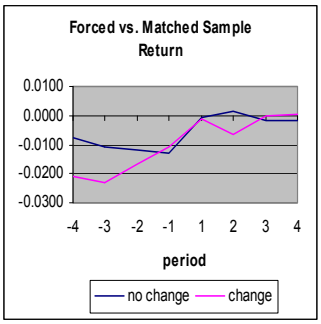
Panel B shows that the late change group is associated with lower performance before the change date. This is expected since by definition, late changes have more months of negative performance. Interestingly, the change group underperforms the control group for the first 12 months after the replacement, with manager change funds averaging excess objective returns lower than the control group by 1.02 and 1.11 percent each of the first two 6-month periods. The only significant negative period post replacement date for the control group is for the 6 month period from 18 to 24 months after the change date. Performance for both groups is neither significantly different from 0, nor different from each other for the full 24 months post-replacement date period, indicating again that performance is no better for those funds which changed managers, even for these late changes which are preceded by longer periods or poor performance.

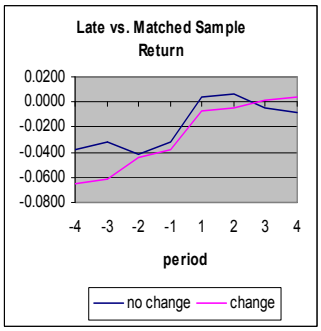
Panel C of Table 1 examines changes between early and late manager replacements. Performance prior to the manager change is not reported since it is much worse for late changes due to the method of classification. Those funds with an early manager change outperform those with a late change by 99 basis points for the first 6 months after the change date. Both groups are negative from months 6 to 12. Performance is similar for the next 12 months, then those funds which replaced the manager late outperform by 50 basis points, but the difference is only marginally significant. Also, performance over the full 24-month period is not significantly different for the two groups. This suggests that the timing of a manager change does not significantly impact post-replacement returns.

The results reported in Table 1 are also shown graphically in Figure 2, which more clearly demonstrates the convergence to 0 of the excess objective return of both the replacement and control groups for all three categories of comparisons. Taken together, these results suggest there is not a significantly greater increase in fund performance for funds which replace a manager either early or late.

Table 1: Mean excess objective return before and after replacement										
This table reports the mean excess objective return for six-month periods surrounding manager replacement for the sample, the control group, and reports differences between the groups.										
Panel A: Forced Change, n=388										
Period	-4 to -1	-4	-3	-2	-1	1	2	3	4	1 to 4
Six months ending	Full 24 prior	-18	-12	-6	0	6	12	18	24	Full 24 post
no change	-0.0267	-0.0078	-0.0108	-0.0121	-0.0129	-0.0007	0.0013	-0.0015	-0.0016	-0.0002
	0.019	0.145	0.002	0.000	<.0001	0.769	0.607	0.456	0.392	0.964
change	-0.0549	-0.0211	-0.0229	-0.0166	-0.0107	-0.0012	-0.0063	-0.0003	0.0003	-0.0053
	<.0001	<.0001	<.0001	<.0001	0.016	0.518	0.010	0.916	0.854	0.271
diff	0.0282	0.0133	0.0121	0.0045	-0.0020	0.0005	0.0076	-0.0010	-0.0020	0.0051
	0.071	0.059	0.025	0.327	0.691	0.857	0.031	0.684	0.447	0.492
Panel B: Late Change, n = 169										
Period	-4 to -1	-4	-3	-2	-1	1	2	3	4	1 to 4
Six months ending	Full 24 prior	-18	-12	-6	0	6	12	18	24	Full 24 post
no change	-0.1175	-0.0378	-0.0317	-0.0417	-0.0322	0.0034	0.0059	-0.0049	-0.0086	-0.0025
	<.0001	<.0001	<.0001	<.0001	<.0001	0.335	0.126	0.148	0.002	0.772
change	-0.1793	-0.0655	-0.0613	-0.0442	-0.0385	-0.0068	-0.0052	0.0012	0.0034	-0.0072
	<.0001	<.0001	<.0001	<.0001	<.0001	0.009	0.074	0.655	0.190	0.204
diff	0.0618	0.0276	0.0296	0.0025	0.0063	0.0102	0.0111	-0.0060	-0.0120	0.0047
	0.002	0.012	0.000	0.747	0.445	0.020	0.022	0.159	0.002	0.649
Panel C: Early vs. Late Change, n = 220/169, changed managers only										
Period	-4 to -1	-4	-3	-2	-1	1	2	3	4	1 to 4
Six months ending	Full 24 prior	-18	-12	-6	0	6	12	18	24	Full 24 post
early						0.0031	-0.0072	-0.0014	-0.0021	-0.0039
						0.229	0.052	0.707	0.325	0.599
late						-0.0068	-0.0052	0.0012	0.0034	-0.0072
						0.009	0.074	0.655	0.190	0.204
Diff						0.0099	-0.0020	-0.0030	-0.0050	0.0033
						0.007	0.665	0.570	0.098	0.719

Figure 2: Return. The three charts below report the trend in return for the sample and control groups.





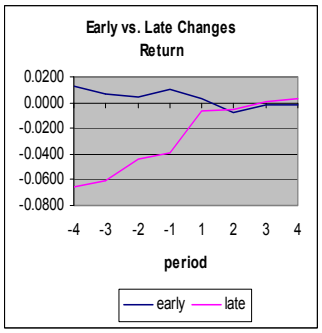


Table 2 Panel A shows that flows are not significantly different for the replacement group and the matched sample before replacement, and were generally falling and approaching 0 net flows by the time of replacement. Flows continue to fall after the replacement date for both groups, with the only significant difference in period 2 in which flows were 2.43 percentage points lower for those funds with a replacement. Flows for both groups are flat in the 12 month period surrounding replacements, so there appears to be no significant signal (either positive or negative) associated with a manager change.

Table 2: Asset flow return before and after replacement

This table reports the mean asset flows for six-month periods surrounding manager replacement for the sample, the control group, and reports differences between the groups.

Panel A: Forced Change, n=388

Period	-4 to -1	-4	-3	-2	-1	1	2	3	4	1 to 4
Six months ending	Full 24 prior	-18	-12	-6	0	6	12	18	24	Full 24 post
no change	0.2987	0.0565	0.0491	0.0019	-0.0162	-0.0014	-0.0239	-0.0464	-0.0112	0.0259
	0.001	<.0001	0.001	0.846	0.168	0.938	0.019	<.0001	0.461	0.789
change	0.1509	0.0359	0.0244	-0.0087	-0.0107	0.0069	-0.0481	-0.0469	-0.0252	-0.0781
	0.011	0.018	0.060	0.421	0.658	0.875	<.0001	<.0001	0.078	0.261
diff	0.1478	0.0206	0.0246	0.0106	-0.0050	-0.0080	0.0243	0.0005	0.0139	0.1040
	0.155	0.303	0.203	0.467	0.838	0.861	0.060	0.966	0.504	0.382

Panel B: Late Change, n = 169

Period	-4 to -1	-4	-3	-2	-1	1	2	3	4	1 to 4
Six months ending	Full 24 prior	-18	-12	-6	0	6	12	18	24	Full 24 post
no change	-0.0065	0.0523	-0.0019	-0.0486	-0.0442	-0.0100	-0.0360	-0.0464	-0.0004	0.0791
	0.883	0.006	0.899	<.0001	0.021	0.781	0.012	0.002	0.990	0.708
change	-0.0661	0.0194	-0.0235	-0.0511	-0.0445	0.0093	-0.0668	-0.0833	-0.0380	-0.1466
	0.157	0.433	0.086	<.0001	0.049	0.916	<.0001	<.0001	0.090	0.275
diff	0.0597	0.0329	0.0216	0.0025	0.0003	-0.0190	0.0308	0.0369	0.0376	0.2257
	0.351	0.289	0.28	0.871	0.991	0.839	0.096	0.049	0.308	0.367

Panel C: Early vs. Late Change, n = 220/169, changed managers only

Period	-4 to -1	-4	-3	-2	-1	1	2	3	4	1 to 4
Six months ending	Full 24 prior	-18	-12	-6	0	6	12	18	24	Full 24 post
early						0.0050	-0.0338	-0.0189	-0.0154	-0.0255
						0.897	0.002	0.096	0.409	0.703
late						0.0093	-0.0668	-0.0833	-0.0380	-0.1466
						0.916	<.0001	<.0001	0.090	0.275
Diff						-0.0040	0.0330	0.0644	0.0226	0.1211
						0.962	0.040	<.0001	0.435	0.419

Panel B reports the results for late changes. Flows prior to the change date are negative and declining for both groups, with no significant differences. After the change date, flows for periods 2 and 3 are significantly lower for the change group vs. the no change group by 3.08 and 3.69 percentage points, respectively. It appears that a manger change is a negative event for a

fund, even when compared to funds with equally poor performance. A new manager does not appear to be a positive signal for a poorly performing fund. Flows are actually higher for poorly performing funds which retain their managers.

Panel C compares early and late manager changes. Flows are higher for the early changes for periods 2 and 3, which suggests that an early change can better stop the trend of decreasing cash flows. Also, since late replacement funds demonstrate lower flows prior to replacement as well, an early replacement may mitigate some of the negative flows associated with retaining a poorly performing manager longer.

The results reported in Table 2 are also shown graphically in Figure 3. As with returns, the flows for both groups are similar except for the early vs. late changes. It appears that the replacement of a manager who has a longer history of poor performance may actually cease the decline in flows during the six months after replacement, but only temporarily as the trend of decreasing flows then continues for the next 12 month period.

Figure 3: Flows. The three charts below report the trend in asset flows for the sample and control groups.

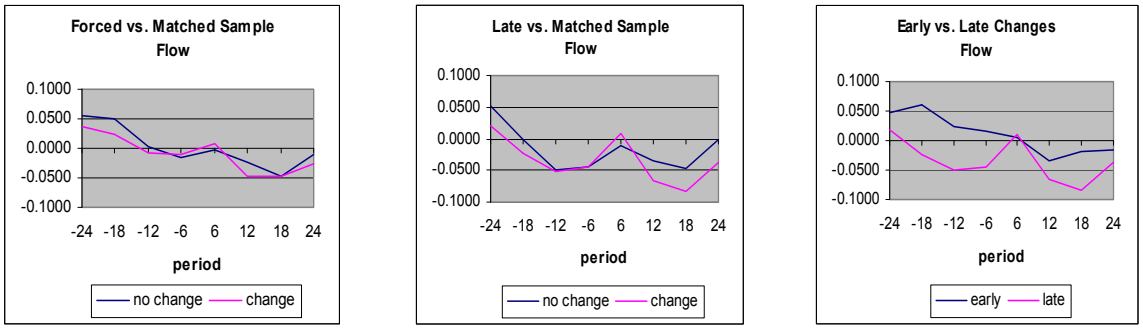


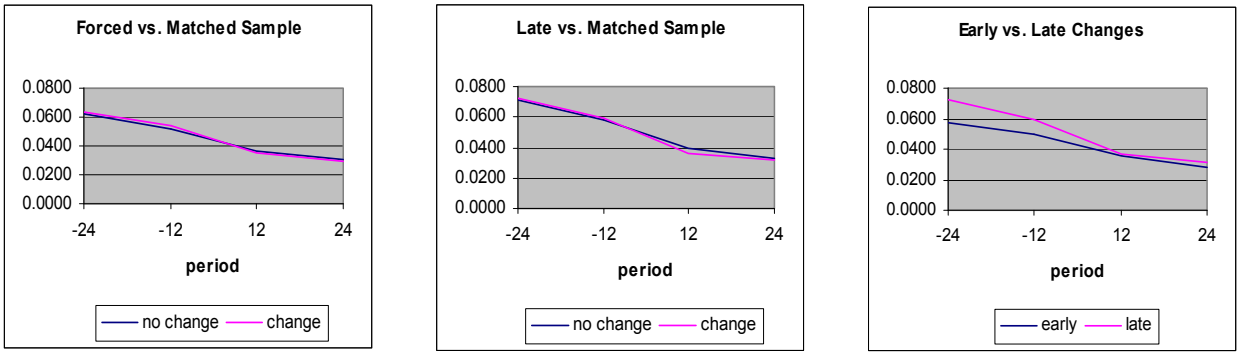
Table 3 reports changes in standard deviation. For the forced replacements in Panel A, the standard deviation of monthly returns is similar for both the sample and the control group. Each group also experiences lower standard deviation across time. This supports Chevalier and Ellison (1997) in that standard deviation declines, but I also find a decline for those funds which did not change their manager. Panel B shows very similar results for late replacements.

Panel C shows that standard deviation is slightly greater for the late changes for the period of return ending two years after the replacement. This may be the result of greater changes to the holding of the portfolio of late replacements. If a fund has performed poorly for a long period, more significant changes in holdings may be needed.

The results from the left half of Table 3 are also shown graphically in Figure 4, which more clearly shows the decreasing standard deviation around the replacement, as well as the very similar pattern for both the change and control groups.

Table 3: Changes among periods in standard deviation of monthly return before and after replacement				
This table reports the mean standard deviation of monthly return for twelve-month periods surrounding manager replacement for the sample, the control group, and reports differences between the groups. Also reported are the differences in mean standard deviation between consecutive six-month periods after manager replacement, as well as differences in periods surrounding replacement.				
Panel A: Forced Replacement, n = 388				
	Annual Standard Deviation of Monthly Return			
Periods	-4,-3	-2,-1	1,2	3,4
12 months ending	-12	0	12	24
no change	0.0631	0.0516	0.037	0.0306
	<.0001	<.0001	<.0001	<.0001
change	0.0636	0.054	0.0362	0.0297
	<.0001	<.0001	<.0001	<.0001
diff	-0.0005	-0.002	0.0008	0.0009
	0.823	0.298	0.575	0.297
Panel B: Late Replacement , n = 169				
Periods	-4,-3	-2,-1	1,2	3,4
12 months ending	-12	0	12	24
No change	0.0709	0.0581	0.0398	0.0331
	<.0001	<.0001	<.0001	<.0001
Change	0.0725	0.0595	0.0365	0.0316
	<.0001	<.0001	<.0001	<.0001
Diff	-0.002	-0.001	0.0033	0.0014
	0.732	0.732	0.199	0.332
Panel C: Early vs. Late Change, n = 220/169, changed managers only				
Periods	-4,-3	-2,-1	1,2	3,4
12 months ending	-12	0	12	24
early			0.0359	0.0283
			<.0001	<.0001
late			0.0365	0.0316
			<.0001	<.0001
Diff			-0.0006	-0.003
			0.769	0.003

Figure 4: Standard Deviation. The three charts below report the trend in standard deviation for the sample and control groups.



While I have shown little incentive for replacing a poorly performing fund manager, prior research as well as intuition suggests that when portfolio performance is below average, the manager may be the problem. In this section, I examine mutual fund board characteristics, and test whether there is a connection between governance and the timing of the decision to replace a mutual fund manager.

I use only the sample of funds which experience a forced replacement, and compare the early changes to the late. Table 4 reports the results from the logistic regression used to test for relations between common board characteristics and the probability of a replacement being an early replacement. Chair age, the percentage of board members which are independent, and board size are all significant predictors of whether a change in fund manager will be an early change. Coefficients for chair age and percentage independent are positive and significant, indicating that the probably of a change being an early change are higher when the chair is older and the board is more independent. The negative coefficient for board size implies that early changes are more likely for smaller boards. Taken together, these results suggest that the board characteristics generally regarded as indicating stronger boards are associated with early replacement.

Table 4: Probability of a change being an early change

This table reports the results of a logistic regression testing the effect of board governance variables on the probability of a manager change being an early change.

P (early replacement) = f {board governance characteristics}

	Odds Ratio Point Estimate	Coefficient	P
Chair age	1.024	0.0237	0.052
Percentage independent	1.02	0.0199	0.08
Size of board	0.855	-0.1565	0
Average age	0.992	-0.0081	0.802
Total Compensation	0.999	-0.0006	0.732
Independent chair dummy	0.974	-0.0268	0.918
N	446		

ROBUSTNESS CHECKS

A potential issue with the data is that the manager changes from CRSP are grouped over a six month window. That is, a manager change in January is reported with the same change date as one in June. To test whether this impacts the results, I collect manager tenure information from Morningstar, then manually calculate the change month. Of the 507 funds from CRSP, 340 were successfully matched against the Morningstar database.

Results related to returns and flows are reported in Tables 10 and 11, and are very similar to the patterns revealed using the full CRSP data. The returns and flows of the change sample and control group again appear to converge after the change date. This again implies no significant advantage to performance or asset flows in replacing a manager.

Table 5: Mean excess objective return before and after replacement – Morningstar Change Dates								
This table reports the mean excess objective return for six-month periods surrounding manager replacement for the sample, the control group, and reports differences between the groups. The change date used for this table is collected from Morningstar.								
Panel A: Forced Change, n=340								
Period	-4	-3	-2	-1	1	2	3	4
Six months ending	-18	-12	-6	0	6	12	18	24
no change	-0.0131	-0.0152	-0.0051	-0.0176	0.0014	0.0001	-0.0029	-0.0011
	0.071	0.005	0.897	<.0001	0.648	0.982	0.244	0.643
change	-0.0222	-0.0148	-0.0113	-0.0164	0.003	-0.0043	0.0013	-0.0021
	<.0001	0.001	0	<.0001	0.27	0.024	0.468	0.229
diff	0.0091	-0.0004	0.0118	-0.001	-0.002	0.0044	-0.004	0.001
	0.315	0.954	0.015	0.828	0.705	0.166	0.171	0.723
Panel B: Late Change, n = 154								
Period	-4	-3	-2	-1	1	2	3	4
Six months ending	-18	-12	-6	0	6	12	18	24
no change	-0.0404	-0.0395	-0.0123	-0.0373	0.0014	0.01	-0.0068	-0.0082
	0.001	<.0001	0.282	<.0001	0.728	0.006	0.058	0.006
change	-0.0611	-0.0488	-0.03	-0.0366	-0.0069	-0.0079	-0.0005	-0.0076
	<.0001	<.0001	<.0001	<.0001	0.039	0.001	0.822	0.004
diff	0.0207	0.0093	0.0245	-0.0007	0.0083	0.0178	-0.006	-0.0006
	0.167	0.332	0	0.93	0.111	<.0001	0.138	0.881

Table 6: Asset flow return before and after replacement – using Morningstar change dates								
This table reports the mean net asset flows for six-month periods surrounding manager replacement for the sample, the control group, and reports differences between the groups. The change date used for this table is collected from Morningstar.								
Panel A: Forced Change, n=340								
Period	-4	-3	-2	-1	1	2	3	4
Six months ending	-18	-12	-6	0	6	12	18	24
no change	0.1279	0.0566	0.0426	-0.1121	-0.0545	-0.0365	-0.0443	-0.0219
	<.0001	0	0.028	0.296	<.0001	0.002	<.0001	0.3
change	0.0774	0.0401	0.0491	-0.0111	-0.0748	-0.0477	-0.0629	-0.0491
	0.002	0.004	0.085	0.5	<.0001	0	<.0001	<.0001
diff	0.0505	0.0165	-0.007	0.087	0.0561	0.0112	0.0186	0.0272
	0.157	0.42	0.85	0.352	0.242	0.509	0.187	0.252
Panel B: Late Change, n = 154								
Period	-4	-3	-2	-1	1	2	3	4
Six months ending	-18	-12	-6	0	6	12	18	24
no change	0.2663	0.0588	0.0108	-0.0344	-0.0754	-0.045	-0.0465	-0.0052
	0.107	0.08	0.68	0.2	<.0001	0.007	0.002	0.878
change	0.0315	-0.0199	-0.0379	-0.0582	-0.0865	-0.0678	-0.0904	-0.066
	0.18	0.151	0.001	<.0001	<.0001	<.0001	<.0001	0
diff	0.2348	0.0787	0.0487	0.0238	0.0111	0.0228	0.0439	0.0608
	0.155	0.03	0.088	0.399	0.57	0.274	0.021	0.113

CONCLUSIONS

While results match previous findings that returns and flows improve and standard deviation is reduced following a manager change, several important new findings are also presented. Most past studies compare funds with a manager change to all other funds with the same investment category, without matching on performance. In using a unique control sample of funds matched on prior period performance, net assets, and investment objective, I have shown that poorly performing managers who retain their positions actually improve fund performance just as well as those funds in which the manager is replaced. Both groups experience improved returns and lower standard deviation of monthly return.

Regardless of the lack of evidence supporting improved performance due to manager replacement, I also find evidence that stronger boards are more likely to replace a manager early in a period of underperformance. Boards which have a larger percentage of independent directors and which are smaller tend to be associated with early replacements.

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CONTRIBUTING SUCCESS FACTORS WITHIN THE FINANCIAL PLANNING PROFESSION: INSIDE FINANCIAL PLANNER PERCEPTIONS.

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ABSTRACT

Financial planner perceptions are made up of a complex neural blend of client management qualities, client demographic qualities, personal qualities, business practice qualities, and job qualities. This study empirically assesses perceptions of the financial planning professional to find those factors seen to be most important and least important contributing to financial planner self reported success. The data utilized within this study were gathered via a survey instrument developed and administered in an online format during the months of June and July 2008. A total of 403 geographically diverse respondents (4% response rate) who are members of the FPA and agree to receive email from the organization answered the survey. The final sample used after significant non-response cases were eliminated was 349 respondents (3.5%). Findings of this study indicate that client relationships, wealth of client served, use of ethical practices, ability to empathize, number of clients served, client referrals, and job autonomy are among the most important contributors to financial planner perceived success.

INTRODUCTION

The financial planning profession provides a unique research opportunity for scholars and practitioners alike. Little if any empirical research has been conducted to this point conceptualizing and evaluating career success dimensions within financial planning. Career success dimensions such as client management, client demographic, personal, job scope, and business practice factors will provide further insight into the perceptions of the financial planner, their job functions, and their self reported level of success. The purpose of this research is to analyze perceptions of these factors and to evaluate which factors are perceived to contribute most to the financial planner. Research within financial planning enhances the opportunity for working world solutions to be developed for the benefit of the profession and those who work daily as financial planners.

LITERATURE REVIEW

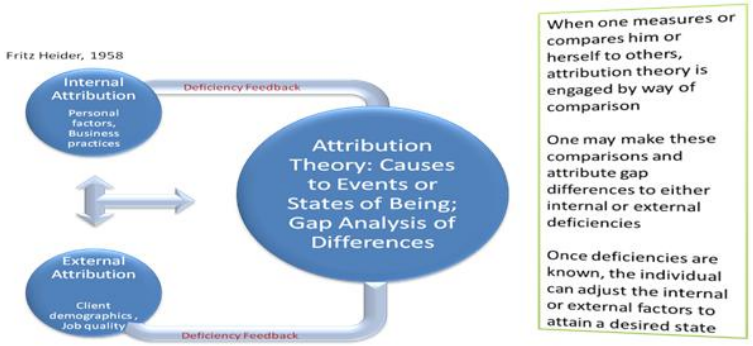
In the 1950's, noted social psychologist Fritz Heider developed a theory explaining how individuals attribute behavior of themselves and others. Heider's work, known as attribution

theory, is a cognitive theory associated with success and interpersonal relationships (Heider, 1958). Attribution theory is the exploration of an individual's awareness of cause and effect scenarios and how the outcomes of such scenarios affect the individual's perception of usefulness. Heider proposed that people strive for prediction and understanding of daily events in order to give their lives stability and predictability (Heider).

Fullin and Mills (1995) write of attribution theory as applied to the field of sports, whereby athletes use awareness of cause and effect scenarios to adjust performance output. Attribution theory divides the way an individual attributes causes to events into two distinct categories: external and internal. External attribution assigns causality to an outside factor, such as client demographics or job qualities, in the current study, or competition in the sports analogy. Internal attribution assigns causality to inside factors of the person, such as personal factors and business practices in the current study, or ability and luck in the sports analogy. Thus, when one measures his or herself or compares his or herself to others, attribution theory is engaged by way of comparison.

One may make these comparisons and attribute differences to either internal or external deficiencies. Once the deficiencies are known, the individual can adjust the internal or external factors to attain a desired state. In the case of an athlete, once deficiencies are known, adjustments to ability, effort, and task difficulty can be made. Mittra, Potts, and LaBrecque (2005) argue the financial planner is at times like a football quarterback moderating the plays of financial life around the key planning areas in a strategic manner. In much the same way as the quarterback athlete, the financial planner can learn from deficiencies and adjust strategy by way of attribution theory.

***Figure 1*. Theoretical Framework Application**



For example, as shown in Figure 1, a financial planner may make comparisons of other planners and oneself finding potential deficiencies within the context of certain success contributors, such as internal attribution factors (personal qualities or business practices for illustration purposes) or external attribution factors (client demographics or job qualities for illustrative purposes). The planner may then realize any shortcomings or potential deficiencies

and may at this point make adjustments to achieve a more desirable state. After an adjustment has been made, for example, working harder to develop client relationships, the planner will then reevaluate and the process again cycles until a desirable state is attained.

Career Success Dimensions

Practically anyone involved within a profession leading to a career has at one point had interest in the contributors to their own success (Hall, 1976, 2002). Heslin (2003) argues little scholarly attention has been given to analyzing the nature of career success in general. Hughes (1937, 1958) operationalized career success with the theoretical distinction between two realms of career: objective and subjective. Hughes further defined the objective career as those elements directly observable (e.g., pay, promotion, status, rank and affiliation). The objective career, Hughes argued, could be easily identified, defined, measurable, and verifiable by a third party. The subjective career conceptualized by Hughes, is that part of a career that is experienced by the individual working within the career. Subjective career dimensions, Hughes states, consists of individuals reactions to stimuli within the chosen career path (e.g., work/life balance, sense of meaning and purpose of the profession, personal growth, creativity, variety, and independence).

Objective criteria have dominated much of the overall career success literature (Heslin, 2005); however, in recent years, studies involving subjective criteria have increased as more people adopt and customize the criteria within career research. As far back as 1934, Thorndike recognized the importance of subjective criteria important to career success. Thorndike conducted studies on the objective critieria, however, was one of the first researchers to examine factors such as job satisfaction to be an important facet of career success. Heslin (2005) argues four inherent assumptions are prevalent in the current career success literature: 1) objective outcomes (pay and/or promotions) stand as a measure of career success, 2) job and career satisfaction provide reactive stimuli to individuals' chosen career paths, 3) people in general exhibit the same level of concern about success achieved by objective criteria, yet, do not exhibit the same level of concern regarding the subjective criteria, 4) a presumption exists that people evaluate their respective success relative to self referent criteria, e.g., career aspirations. Heslin states the scholar should transcend the assumptions and look further than merely objective criteria, focusing on a decent level of subjective criteria as the two together form one's total career.

Perceptions of Success and Financial Planning

Van Auken, Hira, and Norris (1989) examined factors influencing success within financial planning among a study of 275 respondents practicing financial planning and holding the CFP® mark. The results of this work revealed that planning professionals serving larger markets, offering more products and services, and using a commission based fee structure tend to

exhibit higher income levels than those who did not exhibit these characteristics. Other contributors examined within this study were business practices such as affiliation, business structure, span of practice, operating characteristics such as method of making initial contact, functions performed by the planner, and client characteristics such as income differences among clients. This study utilized an analysis with a breakpoint of $50,000 as the metric for "success." Those individuals practicing financial planning, holding the CFP® designation, and reporting income greater than $50,000 were defined as successful, whereas individuals practicing financial planning, holding the CFP® designation, and reporting income less than $50,000 were defined as unsuccessful.

Ross Levin (2001) calculates success holistically by way of a sophisticated tool developed in 1996 as a method for quantifying the success of financial planning against a client's long-term life plan. If wealth of client is a measure of success, Levin integrates all aspects of a client's resources "financial, emotional, physical, and spiritual (p. 93)." Gresham and Cooper (2001) posit a grading system for the financial planner as a tool for assessing success. Three components given by this study are: additional assets, referral business, and new business. Each component is placed into a worksheet from which the planner grades his or her success by comparing to client goals and expectations.

The FPA conducted a study on compensation and staffing in 2001 claiming personnel management in financial advisory firms in the U.S. dramatically affected the success of the financial planning firm (Tibergien & Palaveev, 2001). This study showed the delicate issues owners and financial planning managers' face when dealing with human resource tasks. The study also identified a compensation model of paying competitively within the industry across firms. In particular, advantages were found in hiring specialized financial professionals (staffing) as well as an understanding of how corporate culture can limit the growth of employees of the firm. Peatey (2007) writes that the key to success in financial planning is the ability to provide quality service, which is ultimately dependent upon the quality of staff within the financial planning organization.

Bob Veres, writing for the *Journal of Financial Planning* (2002) discusses important lessons of life and business stating how few they are in the article entitled "The Eternal Determinants of Success." Veres states time and time management to be two of the most important keys to financial planner success. Following this article in the same journal in 2003, Veres writes of a well trodden path to success for financial planners but is puzzled in that the path within the profession (e.g., success) is hardly ever written about in a scholarly fashion (Veres, 2003).

Alexander Scholp (2004) notes that monetary gain and recognition are not the only keys that should be considered to financial planner success. Scholp's argument bridges the great divide within general career success planning by virtue of blending the objective criteria of pay, promotions, and recognition with subjective criteria such as work/life balance. Financial advisor Cindy Vance (2004) provides a "Recipe for Success" rooted heavily in subjective criteria. Vance

states the ingredients to success as a professional in the financial planning domain are trust building with the client and giving back to the community.

Harold Evensky (2005) reviews changes during the last 20 years within financial planning. Evensky stipulates practitioners should focus on realistic planning success, such as meeting client's lifelong goals, as opposed to emphasis on performance of a portfolio. Evensky also notes success will no longer be measured by the planner's ability to outperform other planners or fund managers, but rather how well one meets or exceeds a client's long term life planning goals. Katherine Vessenes (2005) produced a quiz for which financial advisers could self administer to see where they relate relative to their peers defined as superstars, or those planners commanding a gross annual income of one million dollars or more and serving an average of 350 clients. Vessenes closed her article by stating the importance of the path to success as getting individual clients across the table from the planner and closing business with clients at least seven times per week.

The College for Financial Planning conducted a study entitled "2005 Survey of Trends" indicating rising levels in CFP® certificant incomes as well as reporting an increase in job satisfaction among financial planners. The study also indicated that when asked about factors that contributed to their own success, planners gave the highest score to people and communication skills followed by referrals and having the CFP® designation. The study was replicated in 2007 with the same factors of people and communication skills holding as the number one choice by respondents as to the top factors contributing to their own success (O'Brien, 2007). O'Brien also states that this study revealed that reported earnings rise along with planner's years in industry.

Mahli (2005), writing of independent planner success, states the planner should get back to the basics of marketing fundamentals when creating a successful practice. Knowing the client by way of a profile can aid the planner on the course to success. Mahli lists marketing functions such as referrals, targeted emails and mailing campaigns, public relations initiatives, community functions, benchmarking data, and best practice profiles to be of importance to financial planner success. Hayden (2006) developed a planner pyramid of success based on an idea from basketball coach John Wooden in which planning success is largely based on acquisition of clients that generate renewal income and the repetition of quality service for those clients over a lifetime. This logistical approach posed by Hayden creates customer loyalty over time when combined with high ethical standards, continued self-improvement, and a focus on innovation and preparation.

Others, such as Steven Drozdeck (2005) and Gregory Gagne (2005) visualize success within financial planning as more of an attitude, trait, or habit. Drozdeck attributes success within financial planning is based around the habits and attitudes of staying focused, staying motivated, increasing proficiency in financial and psychological profiling and practice management while improving professional knowledge. Gagne posits practices that lead to success for financial planners include the habit of seeking to first understand before being

understood, obtaining a field of specialization, being organized and keeping neat records, keeping one's word, and always reading and learning.

Many financial planners chase wealth management as a tool to find success, often leaving behind other important demographic groups. Amy Buttell Crane (2007) writing for the *Journal of Financial Planning* discusses a trend by American financial planners to ignore the middle class in favor of the wealthy. Crane states this could be an inefficient path to success considering the numbers within the middle class pool.

Bob Veres writes in *Financial Planning* (2007) that practice management ideas can create a productive success strategy. Veres cites management ideas such as efficient office procedures, self organizational tools and staffing methods can be a key to productivity. O'Toole (2008) lists seven disciplines that successful financial planners use in within their practice. These disciplines which include focused strategic direction, client relationship management strategy, and business development strategy help the planner examine strengths, create capacity, and establish efficiency within business practices.

The financial planning landscape is becoming more competitive as evidenced not only by the sheer number of financial planners or advisors operating today but also by the attention the competitive landscape is receiving within the popular press. Duey (2008) offers ideas for financial planners in an effort to better compete within the financial planning profession. The ideas and tips are built on the premise that the planner has first chosen the correct career path. Duey states planners must position themselves in the career by way of a systematic process complete with mentoring, building contacts and referrals, relationships and trusts, as well as getting involved with the community.

Dr. John C. Maxwell, as cited by Leyes (2006), states the key to success lies within three principle things: 1) successful people know their purpose in life, 2) success means growing to your maximum potential, and 3) success means sowing seeds to benefit others. In this way, one can understand that success, even for financial planners is something that must occur over time within a cultivation framework and mindset. Gunz and Heslin (2005) show a cursory search of the literature in general terms yields literally thousands of books and articles about career success in many different formats. More specifically, within financial planning there are many different ideas regarding the perception of success as a financial planner.

DATA AND METHODOLOGY

The data utilized within this study were gathered via a survey instrument developed and administered in an online format during the months of June and July 2008. Contact procedures for this Web survey followed a modified Dillman Email methodology consisting of pre-notice, survey invitation, thank you message, and reminder emails (Dillman, 2000). Three days prior to the launch of the survey instrument, an informational pre-notice email was sent to 10,000 members of The Financial Planning Association (FPA) randomly selected by FPA research

administrators. Following the pre-notice, FPA administrators distributed an invitation to participate in the research survey to potential sample participants via an email that included an embedded Web survey link.

Participation in the survey was voluntary and participants had the option to withdraw at any time without penalty. Respondents choosing to participate in the survey were re-directed to an online survey instrument hosted by Survey Monkey, a secure third party. At no time did the researcher or Survey Monkey have access to any identifying or highly sensitive respondent information in conjunction with the survey instrument.

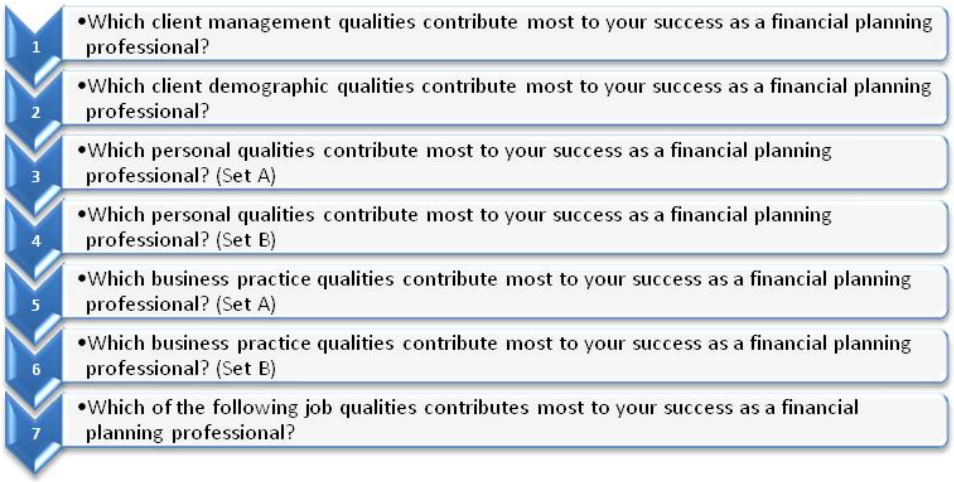
A total of 403 geographically diverse respondents (4% response rate) who are members of the FPA and agree to receive email from the organization answered the survey (for the complete listing of respondent characteristics for the full respondent model, please see Appendix C). This research is statistically representative of the FPA membership with a 5% margin of error at a 95% confidence interval. The final sample used after significant non-response cases were eliminated was 311 respondents (3.1%). All representative data were to reflect the information given by respondents practicing financial services consistent with the six step financial planning process. Of those 403 respondents, 23 cases were deleted as respondents reported job or FPA membership tasks not related to the financial planning process. Further, of the remaining 380 respondent cases, 69 additional cases were deleted due to missing or incomplete values, providing 311 respondent cases for the final dataset.

Upon completion or exit of the 47 question survey instrument, the respondent received a 'thank you' message including a link to an incentive drawing for a free FPA conference of choice. The voluntary incentive drawing was hosted completely separate from the initial survey. Ten days after the initial launch of the survey instrument a reminder email was sent to all potential sample participants by FPA administrators. The survey remained open from June 4th to July 3rd, 2008.

The instrument utilized within this study comprised seven sections complete with 47 questions. The variables utilized in this study (e.g., job autonomy and public recognition of the CFP® mark for illustrative purposes) are in no way all inclusive; however, they are important within the framework of current day financial planner operating environments. Some variables were found within articles in the popular press, some were from experts in the profession, while others were seen to be hot topics of the era. By working with financial planning experts, a master list of variables was created for the purposes of this study and further examined for content, readability, and flow. The instrument was pilot tested by a group of 14 individuals two weeks prior to survey launch. The purpose of this pilot test was to ensure the instrument functioned properly via the Internet. Please see Appendix A for the complete survey.

The first section of the instrument consisted of a question qualifying respondents on the basis of their job task in relation to the six step financial planning process outlined by CFP Board of Standards (CFP Board of Standards Code of Ethics and Professional Responsibility, 2007). Those respondents answering in the affirmative to the question are the focus of this study.

***Figure 2*. Section four questions used in this study.**



Of particular interest to this study are the questions from section four of the survey instrument, as shown in Figure 2. The first question asks the respondent to rate, on a mutually exclusive scale of 1 (least important) to 5 (most important), the importance of which client management qualities contribute most to your success as a financial planning professional. Client management qualities are representative of internal factors of attribution theory. The choices for rank order were as follows: client relationships, placing client interests before personal interests, keeping clients informed, choosing the right clients, and meeting clients needs.

The second question asks the respondent to rate, on a mutually exclusive scale of 1 (least important) to 5 (most important), which client demographic qualities contribute most to your success as a financial planning professional. Client demographic qualities represent external factors of attribution theory. The choices for rank order were as follows: wealth of client served, age of client served, gender of client served, occupation of client served, and ethnicity of client served.

The third question asks the respondent to rate, on a mutually exclusive scale of 1 (least important) to 5 (most important), which personal qualities contribute most to your success as a financial planning professional. Personal qualities represent internal factors of attribution theory. The choices for rank order were as follows: my certifications and designations, my level of education, my membership within professional organizations (FPA, NAPFA, etc.), my level of experience within the planning profession, and my use of ethical practices.

The fourth question asks the respondent to rate, on a mutually exclusive scale of 1 (least important) to 5 (most important), which personal qualities contribute most to your success as a financial planning professional. The choices for rank order were as follows: my analytical ability (preference for numerical information), living a healthy lifestyle, my gender, my ethnicity, and my ability to empathize with my clients.

The fifth question asks the respondent to rate, on a mutually exclusive scale of 1 (least important) to 5 (most important), which business practice qualities contribute most to your success as a financial planning professional. Business practice qualities represent both internal and external factors of attribution theory. The choices for rank order were as follows: money I spend marketing my services, region of the country in which I practice, size of the firm where I am currently employed, choosing the right staff, and number of clients I serve.

The sixth question asks the respondent to rate, on a mutually exclusive scale of 1 (least important) to 5 (most important), which business practice qualities contribute most to your success as a financial planning professional. The choices for rank order were as follows: managing my time effectively, delegation of tasks, diversity of services I provide, sales techniques I use, and client referrals I receive.

The seventh and final question asks the respondent to rate, on a mutually exclusive scale of 1 (least important) to 5 (most important), which job qualities contribute most to your success as a financial planning professional. Job qualities are represented by both internal and external factors of attribution theory. The choices for rank order were as follows: public recognition of the CFP® mark, having an online, (technology) presence, giving back to my community, making more money than other planners, and doing what I want, when I want to; autonomy of job.

Methodology

The hypothesis tested for this study is as follows. H_O: There are no client management, client demographic, personal, job, or business practice factor preferences contributing to the perceived success of an individual working as a financial planner within the financial planning profession. Respondents were asked to identify, from the seven questions, the least important to most important variables that have contributed to their success as a financial planning professional.

Each group of questions within the fourth section provided the respondent with five mutually exclusive categories: least important, not as important, somewhat important, more important, and very important. A one sample chi-square goodness of fit test was utilized to test the null hypothesis that the population frequencies of each question set within section four mentioned above happen by chance and in no preferred or specified order. Results from each set chi-square analyses are discussed in the results section below.

RESULTS

The 311 respondents of this survey were seasoned professionals with average number of years they have been offering advice to clients to be almost 16 years (15.9). Respondents to the survey were predominantly male (70.2%) Respondent ethnicity was predominantly Caucasian / White (89.1%). In general the respondents are well educated as 46.6% hold a bachelor's degree,

33.1% hold a master's degree, and 8% hold a doctorate or a professional degree. High school, some college, and other categories accounted for the remaining 12.3%.

Table 1: Respondent Characteristics, n=311	
Gender	%
Male	70.2
Female	29.8
Ethnicity	
African American	0.0
Asian or Pacific Islander	1.9
Caucasian / White	89.1
Hispanic / Latino	.3
Multi-Ethnic	.6
Native American	.6
Other or N/A	7.5
Level of Education	
High School	1.3
Some College	7.4
Bachelor's Degree	46.6
Master's Degree	33.1
Doctorate or Professional Degree	8.0
Other or N/A	3.6
FINRA Security Licenses and Designations (More than one may apply)	
Series 7	55.3
Series 63	46.9
Series 65	41.8
Series 6, 26	26.0
Series 24	19.6
Series 66	16.4
Perceived Level of Success within the Financial Planning Profession	
Unsuccessful	1.6
Slightly Successful	6.8
Somewhat Successful	19.6
Moderately Successful	45.3
Very Successful	26.7

When asked to rate their own success within the financial planning profession, more than 26.4% of the respondents stated they perceived themselves as very successful. Forty five percent (45%) stated they perceived themselves as moderately successful, 20.9% stated they were somewhat successful, six percent (6%) stated they were only slightly successful with almost two percent (1.7%) stating they perceived themselves as unsuccessful within the financial planning profession. Respondent characteristics are represented in Table 1.

Chi-Square analysis evaluates whether the proportions of individuals who fall into categories of a variable are equal to hypothesized values (Green & Salkind, 2005). Two primary assumptions were met in the selection of this data analysis: 1) the participants were randomly sampled and their responses were independent of each other, and 2) the chi-square test yields a statistic that is approximately distributed as a chi-square when the sample size is relatively large.

This particular work focuses on a one sample chi-square analysis in effort to analyze if the appropriate contributing factors (e.g., client relationships) occur by chance, or in some other preference. The expected count for each level (least important to most important) of the contributing factor, based on the sample collected, is 62.2 (sample size of 311 / 5 levels) in each analysis. For complete statistical analysis information, see Appendix D.

An effect size coefficient was utilized to assess any significant differences between hypothesized proportions and sample proportions. SPSS version 14.0 used in this analysis does not supply an effect size index, however, in each of the respective cases below was computed and reported as follows:

$$\frac{X^2}{(Total\ Sample\ Size\ Across\ All\ Categories)(Number\ of\ Categories - 1)}$$

The effect size coefficient ranges in value from 0 to 1, with a value of 0 indicating that the sample proportions are exactly equal to hypothesized proportions, and with a value of 1 indicating that the sample proportions are as different as possible from the hypothesized proportions (Green & Salkind, 2005). It should be noted that significant non-response cases were eliminated providing 311 respondents.

Client management qualities

Chi-Square analysis showed that client management qualities, given the choices provided, contribute to reported success as a financial planning professional, and that these qualities do not exist by chance alone. Of the choices rank ordered accordingly from the 'least important' to 'most important' (client relationships, placing client interests before personal interests, keeping clients informed, choosing the 'right' clients, and meeting clients needs) all variables within the goodness of fit test showed significance, thus, rejecting the null hypothesis that these variables occur by chance alone.

Upon further analysis examining effect size of the Chi-Square (Green & Salkind, 2005) the variable 'choosing the 'right' clients,' X^2 (4, N = 311) = 321.27, $p < .01$, was found to have the largest effect size, .26, differing most from the expected frequency of 62.2, and was answered in the 'least important' direction. Of 311 respondents, 186 listed 'choosing the right client' to be the least important consideration of client management qualities contributing to their perceived success as a financial planning professional. Other significant variables and effect size were as follows: keeping clients informed, X^2 (4, N = 311) = 177.83, $p < .01$, effect size .14, answered 'not as important,' placing client interests before personal interests, X^2 (4, N = 311) = 139.21, $p < .01$, effect size .11, answered 'most important,' meeting clients needs, X^2 (4, N = 311) = 82.81, $p < .01$, effect size .07, answered 'somewhat important,' anType equation here.d client

relationships, X^2 (4, N = 311) = 82.49, p < .01, effect size .07, answered 'most important' as shown in Figure 3.

***Figure 3*. Chi-square model summary results, client management qualities.**

Client demographic qualities

Of the choices given to planners and rank ordered from the 'least important' to 'most important' (wealth of client, age of client, gender of client, occupation of client, and ethnicity of client) all variables within the goodness of fit test showed significance, thus, rejecting the null hypothesis that these variables occur by chance alone. Examining effect size of the Chi-Square, the variable 'ethnicity of client,' X^2 (4, N = 311) = 762.88, p < .01, was found to have the largest effect size, .61, differing most from the expected frequency of 62.2, and was answered in the 'least important' direction. Of 311 respondents, 255 touted 'ethnicity of client' to be the least important consideration of client demographic qualities contributing to their perceived success as a financial planning professional. Other significant variables and effect size were as follows: wealth of client served, X^2 (4, N = 311) = 409.08, p < .01, effect size .33, answered 'most important,' age of client served, X^2 (4, N = 311) = 223.71, p < .01, effect size .18, answered 'more important,' gender of client served, X^2 (4, N = 311) = 221.04, p < .01, effect size .18, answered 'not as important,' and occupation of client served, X^2 (4, N = 311) = 144.13, p < .01, effect size .12, answered 'somewhat important' as shown in Figure 4.

***Figure 4*. Chi-square model summary results, client demographic qualities.**

Financial planner personal qualities

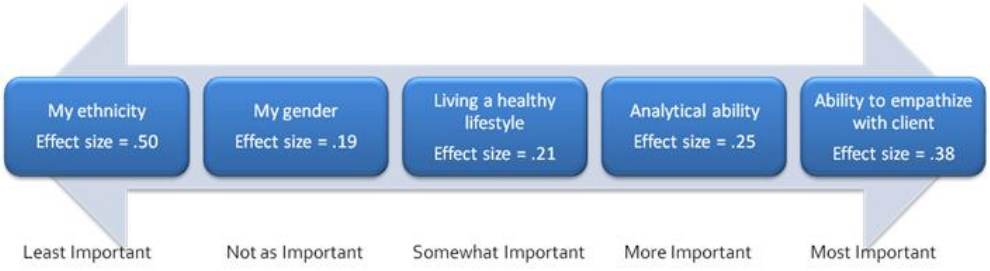
Of the choices given to planners and rank ordered from the 'least important' to 'most important' (my certifications and designations, my level of education, my memberships within professional organizations, my level of experience within the planning profession, my use of ethical practices) all variables within the goodness of fit test showed significance, thus, rejecting the null hypothesis that these variables occur by chance alone. Examining effect size of the Chi-Square, shown in Figure 5, the variable 'my membership within professional organizations,' X^2 (4, N = 311) = 390.27, p < .01, was found to have the largest effect size, .31, differing most from the expected frequency of 62.2, and was answered in the 'least important' direction. Of 311 respondents, 195 listed 'my membership within professional organizations' to be the least important consideration of personal qualities contributing to their perceived success as a financial planning professional. Other significant variables and effect size were as follows: my use of ethical practices, X^2 (4, N = 311) = 246.03, p < .01, effect size .20, answered 'most important,' my level of experience within the financial planning profession, X^2 (4, N = 311) = 137.34, p < .01, effect size .11, answered 'more important,' my level of education, X^2 (4, N = 311) = 75.70, p < .01, effect size .06, answered 'not as important,' and my certifications and designations, X^2 (4, N = 311) = 66.96, p < .01, effect size .05, answered 'somewhat important.'

***Figure 5*. Chi-square model summary results, personal qualities, set A.**

A second set of financial planner personal qualities was also tested during this study. Of the choices given to planners and rank ordered from the 'least important' to 'most important' (my analytical ability or preference for numbers, living a healthy lifestyle, my gender, my ethnicity, and my ability to empathize with my clients) all variables within the goodness of fit test showed significance, thus, rejecting the null hypothesis that these variables occur by chance alone. Examining effect size of the Chi-Square, shown in Figure 6, the variable 'my ethnicity,' X^2 (4, N = 311) = 620.21, p < .01, was found to have the largest effect size, .50, differing most from the expected frequency of 62.2, and was answered in the 'least important' direction. Of 311

respondents, 234 listed 'my ethnicity' to be the least important consideration of personal qualities contributing to their perceived success as a financial planning professional. Other significant variables and effect size were as follows: my ability to empathize with my clients, X^2 (4, N = 311) = 476.18, p < .01, effect size .38, answered 'most important,' my analytical ability (preference for numbers), X^2 (4, N = 311) = 316.32, p < .01, effect size .25, answered 'more important,' living a healthy lifestyle, X^2 (4, N = 311) = 263.55, p < .01, effect size .21, answered 'somewhat important,' and my gender, X^2 (4, N = 311) = 238.03, p < .01, effect size .19, answered 'not as important' as shown in Figure 6.

***Figure 6*. Chi-square model summary results, personal qualities, set B.**



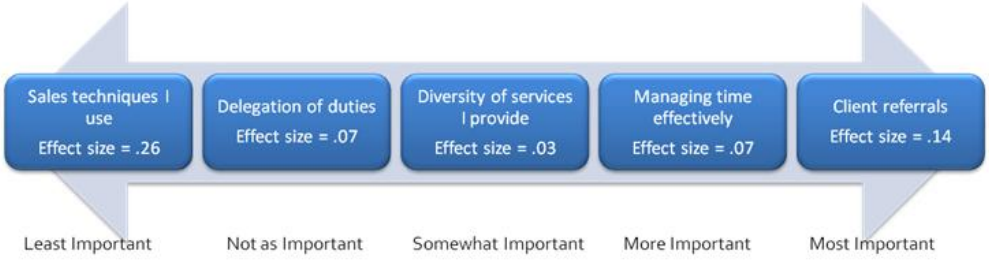
Financial planner business practice qualities

Of the choices given to planners and rank ordered from the 'least important' to 'most important' (money I spend marketing my services, region of the country in which I practice, size of the firm where I am currently employed, choosing the right staff, and number of clients I serve) all variables within the goodness of fit test showed significance, thus, rejecting the null hypothesis that these variables occur by chance alone. Examining effect size of the Chi-Square, the variable 'number of clients I serve,' X^2 (4, N = 300) = 187.38, p < .01, was found to have the largest effect size, .16, differing most from the expected frequency of 60, and was answered in the 'most important' direction. Of 300 respondents, 140 listed 'number of clients I serve' to be the most important consideration of business practice qualities contributing to their perceived success as a financial planning professional. Other significant variables and effect size were as follows: money I spend marketing my services, X^2 (4, N = 300) = 153.03, p < .01, effect size .13, answered 'least important,' choosing the right staff, X^2 (4, N = 300) = 68.57, p < .01, effect size .06, answered 'more important,' size of the firm where I am currently employed, X^2 (4, N = 300) = 52.07, p < .01, effect size .04, answered 'somewhat important,' and region of the country in which I practice, X^2 (4, N = 300) = 47.48, p < .01, effect size .04, answered 'not as important' as shown in Figure 7.

***Figure 7*. Chi-square model summary results, financial planner business practice qualities, set A.**

A second set of business practice qualities was also tested during this study. Of the choices given to planners and rank ordered from the 'least important' to 'most important' (managing my time effectively, delegation of tasks, diversity of services I provide, sales techniques I use, and client referrals I receive) all variables within the goodness of fit test showed significance, thus, rejecting the null hypothesis that these variables occur by chance alone. Examining effect size of the Chi-Square, the variable 'sales techniques I use,' X^2 (4, N = 300) = 311.57, $p < .01$, was found to have the largest effect size, .26, differing most from the expected frequency of 60, and was answered in the 'least important' direction. Of 300 respondents, 178 listed 'sales techniques I use' to be the least important consideration of business practice qualities contributing to their perceived success as a financial planning professional. Other significant variables and effect size were as follows: client referrals I receive, X^2 (4, N = 300) = 173.08, $p < .01$, effect size .14, answered 'most important,' delegation of tasks, X^2 (4, N = 300) = 83.97, $p < .01$, effect size .07, answered 'not as important,' managing my time effectively, X^2 (4, N = 300) = 83.73, $p < .01$, effect size .07, answered 'most important,' and diversity of services I provide, X^2 (4, N = 300) = 38.4, $p < .01$, effect size .03, answered 'somewhat important' as shown in Figure 8.

***Figure 8*. Chi-square model summary results, financial planner business practice qualities, set B.**



Financial planner job qualities

Of the choices given to planners and rank ordered from the 'least important' to 'most important' (public recognition of the CFP® mark, having an online 'technology' presence, giving back to my community, making more money than other planners, and doing what I want, when I want to 'autonomy of job') all variables within the goodness of fit test showed significance, thus, rejecting the null hypothesis that these variables occur by chance alone. Examining effect size of the Chi-Square, the variable 'making more money than other planners,' X^2 (4, N = 300) = 340.43, p < .01, was found to have the largest effect size, .28, differing most from the expected frequency of 60, and was answered in the 'least important' direction. Of 300 respondents, 181 listed 'making more money than other planners' to be the least important consideration of job qualities contributing to their perceived success as a financial planning professional. Other significant variables and effect size were as follows: doing what I want, when I want; autonomy of job, X^2 (4, N = 300) = 254.77, p < .01, effect size .21, answered 'most important,' online (technology) presence, X^2 (4, N = 300) = 73.6, p < .01, effect size .06, answered 'not as important,' giving back to my community, X^2 (4, N = 300) = 68.63, p < .01, effect size .06, answered 'more important,' and public recognition of the CFP® mark, X^2 (4, N = 300) = 55.83, p < .01, effect size .05, answered 'more important' as shown in Figure 9.

***Figure 9*. Chi-square model summary results, financial planner job qualities.**

DISCUSSION

The accuracy of self reported data can be questioned and shown to be limited in scope. Only the members of FPA responded to this survey creating a localized respondent pool that could limit external reliability. An important variable utilized within this study, perceived level of success, is perceptual in nature. Questions of a rank ordered nature receive criticism in that respondents may feel forced to answer based on factors that may or may not be applicable to the individual. The factors important to financial planning and those shown to be contributing to the

financial planner's success are in no way an exhaustive list of all possible factors, however, a review of the literature and expert content validity were utilized in the research process.

Client management qualities are important to the financial planning professional in that without a solid understanding of the client, there's no financial planner marketplace. This study has shown that when asked about client management qualities, financial planners feel that client relationships and placing the interests of the client before that of the planner are paramount to success as a financial planning professional, corresponding to the Vance (2004, p. 46) article stating "in the end it comes down to making your clients your number one priority."

Meeting the client's needs is somewhat important to success as a financial planning professional and is congruent with the Evensky (2005, p. 17) article stating "we will need to measure the whole client, not just the portfolio." Keeping the client informed of the day to day changes that may be occurring was shown to be not as important as a quality contributing to the success of a financial planning professional. Making a choice of which client a planner serves was the quality found least important to contribute to success as a financial planning professional.

When asked about client demographic factors contributing to success as a financial planning professional, the most important factor of the list given was wealth of client served. This confirms the notion that as a client's wealth increases, so too does the stream of income associated to that wealth for the financial planner. The relative age of the client served was listed as more important as one might expect. The occupation of the client was seen as only somewhat important as a contributor to success as a financial planning professional. When examining gender of the client, most financial planners consider this quality to be not as important contributing to success. An overwhelmingly large effect was seen when examining ethnicity of client and was reported as such as the least important factor considered a quality contributing to the success of a financial planning professional.

Two sets of questions were asked along financial planner personal quality dimensions. The first set of questions focused on experience and ethics, and as such, use of ethical practices was shown to be the most important quality of those provided contributing to the success of the financial planning professional. Level of experience was seen as more important to the success of the planning professional while the number of certifications and designations attained by the financial planner was seen as only somewhat important. Surprisingly for this sample of respondents, level of education was identified not as important as a quality contributing to the success of financial planning professionals. The lack of importance placed on education by this group could be due in part to the infancy of the financial planning profession, or possibly to the dynamic nature of the educational backgrounds of the respondents. Quite possibly, experience may outweigh education within the financial planning profession, which is an idea worthy of future study. Memberships within professional organizations were seen as the least important contributor for this group of personal quality variables.

The second set of personal quality questions showed financial planners ability to empathize as the most important factor contributing to success within the given choices. Also noted as more important was the financial planner's analytical ability, or a preference for numbers. Financial planners consider living a healthy lifestyle a somewhat important quality contributing to their success as a financial planning professional. Gender of the financial planner was shown to be not as important to financial planner success, and ethnicity of the financial planner shown to be of least importance as a factor contributing to success as a financial planning professional. One might expect the planner to have a high proclivity for numbers given the technical nature of the job, however, for ability to empathize to rank higher in the ranked order as well as the goodness of fit test is interesting.

Two sets of questions were asked along financial planner business practice quality dimensions contributing most to success within the financial planning profession. The first set of questions asked general questions finding the number of clients a planner serves to be most important of the list given when rank ordered. This finding agrees with Hayden (2006) stating success is largely based on the acquisition of clients that generates renewal income. Choosing the right staff was found as more important with size of firm being somewhat important. Region of practice was seen as not as important and money spent marketing services was ranked as the least important.

The second set of questions regarding business practice qualities found that client referrals are most important to the financial planner among the choices of the question. Time management also ranked more important to the financial planner. Surprisingly, diversity of services provided by the planner rated only somewhat important among the group of variables within the question. Delegation of tasks, not as important and sales techniques utilized was seen as the least important among the choices provided.

The last set of questions from section four consisted of job qualities that contribute most to financial planning professional success. It is no surprise that this particular group of respondents value job autonomy as most important to their success as a financial planning professional. Interestingly, both giving back to the community and the public perception of the CFP® were indicated as more important among the choices provided. Having an online, technology presence was seen to be not as important. The concept of making more money than other financial planners was seen as the least important job quality contributing to success as a financial planning professional.

IMPLICATIONS AND CONCLUSIONS

Seven different dimensional areas of financial planner perceptions were empirically tested within this study. Each area presented significance with regard to the goodness of fit test showing that these variables regarding client management qualities, client demographics,

financial planner personal qualities, business practice qualities, and job qualities are important to financial planner perceived level of success.

One major understanding exists at this point considering this study; more research is needed to further understand the true perceptions of the financial planner. Client relationships were listed as most important contributing to financial planner perceived success, however, keeping the client informed was not as important showing a gap that intuitively leads one to believe client relationships can be improved. If the planner truly places client interests before personal interests, need he or she not also inform the client? Or, possibly, does too much information given to certain types of clients yield less relationship between planner and client? Some clients may not want to be burdened with extreme amounts of information, or information that may be too technical or complicated.

Client demographics are important to the financial planner as one might expect. Wealth of client topped the analysis as a most important contributor to financial planner perceived success. The implication is that financial planners are targeting high net wealth individuals, thus, possibly forgoing other crucial client bracket areas needing financial planning services.

Memberships within professional organizations were shown to be significant in the least important direction as a contributor to financial planner perceived success. Quite possibly the financial planner envisions activities within organizations as administrative costs. The implication for this finding is that organizations need to do a better job of providing value-add for the services provided members. Certifications and designations were shown to be somewhat important to the financial planner and his or her perceived success. Possibly, a benefit of membership to organizations could be certification programs, designations or continuing education programs.

The ability to empathize with the client was seen as a most important contributor to financial planner perceived success. Financial planners understand the importance of being able to relate to the client. Just as empathy is most important, analytical ability was also indicated as more important to financial planner perceived success. Having both emotional skills and analytical skills can possibly provide higher levels of financial planner success.

When examining business practice qualities, financial planners understand the importance of the number of clients served and client referrals as most important contributors to financial planner perceived success. However, money spent marketing his or her services was shown to be a least important contributor to success. Sales techniques were also shown to be least important to financial planner perceived success. This implies that word of mouth marketing is very attractive and important to the financial planning professional. In good economic times, the financial planner may be able to rely on simple word of mouth marketing; however, in the event of tougher economic times, or in periods of competition, the financial planner may find an understanding of the more intricate functions of marketing, such as product, logistic, price, and promotion variations to be helpful to their respective business. An additional implication of the findings of this study could be that financial planners are not understanding or

taking full advantage of marketing programs and services (e.g., sales training, advertising programs) that could enhance their business presence.

The financial planner wants and possibly even craves autonomy. When empirically examining job quality factors, job autonomy rated most important as a contributor to financial planner perceived level of success. Making more money than other planners was of least importance to this sample of financial planners implying that the definition of success for financial planners, as reinforced by the literature, does not revolve around money alone. Giving back to the community is important to today's financial planning professional as is public recognition of the CFP® designation.

This study has indicated the importance of client management, client demographic, personal, business practice, and job quality factors contributing to success as a financial planning professional. The implications of this study are filled with ideas for future research into the individual variables important to financial planning professional success. Within the perceptions of the financial planner one finds there are indeed ideas, concepts, and practices that are perceived to be most important as contributing to success: client relationships, placing client interests before personal interests, wealth of client served, use of ethical practices, ability to empathize with the client, the number of clients served, managing time, client referrals, and job autonomy.

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WHY THE FAMA-FRENCH FACTORS WORK AND SERIAL CORRELATION TOO

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ABSTRACT

We show that the definition of return implicitly contains book to market and size from two time periods. Assuming the Fama and French (FF) factors mimic book to market and size, we show that previous return along with previous period values of *HML* and *SMB* should substitute for their current values. This substitution actually "drives out" current values of *HML* and *SMB* in regressions. This result could be due to previous return mimicking book to market and size better than the FF factors; or a missing variable such as dividend payout. Industry-specific information is ruled out as an explanation.

JEL codes: G12, G14

Keywords: Fama and French Factors, serial correlation, definition of return

INTRODUCTION

Firms with high book to market ratios tend to have higher stock returns (e.g. Fama and French, 1992) as do firms with smaller market capitalizations, or "size" (e.g. Banz, 1981). Fama and French (1993) augment the Capital Asset Pricing Model (CAPM) of Sharpe (1964) and Lintner (1965) by adding two additional factors, *HML* and *SMB*, which mimic the effects of book to market and size, respectively. The Fama and French factors are extremely useful for modeling return, but the theoretical justification for including these additional variables in the model for returns has lagged behind the empirical justification that "they work". Fama and French (1993, p.7) argue that "although size and book to market equity seem like ad hoc variables for explaining average stock returns, we have reason to expect that they proxy for common risk factors in returns". Fama and French (1993) essentially argue that a firm's size and book to market are proxies for the firm's coefficients (loadings) on risk factors that are priced by the market and that the *HML* and *SMB* factors they create serve as proxies for these risk factors. Fama and French (1995) attempt unsuccessfully to explain the linkage of the mimicking factors to returns by searching for such common factors in earnings. Daniel and Titman (1997) find that firm specific measures of size and book to market ratio model returns better than the Fama and French factors.

Fama and French (2008b, p.2973) explain the motivation for using the book to market ratio as a proxy for a factor which affects expected returns by noting that the dividend per share is earnings per share less the change in book value per share. They point out that the dividend

discount model would therefore indicate that both the dividend stream and its present value are dependent on book value. In this paper, we build on this observation, but take a slightly different approach to explain the linkage between return and the book to market ratio and market value. We analyze the definition of expected next period total return and highlight the presence of current period book to market and size as components therein. We find that the reason initial book to market and initial market value "work" is not so much because they proxy for expectations of other common risk factors. Rather, it is because these variables are themselves implicitly contained in the definition of expected return and the Fama and French factors, along with the firm-specific loadings, mimic them. In the appendix, we show why individual firm book to market and market value should be expected to be proportional to the Fama and French *HML* and *SMB* mimicking factors in accordance with the Fama and French (1993) intuition.

In addition, we find that the fact that the definition of return contains the book to market ratio and market size (and thus the Fama and French (1993) mimicking factors) *from two successive time periods* offers a partial explanation for the well known serial correlation of returns (e.g. Fama, 1965) which allows prediction of future returns (e.g. Jagadeesh, 1990). Fama and French (1986) find that negative serial correlation of stock portfolio returns is due to common factors and that, when the common factor that generates negative serial correlation is removed, another factor or factors tend(s) to generate positive serial correlation. Fama and French (1988) point out that negative serial correlation for long horizons indicates a tendency toward reversal. Jegadeesh (1990, p.897) finds strong negative first order serial correlation and significant positive higher order serial correlation of returns. Jegadeesh and Titman (1993) find that the serial correlation can be exploited for individual stocks by developing trading strategies based on previous return: i.e. buying past winners and selling past losers can earn "momentum" returns above those predicted by the Fama and French (1993) three factor model. Fama and French (2008a) find evidence that momentum trading strategies are possible even after controlling for the possibility of undue influence from volatile micro- and small-cap stocks in portfolios. Lo and MacKinlay (1990) point out that momentum trading profits in individual stocks can arise from two credible sources: (1) the stock's return is negatively correlated with lagged returns on other stocks, or factors common to all stocks; and (2) the stock's own return is positively serially correlated from firm-specific sources. It should be noted that Chen and Hong (2002) point out that one of their original possible sources, the stock has a high unconditional mean relative to other stocks, has been rejected by the literature. The Fama and French factors are determined by sorting portfolios based on previously known; that is, lagged, book to market and size. Thus, the known correlation of returns with the Fama and French factors fits under the first of Lo and MacKinlay's (1990) sources for serial correlation.

However, the question of whether Lo and MacKinlay's (1990) second possible source for serial correlation: firm-specific or industry-specific information is also a cause of serial correlation has been a matter of debate. Jagadeesh and Titman (1995) argue that idiosyncratic information may have a role to play because they find that stock prices overreact to firm-specific

information but react with a delay to information about common factors which causes a size-related serial correlation in stock returns. Jagadeesh and Titman (2001) also find support for behavioral explanations of momentum in which investors under or over react to new information, possibly including firm-specific information. Fama and French (1997) find that using the three factor model to estimate returns for various industries is subject to large uncertainty. Moskowitz and Grinblatt (1999) find that strategies of buying past winner industries and selling past loser industries can be (mostly) explained by the industry classification. However, Lee and Swaminathan (2000) control for industry effects in returns to examine how trading volume relates to momentum and find returns continue to exhibit momentum. Grundy and Martin (2001) show that while industry classification helps explain next month momentum, it has little power to explain momentum effects for the next several months. Lewellen (2002) finds that momentum is so pervasive that it shows up in portfolios sorted on book to market and size; as well as in portfolios sorted on industry. However, Lewellen (2002) concludes that serial correlation of macroeconomic factors, rather than firm specific factors must explain momentum.

This paper contributes to the literature regarding this debate. We find that because the definition of (calculation of) return depends on information about book value and size from *two successive time periods*, there is a natural tendency for serial correlation of returns. This tendency would exist whether or not the underlying prices are serially correlated; regardless of trading volume levels (e.g. Lee and Swaminathan, 2000); and even if there is no under- or over-reaction of market participants to information (e.g. Jagadeesh and Titman, 2001 and Lewellen, 2002).

In the empirical portion of this paper, our results tend to support the common factor explanation of serial return. Specifically, we find that one theoretical implication of the fact that the definition of return implies autocorrelation is that a model of returns with the following independent variables: previous period *HML,* previous period *SMB* and previous period return should substitute for the model with the original independent variables: current period *HML* and current period *SMB*. We test this hypothesis using industry return data and data for 25 portfolios sorted on size and book to market available from Kenneth French's website. The results support the theory. In addition, we find that, previous period *SMB* and previous period return drive out current period *HML*, current period *SMB* and previous period *HML* in a general model. We surmise that this result indicates that previous return contains a better proxy for the factor mimicked by *HML* (book to market), than *HML* itself. This result is consistent with the Fama and French (2008b, p.2994) argument that a single period estimate of book value has too much noise to contain all the information contained in previous return and that additional previous period values of book value are needed to duplicate the explanatory power of previous return. Finally, industry return series contain the influence of more than one firm, yet because they are sorted by industry, retain a significant element of idiosyncratic variation relevant to the particular industry. However, the 25 portfolios sorted on book to market and size are highly diversified and contain insignificant firm-specific or industry-specific influences and so, can be compared to the

industry portfolio results to ascertain whether industry-specific information appears to make a difference. We find, in aggregate, there are no differences in the two portfolio return series with respect to our model. Thus, our results indicate that industry-specific information does not explain serial correlation (e.g. Moskowitz and Grinblatt, 1999; Lee and Swaminathan, 2000; Grundy and Martin, 2001 and Lewellen, 2002).

The paper proceeds as follows: In section 2, we show how the definition of return contains the book to market and size factors and link them to the Fama and French (1993) mimicking factors. In section 3, we show how the definition of return implies serial correlation of the factors and derive the result that previous period return, previous period *SMB* and previous period *HML* should substitute for current period *SMB* and current period *HML* in a model of return. In section 4, we describe the empirical justification and methodology and in section 5, we provide our results and conclusions.

RELATING THE DEFINITION OF RETURN TO THE THREE-FACTOR MODEL

The three-factor model with the market coefficient equal to one

We start with the Fama-French (1993) three-factor regression model:

$$R_{it+1} = \alpha + (1 - \beta_i)R_{ft+1} + \beta_{iM}R_{Mt+1} + \beta_{iH}^{'}HML_{t+1} + \beta_{iS}^{'}SMB_{t+1} + e_{t+1} \qquad (1)$$

In this expression, R_{ft+1} is the expected return on a risk free asset; R_{Mt+1} is the return on the market portfolio; HML_{t+1} is the return on the "high minus low" portfolio designed to mimic the effect of the book to market actor; SMB_{t+1} is the return on the "small minus big" portfolio designed to mimic the effect of the firm size (market value) factor and e_{t+1} is the expected error term. The time *t+1* subscripts for the two Fama and French factors indicate coincident returns of portfolios that were sorted based on *previously known* (time *t*, or earlier) book to market and size information. Fama and French (1993, p. 5) find that when their "high minus low" book value to market factor and small minus big market size factor are included in the regression, the slope of the market factor $\beta_{iM}$is not significantly different from 1. Using this result, we can substitute $\beta_{iM} = 1$ into (1), which makes the risk free rate drop out. In addition, we move the return of the market to the LHS:

$$R_{it+1} - R_{Mt+1} = \alpha + \beta_{iH}^{'}HML_{t+1} + \beta_{iS}^{'}SMB_{t+1} + e_{t+1} \qquad (2)$$

In the next section, we show how an expression similar to (2) can be derived based on the definition of total return.

The Definition of Return

We first rewrite the total return of the i^{th} firm or portfolio by breaking it into its market value change and dividend yield components:

$$R_{it+1} = \frac{D_{it+1}}{MV_{it}} + \frac{MV_{it+1}}{MV_{it}} \quad (3)$$

We let F_{t+1} represent the expected fraction of earnings to be paid out as dividends and let E_{t+1} represent expected earnings for the firm to rewrite the expected dividend in (3) in terms of expected earnings and payout.

$$R_{it+1} = \frac{F_{it+1}E_{it+1}}{MV_{it}} + \frac{MV_{it+1}}{MV_{it}} \quad (4)$$

When we define book value BV as previously accumulated retained earnings, the expected amount of earnings to be retained within the firm is equal to the difference between current book value and next period book value. In addition, the expected amount of earnings to be retained within the firm is also equal to the expected retention rate $1 - F_{it+1}$multiplied by expected earnings.

$$BV_{it+1} - BV_{it} = (1 - F_{it+1})E_{it+1} \quad (5)$$

Solving (5) for E_{t+1}, letting $P_{it+1} = F_{it+1}/(1 - F_{it+1})$ and substituting into (4):

$$R_{it+1} = \frac{P_{it+1}(BV_{it+1} - BV_{it})}{MV_{it}} + \frac{MV_{it+1}}{MV_{it}} \quad (6)$$

Examining (6) we can see that return can be characterized as dependent on the difference between the two period's book to market ratios ($\frac{BV_{it+1}}{MV_{it+1}} - \frac{BV_{it}}{MV_{it}}$) and the difference in market values ($MV_{it+1} - MV_{it}$) as well as P_{it+1}. We can create a linear regression approximation of (6), adding an intercept and an error term.

$$R_{it+1} \approx a_i + b_i\left(\frac{BV_{it+1}}{MV_{it+1}} - \frac{BV_{it}}{MV_{it}}\right) + c_i(MV_{it+1} - MV_{it}) + n_i P_{it+1} + e_{t+1} \quad (7)$$

In (7), a_i, b_i , c_i and n_i are all constants. We rewrite (7) by *focusing only on the two variables that are observable and known at time t*: book to market value, $\frac{BV_{it}}{MV_{it}}$ and market value,

MV_{it} , letting the other variables (MV_{it+1} , BV_{it+1} and P_{it+1}) that are not observable at time *t*, be captured in the intercept term.

$$R_{it+1} \approx a_i - b_i \frac{BV_{it}}{MV_{it}} - c_i MV_{it} + e_{t+1} \quad (8)$$

From (8) it can be seen that it is not necessary to develop a theory about how initial book to market and market value serve as proxies for expectations of other variables affecting return. Rather, initial book to market and initial market value affect return because they are *part of the definition of expected return*, not proxies for *other* variables. Because the return of the market R_{Mt+1} is merely a portfolio of security returns, it also can be similarly written.

$$R_{Mt+1} \approx a_M - b_M \frac{BV_{Mt}}{MV_{Mt}} - c_M MV_{Mt} + e_{t+1} \quad (9)$$

Thus, the market return can also be expressed as a linear function of its book to market and market size. In the Appendix, we demonstrate why the *HML* and *SMB* factors should be expected to be proportional to (that is, mimic) book to market and size. For now, we simply *assume* what Fama and French (1993) have long argued: that *HML* and *SMB* are factors that mimic the effects of book to market and size. With this assumption, we can substitute terms that are proportional to the Fama and French factors: $\beta_{iH} HML_{t+1}$ and $\beta_{iS} SMB_{t+1}$for $-b_i \frac{BV_{it}}{MV_{it}}$ and $-c_i MV_{it}$, respectively in the RHS of (8)

$$R_{it+1} \approx a_i + \beta_{iH} HML_{t+1} + \beta_{iS} SMB_{t+1} + e_{t+1} \quad (10)$$

Similarly, we can substitute the Fama and French factors $\beta_{MH} HML_{t+1}$ and $\beta_{MS} SMB_{t+1}$ for $-b_M \frac{BV_{Mt}}{MV_{Mt}}$ and $-c_M MV_{Mt}$ respectively in the RHS of (9).

$$R_{Mt+1} \approx a_M + \beta_{MH} HML_{t+1} + \beta_{MS} SMB_{t+1} + e_{t+1} \quad (11)$$

Subtracting (11) from (10) produces the same expression for $R_{it+1} - R_{Mt+1}$ shown in (2), where $\beta'_{iH} = \beta_{iH} - \beta_{MH}$ and $\beta'_{iS} = \beta_{iS} - \beta_{MS}$.

Thus, we conclude that the Fama and French (1993) *HML* and *SMB* factors work because initial book to market and initial market size are components of the definition of next period total return.

SHEDDING LIGHT ON SERIAL CORRELATION

Below, we show that the presence of serial correlation in returns can at least partly be explained as an artifact of the definition of return. We can examine how previous return may enter (recursively) into the definition of return, by first changing the time subscripts of (7) so that R_{it} is shown to be linear in five variables, all of which are known at time *t*.

$$R_{it} \approx a_i + b_i\left(\frac{BV_{it}}{MV_{it}} - \frac{BV_{it-1}}{MV_{it-1}}\right) + c_i(MV_{it} - MV_{it-1}) + n_i P_{it} + e_t \quad (12)$$

We add (12) to (7) and solve for expected return.

$$R_{it+1} \approx 2a_i - R_{it} + b_i\left(\frac{BV_{it+1}}{MV_{it+1}} - \frac{BV_{it-1}}{MV_{it-1}}\right) + c_i(MV_{it+1} - MV_{it-1}) + n_i(P_{it+1} + P_{it}) + e_{t+1} \quad (13)$$

As before, we want to abstract from the variables in (13) that are not known at time *t*. In addition, the term which depends on previous payout $n_i P_{it}$ also appears in (13). There is a large body of literature relating to the effect of payout on return, including the irrelevance proposition of Modigliani and Miller (1961). In this paper, we elect to focus on the contributions of book to market, size and previous return and abstract from effects which may be contributed by changing payout by letting those effects be captured in the intercept. With these abstractions and, as before, substituting the *HML* and *SMB* factors, with proper subscripts, for book to market and size, respectively, we have:

$$R_{it+1} \approx a_i' + b_i HML_t + c_i SMB_t + d_i R_{it} + e_{t+1} \quad (14)$$

Note that Fama and French calculate time *t+1* values for HML and SMB by sorting portfolios on time *t* values for book to market and size but associating returns earned at time *t+1* with those portfolios. Thus, the time *t+1* values for HML and SMB mimic book to market and size for time *t*. Thus, (14) contains the previous size and book to market mimicking factors, HML_t and SMB_t because previous return must be "corrected" or adjusted for their influence to isolate the information contained in previous return related to most recent book to market and size. The implication of (14) is that previous values for book to market and size, mimicked by HML_t and SMB_t, combined with previous return, *substitute* for the most recent book to market and size, mimicked by $HML_{t+1}$and SMB_{t+1} in (10). The result in (14) is consistent with the Lewellen (2002) finding that the Fama and French factors "absorb", or account for, serial correlation.

EMPIRICAL MOTIVATION AND METHODOLOGY

All of our dependent variable data: industry portfolio returns and the returns of portfolios sorted on book value and size; as well as the data for our independent variables: the Fama and French (1993) factors, *HML* and *SMB* are from the Kenneth French (2009) website. There were 48 industries with monthly data going as far back as 1926 and forward to 2007. Data for the following industries was not complete all the way back to 1926: Soda, Hlth, Rubbr, FabPr, Guns, Gold, Persv, and Paper. The regressions for these industries were performed using whatever lower amount of data was available from Kenneth French's website. Similarly, there are 25 portfolios sorted on size and book to market with data covering the same period.

The two data series we use for the dependent variable are ideally suited to shed additional light on the relative importance of industry-specific information compared to the effect from common factors on serial correlation. The industry return series contain the influence of more than one firm, yet because they are sorted by industry, retain a significant element of idiosyncratic variation relevant to the particular industry. However, the 25 portfolios sorted on book to market and size are highly diversified and should contain no significant firm-specific or industry-specific influences and so, can be compared to the industry portfolio results to ascertain whether industry-specific information appears to make a difference.

As Fama and French (2008, p. 1654) point out, investigations of the effects of factors on rates of return are typically made by either sorting returns based on the factors or by regressing the cross-section of returns on the previously obtained coefficients of the factors. The third approach, used by Fama and French (1993) uses time series regressions of multiple return series on the factors themselves. We employ this third approach in this paper because, as Fama and French (1993, p. 5) say, "the slopes and R^2 values show whether mimicking portfolios related to size and [book to market] capture shared variation in stock [ ] returns not explained by other factors." Perhaps, more importantly for our work, the time series approach allows us to compare the statistical significance of the slopes for previous values of the factors and previous return to the more recent values of the factors. Another reason for using time series regression is our focus on serial correlation of returns rather than the excess momentum returns that serial correlation may make possible.

Both the industry series and the sorted portfolio series exhibit serial correlation and, in addition, we know that the Fama and French factors are serially correlated (Chen and Hong, 2002). Our model in (14) predicts that this serial correlation is an artifact of the definition of return and it arises from the common Fama and French factors. As such, (10) and (14) should be equivalent. In addition, we can suggest at least three possibilities that could explain why (14) might *better explain return* than (10). First, we alluded earlier to the possibility that previous return might contain firm-specific or industry-specific information not contained in the Fama and French factors. Second, our development of (14) assumed the dividend payout to be constant. Thus, previous return might actually contain information about this "omitted variable", that the

Fama and French factors are not designed to capture. Third, the Fama and French factors might not mimic book to market and size as well as previous return. Fama and French (2008b, p. 2994) reason, in particular, that a single period estimate of book value has too much noise to contain all the information about the book to market ratio that is contained in previous return. Further, the Fama and French factors are calculated using portfolios that are "rebalanced" on book to market and size only once per year, whereas our derivations were based on the assumption that the Fama and French factors do a reasonable job of tracking the monthly variation in these factors. So, the question we investigate empirically is: Can we be *indifferent* between a model of returns using (10) with the common factors (*HML* and *SMB*), which are each serially correlated, and a model using (14) with previous values of the factors plus previous return? If not, which of the possible 3 reasons is most valid? To decide whether the models are equivalent, we can determine which variables (if any) become less significant in, or are driven out of, the combined regression model:

$$R_{it+1} \approx a_i^{'} + \beta_{iH} HML_{t+1} + \beta_{iS} SMB_{t+1} + b_i HML_t + c_i SMB_t + d_i R_{it} + e_{t+1} \qquad (15)$$

In addition to identifying which of the five variables are consistently entering the model, we can compare the R^2's of the regressions to shed more light on the sources of serial correlation. For example, if the variables on the RHS of (14) explain industry returns better than the 25 highly diversified sorted portfolio returns, then industry-specific information could be playing a role.

RESULTS AND CONCLUSIONS

Regression Results

The results shown in Table 1 and Table 2 serve as verification (or as a "control") that the Fama and French (1993) factors are effective in modeling returns. The results confirm previous research in the literature: HML_{t+1} and SMB_{t+1} are important and useful factors in explaining returns as predicted in (10). Table 1 shows the regression results for the model in (10), for industry data for the period 8/1926 to 12/2007. Of the total of 49 regressions (48 industries plus the market index) shown in Table 1, there was only 1 without a statistically significant coefficient for HML_{t+1} and only 6 without statistically significant coefficients for SMB_{t+1}. The average R^2 was .142 (not adjusted). Of course the R^2 for well diversified portfolios using the Fama and French three factor model is often on the order of .85 to .95. Well-diversified portfolios are highly correlated with the market portfolio. If we used (2) instead of (10), we would expect R^2's comparable to the three factor model. The size and book to market factors will add only incrementally to the explanatory power of a model which included the market factor. However, we focus on size and book to market (as mimicked) because they appear in the definition of return and because they are known in advance, while the market factor is not. Only

9 of the 48 industries had negative SMB_{t+1} (size) coefficients. The small number of negative SMB_{t+1} coefficients may seem at first to be at variance with previous results using the three factor model which exhibit negative size coefficients. The market index is typically included as a factor in previous studies, so the results are not strictly comparable in this regard. Out of curiosity, we re-ran all of the regressions using data restricted to a more recent time period, 1967- forward, for comparison. All results were similar to those reported here, except that that there were more negative SMB_{t+1} (size) coefficients. Table 2 shows the results of the regressions using (10) with the 25 portfolios that were sorted based on size and book to market. The average R^2 for these 25 regressions was about .378, compared to the average for the 48 industries and the market of .142. The higher R^2's should be expected since the portfolios are pre-sorted on the same factors that are used to create the Fama and French factors: book to market and size. This also tends to support the validity of our assumption that the Fama and French factors are mimicking factors for book to market and size (see appendix). For the 25 sorted portfolios in Table 2, the coefficient for HML_{t+1} was significant in all cases and the coefficient for SMB_{t+1} was not significant in only 3 cases.

Table 3A and Table 3B show the regression results for the general model in (15), for the industry data. Of the total of 49 regressions (48 industries plus the market index) in Tables 3A and 3B, there were only 6 with statistically significant coefficients for HML_{t+1} and only 5 with statistically significant coefficients for SMB_{t+1}. Thus, when previous return, R_t along with the lagged factors, HML_t and SMB_t were added to the model, HML_{t+1} and SMB_{t+1} tended to drop out. In addition, perhaps surprisingly, there were only 6 industries with statistically significant coefficients for the "lagged" HML_t factor. In contrast, SMB_t and *previous return* were almost always statistically significant: in only two cases was SMB_t not significant and *previous return* was not a significant variable only 6 times. Thus these industry results support the idea that *previous return*, R_t, HML_t and SMB_t will substitute for the coincident factors: HML_{t+1} and SMB_{t+1} as our models predict. However, our models did not specifically predict that *previous return* would drive out all the other variables except SMB_t (size). The fact that HML_t is not significant in the general model implies that *previous return* of the industry contains more or better information than the common factor designed to mimic the book to market value ratio. One might be tempted to conclude, based only on the industry results, that industry-specific information is playing a role. However, as can be seen in Table 4, the results of the regressions of the 25 sorted portfolios, which should contain no industry-specific information, also exhibit the same behavior as the industries. In Table 4, only 3 of the 25 portfolios had significant HML_{t+1} coefficients and only 4 had significant SMB_{t+1} coefficients. As with the industries, there were only 4 significant HML_t coefficients. For the general model in (15), the average R^2's were .158 for the industry data and .397 for the sorted portfolios. Both of these are slightly better than their counterparts in the control regressions, (.142 and .378, respectively), but these improvements, both for the 25 size and book to market sorted portfolios *and for the industry*

portfolios, are consistent with the slight amount that would be expected from the addition of 3 more variables in a sample of 941 months of data.

Conclusions

We have demonstrated that the definition of return implicitly includes the book to market and size factors and that this fact helps to explain why the Fama and French (1993) factors "work" in their three factor model. Our examination of the definition of return also indicates that because the calculation of return involves information from two time periods (i.e. expected next period price, expected next period dividends and previous period price) and because these can be expressed in terms of book to market and book value (also from two time periods), there is an inherent serial dependency built into returns. This serial dependency implies that previous return, along with previous values for book to market and size (or their respective mimicking Fama and French factors) will substitute for current values of book to market and size. We find empirical support for these theoretical implications.

Specifically, the regression results indicate that *previous return* and the previous size factor (SMB_t) are more important in a model of returns than either of the current Fama and French factors, in that they drive out the other variables. This indicates that either there is an important omitted variable (such as dividend payout) or that the Fama and French factors do not measure or mimic size and book to market as well as previous return and SMB_t combined, or both. We find the fact that when *previous return* is included in the model, both HML_{t+1} *and* HML_t drop out, to be particularly suggestive that book to market is better measured by *previous return* than by either HML_{t+1} or HML_t. This would be the case if Fama and French (2008b, p.2994) were correct in arguing that a single period estimate of book value has too much noise to contain all the information contained in previous return and that additional previous period values of book value may be needed to duplicate the explanatory power of previous return. Ultimately, more research is needed to create a dividend payout mimicking factor and better size and book to market mimicking factors and to compare their effects. A factor series calculated with *quarterly rather than annual* rebalancing on size and book to market might do a better job than Fama and French's, of capturing *monthly* return behavior and eliminating the power of previous return. Further, if quarterly balanced factors were available, it would make sense to focus a study on quarterly, rather than monthly, returns. Sias (2007) attributes a portion of momentum profits to window dressing and tax loss selling by institutional investors and points out that this result suggests that investors seeking to exploit momentum should focus on quarter ending months rather than all months. This idea would also be consistent with the Jagadesh and Titman (2001) results that momentum profits tend to mean revert beyond one year holding periods. However, this is an avenue for future research.

Finally, we find no difference in our results between the industry portfolios and the 25 sorted portfolios. That is, *previous return* (along with SMB_t) for the industry portfolios (which

can be assumed to contain some amount of industry-specific information) did not enhance the model any more than *previous return* (along with SMB_t) for the 25 sorted, but diversified, portfolios. We conclude from this that industry-specific information did not contribute to the serial correlation of the returns.

APPENDIX

In this Appendix, we show first how book to market $\frac{BV_{it}}{MV_{it}}$ on the RHS of (8) should be expected to be proportional to the Fama and French factor HML_{t+1} on the RHS of (2). Suppose there are N securities and arrange them in order from smallest to largest $\frac{BV_{it}}{MV_{it}}$ so that the rank of each security is indicated by the value of i_t and $\frac{BV_{it}}{MV_{it}} > \frac{BV_{i-1t}}{MV_{i-1t}}$. We allow securities with equal book to market value to have equal ranks. Let φ_{it} be the probability of a certain $\frac{BV_{it}}{MV_{it}}$ within a normal distribution of all observations of book to market values. When $\frac{BV_{it}}{MV_{it}}$ is closer to the mean of all observations, it will have a higher probability φ_{it} of occurrence, but a much smaller φ_{it} when $\frac{BV_{it}}{MV_{it}}$ is in one of the tails of the distribution. For time *t*, the expected difference δ_t between observations of $\frac{BV_{it}}{MV_{it}}$ after ranking can be approximated as the sum of the differences in probability-weighted book to markets.

$$\delta_t \approx \sum_{i=2}^{N} \left[\varphi_{it} \frac{BV_{it}}{MV_{it}} - \varphi_{i-1t} \frac{BV_{i-1t}}{MV_{i-1t}}\right] \quad \text{(A1)}$$

Then, the book to market value $\frac{BV_{jt}}{MV_{jt}}$ of the j^{th} ranked security for time *t* can be estimated by multiplying its rank j_t by the expected difference δ_t between book to market value observations.

$$\frac{BV_{jt}}{MV_{jt}} \approx \delta_t j_t \quad \text{(A2)}$$

According to (A2), at time *t*, the book value of the firm can be estimated as proportional to δ_t with the proportionality coefficient equal to the firm's rank in terms of relative book values. The factor δ_t depends only on the distribution of book to market values of all securities *for that time*. In a similar fashion, we define the expected difference λ_t between ranked market size observations of the same group of N securities.

$$\lambda_t \approx \sum_{i=2}^{N} \left[\varphi'_{it} MV_{it} - \varphi'_{i-1t} MV_{i-1t}\right] \quad \text{(A3)}$$

Again, similar to (A2), the market value of the k^{th} ranked security for time t can be estimated by multiplying its rank k_t by the expected difference between successive market value observations.

$$MV_{kt} \approx \lambda_t k_t \tag{A4}$$

We assign these two respective ranks j and k to the i^{th} security and substitute (A2) and (A4) into the expression for the expected return on the i^{th} security in (8).

$$R_{it+1} \approx a_i + b_i \delta_t j_t + c_i \lambda_t k_t + e_{t+1} \tag{A5}$$

The Fama and French (1993, p.9) "high minus low" book value to market factor is calculated for time *t+1* essentially as the simple average of the returns for time *t+1* for the highest ranked (based on each June's book to market ratio) one third of firms less the average of the returns for the lowest ranked one third of firms. Although the Fama and French portfolios are sorted only on book to markets once each (previous) year in June, we assume that this annual sorting serves as a proxy for sorting based on each previous month's book to market ratio.

$$HML_{t+1} = \frac{1}{N/3}\left[\sum_{i=\frac{2N}{3}+1}^{N} R_{it+1} - \sum_{i=2}^{\frac{N}{3}} R_{it+1}\right] \tag{A6}$$

In (A6), the average of the time *t+1* returns of the top one third of securities based on previous month book to market are subtracted from the bottom ranked one third. Substituting (A5) into (A6) and rearranging shows

$$HML_{t+1} = \frac{\delta_t}{N/3}\left[\sum_{j=\frac{2N}{3}+1}^{N} b_j j_t - \sum_{j=2}^{\frac{N}{3}} b_j j_t\right] + \frac{\lambda_t}{N/3}\left[\sum_{j=\frac{2N}{3}+1}^{N} c_j k_t - \sum_{j=2}^{\frac{N}{3}} c_j k_t\right] \tag{A7}$$

We assume that δ_t and λ_t are independent, so that that the contribution to return from size of the top ranked (in terms of book to market) one third of securities is equal to the contribution from lowest ranked one third. Thus, the c_j's in (A7) will be random, the second term on the RHS of (A7) is zero and the result is an expression that shows that the Fama and French (1993) factor HML_{t+1} is proportional to the expected difference between successively ranked book to market values δ_t.

$$HML_{t+1} = \frac{\delta_t}{N/3}\left[\sum_{j=\frac{2N}{3}+1}^{N} b_j j_t - \sum_{j=2}^{\frac{N}{3}} b_j j_t\right] \tag{A8}$$

We conclude from this that since both the book to market ratio and HML_{t+1} are proportional to δ_t, it follows that the book to market value ratio is also proportional to HML_{t+1} so that the Fama and French (1993) HML_{t+1} factor should be expected to be a mimicking factor of book to market. Using a very similar analysis, it can be shown that the Fama and French (1993) market value factor SMB_{t+1} is proportional to the expected difference λ_t between successively ranked sizes.

$$SMB_{t+1} = \frac{\lambda_t}{N/3}\left[\sum_{k=\frac{2N}{3}+1}^{N} c_j k_t - \sum_{k=2}^{\frac{N}{3}} c_j k_t\right] \quad \text{(A9)}$$

Also, similar to the HML_{t+1} analysis, since both market value and SMB_{t+1} are proportional to λ_t, it follows that size is also proportional to SMB_{t+1} so that the Fama and French (1993) SMB_{t+1} size factor is indeed a mimicking factor of previous period market size.

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Table 1 Equation (10) regression coefficients – all industries

This table shows the regression coefficients and standard errors (in parentheses) for Fama-French's 48 industries, plus the market, over the period 8/1926 to 12/2007. * denotes significance at the 1% level.

$$R_{it+1} \approx a_i + \beta_{iH} HML_{t+1} + \beta_{iS} SMB_{t+1} + e_{t+1}$$

Industry	HML_{t+1}	SMB_{t+1}	R^2	Industry	HML_{t+1}	SMB_{t+1}	R^2
Agric	0.571*	0.378*	0.104	Telcm	0.205*	0.119*	0.034
	(0.069)	(0.064)			(0.043)	(0.040)	
Food	0.259*	0.272*	0.078	BusSv	0.835*	-0.088	0.135
	(0.045)	(0.042)			(0.068)	(0.063)	
Beer	0.720*	0.397*	0.151	Comps	0.680*	-0.131*	0.096
	(0.066)	(0.062)			(0.067)	(0.063)	
Smoke	0.149*	0.275*	0.038	Chips	1.118*	0.181*	0.188
	(0.055)	(0.052)			(0.077)	(0.072)	
Toys	1.400*	0.390*	0.239	LabEq	0.728*	-0.257*	0.131
	(0.086)	(0.080)			(0.063)	(0.059)	
Fun	1.011*	0.535*	0.190	Boxes	0.407*	0.246*	0.075
	(0.080)	(0.075)			(0.057)	(0.053)	
Books	0.797*	0.443*	0.184	Trans	0.676*	0.808*	0.278
	(0.065)	(0.061)			(0.059)	(0.055)	
Hshld	0.402*	0.214*	0.071	Whlsl	1.053*	0.311*	0.256
	(0.056)	(0.052)			(0.062)	(0.058)	
Clths	0.789*	0.147*	0.208	Rtail	0.531*	0.148*	0.099
	(0.051)	(0.048)			(0.055)	(0.051)	
MedEq	0.555*	0.116*	0.094	Meals	0.737*	0.237*	0.159
	(0.058)	(0.054)			(0.059)	(0.055)	
Drugs	0.303*	0.076	0.033	Banks	0.423*	0.397*	0.088
	(0.056)	(0.052)			(0.065)	(0.061)	
Chems	0.356*	0.304*	0.073	Insur	0.366*	0.549*	0.101
	(0.058)	(0.054)			(0.069)	(0.065)	
Txtls	1.045*	0.631*	0.330	RlEst	1.265*	0.650*	0.273
	(0.059)	(0.055)			(0.079)	(0.074)	
BldMt	0.714*	0.407*	0.185	Fin	0.735*	0.572*	0.184
	(0.059)	(0.055)			(0.068)	(0.063)	
Cnstr	1.215*	0.665*	0.258	Other	0.856*	0.104	0.153
	(0.080)	(0.075)			(0.066)	(0.062)	
Steel	0.826*	0.722*	0.225	Soda	0.093	-0.248*	0.017
	(0.070)	(0.066)			(0.090)	(0.099)	
Mach	0.792*	0.463*	0.204	Hlth	0.841*	-0.400*	0.144
	(0.062)	(0.058)			(0.121)	(0.130)	
ElcEq	0.545*	0.383*	0.096	Rubbr	1.012*	0.606*	0.091
	(0.070)	(0.065)			(0.131)	(0.122)	
Autos	0.607*	0.603*	0.157	FabPr	0.814*	-0.299*	0.186
	(0.069)	(0.065)			(0.087)	(0.097)	
Aero	0.870*	0.660*	0.169	Guns	0.514*	0.121	0.056
	(0.083)	(0.078)			(0.092)	(0.102)	
Ships	0.696*	0.747*	0.219	Gold	0.679*	-0.056	0.047
	(0.067)	(0.063)			(0.141)	(0.156)	
Mines	0.670*	0.390*	0.162	PerSv	0.789*	-0.367*	0.186
	(0.060)	(0.056)			(0.088)	(0.098)	
Coal	0.666*	0.360*	0.091	Paper	0.245*	-0.143	0.033
	(0.081)	(0.076)			(0.076)	(0.084)	
Oil	0.211*	0.488*	0.102	Market	0.496*	0.285*	0.141
	(0.055)	(0.052)			(0.048)	(0.045)	
Util	0.239* (0.050)	0.541* (0.0470	0.145		Number of insignificant coefficients 1	Number of Insignificant Coefficients 6	Average R^2 .142

Table 2 Equation (10) regression coefficients – 25 sorted portfolios

This table shows the regression coefficients and standard errors (in parentheses) for Fama-French's 25 size and book to market sorted portfolios over the period 8/1926 to 12/2007 for equation (10). * denotes significance at the 1% level.

$$R_{it+1} \approx a_i + \beta_{iH} HML_{t+1} + \beta_{iS} SMB_{t+1} + e_{t+1}$$

Portfolio	HML_{t+1}	SMB_{t+1}	R^2
Sm lo	1.958*	0.800*	0.356
	(0.095)	(0.089)	
Sm 2	2.167*	0.664*	0.538
	(0.070)	(0.065)	
Sm 3	1.726*	0.788*	0.516
	(0.062)	(0.058)	
Sm 4	1.712*	0.871*	0.608
	(0.052)	(0.049)	
Sm Hi	1.848*	1.192*	0.667
	(0.053)	(0.050)	
2 lo	1.585*	0.044	0.443
	(0.057)	(0.054)	
2 2	1.508*	0.500*	0.488
	(0.054)	(0.051)	
2 3	1.337*	0.636*	0.505
	(0.049)	(0.046)	
2 4	1.305*	0.841*	0.530
	(0.050)	(0.047)	
2 hi	1.454*	1.148*	0.585
	(0.054)	(0.050)	
3 lo	1.363*	0.135*	0.366
	(0.059)	(0.055)	
3 2	1.008*	0.367*	0.324
	(0.052)	(0.048)	
3 3	0.912*	0.637*	0.349
	(0.052)	(0.049)	
3 4	0.944*	0.789*	0.426
	(0.049)	(0.046)	
3 hi	1.065*	1.262*	0.482
	(0.060)	(0.056)	
4 lo	0.811*	-0.065	0.190
	(0.054)	(0.050)	
4 2	0.750*	0.435*	0.242
	(0.052)	(0.049)	
4 3	0.717*	0.592*	0.280
	(0.051)	(0.048)	
4 4	0.717*	0.900*	0.357
	(0.054)	(0.050)	
4 hi	0.919*	1.349*	0.439
	(0.065)	(0.060)	
Big lo	0.362*	0.047	0.051
	(0.051)	(0.048)	
Big 2	0.290*	0.264*	0.073
	(0.048)	(0.045)	
Big 3	0.268*	0.593*	0.173
	(0.050)	(0.047)	
Big 4	0.360*	1.024*	0.329
	(0.054)	(0.051)	
Big hi	0.558*	1.186*	0.127
	(0.121)	(0.113)	
	Number of Insignificant Coefficients 0	Number of Insignificant Coefficients 3	Avg. R^2 0.378

Table 3A Equation (15) Regression Coefficients – Industries, First Half

This table shows regression coefficients and standard errors (in parenthesis) for the first 25 of Fama-French's 48 industries (8/1926 to 12/2007). * denotes significance at the 1% level.

$$R_{it+1} \approx a_i' + \beta_{iH} HML_{t+1} + \beta_{iS} SMB_{t+1} + b_i HML_t + c_i SMB_t + d_i R_{it} + e_{t+1}$$

Industry	HML_{t+1}	SMB_{t+1}	HML_t	SMB_t	R_t	R^2
Agric	0.010	-0.013	-0.072	0.577*	0.387*	0.105
	(0.033)	(0.071)	(0.067)	(0.070)	(0.066)	
Food	0.027	0.042	0.016	0.245*	0.270*	0.080
	(0.033)	(0.046)	(0.044)	(0.046)	(0.043)	
Beer	-0.006	0.096	0.142*	0.697*	0.378*	0.157
	(0.032)	(0.070)	(0.064)	(0.068)	(0.063)	
Smoke	0.047	-0.054	0.047	0.131*	0.262*	0.042
	(0.033)	(0.056)	(0.054)	(0.057)	(0.053)	
Toys	-0.087*	0.271*	0.186*	1.402*	0.371*	0.250
	(0.032)	(0.096)	(0.082)	(0.087)	(0.081)	
Fun	0.063	0.090	0.095	0.949*	0.517*	0.198
	(0.033)	(0.086)	(0.078)	(0.083)	(0.076)	
Books	0.053	0.088	-0.034	0.766*	0.454*	0.190
	(0.032)	(0.070)	(0.063)	(0.067)	(0.062)	
Hshld	0.010	-0.058	0.087	0.390*	0.197*	0.074
	(0.033)	(0.057)	(0.054)	(0.059)	(0.053)	
Clths	0.050	0.012	-0.092	0.779*	0.166*	0.213
	(0.033)	(0.057)	(0.049)	(0.053)	(0.049)	
MedEq	-0.048	0.067	-0.043	0.571*	0.124*	0.097
	(0.032)	(0.061)	(0.056)	(0.059)	(0.055)	
Drugs	0.029	-0.045	0.064	0.286*	0.064	0.035
	(0.033)	(0.057)	(0.054)	(0.058)	(0.053)	
Chems	0.018	0.018	0.072	0.337*	0.292*	0.075
	(0.033)	(0.059)	(0.056)	(0.060)	(0.055)	
Txtls	-0.002	0.112	0.077	1.028*	0.624*	0.334
	(0.033)	(0.068)	(0.060)	(0.062)	(0.056)	
BldMt	-0.012	0.101	0.057	0.705*	0.403*	0.188
	(0.033)	(0.063)	(0.057)	(0.061)	(0.056)	
Cnstr	-0.062	0.054	0.015	1.241*	0.666*	0.261
	(0.032)	(0.089)	(0.079)	(0.081)	(0.076)	
Steel	-0.051	0.004	0.042	0.855*	0.726*	0.227
	(0.033)	(0.076)	(0.071)	(0.073)	(0.067)	
Mach	-0.010	0.009	-0.008	0.798*	0.466*	0.204
	(0.033)	(0.067)	(0.061)	(0.064)	(0.059)	
ElcEq	0.016	0.058	0.014	0.530*	0.381*	0.098
	(0.033)	(0.072)	(0.068)	(0.072)	(0.067)	
Autos	0.025	0.130	0.024	0.578*	0.602*	0.161
	(0.033)	(0.072)	(0.068)	(0.072)	(0.066)	
Aero	0.062	0.063	-0.043	0.834*	0.671*	0.174
	(0.032)	(0.088)	(0.082)	(0.085)	(0.079)	
Ships	-0.075*	0.089	0.020	0.727*	0.762*	0.223
	(0.033)	(0.071)	(0.068)	(0.069)	(0.064)	
Mines	-0.028	0.063	-0.040	0.682*	0.401*	0.164
	(0.033)	(0.064)	(0.058)	(0.062)	(0.057)	
Coal	-0.006	-0.020	-0.138	0.686*	0.382*	0.094
	(0.032)	(0.084)	(0.078)	(0.082)	(0.077)	
Oil	-0.041	0.033	-0.015	0.226*	0.494*	0.104
	(0.033)	(0.056)	(0.055)	(0.057)	(0.053)	
Util	0.085*	-0.073	-0.014	0.222*	0.538*	0.152
	(0.032)	(0.051)	(0.051)	(0.051)	(0.048)	

Table 3B Equation (15) Regression Coefficients – Industries, Second Half

This table shows regression coefficients and standard errors (in parenthesis) for the last 23 of Fama-French's 48 industries, plus the market (8/1926 to 12/2007). * denotes significance at the 1% level.

$$R_{it+1} \approx a_i' + \beta_{iH} HML_{t+1} + \beta_{iS} SMB_{t+1} + b_i HML_t + c_i SMB_t + d_i R_{it} + e_{t+1}$$

Industry	HML_{t+1}	SMB_{t+1}	HML_t	SMB_t	R_t	R^2
Telcm	0.046	0.037	0.092*	0.181*	0.106*	0.043
	(0.032)	(0.044)	(0.041)	(0.044)	(0.041)	
BusSv	-0.014	0.056	-0.097	0.848*	-0.069	0.138
	(0.033)	(0.073)	(0.065)	(0.069)	(0.064)	
Comps	0.021	0.021	-0.020	0.672*	-0.128	0.097
	(0.033)	(0.071)	(0.065)	(0.069)	(0.064)	
Chips	-0.012	-0.015	0.026	1.123*	0.177*	0.188
	(0.033)	(0.085)	(0.074)	(0.079)	(0.074)	
LabEq	-0.011	0.018	-0.035	0.735*	-0.251*	0.131
	(0.033)	(0.067)	(0.061)	(0.064)	(0.060)	
Boxes	0.001	-0.025	0.009	0.407*	0.244*	0.075
	(0.033)	(0.059)	(0.055)	(0.059)	(0.054)	
Trans	0.051	-0.009	-0.011	0.654*	0.804*	0.280
	(0.033)	(0.063)	(0.062)	(0.061)	(0.056)	
Whlsl	-0.019	0.336*	0.232*	1.008*	0.286*	0.290
	(0.032)	(0.069)	(0.059)	(0.063)	(0.058)	
Rtail	0.063	0.032	0.036	0.497*	0.144*	0.105
	(0.033)	(0.058)	(0.053)	(0.057)	(0.052)	
Meals	0.068*	0.065	0.024	0.704*	0.236*	0.167
	(0.032)	(0.064)	(0.057)	(0.060)	(0.056)	
Banks	0.028	0.037	-0.026	0.409*	0.406*	0.089
	(0.033)	(0.066)	(0.063)	(0.067)	(0.062)	
Insur	0.030	0.087	-0.010	0.342*	0.551*	0.104
	(0.033)	(0.070)	(0.068)	(0.072)	(0.066)	
RlEst	-0.048	0.272*	0.050	1.270*	0.659*	0.280
	(0.033)	(0.088)	(0.077)	(0.081)	(0.075)	
Fin	0.049	0.022	-0.026	0.710*	0.571*	0.186
	(0.033)	(0.072)	(0.067)	(0.070)	(0.064)	
Other	0.006	0.108	0.004	0.844*	0.109	0.156
	(0.033)	(0.072)	(0.063)	(0.068)	(0.063)	
Soda	0.011	0.061	-0.061	0.083	-0.243*	0.020
	(0.045)	(0.090)	(0.101)	(0.093)	(0.101)	
Hlth	0.046	0.241	-0.038	0.803*	-0.399*	0.158
	(0.048)	(0.127)	(0.132)	(0.124)	(0.131)	
Rubbr	0.692*	-0.823*	-0.188*	0.686*	0.594*	0.524
	(0.024)	(0.098)	(0.092)	(0.097)	(0.090)	
FabPr	0.019	0.078	-0.081	0.799*	-0.297*	0.191
	(0.044)	(0.094)	(0.099)	(0.089)	(0.099)	
Guns	-0.004	0.037	-0.019	0.511*	0.122	0.056
	(0.044)	(0.095)	(0.103)	(0.094)	(0.104)	
Gold	-0.041	0.035	0.218	0.690*	-0.079	0.053
	(0.044)	(0.144)	(0.158)	(0.141)	(0.158)	
PerSv	0.042	0.016	-0.001	1.232*	0.338*	0.221
	(0.032)	(0.091)	(0.079)	(0.082)	(0.078)	
Paper	0.243*	-0.810*	0.465*	1.741*	1.110*	0.242
	(0.031)	(0.172)	(0.159)	(0.164)	(0.154)	
Market	-0.008	0.046	0.029	0.495*	0.281*	0.143
	(0.006)	(0.050)	(0.047)	(0.049)	(0.046)	
	Number of insignificant coefficients 43	Number of insignificant coefficients 44	Number of insignificant coefficients 43	Number of insignificant coefficients 2	Number of insignificant coefficients 6	Average R^2 .158

Table 4 Equation (15) Regression Coefficients – 25 Sorted Portfolios

This table shows the regression coefficients and standard errors (in parentheses) for Fama-French's 25 size and book to market sorted portfolios over the period 8/1926 to 12/2007 for equation (15).

$$R_{it+1} \approx a_i' + \beta_{iH} HML_{t+1} + \beta_{iS} SMB_{t+1} + b_i HML_t + c_i SMB_t + d_i R_{it} + e_{t+1}$$

Portfolio	HML_{t+1}	SMB_{t+1}	HML_t	SMB_t	R_t	R^2
Sm lo	-0.036	0.331*	-0.264*	1.983*	0.870*	0.368
	(0.032)	(0.114)	(0.094)	(0.096)	(0.090)	
Sm 2	-0.041	-0.028	0.219*	2.168*	0.620*	0.544
	(0.032)	(0.098)	(0.070)	(0.071)	(0.066)	
Sm 3	-0.113*	0.374*	0.132*	1.750*	0.778*	0.526
	(0.032)	(0.083)	(0.064)	(0.063)	(0.058)	
Sm 4	0.037	0.073	0.036	1.681*	0.866*	0.612
	(0.033)	(0.076)	(0.057)	(0.054)	(0.049)	
Sm Hi	0.014	0.042	-0.004	1.837*	1.193*	0.668
	(0.033)	(0.080)	(0.063)	(0.055)	(0.051)	
2 lo	-0.076*	0.160*	-0.034	1.614*	0.052	0.447
	(0.033)	(0.077)	(0.055)	(0.059)	(0.054)	
2 2	0.026	-0.063	0.032	1.494*	0.491*	0.489
	(0.033)	(0.073)	(0.054)	(0.056)	(0.052)	
2 3	0.036	-0.038	0.055	1.312*	0.624*	0.507
	(0.033)	(0.066)	(0.051)	(0.052)	(0.047)	
2 4	0.016	0.027	0.025	1.290*	0.837*	0.531
	(0.033)	(0.066)	(0.055)	(0.052)	(0.048)	
2 hi	0.029	-0.059	-0.012	1.443*	1.142*	0.585
	(0.033)	(0.072)	(0.063)	(0.055)	(0.051)	
3 lo	0.033	-0.052	0.078	1.339*	0.121*	0.368
	(0.033)	(0.073)	(0.056)	(0.061)	(0.056)	
3 2	-0.010	-0.006	-0.005	1.013*	0.368*	0.324
	(0.033)	(0.061)	(0.051)	(0.054)	(0.049)	
3 3	-0.012	0.065	0.055	0.906*	0.632*	0.350
	(0.033)	(0.060)	(0.054)	(0.055)	(0.050)	
3 4	0.023	-0.008	0.038	0.927*	0.780*	0.427
	(0.033)	(0.058)	(0.053)	(0.051)	(0.047)	
3 hi	-0.028	0.090	0.069	1.067*	1.261*	0.483
	(0.033)	(0.069)	(0.070)	(0.062)	(0.057)	
4 lo	-0.008	-0.008	-0.020	0.818*	-0.062	0.190
	(0.033)	(0.060)	(0.052)	(0.056)	(0.051)	
4 2	0.023	0.024	-0.008	0.737*	0.436*	0.243
	(0.033)	(0.058)	(0.052)	(0.055)	(0.050)	
4 3	-0.003	0.024	0.080	0.706*	0.580*	0.282
	(0.033)	(0.056)	(0.053)	(0.053)	(0.049)	
4 4	-0.042	0.058	0.082	0.726*	0.896*	0.359
	(0.033)	(0.059)	(0.059)	(0.056)	(0.051)	
4 hi	-0.041	0.069	0.149	0.926*	1.334*	0.442
	(0.033)	(0.071)	(0.075)	(0.067)	(0.061)	
Big lo	0.036	0.017	0.034	0.343*	0.042	0.053
	(0.033)	(0.053)	(0.049)	(0.053)	(0.049)	
Big 2	0.004	0.015	0.027	0.284*	0.260*	0.074
	(0.033)	(0.049)	(0.047)	(0.050)	(0.046)	
Big 3	0.048	0.019	0.021	0.241*	0.585*	0.176
	(0.033)	(0.051)	(0.051)	(0.052)	(0.047)	
Big 4	0.035	0.039	0.027	0.334*	1.015*	0.332
	(0.033)	(0.056)	(0.061)	(0.056)	(0.052)	
Big hi	0.696*	-0.305*	-0.731*	0.294*	1.077*	0.545
	(0.023)	(0.088)	(0.087)	(0.088)	(0.083)	
	Number of Insignificant Coefficients 22	Number of Insignificant Coefficients 21	Number of Insignificant Coefficients 21	Number of Insignificant Coefficients 0	Number of Insignificant Coefficients 3	Average R^2 0.397

ARE COMPANIES THAT REPORT MATERIAL WEAKNESSES IN INTERNAL CONTROL MORE LIKELY TO RESTATE THEIR FINANCIAL STATEMENTS?

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ABSTRACT

This study provides empirical evidence on the relationship between reported material weaknesses in internal control and the probability of a company restating its earnings, based on a sample of 518 restating companies and 518 matching companies selected from the period January 1, 2004 through December 31, 2005. First, this study finds a significant relationship between the incidence of material weaknesses reported by the firm and the probability of a firm restating its earnings. Second, the magnitude or frequency of material internal control weaknesses reported by the firm is significantly related to the probability of a firm restating its earnings. The higher the number of material weaknesses reported by a company, the greater the probability that the company will restate. Finally, the type of material internal control weakness is significantly related to the probability of a firm restating its earnings. This study finds that companies reporting material weakness in accounting related areas such as accruals, revenue recognition, period-end closings and accounting policies, and complex areas such as derivative and lease accounting are more likely to restate earnings than those companies reporting material weakness in non-accounting areas such as training, segregation of duties, senior management, and subsidiary specific areas

INTRODUCTION

The purpose of this study is to enhance the understanding of the relationships between material weaknesses in internal control and restatements of financial reports (for purposes of this paper, the terms "restatements of financial reports" and "earnings restatements" are used interchangeably). Specifically, we investigate the association between the report of, the number of, and the type of reported internal control weaknesses and earnings restatement. Earnings restatement by publicly traded companies can have multiple adverse consequences including SEC investigation, replacement of top executives, and possibly firm's penalization by investors.

Previous studies show that earnings restatements were increasing in the years prior to the Sarbanes-Oxley (SOX) Act of 2002 (FEI, 2001; Moriarty & Livingston, 2001; GAO, 2005; Weil, 2001). Part of the reasoning behind SOX is to increase transparency of financial statements while reducing the number and magnitude of earnings restatements. However, restatements have risen five-fold from 2002 until 2005 (Glass, Lewis & Co., 2006). Companies with U.S. listed securities filed 1,295 financial restatements in 2005, nearly double the previous year, including 182 "stealth" restatements filed without amended filings, 8-K filings, or other public announcements (Glass, Lewis & Co., 2006). Firms audited by non-Big 4 auditors were six times as likely to restate as those audited by Big-Four firms. Perhaps most troubling is that over half of the restating companies filed financial statements claiming effective internal controls prior to the restatement (Glass, Lewis & Co., 2006). The economic burden of these reporting errors falls on investors.

Disclosure of material internal control weakness is also increasing, totaling 314 in 2004 and 424 in 2005 (Compliance Week, 2006). Of the 424 disclosures in 2005, 87 percent of the firms previously certified controls as effective, with over 40 percent (171 firms) not warning investors of an imminent adverse audit opinion. A possible explanation for the increase in disclosure of material weaknesses in internal control is the reporting requirements of SOX sections 302 and 404. SOX Section 302 establishes the management responsibility to design, maintain, evaluate the effectiveness of the internal control system, and to report on any identified deficiencies or weaknesses. SOX Section 404 relates to the management assessment of the internal control system.

This issue is important and timely because the quality of financial reporting in general is of increasing concern to investors, managers, regulators, auditors, boards of directors, and academics and the accounting characteristics (antecedents) of earnings restatements have not been fully explored. SOX requires that a material control weakness be reported if there is a remote probability that a material error could result as a consequence of the control weakness (PCAOB, 2008). To date, there is no direct evidence linking material internal control weaknesses and the probability of a firm's restating its financial statements due to material errors. There is also no direct evidence regarding the relationship between the types of material control weaknesses and the type of accounts affected by a restatement.

Although a relationship between material weaknesses and restatements has not previously been explored, prior research has explored topics related to internal control weaknesses, non-GAAP reporting, which is comprised of computations used to report corporate income and earnings that are not defined by generally accepted accounting principles (GAAP), and the consequences of earnings restatements. Related topics include corporate governance issues, which may create a weak internal control environment (McCarty, 1999; Abbott & Parker, 2004; Kinney et al., 2004; Agrawal & Chadha, 2005; Aier et al., 2005; Krishnan, 2005), characteristics of companies that restate earnings (Kinney & McDaniel, 1989; Defond & Jiambalvo, 1991; Richardson et al., 2002; Ge & McVay, 2005), earnings persistence and the type of accounts

restated (Cottle et al., 1988; Penman, 2001; Bradshaw & Sloan, 2002; Palmrose & Scholz, 2004). Additionally, the consequences of restatements have been explored in the relationship between restatements and market returns (Kinney & McDaniel, 1989; Dechow et al., 1996; Palmrose et al., 2004). These studies consistently find a significant negative abnormal return around the announcement date.

Prior research has also identified a predictive trend in stock price changes for companies disclosing material weakness or significant deficiencies. While the Glass, Lewis & Co. (2006) study does not find any significant relationship between stock price and disclosing material weaknesses, subsequent studies find a negative price reaction.to disclosure of internal control weaknesses (Hammersley et. al., 2008; Beneish et al., 2008).

Although previous studies have examined the market reaction to disclosure of restatement and internal control weakness, the question arises whether the incidence of reported material internal control weaknesses affects the probability of a company eventually restating its earnings. Since prior research seems to indicate a market penalty for restatements and for reported material internal control weaknesses, this study contributes through an estimation of the incremental effects of different types of internal control weaknesses on the probability of a company's restating its earnings.

This study examines the effect of type of internal control weakness, certain accounting characteristics of earnings restatements and magnitude (the number of material internal control weaknesses reported) on the probability of a company restating its financial statements.

The following research questions are addressed in this study:

1. Are companies that report material weaknesses in internal control more likely to restate their financial statements?
2. Does the number of material internal control weakness reported by a firm affect the probability of that firm restating its earnings?
3. Does the type of material internal control weakness reported by a firm affect the probability of that firm restating its earnings?

The study proceeds as follows. In the next section, we discuss the background of earnings restatements, SOX and internal control regulation and present the hypotheses. We then present the empirical analyses and models and describe the sample. Results of the analyses are described. The final section presents conclusions and suggestions for future research.

HYPOTHESES DEVELOPMENT

Government regulators, the accounting profession, and investors have recognized for many years the need for transparent financial statements and the importance of internal controls in generating those statements. Beginning with the Securities Act of 1933 and the Securities

Exchange Act of 1934, companies have been required to correct inaccurate, incomplete, or misleading disclosures. In 1977, Congress amended Section 13(b) of the Securities Exchange Act of 1934 and required firms to have reasonable internal controls sufficient to provide reasonable assurances to investors. During the next two decades, the Treadway Commission (1987), SEC (1988), Public Accounting Oversight Board (1992), and GAO (2005) all proposed or recommended rules requiring management and/or auditor reporting on the effectiveness of internal controls. In spite of these legislative efforts, earnings restatements by corporations continued to be of significant concern. 919 earnings restatements resulting in $200 billion of market capital loss by investors were required for period between January 1, 1997 and June 30, 2002 (GAO, 2003). This number of restatements is greater than all restatements of the previous three decades. By 2002, a systemic crisis materialized that resulted in legislation requiring publicly traded firms to have adequate controls necessary for complete and accurate financial reporting.

The Public Company Accounting Reform and Investor Protection Act of 2002 (SOX) was enacted in July 2002 largely in response to major corporate and accounting controversies involving many major corporations in the United States. Enron, WorldCom, Tyco, Adelphia, and HealthSouth are a few examples. These scandals exposed serious weaknesses in the system of checks and balances that were intended to protect the interests of shareholders, pension beneficiaries and employees of public companies, and to protect the confidence of the investors in the stability and fairness of the U.S. capital markets. Many investors lost their life savings, employees lost their livelihoods and the faith of many investors in U.S. markets was lost. SOX brought about the most extensive reform that the U.S. capital markets have seen since the passage of the Securities Act of 1933 and the Securities Exchange Act of 1934. Part of the reasoning behind SOX was to increase the transparency of the financial statements and reduce the number of earnings restatements. However, restatements of financial statements by public companies have risen five-fold from 2002 until 2005 (Glass, Lewis & Co., 2006).

Wahlen (2004) points out many factors that affect the economics of non-GAAP versus GAAP reporting. He states that the "firm experiences a set of antecedent circumstances that motivate (and fail to prevent) non-GAAP reporting, setting the stage for the firm to release a non-GAAP financial report". These factors include weak internal controls, strong manager's incentives, weak corporate governance, prior and current earnings performance, existing earnings expectations, firm size, growth, and others.

Earnings are restated for various reasons. Prior research has examined the effect of various restatements on the recalculation of estimated cash flows by investors. Kinney and McDaniel (1989) analyze the stock price reaction for 73 firms that restate between 1976 and 1985 and find that stock returns are negative between issuance of erroneous quarterly statements and its corrections. Dechow et al. (1996) report a negative 6 percent return for a subset of SEC enforcement actions with restatements from 1981-1992. Turner et al. (2001) document negative returns of 12 percent (revenue misstatements) and 5 percent (restructuring, impairment, and other

misstatements) from 1997-1999. Wu (2002) extends Moriarty and Livingston (2001) and finds estimated negative returns of 11 percent for 255 companies either revising earnings announcements or announcing restatements of financials from 1977 to 2000. He also finds that restatements are regarded as bad news by the stock market and that market reaction is stronger when the restated amount is larger and reports an increase in the frequency of restatements and the recent appearance of in-process R&D restatements. The GAO (2002) finds negative 10 percent for a sample of 689 public companies announcing restatements from 1997 to March 2002. Anderson and Yohn (2002) investigate 161 firms from 1997-1999 and find that investors and dealers react negatively (lower market returns [negative 3.8 percent] and increased bid-ask spreads) to restatements. Palmrose et al. (2004) analyze stock market reaction for a sample of 403 restatements of quarterly and annual financial statements from 1995 to 1999 and find a significant negative abnormal return (negative 9.2 percent) over a 2-day event window. Negative abnormal returns are related to indications of management fraud, more material dollar effects, and restatements that are attributable to auditors. They also find a significant association between the dispersion of earnings forecasts by analysts and restatement announcements. A restatement can trigger an SEC investigation, lead to replacement of top executives, and result in the firm being heavily penalized by investors.

Corporate governance issues which may create a weak internal control environment are the subject of previous research. Kinney et al. (2004) investigate the role of auditors and audit committees and find a significant negative association between tax-service fees and restatements, a significant positive association between audit, audit-related and non-audit service fees and restatements. McCarty (1999) and Aier et al. (2005) find a positive association between the financial expertise of CFOs and accounting restatements. Abbott and Parker (2004) study the effect of audit committee characteristics on the probability of financial restatements by companies and find a negative association between restatement and audit committees that have at least one member with financial expertise. Agrawal and Chadha (2005) find that board independence and audit committee independence and the provision of non-audit services by outside auditors are unrelated to the probability of a company restating its earnings. The probability of restatement is lower in companies whose boards or audit committees have an independent director with financial expertise. It is higher in companies in which the CEO belongs to the founding family. The probability of restatement is negatively related to the incidence of independent directors with a background in accounting or finance on the board or audit committee and to the presence of the CFO on the audit committee. Krishnan (2005) studies the incidence of material internal control weakness in a pre-SOX sample (1994-2000) and finds that the quality of audit committees and the frequency of material weaknesses are negatively associated.

Prior research has established characteristics of companies that restate earnings. Kinney and McDaniel (1989) find that, relative to their industry, restating companies are smaller, less profitable, slower growing, have higher debt, face more serious uncertainties and receive more

qualified audit opinions. Defond and Jiambalvo (1991) note that earnings overstatements are negatively correlated with earnings growth and those overstatements are more likely when companies have fewer income-increasing GAAP alternatives available. Richardson et al. (2002) find companies that make restatements have high market expectations for future earnings growth, higher levels of outstanding debt, a string of consecutive positive earnings growth and consecutive positive quarterly earnings surprises. Ge and McVay (2005) investigate the general firm characteristics associated with firms that disclose material weakness. They find that those firms reporting material weaknesses are more complex (as measured by number of operating segments and foreign currency translations), smaller (book value and market cap), less profitable (return on assets and cash from operations) and more inclined to use a large auditor (BDO Seidman, Deloitte & Touche, Ernst & Young, Grant Thornton, KPMG, or PWC). The similarities in characteristics between restating companies and companies reporting material weaknesses lead to the expectation that the probability of companies restating their earnings is positively associated with companies that report material internal control weaknesses.

We test how the occurrence of material internal control weakness affects the likelihood of a company having a misstatement of its earnings. Thus, our first hypothesis (H_1) is:

H_1: The probability that companies restate their earnings is positively associated with reported material internal control weakness.

Moody's Investor's Service rates the level of risk associated with investors' receiving full and timely payment of principal and interest on a specific debt obligation (Moodys.com 2006). Moody's reaction to internal control deficiencies includes distinguishing between situations that merit negative rating action from those that do not. In most cases involving internal control weaknesses, the control problems cited do not affect the company's credit risk. However, Moody's does reevaluate the credit risk of companies that report pervasive control problems, recurring errors, ineffective remediation of lingering control problems, and delinquent filings that are frequently caused by ongoing and uncertain reporting problems.

Based on Moody's model, we expect that the effect of reported material internal control weaknesses on the probability of an earnings restatement increases with the pervasiveness of the internal control weaknesses. This study measures pervasiveness as the number of material internal control weaknesses reported.

We test how the number of reported material weaknesses affects the likelihood of a company having a misstatement of its earnings. Thus, our second hypothesis (H_2) is:

H_2: The probability that companies restate their earnings is positively associated with the number of material internal control weaknesses reported.

Although Section 404 of the Sarbanes-Oxley Act requires management to identify and to report on material weaknesses in internal control, it does not specify how these weaknesses are to be categorized or how management is to explain the weaknesses in the report. The SEC clarified the definitions of material weakness and significant deficiencies but left the manner of reporting up to the individual companies. In an attempt to clarify the matter, the Chief Accountant of the SEC states, "For those companies who do disclose material weaknesses, it will be important that they do so in a manner that enables investors and other market participants to carefully evaluate the circumstances underlying the material weakness" (SEC, 2003). He further states, "Some material weaknesses may have a greater or lesser impact on the investor's decision process. In many cases this decision will likely be influenced by the fullness of management's disclosure, the underlying causes of material weakness, and management's actions to address the material weakness. This is intended to be an open process whereby investors can evaluate both the weakness as well as management's actions to improve controls."

Classification of internal control weaknesses can be done in many ways. The GAO (Report Pursuant to Section 704 of the Sarbanes-Oxley Act of 2002) classifies internal control weaknesses into four broad categories: (1) improper revenue recognition (improper timing, fictitious revenue, and improper valuation), (2) improper expense recognition (improper capitalization/deferral, overstating ending inventory values, improper use of restructuring and other liability reserves, understating reserves for bad debts and loan losses, and failure to record asset impairments), (3) improper accounting in connection with business combinations (improper asset valuation, improper use of merger reserves, and inappropriate application of purchase/pooling methods), and (4) other areas of improper accounting (inadequate disclosures in management discussion, failure to disclose related party transactions, inappropriate accounting for non-monetary and roundtrip transactions, foreign payments in violation of the FCPA, improper use of Non-GAAP Financial Measures, and improper use of Off-Balance Sheet Arrangements).

Moody's uses two broad categories to classify internal control weaknesses. Weaknesses that relate to controls over specific account balances or transaction-level processes are grouped as Category A and include weaknesses that relate to income tax accounting, account specific accounting, revenue and related receivables, acquisition and consolidation, and technology and data access controls. Weaknesses that relate to company specific controls are included in Category B and include control weaknesses such as an ineffective control environment, weak overall financial reporting processes, tone at the top, delinquent filers and ineffective personnel. Category B weaknesses also include those companies that report several Category A weaknesses and those companies that have reported material control weaknesses for the second year running. Moody's gives much greater concern to company specific controls. Upon classifying internal control weaknesses as relating to company specific controls, Moody's generally re-evaluates the rating given the firm. The financial consequences of a change in rating can include an increase in a firm's cost of capital. Frank and Cheh (2006) conclude that it is reasonable to assume that if the

type of material weakness affects part of a firm's cost of capital, it should also affect investors' perception of the value of a firm reporting control weaknesses.

Recent interest in earnings management has focused research on income statement accounts. Researchers and practitioners find it particularly useful to differentiate accounts affected by restatements (Cottle et al., 1988; Penman, 2001; Bradshaw & Sloan, 2002; Palmrose & Scholz, 2004). Generally, accounts are divided between 1) core earnings (that is, affect the ongoing operating results of the firm and include revenue, COGS, and SGA expense) and 2) non-core earnings (that is, one-time items like goodwill and research and development). Core earnings are more important to investors than non-core earnings because core earnings affect the persistent earnings of a firm that can be expected to repeat and contribute to a firm's future earnings (Penman, 2001).

Ge and McVay (2005) find 493 distinct deficiencies in internal control among 261 firms and report that these disclosures vary widely in terms of details. They group these deficiencies based on the specific material weaknesses disclosed by management and categorize internal control weaknesses into nine deficiency types: (1) Account-Specific, (2) Training, (3)Period-End Reporting/Accounting Policies, (4) Revenue Recognition, (5) Segregation of Duties, (6) Account Reconciliation, (7) Subsidiary-Specific, (8)Senior Management, and (9)Technology Issues. Frank and Cheh (2006) use a classification scheme compiled from both sources. The classification is applied based on Moody's dichotomy and cross-classified according to the typology of Ge and McVay (2005).

We use Ge and McVay's (2005) classification of internal control deficiency type and test how the type of material internal control weakness affects the likelihood of a company having a misstatement of its earnings. The Appendix A provides a detailed description and examples of specific weaknesses under each category. Thus, our third hypothesis (H_3) is:

H_3: The probability that companies restate their earnings is positively associated with the type of material internal control weakness reported by a firm.

METHODOLOGY

We investigate financial accounting restatements filed with the Securities and Exchange Commission between December 2003 and March 2006. Restating companies are matched with non-restating companies (firm did not restate its earnings in the 2 years prior to the date of the restatement announced by its matched firm) based on size, industry, and the year in which the restating company publicly announced a restatement. We use logistic regression in the initial analysis to determine if reported material internal control weaknesses are associated with the likelihood that a company will restate its earnings. To explore the relation between accounting restatements and material internal control weaknesses, we estimate a regression that includes

restatement and company characteristics expected to influence a firms' decision to restate its earnings.

Prior studies find that earnings management is likely to increase the probability of a company restating its earnings and have identified incentives to manage earnings in companies that have restated their earnings. Dechow et al. (1996) report that the demand for external financing is an important determinant of earnings management. Also, Richardson et al. (2002) find that the need to meet analyst expectations is an important determinant of earnings management. Dechow uses two measures of external financing, free cash flow (FREEC) and the actual amount of financing raised (FINRAISED). Richardson et al. (2002) measure leverage (LEV) and report that these variables are incentives for earnings management. Consequently, we include these variables as control variables in the model. The inclusion of these additional variables should improve the explanatory power of the tests. We use the following model to test H_1 examining the association between firm's earnings restatement and the reporting of internal control material weaknesses:

$$REST_{it} = \beta_0 + \beta_1 ICW + \beta_2 FREEC + \beta_3 FINRAISED + \beta_4 LEV + \varepsilon \qquad (1)$$

Where ε is a random error term and for a given company i:

t = for each restating company and its matching non-restating company, the year in which the restating company publicly announced a restatement;
REST = a dichotomous variable coded 1 if the firm has restated its earnings, 0 otherwise;
ICW = dummy variable coded 1 if the firm reported a material internal control weakness, 0 otherwise;
FREEC = net cash flows from operating activities (Compustat data item 308) less average capital expenditures (Compustat data item 128) deflated by total assets (Compustat data item 6);
FINRAISED = sum of new debt and equity issued by the company; Sale of Common and Preferred Stock (Compustat data item 108) plus Long-Term Debt – Issuance (Compustat data item 111) deflated by total assets (Compustat data item 6);
LEV = total debt (Compustat data item 34 plus data item 9) deflated by total assets (Compustat data item 6).

To explore the relation between accounting restatements and the number of reported material internal control weaknesses, we estimate a regression that includes restatement and company characteristics expected to influence a firms' decision to restate its earnings. We also include control variables in the model that prior research identifies as important determinants of restatements. The inclusion of these additional variables should improve the explanatory power

of the tests. The model to test H_2 examining the relation between earnings restatements and the number of reported internal control weaknesses is summarized as follows:

$$REST_{it} = \beta_0 + \beta_1 NUMBER + \beta_2 FREEC + \beta_3 FINRAISED + \beta_4 LEV + \varepsilon \qquad (2)$$

Where ε is a random error term and for a given company i:

t = for each restating company and its matching non-restating company, the year in which the restating company publicly announced a restatement;
REST = a dichotomous variable coded 1 if the firm has restated its earnings, 0 otherwise;
NUMBER = number of material internal control weaknesses reported.

Control variables are the same as defined in the first regression model.

To explore the relation between accounting restatements and the type of reported material internal control weaknesses, we estimate a regression that includes restatement and company characteristics expected to influence a firms' decision to restate its earnings. We also include control variables in the model that prior research identifies as important determinants of restatements. The inclusion of these additional variables should improve the explanatory power of the tests. We use the following model to test H_3 examining the association between firm's earnings restatements and the type of internal control weaknesses:

$$REST_{it} = \beta_0 + \beta_1 AS + \beta_2 T + \beta_3 PERAP + \beta_4 RR + \beta_5 SOD + + \beta_6 AR + \beta_7 SS + \beta_8 SM + \beta_9 TI + \beta_{10} FREEC + \beta_{11} FINRAISED + \beta_{12} LEV + \varepsilon \qquad (3)$$

Where ε is a random error term and for a given company i:

t = for each restating company and its matching non-restating company, the year which the restating company publicly announce a restatement;
REST = a dichotomous variable coded 1 if the firm has restated its earnings, 0 otherwise;
AS = a dummy variable coded 1if ICW area is Account-Specific, 0 otherwise
T = a dummy variable coded 1if ICW area is Training, 0 otherwise;
PERAP = a dummy variable coded 1 if ICW area is Period-End Reporting/ Accounting Policies, 0 otherwise;
RR = a dummy variable coded 1if ICW area is Revenue Recognition, 0 otherwise;
SOD = a dummy variable coded 1if ICW area is Segregation of Duties, 0 otherwise;
AR = a dummy variable coded 1if ICW area is Account Reconciliation, 0 otherwise;

SS = a dummy variable coded 1if ICW area is Subsidiary-Specific, 0 otherwise;
SM = a dummy variable coded 1if ICW area is Senior Management, 0 otherwise;
TI = a dummy variable coded 1if ICW area is Technology Issues, 0 otherwise.

Control variables are the same as defined in the first regression model.

Sample Selection

The sample of companies announcing restatement of financial statements for the period January 1, 2004 through December 31, 2005 is obtained from the Lexis-Nexis News Library using keyword searches for restatements. These include "restate", "restated", "revise", "revised", "adjust", "adjusted", and "error". Also, certain companies are added that were obtained from a listing of firms that announced restatements and is compiled by Compliance Week. Compliance Week compiles its list from data taken from disclosures within the Russell 3000 Index and represents approximately 98% of the U. S. market (Compliance Week, 2005). The sample includes only misstatements of earnings rather than misstatements for technical reasons. Technical restatements are not caused by improper accounting methods and arise from routine actions including FASB emerging-issues task force rulings and discontinued operations. Prior research typically ignores technical restatements (Raghunandan et al., 2003; Palmrose & Scholz, 2004). Following Agrawal and Chadha (2005), we exclude retroactive restatements required by GAAP for accounting changes (e.g. change from FIFO to LIFO) and subsequent events (e.g. stock splits, mergers, and divestitures), preliminary earnings restatements that do not get reflected in published financial statements and cases where a potential restatement was announced but did not actually occur.

As shown in Table1, keyword sources generated 712 restatements between January 1, 2004 and December 31, 2005. Comparing this list to the Compliance Week database added 43 other firms, for an initial sample of 755 restating companies. Each company's reason for restatement is determined by reading through each announcement fully. Companies that restate for technical reasons (138) are dropped from the sample, as well as those whose financial data is not reported on the Compustat database (57), leaving 560 observations. For each restating firm, following Dechow et al. (1996) and Aier et al. (2005), a control firm is identified. The Compustat database is used to generate a matching (control) sample based on (1) similar size (total assets at the end of the year before the year of announcement of the restatement), (2) industry (4-digit SIC code), (3) year (using the year of accounting misstatement), and (4) firm did not restate its earnings in the 2 years prior to the date of the restatement announced by its matched firm. Of the 560 restating companies remaining in the sample, a matching control firm for 42 could not be identified. The final sample consists of 518 restating firms matched with 518 control firms for a total of 1,036 observations.

TABLE 1	
Sample Selection	
Number of Selection Criteria	Observations
Keyword searches	712
Other sources	43
Initial Sample	755
Reasons for deletions:	
Technical restatements	138
Compustat data not found	57
Matching company not found	42
Number deleted	237
Subtotal for restatement sample	518
Add: Control sample matched on size, industry and year using the Compustat database	518
Total observations	1036

Compliance Week is used to identify firms that reported material control weaknesses during the period January 2004 through December 2005. A total of 842 companies reported material internal control weaknesses during the period. Each of the disclosures is read to determine if the identified disclosure pertains to an identified material internal control weakness. Finally, those companies in both the restating and control groups that reported internal control weaknesses are identified. This sample group totals 214 firms. Each of these disclosures is read to determine the number of material weaknesses identified. Using Ge and McVay (2005)'s classification of internal control deficiency type, each weakness is then categorized into one or more of nine categories (see Appendix A).

RESULTS

Table 2 presents descriptive statistics of the 518 restating companies and 518 control companies. The average restating company is 19.69 percent larger than the companies in the control sample ($7.808 billion versus $6.524 billion total assets). However, restating companies have, on average, lower net income (14.70 percent), lower market values (11.30 percent), and lower market/book ratios (20.10 percent) suggesting that restating companies do not perform as well as companies in the control group. Restating companies also have a significantly lower price-to-earnings ratio (47.15 percent) than the control group, suggesting from the literature review that the market penalizes companies that restate earnings. The differences between the restating and control groups in total assets, net income, market values, and market/book ratios are not statistically significant suggesting the matching is appropriate.

Aier et al. (2005) find similar non-statistical results on many of the same variables to check for differences between restating and non-restating firms. Aier et al. (2005) find that total assets, net income, market values, market/book ratios and price-to-earnings ratio are not significantly different from zero. This paper's and Aier et al. (2005) result's are in contrast to that of Richardson et al. (2002). Richardson et al. (2002) report that price-to-earnings ratio,

book-to-market ratio, and net income are all statistically significantly lower for restating companies. Finally, the measures used to determine earnings management, free cash, financing raised and leverage, are not significantly different between the restatement and control groups.

TABLE 2
Financial Statistics for Companies Examined

Restatement Sample (n = 518)			Control Sample (n = 518)		
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean Diff.[a]
Total Assets	7,808.524	59,622.320	6,524.047	46,899.882	1,284.477
Net Income	112.590	836.117	131.995	722.536	-19.405
Market Value	2,798.407	12,276.037	3,154.770	11,056.853	-356.363
Market/Book	3.081	11.976	3.856	13.679	-0.775
Price/Earnings	9.104	74.102	17.234	72.098	8.130*
FreeC	-0.050	0.440	-0.012	0.271	-0.038
FinRaised	0.218	0.385	0.186	0.325	0.032
LEV	0.274	0.329	0.290	0.536	-0.016

[a]** Signifies statistically significant (p-value is less than 0.05) and * signifies marginally significant (p-value is less than 0.10) using a t-test.

Total Assets = total dollar value of the company's assets in millions (Compustat data item 6);
Net Income = total dollar value of the company's bottom-line net income in millions (Compustat data item 172);
Market Value = total market value in millions of dollars calculated as the year-end closing share price multiplied by the year-end number of shares outstanding (Compustat data item 24 multiplied by Compustat data item 25);
Market / Book = the ratio of the company's market value divided by the company's book value of net assets (market value from above/Compustat data item 216);
Price / Earnings = measured as the company's year-end closing price divided by earnings per common share-excluding extraordinary items (Compustat data item 24 / Compustat data item); 58
FreeC = net cash flows from operating activities (Compustat data item 308) less average capital expenditures (Compustat data item 128) deflated by total assets. (Compustat data item 6);
FinRaised = sum of new debt and equity issued by the company (Compustat data item 108 plus data item 111) deflated by total assets (Compustat data item 6);
LEV = total debt (Compustat data item 34 plus data item 9) deflated by total assets (Compustat data item 6);

A description of the sample by industry is reported in Table 3. Manufacturing and Service companies represent over half of the sample with a total of 29.92 percent and 21.81 percent respectively. Transportation & public utilities companies represent 14.67 percent of the sample, the retail trade industry accounts for 13.13 percent, and finance, insurance and real estate firms make-up 11.20 percent of the sample. Mining (5.41 percent), wholesale trade (3.09 percent), construction (0.58 percent), and agriculture, forestry, and fishing (0.19 percent) constitute the remainder of the sample. The public administration and non-classifiable

establishments industries are not represented in the sample. We are confident that the sample is reasonably representative of the economy.

TABLE 3
Description of Sample by Industry (SIC Code)

Industry (SIC)	Number of Companies	Percentage of Sample
Agriculture, forestry, and fishing (01-09)	2	0.19%
Mining (10-14)	56	5.41%
Construction (15-17)	6	0.58%
Manufacturing (20-39)	310	29.92%
Transportation and public utilities (40-49)	152	14.67%
Wholesale trade (50-51)	32	3.09%
Retail trade (52-59)	136	13.13%
Finance, insurance, and real estate (60-67)	116	11.20%
Services (70-89)	226	21.81%
Public administration (91-97)	0	0.00%
Nonclassifiable establishments (99)	0	0.00%
Total	1,036	100.00%

Table 4 summarizes the logistical regression analysis of whether financial restatements are associated with the presence of material internal control weaknesses. The ICW (p-value < 0.001) variable is significantly associated with restatements. Therefore, it appears that the incidence of a reported material internal control weakness is more likely for a company that restates its earnings than for a company that does not. Thus, we reject the null hypothesis (supporting H_1).

TABLE 4
Ability of Reported Material Internal Control Weakness to Explain the Likelihood of Making an Earnings Restatement

$$REST_{it} = \beta_0 + \beta_1 ICW + \beta_2 FREEC + \beta_3 FINRAISED + \beta_4 LEV + \varepsilon$$

	Coefficient	Standard Error	Significance
Intercept	-0.347	0.092	0.000***
ICW	1.796	0.190	0.000***
FREEC	-0.217	0.254	0.392
FINRAISED	0.260	0.239	0.278
LEV	-0.108	0.154	0.481

*, **, *** Significant at p =0.10, p = 0.05, and p = 0.01 level, respectively, in a one-sided hypothesis test

n= 1036 Pseudo $R^2 = 0.141$

REST = a dichotomous variable coded 1 if the firm has restated its earnings, 0 otherwise;
ICW = dummy variable coded 1 if the firm reported a material internal control weakness, 0 otherwise;
FREEC = net cash flows from operating activities (Compustat data item 308) less average capital expenditures (Compustat data item 128) deflated by total assets. (Compustat data item 6);
FINRAISED = sum of new debt and equity issued by the company (Compustat data item 108 plus data item 111) deflated by total assets (Compustat data item 6);
LEV = total debt (Compustat data item 34 plus data item 9) deflated by total assets (Compustat data item 6);

Tests of the control variables reported in Table 4 indicate that none of the variables are significantly different from zero. Prior research shows conflicting results. For example, Richardson et al. (2002) and others, find significance in the control variables, while Aier et al. (2005) do not. This finding may be attributed to the matching procedure used to generate the control sample. Richardson et al. (2002) use all companies in the Compustat database as the control sample, while Aier et al. (2005) and this study match each restating company based on size, industry, and year of the restatement.

Table 5 summarizes the logistical regression analysis of whether the restatements of financial statements are associated with the number of reported material internal control weaknesses. The NUMBER variable is marginally significant in relation to restatements (p-value<0.10). It appears that as the number of reported material control weaknesses rises, so does the probability of a firm restating its earnings. Companies with fewer reported material internal control weaknesses are less likely to restate their earnings. Thus, we reject the null hypothesis (supporting H_2).

TABLE 5

Ability of the Number of Reported Material Internal Control Weakness to Explain the Likelihood of Making an Earnings Restatement

$REST_{it} = \beta_0 + \beta_1 NUMBER + \beta_2 FREEC + \beta_3 FINRAISED + \beta_4 LEV + \varepsilon$

	Coefficient	Standard Error	Significance
Intercept	-1.052	.345	0.002***
MAGNITUDE	.276	.161	0.085*
FREEC	.633	.773	0.413
FINRAISED	-.361	.710	0.611
LEV	.271	.645	0.675

*, **, *** Significant at p =0.10, p = 0.05, and p = 0.01 level, respectively, in a one-sided hypothesis test

n = 214 Pseudo R^2 = 0.042

REST = a dichotomous variable coded 1 if the firm has restated its earnings, 0 otherwise;
NUMBER = number of material internal control weaknesses reported
FREEC =net cash flows from operating activities (Compustat data item 308) less average capital expenditures (Compustat data item 128) deflated by total assets. (Compustat data item 6);
FINRAISED = sum of new debt and equity issued by the company (Compustat data item 108 plus data item 111) deflated by total assets (Compustat data item 6);
LEV = total debt (Compustat data item 34 plus data item 9) deflated by total assets (Compustat data item 6);

Table 6 summarizes the logistical regression analysis of whether financial restatements are associated with the type of reported material internal control weaknesses. The AS (p-value < 0.001) variable, PERAP (p-value < 0.005) variable, and the RR (p-value < 0.023) variable are significant and positively associated with the probability of restatement. Therefore, it appears that those material internal control weaknesses more closely associated with account-specific, revenue recognition, period end reporting and accounting policy deficiencies are more likely to

increase the probability of a company restating its earnings. None of the other variables are statistically significant. Material internal control weaknesses classified as training, segregation of duties, account reconciliation, subsidiary specific, senior management and/or technological issues do not appear to significantly increase the likelihood of a restatement. Thus, we reject the null hypothesis (supporting H_3).

TABLE 6

Ability of Type of Reported Material Internal Control Weakness to Explain the Likelihood of Making an Earnings Restatement

$$REST_{it} = \beta_0 + \beta_1 AS + \beta_2 T + \beta_3 PERAP + \beta_4 RR + \beta_5 SOD + \beta_6 AR + \beta_7 SS + \beta_8 SM + \beta_9 TI + \beta_{10} FREEC + \beta_{11} FINRAISED + \beta_{12} EPSGROWTH + \beta_{13} LEV + \varepsilon$$

	Coefficient	Standard Error	Significance
Intercept	-.297	.090	0.001***
AS	1.786	.298	0.000***
T	-.748	.493	0.129
PEPAP	1.041	.372	0.005***
RR	1.848	.813	0.023***
SOD	.236	.867	0.786
AR	1.319	1.144	0.249
SS	20.742	13127.009	0.999
SM	.576	.898	0.521
TI	.250	.745	0.737
FREEC	-.235	0.256	0.359
FINRAISED	.283	0.241	0.241
LEV	-.131	0.154	0.396

*, **, *** Significant at p =0.10, p = 0.05, and p = 0.01 level, respectively, in a one-sided hypothesis test

n = 1036 Pseudo $R^2 = 0.148$

REST = a dichotomous variable coded 1 if the firm has restated its earnings, 0 otherwise;
AS = a dummy variable coded 1if ICW area is Account-Specific, 0 otherwise
T = a dummy variable coded 1if ICW area is Training, 0 otherwise;
PERAP = a dummy variable coded 1if ICW area is Period-End Reporting/Accounting Policies, 0 otherwise;
RR = a dummy variable coded 1if ICW area is Revenue Recognition, 0 otherwise;
SOD = a dummy variable coded 1if ICW area is Segregation of Duties, 0 otherwise;
AR = a dummy variable coded 1if ICW area is Account Reconciliation, 0 otherwise;
SS = a dummy variable coded 1if ICW area is Subsidiary-Specific, 0 otherwise;
SM = a dummy variable coded 1if ICW area is Senior Management, 0 otherwise;
TI = a dummy variable coded 1if ICW area is Technology Issues, 0 otherwise;
FREEC =net cash flows from operating activities (Compustat data item 308) less average capital expenditures (Compustat data item 128) deflated by total assets. (Compustat data item 6);
FINRAISED = sum of new debt and equity issued by the company (Compustat data item 108 plus data item 111) deflated by total assets (Compustat data item 6);
LEV = total debt (Compustat data item 34 plus data item 9) deflated by total assets (Compustat data item 6);

CONCLUSIONS

This paper provides empirical evidence on the association between reported material internal control weakness and the probability of a company restating its earnings based on a sample of 518 restating companies and 518 matching companies selected from the period January 1, 2004 through December 31, 2005. After analyzing and interpreting the results, we have concluded that all three tests failed to reject the null hypotheses. First, this study finds a significant relationship between the presence of material internal weaknesses reported by the firm and the probability of a firm restating its financial statements. Results indicate that the presence of a reportable weakness increases the probability that a company will restate its earnings. This finding makes intuitive sense in light of the PCAOB Auditing Standard No.2 that defines a material weakness as a significant deficiency or a combination of significant deficiencies, resulting in more than a remote likelihood that a material misstatement of the annual or interim financial statements will not be prevented or detected on a timely basis. Firms that have identified and reported a material weakness in internal control would be expected to experience a higher probability of restatement due to the internal control weakness.

Second, the number of material internal control weaknesses reported by the firm is significantly related to the probability of a firm restating its earnings. The higher the number of material weaknesses reported by a company, the greater the probability that the company will restate its earnings. These results make sense intuitively as the greater the number of material weaknesses existing in internal control, the greater the probability that a company would not find errors that eventually lead to restatements.

Finally, the type of material internal control weakness is significantly related to the probability of a firm restating its earnings. This study finds that companies that report material weakness in accounting related areas such as accruals, revenue recognition, period-end closings and accounting policies, and complex areas such as derivative and lease accounting, are more likely to restate earnings than those companies reporting material weakness in non-accounting areas such as training, segregation of duties, senior management, and subsidiary specific areas. These findings lend support to the research that emphasizes the importance of income statement accounts, e.g. Penman (2001). This research finds that those accounts that affect the ongoing operating results of the firm and include revenue, COGS, and SGA expense are more important to investors than one-time items like goodwill and research and development. This research gives evidence that accounting specific and accounting related material weaknesses are an important determinant in non-GAAP reporting. These findings are important because they help us to develop a more complete understanding of the determinants of non-GAAP accounting.

This study has limitations due to the sample composition. Smaller companies that restate earnings are not included in this study because they do not appear in the Lexis-Nexis database. This study identified 712 restatements through keyword searches over the period 2004 to 2005. In comparison, Glass-Lewis & Co. identified 1,295 restatements in 2005 alone, consisting of

many smaller public companies and small-business, or "SB" filers. This study also classifies material internal control weaknesses according to one technique. There are numerous other schemas available to classify material weakness. Other classification could result in different findings. Another limitation is based on the measurement of the number of material weaknesses. This measure does not capture the true pervasiveness of the weaknesses. Pervasiveness could include the frequency of occurrence and the length of time an internal control weakness persists.

Prior research finds that the market reacts more strongly to surprises in persistent or on-going operating income than to one-time items that affect income only on special occasions and do not persist into future periods (Elliot & Hanna, 1996). Future research might investigate the relationship between the types of material weakness reported and the types of account affected by a restatement.

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APPENDIX A

Material Weakness Classification and Examples

Account-Specific

Internal control matters with respect to inventory transactions
Inadequate internal controls for accounting for loss contingencies, including bad debts
Improper accounting for accruals such as prepaid expenses and accrued expenses
Improper accounting for income taxes
Internal control deficiencies related to the reconciliation of service advances
Problems, such as a lack of effective documentation, with options and other compensatory equity grants
Improper accounting for derivatives
Failure to record patents or trademarks in a timely fashion, or to analyze timely the patents and trademarks for usefulness and possible impairment
Weaknesses in the process to gather information in order to complete the annual impairment testing of recorded goodwill and indefinite lived intangible assets
Inadequate procedures to reconcile intercompany accounts and transactions
Inadequate implementation of uniform controls over certain acquired entities and operations
Improper accounting procedures for capitalized software development
Improper accounting for an equity method investment
Weak procedures for applying SFAS No. 131, such as segment determination
Inadequate control over classification of certain fixed asset balances
Deficiencies in the documentation of a receivables securitization program
Improper accounting for convertible debentures with warrants and related measurement and recognition of beneficial conversion and warrant discounts and issuance costs
Improper accounting for pension liability
Weaknesses in the process to record liabilities related to large deductible insurance programs
Lack of compliance with established procedures for appropriately applying SFAS No. 5, *Accounting for Contingencies*

Training

Inadequate qualified staffing and resources leading to the untimely identification and resolution of certain accounting and disclosure matters and failure to perform timely and effective reviews.
The need to increase the training of the financial staff.
Period-End Reporting/Accounting Policies

Deficiencies in the period-end reporting process (closing process)
No adequate internal controls over the application of new accounting principles or the application of existing accounting principles to new transactions
The absence of ineffectiveness of a rule compliance checking procedure for SEC filings
A lack of effective record keeping and compliance assistance for reports required under Section 16(a) of the Exchange Act
Inadequate internal controls relating to the authorization, recognition, capture, and review of transactions, facts, circumstances, and events that could have a material impact on the company's financial reporting process
Deficiencies related to the design of policies and execution of processes related to accounting for transactions
Weaknesses related to the establishment of standards for review of journal entries and related file documentation
Deficiencies related to the accounting and financial reporting infrastructure for collecting, analyzing, and consolidating information to prepare the consolidated financial statements
Inadequate procedures for appropriately assessing and applying certain SEC disclosures and requirements
Inconsistent application of accounting policies

Revenue Recognition

Weak internal controls related to the design and review of revenue-recognition policies
Weak internal controls related to contracting practices
Weaknesses over certain internal controls related to the detection of side letters and the process of investigating customer assertions regarding terms not specified in the agreements

Segregation of Duties

Weak internal controls and procedures relating to separation of duties (e.g., lack of separation of certain duties between payroll and other accounting personnel)
Inappropriate segregation of duties to ensure that accurate information is contained in certain types of internal and external corporate communications, including press releases

Account Reconciliation

Problems with certain accounting reconciliations and review procedures
Lack of compliance with established procedures for monitoring and adjusting balances relating to certain accruals and provisions, including restructuring charges

Subsidiary-Specific

Deficiencies related to the timely completion of statutory filings in foreign countries
Deficiencies related to the timely and complete revelation of material contracts entered into by subsidiaries of the company
Employees overseas engaged in improper transactions and unauthorized trading
Internal accounting control that could have permitted employees at certain company locations to circumvent federal and state laws relating to the reporting of certain cash payments

Senior Management

Override by senior management
Ineffective control environment
No full-time CFO who has SEC and reinsurance experience to focus on the financial affaire of the company

Technology Issues

The security of systems used for the entry and maintenance of accounting records requires additional documentation and scrutiny to ensure that access to such systems and the data contained therein is restricted to only those employees whose job duties require such access
Information technology has a number of areas where formal, documented policies and procedures have not been developed

AN EX-POST EVALUATION OF SARBANES-OXLEY ACT ON FIRMS' INTRINSIC VALUE: A PRINCIPAL-AGENT FRAMEWORK

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ABSTRACT

The Sarbanes-Oxley Act of 2002 (SOX) is viewed as the regulatory solution to accounting and financial scandals that creates a way of re-aligning the goals and behavior of the manager-agent and auditor-agent with those of the shareholder-principal to maximize the firm's intrinsic value, true returns and risk. A principal-agent model with multiple agents and risk considerations is developed and empirical tests are used to evaluate the effectiveness of SOX. This framework seems to explain auditor-agent and manager-agent behavior in issuing accurately stated financial statements, implying the use of less aggressive earnings management strategies. Relative to the pre-SOX period, the new principal-agent relationship appears to explain greater goal congruence in the post-SOX period.

INTRODUCTION

In 1998, the Chairman of the Securities and Exchange Commission (SEC) warned the financial community about aggressively managing reported earnings and making deliberate misstatements regarding firm performance because it was eroding the quality of financial reporting (Levitt 1998). Within a few years, a string of accounting scandals and forced restatements of financial reports emerged by very large companies among the Fortune 500, such as Enron, WorldCom, Tyco, HealthSouth, and Global Crossing who were seemingly oblivious to the warning. Managers had pursued their own self-interests despite the SEC's warning about the numbers game eroding the integrity of the financial reporting system. The problem manifested by material misrepresentations, inaccurate reporting by managers and ineffective auditing by auditors. It resulted in wiping out billions of dollars in shareholder wealth and, consequently, impaired the efficiency and liquidity of the US capital markets. Not only does such action lead to low investor confidence about the reliability of financial statements, it also impacts the intrinsic value of the firm.

In response, the U.S. Congress passed the Public Company Accounting Reform and Investor Protection Act of 2002, commonly called the Sarbanes-Oxley Act of 2002 (SOX), which was signed by the President into law on July 30, 2002, with the objective of restoring investor confidence in the quality of financial reporting (U.S. Congress 2002) and aligning the

goals of management and stockholders. We assert that the uncertainty about managers telling the truth about the outcome of their reported actions is a moral hazard problem that makes it difficult for shareholder-principals to evaluate the true profitability and risks of their capital investments. An agency problem exists when an agent puts their own self-interest ahead of the principals' (shareholders'), who compensates the agent to make reporting decisions that benefit the firm in the long run (i.e., Berle and Means 1932; Ross 1973; Jensen and Meckling 1976; Jensen and Murphy 1990). In the Pre-SOX period, we assert that two types of agents, the manager and the independent auditor, contribute to the moral hazard agency problem related to inaccurate financial reporting. First, if the manager-agent plays the numbers game and excessively manages earnings, then the quality of financial reporting erodes. (For example, in 2001 and 2002, many headlines linked Fortune 500 companies to a wave of accounting irregularities and securities fraud.) Consequently, such erosive and self-interested actions can destroy billions of dollars of shareholders wealth. Second, failure of the auditor-agent to conduct effective independent monitoring of its large audit clients and not obfuscate their interest with the client's may contribute to auditor-agent's own demise (e.g., Arthur Andersen LLP). Prior to SOX, however, each of the Big 5 accounting firms had several large audit clients under SEC investigation (Scott and Gist 2010).

The Sarbanes-Oxley Act is aimed at re-aligning the behaviors of the manager-agent and auditor-agent with those of the shareholder-principal by providing incentives for accurate financial reporting by managers and reliable assurance services by auditors to the shareholders. Whether SOX was effective in realigning the agents' goals in line with those of the shareholders is an empirical question, requiring ex-post comparison of risk and return data in a behavioral modeling framework. Some studies have focused on surveys to draw implications about the perceived benefits of SOX relative to the expected internal control compliance costs (Carney 2005; Solomon and Bryan-Low 2004 WSJ; Serwer 2006 Fortune; DaVay 2006; Bedard 2006). Other studies have examined the market reaction to SOX-related events (i.e., Zhang 2007, Li, Pincus and Rego 2008); documented changes in firm behavior by adopting strategies to avoid SOX requirements, such as going private or delisting (i.e., Leuz, Triantis and Wang 2008); and examined how SOX has affected managerial decisions related to discretionary accruals and corporate investments (i.e., Cohen Dye and Lys 2007; Bargeron, Lehn and Zutter 2009). The focus on incentives to realign behavior and goals between agents and principal and resolve the bigger moral hazard issues is yet to be addressed.

In this exploratory study, we develop a principal-agent model with risk considerations and evaluate the effectiveness of SOX on the firm's intrinsic value. We assume that audit fees and various forms of management compensation are used by the principal to induce high effort on the part of the agents. We also assume that in the post-SOX era firms will adopt either one of three earnings management strategies: avoid negative return on equity, target industry or market averages, or exceed industry or market expectations. It is important to note that auditors in the U.S. may not require firms to meet specific performance goals, but will evaluate performance

vis-à-vis industry performance. A Mann Whitney U-test was used determine if distributions around the three earnings management targets were distinct. A random utility discrete choice model was used to empirically test the theoretical findings. The cluster approach used to examine earnings and evaluate the effectiveness of SOX is intuitive and direct. It does not require estimates of normal or abnormal accruals which are inevitably noisy. It is hypothesized that SOX, on average, will encourage earnings management towards the industry average and provide disincentives to managers to engage in excessive high risk, high return strategies. Such actions will have a positive impact on the intrinsic value of the firm and could be effective in minimizing the moral hazard problem related to the quality of financial reporting. This paper is organized as follows. Section 2 discusses agency theory under SOX and assessing goal congruence with SOX. Section 3 describes the theoretical framework. Section 4 describes the empirical method and data used. The results are presented in Section 5 and we conclude the paper in Section 6.

AGENCY THEORY, GOAL CONGRUENT, AND EARNINGS MANAGEMENT WITH SOX

Agency Theory under SOX

The CEO is an agent of the shareholder-principal. The CEO-agent is hired to make decisions, to manage the corporation and increase the value of the firm. The independent auditor is also an agent of the shareholder-principal. The independent auditor-agent performs an audit and verifies the faithfulness of reported numbers from the manager-agent on behalf of the shareholder-principal. The monitoring role of the independent auditor is to give the shareholder-principal a level of assurance about the relevance and reliability of the financial reports prepared by the manager-agent.

The concern about the perception of auditor-agents seemingly acting in their own self-interest is due to (a) earning nontrivial revenues from non-audit services equal to or greater than the respective audit fees, and/or (b) acquiescing to management pressure on reporting issues and allowing manager-agents to aggressively manage earnings to the point of deliberate misstatements. Such uncertainty about manager-agent and auditor-agent behaviors creates a moral hazard problem and makes it difficult for the shareholder-principal to evaluate the true returns and risks of their capital investments. A major goal of Congress, through the implementation of SOX, was to minimize the agency problem that resulted in so many accounting irregularities.

We highlight a few changes to the corporate governance system (principal-agent relationship) required by SOX. (1) To implement SOX, a new federal agency called the Public Company Oversight Board (PCAOB) was created. The PCAOB has oversight responsibility of the independent accounting firms (Section 103). (2) SOX prohibited the independent accounting

firms from providing certain non-audit services to their audit clients in an effort to enhance the perception of auditor independence in-fact and in-appearance (Section 201). This specific action reduces the future stream of revenues from non-audit services and lessens the auditors' motivation to give into management pressure. (3) Prior to SOX, the CEO would make the decision to retain the independent auditor and the auditor would report audit results to the CEO. Post SOX, it is the audit committee of the Board of Directors that makes the independent auditor retention decision and to whom the auditor reports (Section 204). (4) In addition, the Board's audit committee must pre-approve all audits and permitted non-audit services (Section 202). (5) SOX contains provisions that require both the CEO and CFO to certify that, to the best of their knowledge, the financial report filings with the SEC are accurate and that non-deficient internal financial controls are in place (Section 302). (6) Now, intentional misrepresentation of financial reports and disclosures submitted to the SEC carries substantial criminal penalties of up to 20 years of imprisonment (Section 802). (7) Finally, independent auditors are required to audit the internal controls of the financial reporting system of the company (Section 404).

This study does not assess the adequacy of the internal control requirements of SOX. Rather, we focus on goal congruence, whether SOX effectively realigns the principal-agent relationship to improve the intrinsic value of the firm. Section 404 creates great controversy as executives complain about the current and expected internal control compliance costs to acquire the relative perceived benefits of SOX (i.e., Carney 2005; Solomon and Bryan-Low 2004 WSJ; Serwer 2006 Fortune; DaVay 2006). Bedard (2006) finds that the internal control requirements of Section 302 and Section 404 SOX improve the quality of reported earnings based on the magnitude of unexpected accruals. Various researchers and executives have complained that the expected hefty costs of internal control compliance may lead to higher expenses and lower earnings that may possibly affect their compensation. This study adds to the literature since little or no empirical evidence has been provided about the impact of SOX in resolving the agency problem and on firms' intrinsic value, true profitability and risks.

Assessing Goal Congruence and Earnings Management with SOX

Goal congruence is the desired outcome from the shareholder-principal's point of view. If the manager-agent is making decisions in the best interest of the shareholder-principal then goal alignment has occurred. There had been much discussion of how and whether corporations adequately solve the issue of motivating the manager-agent to act in the best interest of the principal (Garen 1994). "Management's goal should be to take actions designed to maximize the firm's intrinsic value, not its current market price," (Brigham and Houston 2007 p. 11). Proper action of producing accurate financial reports over the long run increases the credibility of management's financial reporting output over the long run. In the principal-agent relationship, the principal is at an information disadvantage as agents have better information about their actions that influence intrinsic value. The principal is unable to observe and verify every action

of the agent. This modeling process views the incentives of two agents, the manager and the independent auditor.

In this study, we assume that both the agents and principal are risk averse, compared to traditional principal-agent models where only the principal is assumed to be risk averse. That is, the principal and agents prefer to take actions that avoid risk and negative outcomes such as managers incurring a criminal penalty for intentional inaccurate reporting or auditors impairing the reputation of their audit service. The underlying assumption is that achieving principal-agent goal congruence will lead to more accurate reporting about performance that, in turn, will enhance the quality of financial reporting. This will increase shareholders' intrinsic value and increase their confidence about the credibility of the reports. Accurate reporting is evaluated empirically by: 1) comparing actual and predicted returns prior, during, and after SOX implementation and 2) determining the marginal contribution of incentives and restatements in achieving the principal's goal, to maximize intrinsic value. If goal congruence is not obtained, then SOX will be ineffective in realigning actions of the agents with those of the principle and, consequently, will not enhance investor confidence about the quality of financial reporting.

Managers are paid to manage earnings and for achieving desired operating performance targets such as net income and return on equity (ROE) measures. The successfulness of attaining the desired target measures has economic consequences for the managers in the form of cash, bonuses, and stock compensation. There are two common ways that managers can practice earnings management: accrual-based earnings management and real earnings management. Accrual-based earnings management occurs through the use of accounting estimates, such as bad debt expense and depreciation expense. The accounting estimates use various assumptions, based on the manager's judgment, in the calculation of particular expenses. (An example of a discretionary accrual based expense is the calculation of depreciation expense for a long-term asset. Depreciation expense is based on the manager's assumption of the estimated life and the estimated salvage value at the end of the estimate life for that long term asset and the choice of measurement method such as straight-line or accelerated.) In accordance with generally accepted accounting principles (GAAP), managers have the discretion to choose certain assumptions that may increase (or decrease) current reported earnings to achieve the targeted profitability metrics, such as net income and/or ROE. In contrast, real earnings management occurs through events and transactions that affect reported earnings, such as reporting lower cost of goods sold through increased production, or accelerating the timing of asset sales through increased price discounts. A substantial difference between accrual based and real earnings management is that discretionary estimations can be subsequently revised, whereas once a company sells an asset, it cannot undo this event without creating another real transaction. Aggressive (as opposed to conservative) earnings management tends to maximize current net income and return on equity measures, sometimes to the point of deliberate misstatements that overstate firm performance (i.e., Enron).

Prior studies find empirical evidence that managers are using less accrual based earnings management in favor of more real earnings management transactions after the passage of SOX, relative to the pre-SOX period (Lobo and Zhou 2009; Cohen, Dye and Lys 2007a). The choice of earnings management strategies may be motivated by section 802 of SOX that encourages more truth telling about the firm's actual performance and are dissuaded by the cost of intentional misrepresentation of financial performance of a fine plus up to 20 years of imprisonment. Relative to the pre-SOX period, Bargeron et al. (2009) and Cohen et al. (2007) document that managers choose less risky investment projects in the post-SOX period. The economic consequences of less risky investment projects decrease the potential of the firm to earn high returns relative to more risky investment projects, which may also have dampened performance measures in the post-SOX period. Bargeron et al. (2009) argue that the declines in major, new risky investment projects are partly due to managers' preoccupation with the risks and consequences of making a mistake. The Sarbanes-Oxley Act does not provide direction to the manager-agent in the choice of earnings management strategies or in the selection of alternative investment projects; rather, the goal of SOX is to prevent the issuance of misleading reports about the outcome of those choices (i.e., to reduce the moral hazard problem). However, comparison to industry averages and managing earnings to avoid negative returns are common practices (see Figure 1)

Major Factors affecting Goal Congruence

The main purpose of SOX is to protect current and future investors by improving the accuracy and reliability of corporate disclosures that will lead to restoring investor confidence in the integrity of financial reports prepared by the manager-agent.

Financial Restatements: When management discovers that previously issued financial statements are false and/or misleading, the error is corrected and reflected in the revised financial statements. The Securities and Exchange Commission indicates that managers have a duty to correct previously issued filings of financial statements that are later discovered to be inaccurate, incomplete or misleading (Skinner 1997). Therefore, the intrinsic value or true returns and risk of the firm are at issue. According to Turner and Weirich (2006), the number of financial restatements had increased since the passage of SOX. Eventually, as managers are deterred from overly aggressive management of earnings to the point of misleading investors, the needs to restate financial reports are expected to decrease. Research shows that restatements are, on average, significant economic events (Dechow et al., 1996; Palmrose et al. 2004). Palmrose, Richardson and Scholz (2004) examined the market reaction to a sample of 403 restatements announced from 1995 to 1999. Using a short two-day announcement window, they document a significant negative mean abnormal return of -9 percent. While Hranaiova and Byers (2007) regression results of dampened abnormal returns in the post-SOX period are consistent with Palmrose et al. (2004), Hranaiova and Byers find that the magnitude of negative market

abnormal returns are more than twice the magnitude of the positive abnormal returns in both the pre-SOX and post-SOX periods. Hence, the market perceives restatements as conveying negative information about the quality of financial reporting, thus eroding firm value.

Although restatements occur when managers correct previous reports and reissue more accurate information, not all restatements are a result of errors or fraud. For example, certain changes in accounting principles require restatement of prior period financial statements and are not considered errors. Therefore, in this study, restatements due to changes in accounting principles are not considered as a restatement, consistent with prior research. In this study, restatements are used as a surrogate variable to access the interests and marginal effects upon the agents' incentives that affect firms' intrinsic value pre- and post-SOX.

Incentive-based Compensation: Incentive based compensation is used to motivate the manager-agent to make decisions on behalf of the shareholder-principle. Compensation often contains two components, short-term and long-term incentives. The short-term component consists of cash and bonus compensation to motivate current performance. The long-term component consists of stock option compensation to motivate managers to make decisions that will improve the firm's long-term performance. The choice of earnings management strategies and risky investment projects in the post-SOX period, relative to the pre-SOX period, may not only dampen net income, but it may also affect certain components of managers' compensation (Cohen et al. 2007).

The Sarbanes-Oxley Act encourages good corporate governance by creating a way of realigning the actions and behavior of manager-agents by increasing their accountability (certification of accurate financial statements) and motivating truth telling (false information allows criminal prosecution). The Sarbanes-Oxley Act encourages good corporate governance by creating a way of realigning the actions and behavior of the auditor-agents by increasing the accountability (report audit results to the audit committee) and reputation of auditor independence (prohibition of certain non-audit services). We assert that the actions of increasing the accountability, truth telling, and reputation of the agents are linked to enhancing the principal-agent relationship, which is linked to long-term value creation or the intrinsic value of the firm.

THEORETICAL FRAMEWORK

As indicated earlier, one direct application of the principal-agent framework is that between stockholders-board of directors and the auditor. The problem may be illustrated by applying a variant of the moral hazard model by Varian (1992) to include both economic and regulatory incentives under conditions of risk and uncertainty. Extensive applications of the moral hazard model have been used by several economists (Prescott, 1999; Cooper and Ross, 1985; Richter et al., 2003; Elbasha and Riggs, 2003).

Consider a firm operating under approved SOX conditions which employs an auditor to perform audit activities. The board of directors (BoDs), (a select group of shareholders representing all shareholders) acting as principal, is assumed to be risk averse by seeking to maximize expected earnings and is willing to pay a risk premium, $c(g)$. The risk premium includes all costs, other than wages, required for effective implementation of SOX. It also includes incentives to set desired optimal earning management targets (e.g., probability that return on equity is within a desired range). The output produced by the manager of the firm, the financial reports, communicates financial information about the performance of the firm that the BoDs use to assess the firm's intrinsic value. The BoDs requires the auditor, acting as an agent, to perform monitoring services that will lead to greater accuracy in financial reporting of output (financial statements), denoted by Δ. Output is assumed to be discrete, and takes a value from within a finite range $\{\Delta_1,\ldots, \Delta_n\}$. This does not contradict the profit maximizing or cost minimizing objective of most economic operations because inaccurate financial reporting can wipe out profits and bankrupt the operation, as in the examples of Enron and WorldCom discussed earlier.

Moral hazard problems of financial reporting accuracy produced by the manager and audited by the auditor occurs when BoDs are unable to observe the agents' efforts, thereby creating a welfare loss. The inability of the principal to learn the agents' effort level merely by observing the outcome arises from the fact that outcomes are partly determined by chance, sometimes observed by an associated probability level. According to Weiss (1997), such a model could be applied in analyzing how effectively the principal guards against failures which are subject to chance.

The model by Richter et al. (2003) explains the role of psychic income and current monetary incentives in reducing welfare loss. This model assumes that the effort applied by the agent is discrete, and has only two levels, high effort, e_H and low effort, e_L. It is assumed that the auditor-agent operates under SOX guidelines, g, prior to starting work, so that an increase in psychic income is induced each time the auditor does a good auditing job. Effort creates disutility in the auditor, so that the disutility of high effort, $d^H(g)$, is greater than the disutility of low effort, $d^L(g)$. In addition, it is assumed that the manager-agent operates under SOX guidelines, g, prior to starting work, so as to avoid substantial criminal penalties due to intentional misrepresentations to the SEC. Similarly, effort creates disutility in the managers, so that the disutility of high effort, $d^H(g)$, is greater than the disutility of low effort, $d^L(g)$.

In the model, SOX regulation is assumed to affect the agents' disutility of effort because it increases the likelihood of accurate financial restatement and strengthens the firms' internal control system and adherence to GAAP. SOX decreases the disutility of exerting high effort and increases the disutility of exerting low effort so that $\partial d^H(g)/\partial g < 0$ and $\partial d^L(g)/\partial g > 0$.

To construct the BoDs-principal's benefit function, we let *f*(*r*) be the returns from accurate reporting by the firm (including restatements *r*), and *w*(*r*) be the monetary payment to the agent so that $\partial f(r)/\partial r > 0$ and $\partial w(r)/\partial r > 0$. Therefore the BoDs' benefit function is $f(r) - w(r) - c(g)$. Also, the agents are assumed to have a utility function defined as $U(w(r)) + d(g)$, with $U'(w(r))$, a von Neumann Morgenstern utility function strictly decreasing in w.

The model is further simplified by assuming that, although BoDs-principals cannot precisely determine the agents' effort level based on the value of output, given a certain level of effort, the probability distribution of returns or outcome Δ can be estimated using a discrete choice model. The probability distribution of Δ at high effort is defined as $\{\pi_{iH}\}$ and the probability distribution of Δ at low effort as $\{\pi_{iL}\}$. Since Δ is assumed to be discrete, it follows that both the monetary value of accurate financial reporting *f*(Δ) and monetary payment to the agent w(Δ) are also considered discrete. In reality, the principal will only be able to estimate Δ, and the higher the monitoring level (independence induced by SOX) the better the financial reporting will be.

If we assume, based on classic agency theory, that effort is not observable, then the problem when SOX is introduced is stated as:

$$1. \quad \max_{w_i} \sum_{i=1}^{n} E\left(f(\Delta_i) - w(\Delta_i)\right)\pi_{ie^*} - c(g)$$

$$\text{s.t.} \quad \sum_{i=1}^{n} U\left(w(\Delta_i)\right)\pi_{ie^*} - d^{e^*}(g) \geq \bar{U}$$

$$e^* \text{ solves } \max_{e} \sum_{i=1}^{n} U\left(w(\Delta_i)\right)\pi_{ie} - d^{e}(g),$$

where the first constraint is the participation or individual rationality constraint, and the second constraint is the incentive compatibility constraint. The risk averse BoDs' goal is to maximize long run earnings or intrinsic value. However, the risk averse auditor-agent could choose not to accept the contract and indulge financial restatement or the risk averse manager-agent could choose not to accept do more work for less pay, unless the agent receives at least his reservation utility level $\bar{U}$. The participation constraint becomes binding at the optimum. If the incentive compatibility constraint is satisfied, then the auditor-agent finds it optimal to exert the effort level that the BoDs-principal wants him to apply.

The problem in equation 1 is analyzed in two stages. First, the problem is solved with low effort and no SOX guidelines implemented. Under such circumstances, the optimum solution is to pay the agent a payment of

2. $$w = U^{-1}\left(\bar{U} + d^{L}(0)\right).$$

Because payments do not depend on the effort level applied by the agent, the agent will choose the effort level that brings about the lowest disutility, but still lets him earn his reservation utility. Adding SOX implementation guidelines to the low effort case will only lead to an increase in payments and costs since the disutility of low effort increases with SOX, such that only SOX guidelines solve the low effort situation.

The other scenario considers the high effort case with SOX guidelines. The problem is formulated with payment *w* as the only choice variable and SOX guidelines *g* as a parameter so that comparative statics can be performed on the optimized function while varying *g* (pre-SOX era, Sox era, and post-SOX era). This allows for a more intuitive understanding of the problem

3. $$\max_{w_i} \sum_{i=1}^{n} E\left[f(\Delta_i) - w(\Delta_i)\right]\pi_{ie} - c(g)$$

s.t.

$$\sum_{i=1}^{n} U\left(w(\Delta_i)\right)\pi_{iH} - d^{H}(g) \geq \bar{U}$$

$$\sum_{i=1}^{n} U\left(w(\Delta_i)\right)\pi_{iH} - d^{H}(g) \geq \sum_{i=1}^{n} U\left(w(\Delta_i)\right)\pi_{iL} - d^{L}(g),$$

where the first constraint is the participation constraint and the second constraint is the incentive compatibility constraint. The optimal payment scheme will maximize stockholders' expected returns by inducing the auditor to exert high effort and recommend restatements accordingly.

Extending the above problem to a multi-agent concept is a necessary but trivial problem. We have management as another agent performing the financial reporting tasks to accurately reflect performance. Both the management prepared financial statements and the auditor's opinion on those financial statements are considered a single joint output. Moral hazard issues arise for multi-agent problems when there is uncertainty in output because agents who cheat cannot be identified if joint output is the only observable indicator of inputs (Holmstrom 1979). The model assumes a risk averse principal and *k* risk-averse agents (in this case just two agents) producing a single output for which individual contributions cannot be differentiated

4. $$\max_{w_i} \sum_{i=1}^{n} E\left[f(\Delta_i) - \sum_{k=1}^{m} w_k(\Delta_i)\right]\pi_{ie} - \sum_{k=1}^{m} c_k(g)$$

s.t.

$$\sum_{i=1}^{n} U_k\left(w_k(\Delta_i)\right)\pi_{iH} - d_k^{H}(g) \geq \bar{U}_k$$

$$\sum_{i=1}^{n} U_k\left(w_k(\Delta_i)\right)\pi_{iH} - d_k^H(g) \geq \sum_{i=1}^{n} U_k\left(w_k(\Delta_i)\right)\pi_{iL} - d_k^L(g)$$

.

The Kuhn-Tucker conditions obtained when the Langrangian of the above problem is differentiated with respect to w show that

$$\frac{1}{U_k^{'}} = \lambda_{k1} + \lambda_{k2}(1 - \pi_{iL}/\pi_{iH}) \quad . \tag{5.}$$

Given $\lambda_{k1} > 0$, $\lambda_{k2} > 0$, this suggests that the optimal compensation for management (salaries plus stock option) and auditor (auditor fees) will depend on the likelihood ratio of π_{iL}/π_{iH}. The likelihood ratio is the ratio of probabilities of obtaining accurate financial reporting, i, given low and high efforts. For accurate reporting it implies SOX will induce high effort levels or a desire for the likelihood ratio to be large because a large amount of errors in reporting should be associated with low effort as compared to high effort. SOX will allow obtaining a better estimate of this ratio and induce high efforts from both agents to achieve targeted performance goals and avoid negative returns shareholders.

EMPIRICAL METHOD AND DATA

When managers have the choice of managing earnings around certain targets, the utility functions specified in the theoretical model can be estimated by a limited discrete choice model. The errors are assumed to be random independent variables and to follow a Weibull distribution. Consequently, the difference between errors is logistic (Domencich and McFadden 1975). With the assumption that the principal is risk averse, the BoD can optimize ROE performance standards. In this study we assume that the BoD has the choice of three alternative earnings management categories: abnormal positive earnings (ROE greater than 10 percent, higher than industry averages), normal earnings (ROE around 10 percent, or aggregate industry average), and negative earnings (ROE less than zero percent). Although these are reasonable earnings management targets, additional tests to ensure that the categories are significantly distinct were necessary. These tests are also used to determine whether aggregation of the data into discrete categories resulted in significant loss of information from observed ROE data. The non-parametric Mann-Whitney test (also known as Mann Whitney U-test when U is calculated) was used to ensure that aggregated data fell into distinct categories. This test is used instead of the parametric t-test because of deviations from normality and differences in the sub-sample sizes in each ROE category. Three test measures were performed for the three multinomial categories (normal versus abnormal, abnormal versus negative ROE and negative ROE versus normal around industry average) with the data assembled into a single set of size $N = n_a + n_b$ for each pair. The N-size measures are then ranked in ascending order, and the rankings returned to the original samples in place of the raw measures, so that n_a is the number of ranks in group A (normal

ROE), and n_b is the number of ranks in group B (abnormal). In addition, we define T_A as the sum of n_a ranks in group A, T_B as the sum of n_b ranks in group B, and T_{AB} as the sum of N ranks in groups A and B. The Mann Whitney test used here is based on the z test which is defined as $z = \frac{(T_{obs} - \mu_T) \pm 0.5}{\sigma_T}$, where T is the observed value for either T_A or T_B, μ_T is the mean of the corresponding sampling distribution of T, σ_T is the standard deviation of that sampling distribution, and 0.5 is used as a correction for continuity (with -0.5 used when $T_{obs}>\mu_T$ and +0.5 used when $T_{obs}<\mu_T$). With a calculated symmetric z-value of 234.71 and a p-value of 0.0001, we conclude that data for abnormal ROE and normal ROE can be grouped into separate discrete categories without significant loss of information.

To test the parameters of the principal-agent model (equation 5) and estimate the probability of returns for these three categories, the multinomial logit model is used. (However, results were compared with the ordered probit model results to assess robustness of parameter estimates.) In this model, the probability distribution of firm returns falling in one of the three ROE categories is a function of audit fees; non-audit fees; management compensation, with and without stock options (Stock options cashed over a period of time is identified in the literature as one strategy that can be used to align BoDs and managements' goal to maximize firm intrinsic value.); dummy variables for SOX and post SOX regulation; a dummy variable indicating restatements; a quadratic interaction term indicating the combined effects of the magnitude of restatement and stock compensation, incentives for both agents; and all three other arguments used to ensure ROE estimations, as in the DuPont analysis framework, are exhaustive were included (profit margin, asset turnover ratio, and the equity multiplier or a liability ratio capturing financing risk). The multinomial logit model is used because the dependent variable, the ROE category, is qualitative in nature and it is classified in more than two alternatives. The marginal impacts of the independent variables are used to evaluate transition probabilities for firms moving from one category to the next for the different years and as a result of SOX.

It is assumed that the negative ROE category is the base category (relating to firms managing their earnings to avoid loss) and is chosen outside of the modeling framework. Therefore, the probability of falling in the base category is indeterminate in the present choice set. Nevertheless, in normalizing the coefficients for 'negative ROE category' to zero, the problem is resolved (Amemiya and Nold, 1975). Full information maximum likelihood (FIML) is utilized to estimate the coefficients for the other 'normal ROE' and 'abnormal ROE' categories. The probability of the *j*th firm falling in the *i*th ROE category can be calculated as in equation 6 (Greene, 1995).

$$6. \qquad \text{Prob[choice j]} = \frac{\exp(\beta_j' X_{jt})}{\sum_i^J \exp(\beta_m' X_{mt})}, \; j = 0,1,\&\,2.$$

The marginal effects of the variables, X_j, can also be estimated. In the discrete choice model, the effect of a change in attribute *m* (such as audit fees, restatement, etc.) of the

alternative j on the probability that the firm would choose alternative *k* (where *k* may or may not equal j) is estimated as in equation 7 (Greene, 1995).

7. $\partial_{jk}(m) = \partial \text{Prob}[y_i=k]/\partial x_{ij}(m) = [1(j=k) - P_jP_k]\beta_m$

It is essential to evaluate the differential impacts of SOX on the quality of financial reporting, profitability and risk. The probabilities and marginal effects from the multinomial logit model are estimated by the LIMDEP econometrics software package (Nlogit version 3.0).

To assess the effectiveness of SOX, we obtain firm financial data, auditor fees, and executive cash and stock compensation data from the University of Pennsylvania's Wharton Research Database (WRDS) for years 2000 through 2005. We begin with year 2000 because that is the first year auditor fee data had become publicly available. We obtained 8,828 observations across 14 industries based on four-digit SIC codes. After the deletion of observations with significant missing data, and 100 outlier observations, our final sample consists of 7,497 observations, an average of approximately 1,065 firms per year. Firms in the durable manufacturing industry represent 26 percent of the sample. The computer and retail-other industries represent 15 and 10 percent, respectively, of the sample firms. Table 1 shows the distribution of all sampled firms by industry membership based on four-digit SIC codes.

Table 1

Industry membership

Industry	Pre-SOX	SOX	Post-SOX	Total
Other	17	10	32	59
Mining & Construction	53	30	123	206
Food	60	35	134	229
Textiles	163	90	333	586
Chemicals	76	43	162	281
Biotechnology/Pharmaceuticals	101	54	216	371
Extractive	100	53	214	367
Durable Manufacturers	516	300	1,112	1,928
Computers	307	177	618	1,102
Transportation	123	63	238	424
Retail - Wholesale	81	47	175	303
Services	159	92	335	586
Utilities Electric & Gas	99	56	214	369
Retail - Other	223	122	441	786
TOTAL	2,078	1,172	4,347	7,597

Classification of industry membership is similar to that of Frankel, Johnson, Nelson (2002). Industry membership is determined by SIC code as follows: mining and construction (1000-1999, excluding 1300-1399), food (2000-2111), textiles and printing/publishing (2200-2799), chemicals (2800-2824 and 2840-2899), biotechnology/pharmaceuticals (2830-2836 and 8731-8734), extractive (1300-1399 and 2900-2999), durable manufacturers (3000-3999, excluding 3570-3579 and 3670-3679), computers (3570-3579, 3600-3679 and 7370-7379), transportation (4000-4899), retail–wholesale (5000-5999, excluding 5200-5961), services (7000-8999, excluding 7370-7379), financial services (6000-6798), utilities electric & gas (4900-4999), retail-other (5200-5961), and other (000-0999, 9000-9999).

Since restatements that most concern investors involve overstatement of revenues and accounts receivable as well as improper recognition of expenses, we first identify financial restatements that involve total assets (Compustat data6), sales (Compustat data12), and net income (Compustat data172). Next, we compare the originally stated values to the respective restated values (Compustat data120, data117, and data177) to obtain differential values. Restatements were identified if the differential value is nonzero. Restatements due to discontinued operations, changes in accounting principles, and acquisitions/mergers are not counted as restatements, consistent with prior studies. Then, if one or all three differential values obtain a nonzero value per firm in a given year, we consider it as a single restatement item for that year for that firm to avoid double counting. In addition, we divide our sample into three sample periods, Pre-SOX (years 2000 – 2001), DSOX or year of SOX implementation (year 2002), and Post-SOX (years 2003 – 2006). This allows us to assess the marginal effects of restatements upon intrinsic value and evaluate the differences between actual and predicted earnings for those periods. Table 2 shows the number of restatements per year for pre-, during, and post- SOX periods. In our multinomial logistic model, we use indicator variables to control for the sample periods. Pre-SOX is an indicator variable that equals 1 if the year is 2000 or 2001 and 0 otherwise. DSOX is an indicator variable that equals 1 if the year is 2002 and 0 otherwise. DPOSTSOX is an indicator variable that equals 1 if the year equals 2003, 2004, 2005, or 2006 and 0 otherwise.

Table 2

Frequency of Restatements

	Year	2000	2001	2002	2003	2004	2005	2006	Total
None	0	377	581	684	718	763	914	747	4784
Restatements	1	547	549	460	461	441	240	15	2713
Total # of Restatements		924	1130	1144	1179	1204	1154	762	7497
Percentage of Observations with Restatements per Year		59.2%	48.6%	40.2%	39.1%	36.6%	20.8%	2.0%	36.2%

Sample Period	Observations without Restatements	Observations with Restatements	Total	Percentage of Observations with Restatements per Sample Period
PRESOX	958	1,096	2,054	53.4%
DSOX	684	460	1,144	40.2%
POSTSOX	3,142	1,157	4,299	26.9%
Totals	4,784	2,713	7,497	36.2%

Pre-SOX is an indicator variable that equals 1 if the year is 2000 or 2001 and 0 otherwise.
DSOX is an indicator variable that equals 1 if the year is 2002 and 0 otherwise.
DPOSTSOX is an indicator variable that equals 1 if the year equals 2003, 2004, or 2005 and 0 otherwise.

To obtain goal congruence on increasing intrinsic value, agency theory purports that the principal motivates the agent though compensation incentives. The independent auditor-agent plays a significant role in monitoring the faithful representation of financial reports produced by the manager-agent. Total auditor fees paid to the auditor consist of two basic components, audit

fees and non-audit service fees. We use two variables, AFEAS and NFEAS, to represent compensation payment to the independent auditor-agents. AFEAS equals audit fees received by the auditor paid by the client firm divided by total assets. The agreed upon compensation for providing audit services, AFEAS, is positively correlated to the level of expected auditor effort (Gist 1994; Davidson and Gist 1996). NFEAS equals non-audit service fees received by the auditor paid by the client firm divided by total assets. Since the SOX Act has limited the type of non-audit services that an auditor can provide to their audit client, we expect NFEAS to play an insignificant role in motivating principal-agent goal congruence.

Executive compensation consists of two basic components to motivate managers to enhance the value of the firm in both the short and long run. TCOMP and COMP are variables that indicate compensation to the executive managers in the form of executive compensation. TCOMP equals the sum of cash and bonus compensation paid to executive managers for the recent performance. COMP, the long run incentive, represents the stock option compensation granted to executive managers. DRESTAT is an indicator variable that equals 1 if the year the firm issued a restatement that involves either sales, net income or total assets as reported by Compustat, and 0 otherwise. QRSCOMP is a quadratic interaction term that equals DRESTAT multiplied by COMP.

We also control for financial risk (LIABR variable) and profitability (PMR variable). LIABR equals total liabilities divided by total assets. PMR represents the profit margin ratio calculated as net income divided by sales. Table 3 lists the variables used in this study.

Table 3
List of Variables

ROE	the independent variable that equals OPM x ATR x EM	
	where	
	OPM	= Operating Profit Margin Ratio = Income from Operations + Interest Expense divided by Gross Revenues
	ATR	= Asset Turnover Ratio = Gross revenue divided by average Total assets
	EM	= Equity Multiplier = Average Total Assets divided by Average Shareholder's Equity
AFEAS	audit fees received by the auditor paid by the client firm divided by total assets.	
NFEAS	non-audit service fees received by the auditor paid by the client firm. divided by total assets	
TCOMP	the sum of cash and bonus compensation paid to executive managers for the recent performance.	
COMP	the long run incentive, represents the stock option compensation granted to executive managers.	
DRESTAT	an indicator variable that equals 1 if the year the firm issued a restatement that involves either sales, net income or total assets as reported by Compustat, and 0 otherwise.	
LIABR	total liabilities divided by total assets; to control for financial risk.	
Pre-SOX	an indicator variable if year is from 2000 to 2001 or zero otherwise.	
DSOX	an indicator variable if year equals 2002 or zero otherwise.	
DPOSTSOX	an indicator variable if year is from 2003 to 2005 or zero otherwise.	
PMR	net income divided by sales; to control for profitability.	
QRSCOMP	equals DRESTAT multiplied by COMP; a quadratic interaction term of the magnitude of restatement and stock compensation option	

Descriptive Statistics

Pearson correlation analysis identified correlation between the variables and are shown in Table 4. AFEAS is positively correlated with NFEAS (0.327), COMP (0.577) is negatively correlated with PMR (-0.445). COMP is positively correlated with TCOMP (0.439), NFEAS (0.277), QRSCOMP (0.350) is negatively correlated with PMR (-0.416). PMR is negatively and significantly correlated with LIABR (-0.514) and positively correlated with ROE (0.289). QRSCOMP is correlated with DRESTAT (0.422). As a result, a choice-based sampling procedure was used during the empirical analysis to ensure that the estimated parameters are robust and to correct potential multicollinearity problems. Thus, the estimation errors are minimized but the coefficients are not affected.

Table 4
Pearson Correlations

	NET INCOME	ROE	AFEAS	NFEAS	TCOMP	COMP	DRESTAT	LIABR	DSOX	DPOSTSOX	PMR
ROE	.167**										
	0.000										
AFEAS	-.074**	-.096**									
	0.000	0.000									
NFEAS	-.049**	0.003	.327**								
	0.000	0.816	0.000								
TCOMP	-.039**	.034**	.217**	.140**							
	0.001	0.004	0.000	0.000							
COMP	-.071**	-.077**	.577**	.277**	.439**						
	0.000	0.000	0.000	0.000	0.000						
DRESTAT	0.005	-0.002	-.118**	0.011	.059**	.077**					
	0.668	0.838	0.000	0.355	0.000	0.000					
LIABR	0.012	.064**	.213**	.161**	-.072**	.104**	.087**				
	0.280	0.000	0.000	0.000	0.000	0.000	0.000				
DSOX	-.060**	-.066**	-.072**	0.012	-.024*	0.012	.171**	0.004			
	0.000	0.000	0.000	0.306	0.038	0.302	0.000	0.748			
DPOSTSOX	.067**	.050**	.213**	-.199**	0.004	-0.006	-.164**	-0.008	-.492**		
	0.000	0.000	0.000	0.000	0.709	0.610	0.000	0.493	0.000		
PMR	.140**	.289**	-.445**	-.207**	-.056**	-.416**	0.001	-.514**	-.069**	.047**	
	0.000	0.000	0.000	0.000	0.000	0.000	0.945	0.000	0.000	0.000	
QRSCOMP	-.050**	-0.002	.084**	.117**	.261**	.350**	.422**	-.055**	.081**	-.102**	0.022
	0.000	0.851	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056

**Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

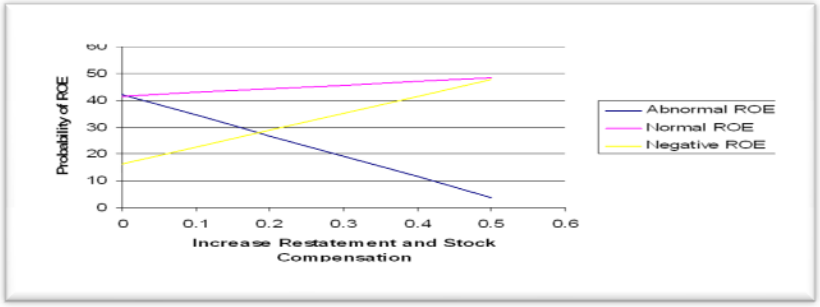
We present the descriptive statistics in Table 5. Analysis of variance indicates that net income, AFEAS, NFEAS, TCOMP, QRSCOMP, and PMR are significantly different across periods. The mean Pre-SOX ROE of 8.18 percent decreases significantly to 3.05 percent in year 2002 then significantly increases to 9.81 percent in the Post-SOX period. Although the mean Post-SOX ROE is higher than the mean Pre-SOX ROE, the difference is not significant. Meanwhile, the median ROE shows less variation across periods. Detail empirical results from the multinomial logit analysis are presented next. Figure 1 presents further evidence that

earnings management strategies target toward the aggregate industry average performance measure.

Table 5 Descriptive Statistics

		NET INCOME	ROE	AFEAS	NFEAS	TCOMP	COMP	LIABR	PMR	QRSCOMP
PreSOX n = 2054	Mean	232.98	0.082	0.001	0.001	0.004	0.001	0.529	0.034	0.001
	Median	46.18	0.108	0.000	0.001	0.001	0.001	0.543	0.044	0.000
	Std. Deviation	1,164.47	0.345	0.001	0.001	0.009	0.002	0.232	0.127	0.003
	Minimum	-16,198.00	-2.747	0.000	0.000	0.000	0.000	0.023	-1.749	0.000
	Maximum	17,720.00	2.844	0.016	0.024	0.143	0.054	1.879	0.985	0.054
SOX n = 1144	Mean	48.16	0.031	0.001	0.001	0.003	0.001	0.529	0.003	0.001
	Median	37.98	0.088	0.001	0.000	0.001	0.001	0.535	0.036	0.000
	Std. Deviation	3,144.28	0.396	0.001	0.001	0.007	0.003	0.263	0.180	0.002
	Minimum	-98,696.00	-2.862	0.000	0.000	0.000	0.000	0.026	-2.877	0.000
	Maximum	14,118.00	2.925	0.026	0.015	0.129	0.067	2.958	0.853	0.020
PostSOX n = 4299	Mean	421.67	0.098	0.002	0.000	0.003	0.001	0.525	0.041	0.001
	Median	76.47	0.118	0.001	0.000	0.002	0.001	0.517	0.053	0.000
	Std. Deviation	1,675.32	0.319	0.002	0.001	0.009	0.002	0.316	0.213	0.002
	Minimum	-17,462.20	-2.847	0.000	0.000	0.000	0.000	0.000	-10.669	0.000
	Maximum	39,500.00	2.917	0.051	0.045	0.389	0.065	11.383	0.642	0.029
Total n = 7497	Mean	312.98	0.083	0.001	0.001	0.003	0.001	0.527	0.033	0.001
	Median	60.43	0.111	0.001	0.000	0.001	0.001	0.525	0.049	0.000
	Std. Deviation	1,872.80	0.340	0.002	0.001	0.009	0.002	0.287	0.189	0.002
	Minimum	-98,696.00	-2.862	0.000	0.000	0.000	0.000	0.000	-10.669	0.000
	Maximum	39,500.00	2.925	0.051	0.045	0.389	0.067	11.383	0.985	0.054

Figure 1 **Transition Probabilities with Increase Restatements and Stock Compensation under SOX Guidelines**



EMPIRICAL RESULTS

Multinomial Logit Analysis

Three goodness-of-fit measures are used to evaluate the overall fit of the model. The estimated value of the McFadden R^2 is 0.206, which is appropriate for categorical and limited dependent variable models. The estimated chi-square test statistic is equal to 3,190.234 with 18 degrees of freedom and it is significant at the 0.001 percent level. The percentage of correct

predictions is equal to 70.37 percent. The three measures-of-fit together indicate that the explanatory power of the model is good. To ensure that parameter estimates are efficient and unbiased the full information maximum likelihood estimator procedure and choice based sampling procedure is used to estimate the multinomial logit model.

As the model is a multinomial logit, two sets of coefficients are mentioned, one for the 'normal ROE' category and one for the 'abnormal ROE' category. Whatever the set, most of the coefficients are significant at the 5 percent and 1 percent level of significance. The explanation of the multinomial logit results follow the recommendation by Greene (2003, 722), as he noted that these coefficients should not be explained as those from a continuous variable model. Table 6 shows the estimated results. Overall, the coefficients from the normal and abnormal ROE reveal very interesting results relating to the hypothesis stated earlier.

Table 6
Results of Multinomial Logit Model

Variable	Coefficient	Standard Error	b/St.Er.	P[|Z|>z]	Mean of X
Characteristics in numerator of Prob[Y = Normal ROE]					
AFEAS	-51.27606	34.21355	-1.499	.1339	.00116
NFEAS	57.56726	93.09157	.618	.5363	.000513
TCOMP	1.91715	10.70605		.179	.8579
COMP	111.95140	42.82958	2.614	.0090	.001276
DRESTAT	.16841	.09088	1.853	.0639	.461251
LIABR	.22714	.15350	1.480	.1389	.525896
DSOX	.28090	.11303	2.485	.0129	.152594
DPOSTSOX	.66629	.08935	7.457	.0000	.573429
PMR	13.15575	3.43785	3.827	.0001	.033131
QRSCOMP	-101.85506	30.65802	-3.322	.0009	.000783
Characteristics in numerator of Prob[Y = Abnormal ROE]					
AFEAS	-137.00901	54.46262	-2.516	.0119	.001163
NFEAS	-40.41858	131.42663	-.308	.7584	.000513
TCOMP	18.10742	10.99490	1.647	.0996	.003410
COMP	90.83900	88.58331	1.025	.3051	.001276
DRESTAT	-.27362	.09640	-2.838	.0045	.461251
LIABR	1.13206950	.21017	5.386	.0000	.525896
DSOX	-.54258	.10114	-5.364	.0000	.152594
DPOSTSOX	-.07638	.11857	-.644	.5195	.573429
PMR	26.52937	6.74223	3.935	.0001	.033131
QRSCOMP	-92.40322	42.3059 7	-2.184	.0290	.000783

See Table 3 for list of variable definitions.

As expected, audit and non-audit fees (AFEAS and NFEAS) will reduce ROE when these are significant. NFEAS was not significant. However, AFEAS played a significant role at the 1 percent level in deterring management from engaging in higher risk higher return behaviour. This suggests that increasing audits (e.g., audit fees) will discourage aggressive earnings management behaviour by firms that may yield higher than industry average ROE but also increase the likelihood of loss. Higher total compensation package (TCOMP) paid to management is associated with the likelihood of higher abnormal returns and is significant at the 10 percent level. This suggests that higher than average ROE may result in bonuses for the

manager-agent. Stock compensation (COMP) on the other hand tells a very interesting story. COMP is not significant for the abnormal ROE category but it is positive and significant for the normal ROE category at the 1 percent level. This is a good indication that stock compensation will encourage management to adopt a solid earnings management strategy around industry averages that may lead firms to maximize long-run intrinsic value of the firm. Another interesting observation was the effect of reinstatement (DRESTAT) in goal congruent. As with the impact of stock compensation, reinstatement will favour a solid earnings management strategy around the industry average that discourages behaviour to engage in pursuing abnormal high returns that may also imply high risk. An interesting observation is that the quadratic interaction term of the magnitude of restatement and stock compensation option (QRSCOMP) is significant and negative, indicating that reinstatements may be viewed negatively by investors even when firms are employing strategies to maximized long-run intrinsic value of the firm.

A major focus of our analysis is to investigate the impact of SOX in aligning principal and agent behaviour. The results reveal that SOX guidelines had significant positive impacts in aligning management's goal around solid earnings management strategies (industry averages) and discourage behaviour to pursue risky behaviour that may increase returns but also exposes the firm to loss. The results suggest that SOX guidelines have a significant effect on reconciling moral hazard problems between BoDs-principal and the manager-agent, as it relates to accurate financial reporting. The marginal impact of SOX guidelines will be discussed later.

Finally, in the last set of variables, the liability ratio (LIABR) and profit margin (PMR) are analyzed. The estimated coefficients are all positive and significant, except for the LIABR of the normal ROE category. These results are as expected, as leverage and profitability increase, ROE will increase. However, as a firm takes on increasing amounts of debt, it leads to an increase in financial leverage and financial risk that may, at very high levels, have an adverse impact on the earning management strategy.

Marginal Impact Analysis

The predicted probabilities for all three categories (abnormal ROE, normal ROE and negative ROE) are 44.1 percent, 41.9 percent and 14.0 percent, respectively. In order to understand how each independent variable impacts the results of the model, the marginal probability of the variable must be determinate. Table 7 reports the marginal impacts of selected variables averaged over firms on the probability to be classified as 'abnormal ROE,' 'normal ROE,' and 'negative ROE.' The entire results of the marginal impacts and elasticities are included in Appendix A.

Restatements (DRESTAT) have a negative and significant marginal impact on firms that have abnormal ROE, firms that might have overstated earnings. DRESTAT has a positive significant marginal impact on firms with normal ROE. Interestingly, QRSCOMP, the quadratic interaction term of restatement and stock compensation, has a positive and significant marginal

impact on firms that have negative ROE. As seen in Appendix A, stock option compensation by itself does not have the greatest impact on accurate financial reporting or earnings management strategy. The results suggest firms may issue more accurate financial reporting by using a joint strategy of providing the auditor-agent with greater independence by reporting directly to the audit committee of the BoDs-principal, while continuing to provide the manager-agent with stock compensation options. Focusing solely on management incentives, the stock compensation option without auditor incentives may not accurately correct the problems of accurate financial reporting and effective earnings management.

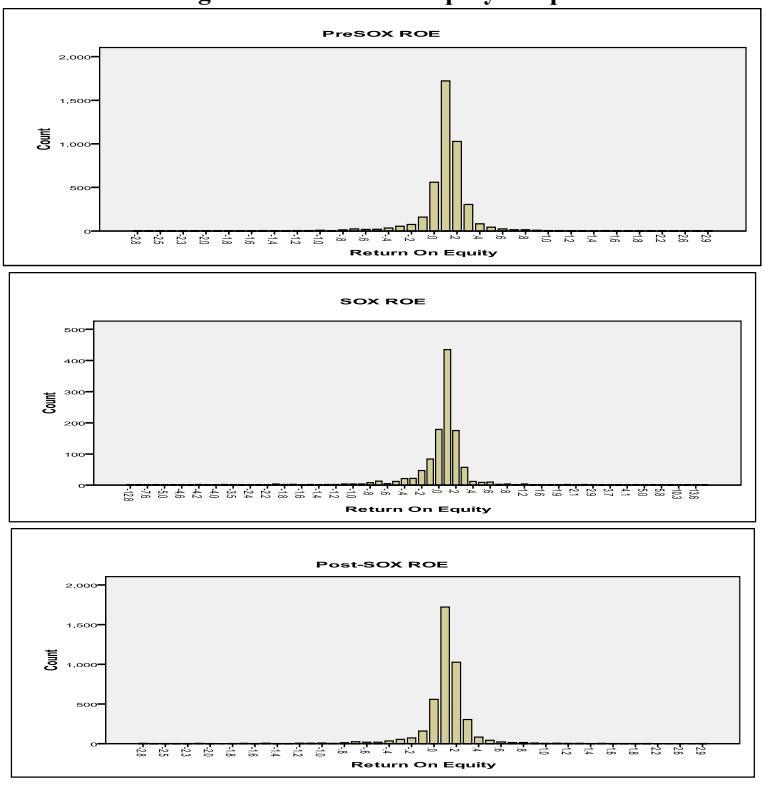
Table 7

Summary of Marginal Effects of Selected Variables Averaged Over Firms

	Y = Negative	Y = Normal	Y = Abnormal
Variable	ROE	ROE	ROE
DRESTAT	0.0028	0.0757	-0.0785
LIABR	-0.0617	-0.1240	0.1857
DSOX	0.0085	0.1392	-0.1477
DPOSTSOX	-0.0328	0.1480	-0.1152
QRSCOMP	9.5551	0.0000	0.0000

*See Table 3 for list of variable definitions.

Figure 2. Return On Equity Graphs



CONCLUSION AND IMPLICATIONS

The main objective of this study is to evaluate the effectiveness of SOX as the regulatory solution to accounting scandals, by creating a way of re-aligning the actions and behavior of the manager-agent and auditor-agent with those of the shareholder-principal to maximize the firm's intrinsic value. A principal-agent model with multiple agents is developed based with risk considerations**.** In this model, the probability of being in one of the three ROE categories ('abnormal,' 'normal,' and 'negative') is a function of audit fees, management compensation, and other control variables are used to better simulate actual firm behavior in the analysis and improve the model's predicting power. In traditional principal-agent models, the principal is assumed to be risk neutral. However, in reality and in our paper, the principal often pays a risk premium, c(g), to its manager-agent to achieve desirable profit margin (PMR) and manage financial risk (LIABR) that, in turn, directly affects the choice of ROE categories. That risk premium can be in the form of employee compensation, additional employees, technology or other costs necessary to achieve the target (e.g., ROE falling within normal category).

The multinomial logit procedure is used to empirically evaluate and test the theoretical findings, and the principal-agent framework seems to explain auditor-agent and manager-agent behavior in issuing accurately stated financial statements, implying the use of less aggressive earnings management measures. Relative to the pre-SOX period, the principal-agent relationship appears to obtain greater goal congruence in the post-SOX period. The evidence indicates that SOX provides disincentives for the agents to engage in excessive high risk high return strategies.

The policy implications of these findings are multiple. First, an emphasis on firm intrinsic value that targets management and auditor incentives may be most effective for accurate financial reporting. Second, SOX guidelines may be ineffective if auditors are provided with fixed audit fee compensation, as that may adversely impact the auditor's incentive to require managers to report restatements. Third, increasing audit fees, as a proxy for increasing auditor effort, contributes significantly to lowering abnormal ROE or more accurate financial reporting. Further research that explicitly incorporates the cost of SOX implementation is warranted. Also, similar analyses should be conducted for different industries.

Supporters of SOX say that it has helped protect investors while critics complain about the cost of compliance. As plaintiffs challenge the creation of the PCAOB and its power to set auditing standards and investigate suspected wrongdoing by audit firms to the Supreme Court (Hilzenrath 2009), maybe they should consider the role that the PCAOB plays in enhancing the effectiveness of SOX in realigning the principal-agent interests.

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Appendix
A Summary of Marginal Effects and Elasticities

|Variable | Coefficient | Standard Error |b/St.Er.|P[|Z|>z] |Elasticity|

Marginal effects on Prob[Y = Negative ROE]

AFEAS	11.45992	5.24759	2.184	.0290	.095219
NFEAS	-.88694	13.26057	-.067	.9467	-.003250
TCOMP	-1.22927	1.24893	-.984	.3250	-.029947
COMP	-12.1746	7.72079	-1.577	.1148	-.110945
DRESTAT	.00699	.01047	.668	.5044	.023027
LIABR	-.08315	.02410	-3.450	.0006	-.312416
DSOX	.01697	.01221	1.389	.1647	.018502
DPOSTSOX	-.03441	.01089	-3.160	.0016	-.140954
PMR	-2.40846	.48563	-4.960	.0000	-.570069
QRSCOMP	11.6784	4.22440	2.765	.0057	.065297

Marginal effects on Prob[Y = Normal ROE]

AFEAS	12.83315	6.17592	2.078	.0377	.035584
NFEAS	21.48742	9.26649	2.319	.0204	.026279
TCOMP	-2.87941	1.61849	-1.779	.0752	-.023409
COMP	10.47398	11.12596	.941	.3465	.031852
DRESTAT	.09158	.01638	5.590	.0000	.100707
LIABR	-.15390	.02329	-6.609	.0000	-.192961
DSOX	.16867	.02594	6.502	.0000	.061365
DPOSTSOX	.17636	.02456	7.181	.0000	.241119
PMR	-1.69910	.45274	-3.753	.0002	-.134213
QRSCOMP	-7.72638	5.27173	-1.466	.1428	-.014417

Marginal effects on Prob[Y = Abnormal ROE]

AFEAS	-24.29307	9.21698	-2.636	.0084	-.064123
NFEAS	-20.60048	17.63131	-1.168	.2426	-.023983
TCOMP	4.10868	1.74697	2.352	.0187	.031798
COMP	1.70066	17.18502	.099	.9212	.004923
DRESTAT	-.09856	.01667	-5.911	.0000	-.103182
LIABR	.23705	.03669	6.461	.0000	.282935
DSOX	-.18564	.02270	-8.178	.0000	-.064293
DPOSTSOX	-.14196	.02753	-5.157	.0000	-.184750
PMR	4.10757	.93007	4.416	.0000	.308863
QRSCOMP	-3.95199	7.37353	-.536	.5920	-.007019

See Table 3 for list of variable definitions.

MANAGED EARNINGS: A CLOSER LOOK AT PENSION EXPENSE

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ABSTRACT

Relatively recent earnings management studies provide evidence companies manage reported earnings to achieve certain capital market reporting objectives. However, there seems to be limited empirical evidence identifying the specific financial accounts that companies use to manage their reported earnings.

This paper extends earlier research by not limiting the sampling technique to only those companies with actual earnings in a relatively small neighborhood very near to their actual capital market benchmark. This allows a much broader array of companies to be included in this study. Evidence indicates that pension expense is actively used by companies to manage bottom-line, reported earnings. Based on a proxy for premanaged earnings, companies hypothetically missing their capital market earnings benchmark (i.e. prior year earnings target) are predicted to reduce their actual pension expense to increase actual reported earnings; whereas companies hypothetically beating their capital market earnings benchmark (i. e. prior year earnings target) are predicted to increase their actual pension expense to reduce their actual reported earnings.

Both sets of companies are predicted to manipulate reported earnings in the direction that will move them closer to their capital market earnings benchmark (i.e. prior year earnings) than they would have otherwise been. Results suggest companies use pension expense to actively and predictably manage actual reported earnings.

INTRODUCTION

This study scrutinizes whether or not companies use pension expense as an earnings management device to maintain a steady stream of earnings. The capital market benchmark for the current year is equal to the prior year earnings. Earlier research studies are inconsistent in providing evidence that pension expense is used as an earnings management device to manage reported bottom line earnings. This lack of convincing empirical evidence is baffling because survey evidence indicates auditors perceive pension expense as a frequently used earnings management device (Nelson et al. 2000). Most early studies are unable to consistently detect pension expense manipulation as these studies focused primarily on contracting motivators rather than on capital market reporting motivators for explaining earnings management. Another

reason may be that most early studies focused on pension rate manipulation rather than directly on pension expense manipulation.

One research study (Bergstresser et al. 2006) indicates companies are more aggressive with their assumed expected long-term rate of return on pension assets when these companies are near critical earnings thresholds and this rate assumption has greater potential to impact actual reported earnings. Since changes in either the discount rate assumption or the compensation rate assumption could offset the impact on pension expense caused by the change in the assumed expected long-term rate of return on pension assets, this study extends earlier research by focusing directly on pension expense taken as a whole rather than focusing only on the affect of one of the three pension rate assumptions. Therefore, focusing directly on pension expense considers the cumulative results of all pension rate assumptions.

This study differs from earlier studies in that it examines whether or not the prior year earnings benchmark creates a motive to manipulate pension expense in a predictable economic manner. In addition, this study expands earlier capital market reporting motivator research that limited sampling to only those companies with actual earnings in a neighborhood relatively close to their capital market earnings benchmark. So the broader approach taken in this study looks at not only companies critically near their earnings threshold but companies with available data for the sample period. In essence, this study removes the sample screening process to allow for a larger sample of companies. The research findings provide practical analyses for various stakeholders, such as investors, standard setters and regulators, to carefully monitor changes in pension expense to reduce future financial reporting manipulation.

One difficulty associated with attempting to test for pension expense manipulation is that of determining what a company's pension expense would be without the manipulation. The Statement of Financial Accounting Standards No. 87, *Employers' Accounting for Pensions* (SFAS No. 87), provides a unique measure of what pension expense should be from year to year based on the corridor approach. Accordingly, companies are allowed to spread pension expense over time in order to avoid the immediate recognition of wide swing market fluctuations that affect pension investments. The reason regulation allows companies to smooth (i.e., spread uniformly) pension expense is that over the long-term market fluctuations are expected to average out. Therefore, it is possible to reasonably estimate what a company's pension expense would be absent manipulation. The proxy for pension expense absent manipulation is in essence the prior year pension expense.

So based on theory, pension expense should be approximately the same from year to year unless there is a change in the number of employees, industry effects, and or time fixed effects. The research model captures the industry effects and time fixed effects with dummy variables for industry and year.

In addition, common accounting practice supports the selected proxy for current year pension expense. Managers run "what if analyses" at year-end to determine whether or not the prior year earnings benchmark amount will be achieved. In other words, are this year's earnings

equal to last year's earnings? In these analyses managers substitute the prior year pension expense as the current year pension expense which allows managers the flexibility then to adjust the actual pension expense upward or downward in the direction that will move their current year reported earnings toward their desired prior year earnings amount.

Pension expense is a perfect general ledger account for manipulating. First, pension expense is one of the last general ledger accounts that can be adjusted or manipulated at year-end to meet a given earnings target. Second, there is a lack of precision in the guidelines set forth in SFAS No. 87 which allows companies great flexibility in choosing their assumed discount rate, compensation rate, and expected rate of return on pension assets. Third, it is highly probable that companies have access to and authority over superior proprietary information regarding their applicable pension plans than is readily available to other interested parties. Fourth, there is a lack of timely verification of the pension rate assumptions and estimates because these rates and assumptions cover discounted projections out in the future generally 20 plus years. The long time span in and of itself provides the ability for managers to annually tweak the numbers in the desired direction to sustain their earnings.

The behavior of pension expense is modeled in the research design by identifying the discretionary and nondiscretionary components of the expense. So that by design, any change in pension expense from year to year is considered discretionary and is the prime focus of explanation.

The benchmark (i.e., prior year earnings) test focuses importance on whether or not companies use pension expense manipulation to continue a steady stream of earnings. Barth et al. (1999) show evidence those companies with consecutive earnings increases experience higher stock prices, and when those companies encounter declines in reported earnings, the premium stock prices fall disproportionately. As a result, companies have strong motives to continue a steady stream of earnings to acquire market share and to avoid market devaluation (Matsunaga and Park 2001).

The remainder of this paper is organized into four areas. The first describes regulations and literature review. The second provides the research design, hypothesis development, sample selection and other statistical considerations. The third provides the results, interpretations, and limitations. The fourth provides the summary conclusions.

REGULATIONS AND LITERATURE REVIEW

In 1985, the FASB issued SFAS No. 87, *Employers' Accounting for Pensions*, which is the standard influencing financial statement *measurement* for defined benefit plans. In 2003, the FASB revised SFAS No. 132, *Employers' Disclosures about Pensions and Other Postretirement Benefits*, which is the standard influencing pension *disclosure*.

Pension research for the last two decades (Kwon, 1989; Blankley, 1992; Ali and Kumar, 1993; Weishar, 1997; Brown, 2001 and Bergstresser et al., 2006) focused mainly on the

explanation of pension rates and how and why companies select the particular pension rates disclosed in their financial statements. Improved disclosures required by SFAS No. 132 now provide enough information to recalculate pension expense using the three pension rate assumptions. Therefore, a paradigm shift in pension research may occur where pension rates are no longer the primary focus of explanation.

Kwon's (1989) research focused on the explanation of only the discount rate. Blankley's (1992) research focused individually on the explanation of the discount rate, compensation rate, and expected long-term rate of return on plan assets. Weishar's (1997) research focused on the explanation of the simultaneous effects of the discount rate, compensation rate, and expected long-term rate of return on plan assets. Brown (2001) not only focused on explaining the three pension rates but somewhat changed the direction of research by including a market valuation model to examine the value relevance of economic factors and reporting incentive factors.

In these earlier studies, the only explanatory variable that was consistently significant in explaining pension rate assumptions was the funding ratio variable. Other variables such as leverage, unrestricted retained earnings, cash constraints, manager control, size, unionization, tax loss, and change in CEO were not consistently significant from study to study. Conceivable explanations for the inconsistent findings may be due to omitted variables, measurement error, lack of power, and or misspecified models. Therefore, it is possible these models explaining pension rates may not fully capture the impact of pension expense manipulation as it relates to financial statement reporting.

Whether managers act in self-interest or in the interest of shareholders, their performance is monitored by directors, auditors, investors, creditors, and regulators, which in turn, creates strong motives to manage earnings. For these reasons, this study expects the capital market based incentives (i.e., prior year earnings) to capture more fully the effects of pension expense manipulation on financial statement reporting than earlier pension rate studies.

Burgstahler and Dichev (1997) theorized that investors in publicly traded companies use earnings-based benchmarks, in determining company value. In addition, prospect theory was another reason for using benchmarks, whereby investors value gains and losses using a reference point rather than by an absolute level of worth. Therefore, Burgstahler and Dichev (1997) use frequency distribution as a method for demonstrating the existence of earnings management. Evidence indicated a disproportionally low incidence of companies reporting small decreases in earnings and small losses relative to a high incidence of companies reporting small increases in earnings and small positive earnings.

DeGeorge et al. (1999) used a similar research design as Burgstahler and Dichev (1997) and reported earnings are the single most value relevant item provided to investors in financial statement reporting. Earnings were used as performance measures, which in turn, provided the enticement for companies to manipulate earnings. Their research revealed how efforts to exceed thresholds, that is, to sustain recent performance, to report positive earnings, and or to meet analysts' expectations, induced particular patterns of earnings management. Clearly emerging

patterns showed earnings falling just short of thresholds were managed upward. Additional evidence suggests future performances of companies just achieving thresholds were poorer than performances for control companies that were less suspect of managing earnings (DeGeorge et al. 1999).

Barth et al. (1999) depicted companies with longer strings of repeated earnings increases are priced at a premium but when these companies experience declines in earnings, the premiums fall disproportionally. Moehrle (2002) found evidence suggesting some companies record restructuring charge reversals to avoid earnings declines, to avoid reporting net losses, and to meet analysts' earnings forecasts.

Parker and Sale (2007) and Parker (2009) investigated whether or not companies with actual reported earnings in a neighborhood close to their earnings benchmark (i.e., prior year earnings and analysts forecasts, respectively) use pension expense as a means to maintain a steady stream of earnings. The screened results for companies with actual reported earnings in a neighborhood very close to their earnings benchmark indicated pension expense was used to manage actual earnings when these companies would otherwise miss their capital market benchmark.

In aggregate, earlier benchmark studies suggest that companies manage earnings to avoid an earnings decline, to avoid reporting losses, and to meet analysts' earnings forecasts. Therefore, based on the logic of these earlier studies, this study extends the investigation by not limiting the sampling technique to only those companies with actual earnings in a relatively small neighborhood very near to their actual capital market benchmark.

RESEARCH DESIGN

Three basic research models are used extensively in the earnings management literature (McNichols 2000). The primary objectives of these models are to discover how companies manipulate earnings, to determine what motivates companies to manipulate earnings, and to evaluate what costs and benefits are associated with company manipulation.

The aggregate accruals model, the specific accruals model, and the earnings-based distribution model are the three models prevalent in the earnings management literature (McNichols 2000). As with all research, there are advantages, disadvantages and tradeoffs with each model.

Healy and Wahlen (1999) suggest future research contributions in earnings management will come primarily from identifying factors that limit company ability to manage earnings and from documenting the extent and magnitude of the effects of specific accruals. The specific accruals research model is based on a disaggregated concept that examines individual accounting items that are subject to substantial manager judgment and are able to significantly impact reported earnings. The most important advantage to a researcher of the specific accruals model is the ability to make directional predictions based on his or her knowledge and skill. Whereas,

the disadvantage of the specific accruals research model is its inability to analyze simultaneously aggregated effects of accounting manipulation used by managers in managing earnings (McNichols 2000, Fields et al. 2000, Francis 2001).

This study uses a specific accruals research model with the explanatory variable set as an earnings-based benchmark (i.e., prior year earnings). The research model is a collection of prior research rudiments that provide discovery, better understanding, and a more complete explanation regarding whether pension expense is predictably manipulated in a logical economic manner to achieve the earnings-based benchmark.

The distinction from earlier research is determining whether or not there is an association between the change in pension expense and the amount that companies hypothetically beat or hypothetically miss their benchmark based on premanaged earnings. A distinguishing feature of the study is that it does not limit the sampling technique to companies with actual reported earnings in a neighborhood very close to their prior year actual reported earnings (i.e., earnings based benchmark).

The hypothesis presented in alternate form.

$H1_A$: Pension expense is manipulated in a rational economic manner to achieve the current year earnings benchmark, which is equal to the prior year reported earnings.

The hypothesis is testing for both benchmark and smoothing behaviors. Benchmark behavior is where a company decreases actual pension expense to increase actual current year earnings in an attempt to reach their earnings benchmark (i.e., prior year earnings). Smoothing behavior exists when a company stores up reserves for meeting their earnings benchmark in future periods.

Lagged assets are used to scale variables in an attempt to control for size variations in companies. The cross sectional regression model is presented below.

$$\text{PE\_diff} = \alpha_0 + \alpha_1 \text{Miss\_D} + \alpha_2 \text{Motivate} + \alpha_3 \text{Interact} + \alpha_4 \Delta\text{Emp} + \sum_{t=1996}^{t=2001} \alpha_t \times yrD_t + \sum_{i=1}^{i=61} \alpha_i \times indD_i + \varepsilon \quad (1)$$

PE_diff — Is the change in pension expense equal to current year pension expense minus prior year pension expense all scaled by lagged assets.

Miss_D — Is a dummy variable that equals 1 if the continuous variable, Motivate < 0, and 0 otherwise.

Motivate — Is a continuous variable equal to pretax income absent manipulation minus the applicable benchmark all scaled by lagged assets.

Interact	Is an interaction variable equal to Miss_D times Motivate.
ΔEmp	Is a control variable equal to the number of employees for the current year minus the number of employees for the prior year all scaled by lagged assets.
yrD_t	Is a dummy variable for each applicable year 1995-2001 with the 1995 dummy effects captured in the intercept.
$indD_i$	Is a dummy variable representing each applicable industry. The number of industries is 62.
α_0	Intercept for Motivate $\geq$ 0 where Miss_D = 0.
$\alpha_0 + \alpha_1$	Intercept for Motivate < 0 where Miss_D = 1.
α_2	Motive slope for Motivate $\geq$ 0 where Miss_D = 0.
$\alpha_2 + \alpha_3$	Motive slope for Motivate < 0 where Miss_D = 1.

PE_diff is the *measure of earnings management* and the proxy for the extent of manipulation in pension expense. The proxy development is accomplished by using the feature of SFAS No. 87 whereby the prior year pension expense provides a logical approximation for the company's premanaged or premanipulated pension expense. That is assuming the number of employees remains constant from year to year and there is no yr and industry effects. PE_diff is defined as the current year pension expense minus the prior year pension expense all scaled by lagged assets.

Premanipulated actual earnings relative to the earnings benchmark (i.e., prior year earnings) represents the level of capital market motivator for earnings management. The capital market based motivator measure to manipulate earnings is represented by the continuous scaled variable, Motivate. Premanipulated actual earnings are derived by adding current year pension expense back to current year earnings to zero-out the effect of current year pension expense and then subtracting prior year pension expense. In essence, prior year pension expense is simply substituted in place of current year pension expense to calculate earnings absent pension manipulation.

Benchmark earnings, as well as premanipulated actual earnings, are reported on a pretax basis (Burgstahler and Eames 2002) rather than an after tax basis because pension expense is reported in financial statements on a pretax basis. Again, the proxy measure for pension expense absent pension manipulation is the prior year pension expense.

Because both benchmark and smoothing motivators exist, it is important to distinguish companies that hypothetically miss their benchmark from companies that hypothetically beat their benchmark. Therefore, a dummy variable (i.e., Miss_D) for hypothetically missing the benchmark is included in the analysis. Miss_D is coded zero for companies that hypothetically beat their benchmark using premanaged earnings. Whereas, Miss_D is coded one for companies

that hypothetically miss their benchmark using premanaged earnings. If α_1 is significant and positive, companies missing their benchmark have a higher intercept than the other companies. If α_1 is significant and negative, companies missing their benchmark have a lower intercept than the other companies. If α_1 is insignificant, there is no difference between the two groups of companies.

After controlling for the change in the number of employees, industry effects, and time fixed effects, the association between PE_diff and the level of capital market motivators (i.e., Motivate) for earnings management constitutes this study's *test of interest*. PE_diff is expected to be positively correlated with the motivator variable, Motivate. The slope coefficient for the group of companies that hypothetically beat their benchmark is represented by α_2. The slope coefficient for the group of companies that hypothetically miss their benchmark is represented by $\alpha_2 + \alpha_3$. Thus, I predict that $\alpha_2 > 0$, and that $\alpha_2 + \alpha_3$ is > 0.

If $\alpha_2 + \alpha_3$ is significant and positive, this suggests the primary companies of interest hypothetically missing their benchmark are actually decreasing pension expense to increase reported earnings to avoid missing their benchmark. If $\alpha_2 + \alpha_3$ is significant and negative, this suggests companies hypothetically missing their benchmark are not actually decreasing pension expense.

If α_2 is significant and positive, this suggests the secondary companies of interest hypothetically beating their benchmark are actually increasing pension expense to decrease earnings to move closer to their benchmark than they would otherwise be. If α_2 is significant and negative, this suggests companies hypothetically beating their benchmark are not actually increasing pension expense.

The logic behind the predictions for α_2 and $\alpha_2 + \alpha_3$ is that PE_diff is expected to move in the same direction as Motivate. For example, if a company has premanaged earnings equal to $.28 per share and benchmark earnings (i.e., prior year earnings) equal to $.26 per share, the company is expected to manipulate actual earnings by increasing pension expense by $.02 in order to offset the $.02 excess in premanaged earnings. In this situation, there is a positive $.02 excess in premanaged earnings and the change in pension expense (i.e., PE_diff) is expected to move $.02 in a positive direction as well. Motivate (i.e. α_2) captures the positive $.02 excess in premanaged earnings. Therefore, because PE_diff and Motivate move together in the same direction, a positive correlation is predicted.

On the other hand, if a company has premanaged earnings equal to $.26 per share and benchmark earnings (i.e., prior year earnings) equal to $.28 per share, the company is expected to decrease pension expense by $.02 to offset the $.02 negative premanaged earnings. Motivate (i.e., $\alpha_2 + \alpha_3$) captures the negative $.02 deficiency in premanaged earnings. Here again, because PE_diff and Motivate move together in the same direction, a positive correlation is predicted.

So in summary, the prior year earnings (i.e., benchmark) create motivators for companies that are in opposite directions depending on their level of premanaged earnings. Therefore,

companies hypothetically missing their benchmark are expected to exhibit benchmark behavior by manipulating pension expense to increase actual earnings in order to reach their benchmark earnings. On the other hand, companies hypothetically beating their prior year earnings (i.e., benchmark) are expected to exhibit smoothing behavior by manipulating pension expense to decrease actual earnings so that their actual earnings are closer to their benchmark earnings than they would otherwise be. Smoothing behavior allows cookie jar reserves to be stored up for use in future years.

ΔEmp is a control variable that accounts for any variation in the dependent variable (i.e., PE_diff) caused by the change in the number of employees from year to year. ΔEmp is calculated as the current year number of employees minus the prior year number of employees all scaled by lagged assets. In addition, the inclusion of the control variable, ΔEmp, should mitigate confounding results attributable to changes in organizational structure such as mergers and acquisitions. A positive relationship is expected between the change in pension expense (i.e., PE_diff) and the change in the number of employees from year to year (i.e., ΔEmp). The reasoning is plausible because an increase in the number of employees is expected to result in an increase in pension expense, whereas a decrease in the number of employees is expected to result in a decrease in pension expense. Therefore, a positive slope coefficient is predicted for ΔEmp.

The final sample consists of 4,203 cross-sectional company observations with applicable data for the period 1995 through 2001 which are derived from the Compustat database. The data coincides with an earlier study and is therefore very cost effective for the researcher. At the time the sample was selected, it included all years for which pension data was available from the data source. This study does not use a screening process similar to Dhaliwal et al. (2002) as the screening process looks only at companies that are more suspect of managing earnings in response to capital market motivators. Therefore possible bias from the screening process is eliminated in this study.

Outlier observations are windsorized so that large and small outlier values are still large and small values within the dataset but are less likely to disrupt the mean, standard estimates, and other statistics that depend upon them. The action taken to address outlier observations should mitigate the possible influence these observations bias the overall statistical outcome.

Multicollinearity diagnostics indicate no problem exists with independent variables being highly collinear. In this study, it is important to be mindful that OLS coefficients are unbiased in the presence of heteroscedasticity. So the dollar magnitudes will not be affected even if heteroscedasticity is present. Heteroscedasticity in an OLS regression causes the true variance to be understated and causes the t-statistic to be overstated. For this reason, based on White's joint test for model misspecification and heteroscedasticity, t-statistics are reported using White's corrected t-statistics if applicable and are otherwise reported using OLS t-statistics.

RESULTS AND INTERPRETATIONS

Table 1 summarizes the sample selection information. The final sample consists of 4,203 company observations representing 62 industries from the period 1995-2001. The large sample provides information on a wide range of industries which is desirable in this study.

Table 1: Sample Selection	
Firms in original sample covering 1995-2001	21,608
Firms that do not have defined benefit plans and firms with missing observations	-17,405
Firms in final sample	4,203

The regression results reported in Table 2 use the equation (1) regression model. PE_diff, representing company manipulation, is expected to be positively correlated with the motivator variable of interest, Motivate. The motivator slope is captured in the model for the companies that hypothetically beat their benchmark by α_2 and for the companies that hypothetically miss their benchmark by $\alpha_2 + \alpha_3$. The slope on Motivator (i.e., α_2 and $\alpha_2 + \alpha_3$) represents the estimated average change in pension expense when the applicable motivator variable increases or decreases by one unit. If companies are more concerned with reaching their benchmark than smoothing, we predict that $\alpha_3 > 0$.

The slope coefficient (i.e., $\alpha_2 > 0$) for the companies that hypothetically beat their benchmark earnings is expected to be statistically significant. The slope coefficient (i.e., $\alpha_2 + \alpha_3 > 0$) for the companies that hypothetically miss their benchmark earnings is expected to be statistically significant as well and is the key variable of interest.

The foregoing rationale is based on the belief that pension manipulation is a function of the value of the magnitude of hypothetically missing or hypothetically beating the benchmark earnings (i.e., prior year earnings) based on premanaged earnings. The economic substance is captured in the regression model by the main effects of the motivator variable for the two distinct groups of companies. Therefore, the results on the control variables are not important for interpretation and are not reported.

Table 2: Cross Sectional Pooled Effects Estimation With Time and Industry Fixed Effects				
Variable		*Prediction*	*Coefficient*	*One Tail p-value*
intercept		+	-0.03305	.1318
Miss_D		-	0.01415	.0925
motivate		+	0.04117	.0001
interact		+ / -	-0.01451	.0122
$\alpha_0 + \alpha_1$		-	-0.01890	.2596
$\alpha_2 + \alpha_3$		+	0.02666	.0004
F-statistic as p-value	.0001			
R^2	.0332			
Adjusted R^2	.0166			

Table 2 reports the results of the association test. The significant F-statistic (i.e., p-value = .0001) for the model indicates strong evidence of linearity. The R^2 and Adjusted R^2 are .0332 and .0166 respectively, which indicates the proportion of the change in pension expense that is explained by the combination of independent variables.

The slope on Motivate captures the average magnitude of the change in pension expense when there is a one unit change in the motivator variable for the two distinct groups of interest. As predicted, the motivator variable for both groups of companies is positive and significant. This pattern of evidence supports the notion that both groups of companies are using pension expense in a predictable rational economic manner based on the magnitude of hypothetically missing or hypothetically beating their benchmark earnings.

The results further indicate smoothing behavior is dominant. For every $1 that premanaged earnings are above the earnings benchmark (i.e., prior year pretax earnings), pension expense increases by $.04 to reduce actual reported earnings. Whereas, for every $1 that premanaged earnings are below the earnings benchmark (i.e., prior year pretax earnings), pension expense decreases by $.03 to increase actual reported earnings. One plausible explanation is that auditors may be more vigilant in constraining upward earnings manipulation (i.e., benchmark behavior) than downward earnings manipulation (i.e., smoothing behavior).

Again, it is interesting the reported results are in agreement with the findings in the Nelson et al. (2000) survey study where evidence suggests income-decreasing earnings management attempts are more likely to occur with respect to imprecise financial standards. SFAS No. 87 can be classified as an imprecise financial standard partly because of the allowed company flexibility in choosing the discount rate, the compensation rate, and the expected rate of return on plan assets. Assuming the motivation to manipulate earnings upward to meet benchmark earnings is at least equal to the motivation to manipulate earnings downward to meet benchmark earnings, the pattern of evidence from Table 2 suggests auditors are more vigilant in constraining upward earnings management to meet benchmark earnings than in downward earnings management to meet benchmark earnings. One plausible explanation is that auditors are more likely to be suited for upward earnings manipulation than for downward earnings manipulation. Here upward earnings manipulation uses future resources in the current period whereas downward earnings manipulation stores up earning reserves for use in future periods.

CONCLUSIONS

Whether acting in self-interest or in the interest of shareholders, manager performance is monitored by directors, auditors, investors, creditors, and regulators, which in turn, creates strong motives to manage earnings. Therefore managers use discretionary accounting devices to manage earnings to continue a steady stream of earnings to avoid market devaluation and to reap stock price rewards (Powell et al. 1993). As commonly known, many contracting motivators are

also tied to earnings based measures which again provide strong motivators for managed earnings.

This study extends earlier research by providing additional evidence that company managers are using pension expense in a predictable economic manner to move their actual reported bottom-line earnings closer to their benchmark (i.e., prior year earnings) than they would otherwise be. The study also provides additional evidence that prior year earnings (i.e., benchmark earnings) create capital markets motivators for companies in opposite directions depending on their economic status as measured by whether or not companies will miss or beat their benchmark earnings based on premanipulated earnings. So by using "what if" analyses, companies that hypothetically miss their benchmark earnings are predicted and shown to manipulate actual pension expense downward to increase actual earnings; whereas, companies that hypothetically beat their benchmark earnings are predicted and shown to manipulate actual pension expense upward to decrease actual earnings. Therefore as predicted, *both groups of interest are successfully manipulating pension expense in the direction that moves their actual earnings closer to their benchmark earnings (i.e., prior year earnings) than they would otherwise be*.

The results suggest that smoothing behavior is stronger than benchmark behavior. One plausible explanation is that auditors may be more vigilant in constraining efforts to manage earnings upward than in constraining efforts to manage earnings downward.

Rationale is provided that pension expense is likely the earnings management device of choice as it allows managers to manipulate earnings directionally as needed without easily being detected by interested outside parties. Furthermore, sensitivity analyses support the research findings are robust to controls for industry and time effects, as well as to the change in the number of employees.

Since capital markets and the U.S. Economy are heavily influenced by the integrity of financial statement reporting, this study should be of interest to a wide audience such as academicians, investors, directors, creditors, auditors, and regulators. It provides timely and relevant information about how managers are using pension expense to manipulate the most value relevant amount (i.e., actual reported bottom-line earnings) reported to investors.

Perhaps this research will be a stimulus for the FASB to continue rethinking its current position regarding pension standards on pension measurement and reporting. Interest in pension accounting is widespread and provides many opportunities for future research.

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THE CALL FOR INCREASING THE INTERNATIONAL COMPONENT OF ACCOUNTING EDUCATION

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ABSTRACT

This study examines the call for accounting curricula to increase its coverage of international issues as a result of the globalization of business. In particular, coverage of International Financial Reporting Standards (IFRSs) is especially important given their increasing acceptance in countries around the world. The study reports the results of a survey of accounting students that indicates a lack of understanding of current international accounting developments. Increasing the international component of the curricula would help prepare students for their future careers and may attract a larger, more diversified pool of students. Incorporating more international coursework into current accounting curriculums would increase the utility of a U.S. accounting degree for resident and non-resident students alike.

INTRODUCTION

A multitude of changes have taken place in the accounting profession in recent years. Information technology is replacing many of the traditional duties of accounting, while increasingly complex business transactions are giving rise to new responsibilities for accountants and auditors. Global economic integration, the transnational activities of multinational corporations, and the convergence of financial reporting standards are internationalizing the accounting profession. With this internationalization comes an increased demand for intelligent, well-educated, highly versatile accountants and auditors that can quickly adjust to the dynamics of today's modern global business environment. Understanding of current international issues is critical to the future success of accounting students (Ashcroft et al., 2008; Smith 2008; and Smith et al. 2008).

During the 1990s the number of accounting graduates in the U.S. decreased. As a result, for a number of years the accounting profession experienced a shortage of capable graduates. The worldwide recession, starting in 2008, alleviated the shortage, at least in the short term. However, the gap between supply and demand is not just a game of numbers. Many in the profession feel that accounting education is not producing the quality of graduates that today's

businesses demand. Observations of this problem were noted by Albrecht and Sack in their 2000 landmark study:

> "A growing gap exists between what accountants do and what accounting educators teach….Accountants who remain narrowly educated will find it more difficult to compete in an expanding profession…" (Bedford Report, 1986, as cited in Albrecht and Sack, 2000, p. 2).
>
> "In too many respects, accounting education is being delivered the same way today as it was 20 or 30 years ago" (Albrecht and Sack, 2000, p. 2).
>
> "In the best case—the number of students majoring in accounting is down. In the worst case, both the quantity and quality of students electing to major in accounting have decreased" (Albrecht and Sack 2000, p. 23).

The purpose of this study is examine the call for accounting curricula to increase its coverage of international issues, evaluate future accountants' knowledge of international accounting issues, and consider the potential benefits resulting from including international accounting in the accounting curriculum. Due to the ever-changing nature of modern business and the worldwide movement towards global accounting standards, U.S. accounting programs will likely benefit by broadening their curricula to include more international topics. This study supports the internationalization of the U.S. accounting curriculum since such a shift will enhance the capabilities of accounting graduates and may attract a larger, more diversified pool of students, including non-residents, a demographic group that has traditionally been smaller in accounting than in other functional business areas.

INTERNATIONAL BUSINESS AND THE ACCOUNTING PROFESSION

Recent decades have seen a steady increase in the number of business firms providing products and services to customers around the world. Exhibit 1 shows a model of information flows mediated by the various border crossings inherent in global operations. The complexity associated with multinational operations results from subsidiary operations in business settings that may differ substantially from the parent, thereby resulting in a complex operating, reporting, and information environment. Business firms engaged in international operations carry on business in a more complex environment than strictly domestic firms (Runyan and Smith, 2007). The movement toward global accounting standards, i.e., the IFRSs, will help alleviate some of this complexity, at least for accounting and financial reporting. In addition, use of IFRSs will facilitate efficiency in the global capital markets, including those in developing countries (Hunter and Smith, 2008).

The international business environment continues to evolve. According to Albrecht and Sack (2000), three major developments are affecting the number and type of services accountants perform and the way in which accountants perform them. The first of these is technology.

Modern information and communication technology allows firms to gather, organize, and utilize financial data at record speeds. Advances in information technology facilitate and even replace many first-stage accounting services. As a result, traditional accounting responsibilities can now be performed by fewer individuals using a host of software and data analysis programs (Albrecht and Sack, 2000).

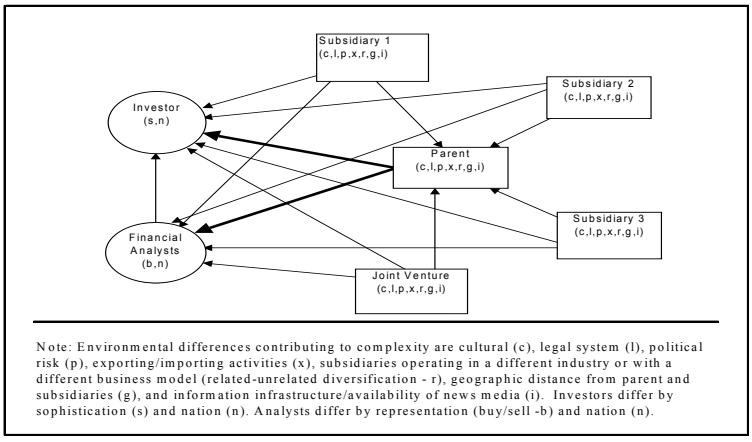


Exhibit 1: **Information Flows of Subsidiary and Parent Information to Investors and Analysts**
Source: B. Runyan and L.M. Smith. 2007. The Effect of Multinationality on the Precision of Management Earnings Forecasts. *International Journal of Accounting, Auditing & Performance Evaluation*, Vol. 4, No. 6: 572-588.

The second major development affecting global business and the accounting profession is globalization. Increasingly integrated markets and cross-border transactions are giving rise to new types of financial reporting issues. Trade liberalization and communication technology have allowed the world's consumers to choose between an increasing array of international and domestic companies. Firms can quickly respond to the strategies of their competitors, resulting in fierce competition for customers and resources (Albrecht and Sack, 2000).

The globalization of accounting and corporate financial reporting has been profoundly affected by the increasing acceptance of International Financial Reporting Standards (IFRSs) in countries around the world. IFRSs are the accounting standards published by the International Accounting Standards Board (IASB). In recent years, IFRSs went from being little used to what is now the world's dominant set of accounting standards (Smith 2008).

A few pivotal events led to the dominance of IFRSs over US GAAP and other accounting standards. Pivotal events include the financial scandals occurring in the US in the early 2000s, notably Enron, which highlighted weaknesses in US GAAP. A second pivotal event was adoption of IFRSs for financial reporting by listed companies in the EU in 2005. A third pivotal event was the US Securities and Exchange Commission's announcement in late 2007 to accept

IFRSs for financial reporting by non-US companies listed in the US stock market (Smith, 2008; Smith et al. 2008).

The third major change altering the way accountants perform their duties is the "concentration of power" in certain market participants. Mutual and pension funds control increasingly large stakes in international companies, adding to the competitive pressures to perform. Such control raises "the competitive bar very high and shorten(s) the periods over which success is measured" (Albrecht and Sack, 2000, p. 6).

Driven by these three major changes, the accounting profession is experiencing a pace of change never before seen. Product life cycles have been shortened and competitive advantages weakened. Managers and accountants must constantly adjust to ever-emerging trends and information. Global economic integration is giving rise to new companies and industries, which in turn, are giving rise to new accounting and auditing services. At the same time, increased competitive pressures are forcing companies to out-source non-value added activities that have traditionally been performed by accountants (Albrecht and Sack, 2000). Exhibit 2 highlights some of these changes.

Exhibit 2: Changes in the Global Business Environment Noted by Albrecht and Sack's 2000 Study

- Increased pace of change in the business world
- Shorter product life cycles
- Emergence of new companies and new industries
- Emergence of professional services
- Outsourcing of non-value added services
- Increase uncertainty and the explicit recognition of risk
- Increasingly complex business transactions
- Changes in financial reporting
- Increase regulatory activity
- Increase focus on customer demand

Source: Albrecht and Sack (2000)

Not only are international business activities affecting the degree and type of services accountants and auditors perform, but also they are driving the convergence of national accounting standards. This convergence should have implications for accounting education. A high likelihood that accounting graduates will work in a multinational corporation at some point in the career means that new accounting students need to be familiar with both U.S. GAAP and international accounting standards.

According to McAllister, Orsini, and Gould (1997) globalization and technology are driving accounting standards convergence. Information technology, especially the Internet, has made access to financial statements quick and easy, putting important information into the hands of investors, regulators, even competitors at unprecedented speed. In its 2004 Review of International Accounting and Reporting Issues, the United Nations Center for Trade and

Development (UNCTAD) states that the motivation for global accounting standards stems from the potential ability of localized or regional crises to affect the world economy. The report states that there is widespread recognition that global financial stability rests on robust national systems.

UNCTAD supports the convergence of global accounting standards for several reasons. First of all, global accounting standards promote transparency. Transparency lends to market efficiency and corporate discipline by assuring investors that financial reporting is accurate. Secondly, homogenized financial reporting practices allow for better comparability across international firms. Thirdly, transparency and comparability allow more accurate benchmarking and firm valuation. Lastly, assurance in company financial reports attracts investment, which is crucial for economic vitality (UNCTAD, 2004).

Countries worldwide are embracing accounting standards convergence. Since 2001, the International Accounting Standards Board (IASB), a London-based private standard setter, has been cooperating with national standards boards across the globe to facilitate the adoption of its International Financial Reporting Standards (IFRSs). Even the U.S. Financial Standards Accounting Board (FASB), a historically outspoken rival of the IASB, is now working towards the harmonization of IFRSs and U.S. GAAP (Gannon and Ashwal, 2004; FASB, 2006; Smith 2008).

The worldwide adoption of IFRSs requires accountants and auditors to be familiar with changes in international accounting standards. U.S. companies, even those not directly involved in operations overseas, may be required to report financial statements in IFRS format (Gannon and Ashwal, 2004). In addition, experts predict that the U.S. will eventually require use of IFRSs in place of U.S. GAAP for all firms trading on the U.S. stock market, both U.S.-based and non-U.S.-based firms (Smith 2008).

A SURVEY OF FUTURE ACCOUNTANTS' KNOWLEDGE OF INTERNATIONAL ACCOUNTING

How much do future accountants, i.e., students, know about international accounting? To assess future accountants' general knowledge of contemporary international accounting issues, a short survey of 161 students at two southwestern U.S. universities was completed in the spring 2008. Seven statements were prepared and students' level of agreement was obtained on a Likert scale from 1=strongly disagree to 5=strongly agree. All seven statements should have resulted in a "strongly agree" (5) or "agree" (4) response. Thus, the expected mean score is between 4 and 5. The mean scores to all seven statements is shown in Exhibit 3.

The first statement, of seven, was simply to ascertain students' understanding of a basic definition of accounting: Accounting is the recording, summarizing, and reporting of economic activities. Responses average 4.30. As this is a basic definition of accounting, a higher average

might have been preferable. However, the mean score is between 4 and 5 and therefore indicates that the average student in the sample knows the definition of accounting.

Exhibit 3 Survey of Accounting Students' Knowledge of International Accounting		
1	Accounting is the recording, summarizing, and reporting of economic activities.	4.30
2	Accounting standards differ due to culture, politics, laws, and economic factors	3.99
3	Globalization makes financial reporting technically demanding.	3.78
4	One set of accounting standards would simplify accounting for multinational enterprises (MNEs).	3.89
5	Consideration must be given to national differences in accounting standards.	4.11
6	The International Accounting Standards Board (IASB) is developing a single set of high-quality accounting standards.	3.65
7	The Securities and Exchange Commission (SEC) is considering allowing use of International Financial Reporting Standards (IFRS) instead of US GAAP.	3.56
Note: Sample included 161 accounting students. Responses ranged from 1=strongly disagree to 5=strongly agree.		

For the next six statements, all but one had a mean score below 4 (agree); this indicates a general lack of understanding of international accounting issues. For the second statement: Accounting standards differ due to culture, politics, laws, and economic factors, the mean score was 3.99. Given the news and general media attention to the impact of national and cultural differences, students would have been expected to agree (4) or strongly agree (5) on this statement.

For the third statement: Globalization makes financial reporting technically demanding, the mean score was 3.78. For the fourth statement: One set of accounting standards would simplify accounting for MNEs, the mean score was 3.89. Accounting students should realize, even without the benefit of a course on international accounting, that accounting would be more complex for a company with global operations. Further, students should know that one set of standards, as opposed to multiple sets, would simplify accounting. Mean scores were below 4, which show that students do not have an adequate understanding of these concepts.

For the fifth statement: Consideration must be given to national differences in accounting standards, the mean score was 4.11. The average student understands that accounting is affected by differences among nations. For the sixth statement: The IASB is developing a single set of high-quality accounting standards, the mean score was 3.65. While this has been widely reported, the average student was well below "agree" (4) on this statement.

For the seventh and final statement: The SEC is considering allowing use of International Financial Reporting Standards (IFRS) instead of US GAAP, the mean score was 3.56. This was widely reported in the news and especially in accounting publications throughout 2007 and early 2008. The fact that the mean student score was so low, the lowest of the seven statements, indicates a lack of knowledge of current events affecting accounting, specifically with regard to the International Financial Reporting Standards. Overall, based on the survey, future

accountants' knowledge of international accounting is deemed inadequate. If the two schools in the study are representative of other accounting programs, then this suggests a need to expand coverage of international accounting issues within the accounting curriculum.

HISTORICAL SHORTAGE OF U.S. ACCOUNTING GRADUATES

While not a problem at the time of this writing, the accounting profession has periodically experienced substantial shortages of qualified graduate. Research by the AICPA in 2002 found that the number of undergraduate and graduate students majoring in accounting declined by 21.3%, from 59,110 in 1991, to 46,555 in 2001. Likewise, the number of candidates sitting for the CPA exam fell some 24%, from 140,042 in 1991 to 106,072 in 2001 (Hartwell, Lightle, and Maxwell, 2005).

Demand for accounting graduates however, remains strong. According to the U.S. Department of Labor the job market for accountants and auditors is expected to grow 18-26% through 2014 (U.S. Department of Labor 2006).

Salary differential was a major reason fewer students chose accounting in the 1990s. Traditionally, and especially in the 1990s, accounting graduates commanded lower starting salaries than graduates in other areas such as finance and management information systems (MIS). In 2000 most accounting graduates' salaries still lagged those of finance and MIS. Since the passing of Sarbanes-Oxley however, advances in accounting salaries have outpaced those of other functional areas. To attract the necessary skills they need compete in the global business environment, companies have been forced to raise offers to new graduates. In 2006, the average starting salary for a bachelor's degree in accounting was higher than both finance and MIS. According to the National Association of Colleges and Employers, 2006 salaries for accounting graduates were higher than business management, marketing and MIS, and only slightly below financial services. Exhibit 4 shows a comparison of accounting graduates to other majors (NACE 2007).

Accounting salaries have risen in recent years, possibly due to cyclical demographics (i.e. smaller number of business majors as a whole) (Billiot, Glandon, and McFerrin, 2004), or it could be due to students' perceptions of what life as an accountant is like. According to Hartwell, Lightle, and Maxwell (2005), the job of filling the increasing demand for accountants and auditors begins with an understanding the target pool of potential new hires.

Student perceptions about life as an accountant play a major role in their decision of whether or not to major in accounting. The typical stereotype pegs accountants as boring people who work alone, creating the impression that accounting is largely non-interactive. To gain a better understanding of how those planning to major in accounting view the profession versus those choosing other majors, Hartwell et al. (2005) surveyed 278 high school students from Indiana and Ohio in 2002, the majority of which (93%) planned to pursue post-secondary

education. Among their respondents, 87 percent started thinking of a college major at the beginning of their senior year in high school, and 70% were considering a major in business.

Exhibit 4: Average Starting Salaries By Degree Field	
Degree Field	Average Starting Salary
Accounting	$47,421
Business Management	$44,048
Chemical Engineering	$59,707
Civil Engineering	$47,750
Computer Science	$52,177
Management Information Systems (MIS)	$46,966
Marketing	$41,285
Financial Services	$47,877
Economics	$53,449
Liberal Arts	$31,333
Source: NACE (2007).	

The Hartwell et al. (2005) survey results indicate that accounting majors versus non-accounting majors were less likely to hold the 'Hollywood' stereotype of accountants as bland, detail-oriented persons doing tedious tasks. Accounting majors were also more likely to see accounting as challenging work than non-accounting majors, (Hartwell et al. 2005). The difference in perceptions between those planning to major in accounting versus non-accounting majors may suggest the need for recruiters and faculty to highlight the challenging, interactive aspects of accounting. Doing so may help paint a more realistic picture of the accounting profession.

Another reason accounting may be attracting fewer students is the 150-hour rule. Intended to increase and broaden the training level of CPAs by increasing the number of college credits needed to sit for the CPA exam to 150, the 150-hour rule may actually be constraining the pool of potential accounting students. Some studies suggest that the 150-hour rule may negatively affect the number of students willing to pursue a career in accounting. To accommodate for the 150-hour rule some schools have implemented Masters of Accountancy degrees. This alone appears not to be attracting more undergraduate students (Billiot, Glandon, and McFerrin, 2004).

What is the value of an accounting degree? A study by Wilder and Stocks (2004) surveyed 114 company recruiters to determine how they viewed the potential of accounting graduates against graduates from other business disciplines. They found that the majority of recruiters preferred bachelor's of accounting graduates (mean rating of 75.13) over graduates with bachelor degrees in general business (67.00). Likewise, recruiters favored MBAs (72.75) over BBAs (69.00), and MBAs with bachelors in accounting (75.66) over BBAs in accounting (74.35).

Wilder and Stock's (2004) study finds that employers are seeking out accounting graduates, and prefer the combination of an undergraduate degree in accounting and an MBA. Such a combination tends to provide the best of both worlds. Though accounting skills are sought after, those students who combine the technical skills of undergraduate accounting with the critical thinking skills of an MBA were considered most ideal, an indicator of the need for accountants to be more broadly educated. The importance of Wilder's study is that accounting recruiters are seeking out the most versatile graduates from a pool that is not getting larger.

The number of international students seeking business-related degrees continues to climb. International students account for roughly 20-30% of U.S. business students. In European business schools the proportion of non-domestic students is higher. For example, in Barcelona's IESE, only 20% of the student population is of Spanish origin. At INSEAD, less than 10% of students are French. This applies to professors as well. Two-thirds of INSEAD's faculty are from countries other than France (Economist 2004).

Though the market for non-resident students in the U.S. remains strong, the ability of accounting programs to attract these students has been weak compared to other functional business areas. According to the U.S. Department of Education, Institute for Education Sciences, accounting has generally attracted fewer non-resident students as a proportion of total non-residents pursuing BBAs in the U.S. than other disciplines. While this number is growing, it still lags behind general business, MIS, finance, and management science. Exhibit 5 shows how accounting has fared against other business disciplines for the number of bachelors and masters degrees awarded to non-residents in selected years 1994, 1997, and 2003 (USDE 2006).

Exhibit 5: Percent of total degrees awarded to non-residents in the U.S.

	Percent of Bachelors degrees			**Percent of Masters degrees**		
Discipline	**2003**	**1997**	**1994**	**2003**	**1997**	**1994**
Accounting	4.41%	3.20%	3.24%	16.99%	14.75%	13.66
Business Administration	6.86%	5.49%	5.16%	20.24%	18.01%	17.56
MIS	7.98%	7.22%	7.71%	28.71%	27.10%	26.36
Finance	4.85%	8.04%	8.37%	30.29%	34.16%	26.09
Management Science	5.21%	5.27%	5.06%	25.19%	16.00%	13.26
Marketing	2.90%	5.45%	5.59%	27.29%	20.00%	11.41
Human Resources	1.80%	2.49%	2.58%	8.34%	7.81%	9.22
International Business	13.74%	14.08%	12.94%	33.69%	28.50%	30.13
Source: USDE (2006).						

Accounting attracts fewer non-resident accounting students as a proportion of total non-resident business students, than other functional business areas. The percentage has changed little in the last decade, from 3.24% in 1994 to 4.41% in 2003. At the same time, the percentage of non-resident business students majoring in international business has grown slightly from 12.94% in 1994 to 13.74% in 2003. This suggests that an international business degree holds more utility for non-resident students over traditional business degrees (USDE 2006).

PROBLEMS WITH CURRENT U.S. ACCOUNTING CURRICULA

The following observations summarize a joint study by the American Accounting Association (AAA), the American Institute of Certified Public Accountants (AICPA), the Institute of Management Accountants (IMA), Arthur Anderson, Deloitte & Touche, Ernst & Young, KPMG, and Pricewaterhouse Coopers, and written by Albrecht and Sachs (2000) on the current state of U.S. accounting education:

> "Most [accounting educators]…would not get an accounting degree if completing their education over again" (p.33).
>
> "If those who practice and teach accounting cannot provide positive testimonials about the value of accounting degrees, then who can?" (p. 34).

According to Albrecht and Sack, the majority of accounting faculty and practitioners, if given the opportunity to decide again, would not major in accounting a second time. Only 4.3% and 6.4% of respondents said they would get a bachelor's degree in accounting and stop there. Most responded that they would continue on with a Master's degree, but only 31.5% of those in academia, and 5.9% of those in industry would pursue a Master's of Accountancy. A significant proportion of practicing accountants, 36.4 percent, and of faculty, 37.7 percent, preferred an MBA to a Masters degree in accounting (Albrecht and Sack, 2000).

The fact that the majority of respondents to Albrecht and Sack's study would not repeat their decision to major in accounting highlights the problems facing accounting education. If practitioners and academicians cannot positively attest to the value of an accounting degree then the future of accounting education may indeed be in trouble. A shortage of quality students, a shortage of properly trained faculty, an out-of-date curriculum, and a rapidly evolving business landscape raise legitimate challenges for the future of U.S. accounting education. Accounting programs unable to keep up with this changing landscape will have a difficult time attracting quality students. Any solution to the problem must include the modernization of accounting education to reflect today's international business environment.

INTERNATIONALIZING THE U.S. ACCOUNTING CURRICULUM

Major accounting firms such as PricewaterhouseCoopers have made substantial efforts to assist accounting educators in including international materials in their courses. An online video available from the company's website is: IFRS Ready--Why are International Financial Reporting Standards important to you? (http://www.pwc.com/us/en/careers/pwctv/ch3-ifrs-ready.jhtml) and (2) Global Opportunities--Working Half a World Away (http://www.pwc.com/us/en/careers/pwctv/ch2-global-opportunities.jhtml).

According to a survey on the internationalization of U.S. business schools by Kwok et al. (1994), accounting education lags behind other functional areas in the internationalization process. Beed and Shooshtari (1998) identify several reasons why this might be. The foremost of these is lack of industry interest. Accounting education is so closely tied to practice, that a lack of industry interest has resulted in a lack of academic interest. For years U.S. industry and the Securities and Exchange Commission (SEC) resisted outside attempts to alter U.S. accounting practices. Only recently has the U.S. been working with the IASB and the International Organization of Securities Commissions (IOSC) to harmonize U.S. GAAP with IFRSs.

For U.S. schools to sufficiently internationalize, faculty members need to be familiar with international issues. The best method for training faculty in international accounting is during the doctoral process. Unfortunately, as with bachelors and masters programs, most doctoral programs in accounting offer few classes in international business (Beed and Shooshtari, 1998). Other ways to expose faculty to international issues is to get them involved in international research and conferences. This, however, may be an expensive alternative. An accounting department's funding is often dependent on the size of its student body. A shrinking pool of graduates means smaller budgets.

Another reason why accounting education may be slow to internationalize is the mutual relationship between textbooks and the CPA exam. As Beed and Shooshtari (1998) explain that books mimic the exam and the exam mimics the current textbooks. Their survey of the most commonly used textbooks in accounting classes found the majority to be void of international material. Those that did contain international information were 'superficial,' usually focusing on accounting systems in Canada, Australia, Britain, or New Zealand. If the material is not in the textbooks, students may get the idea that it is not relevant.

Educators should incorporate more international coursework into their accounting curriculums (Nix and Smith 2006). They can do this either by offering supplemental classes or by integrating international content into current classes. Students can also gain exposure to international accounting through international internships or international work-study projects. According to Kwok et al. (1994), schools can internationalize their accounting curriculums in several ways:

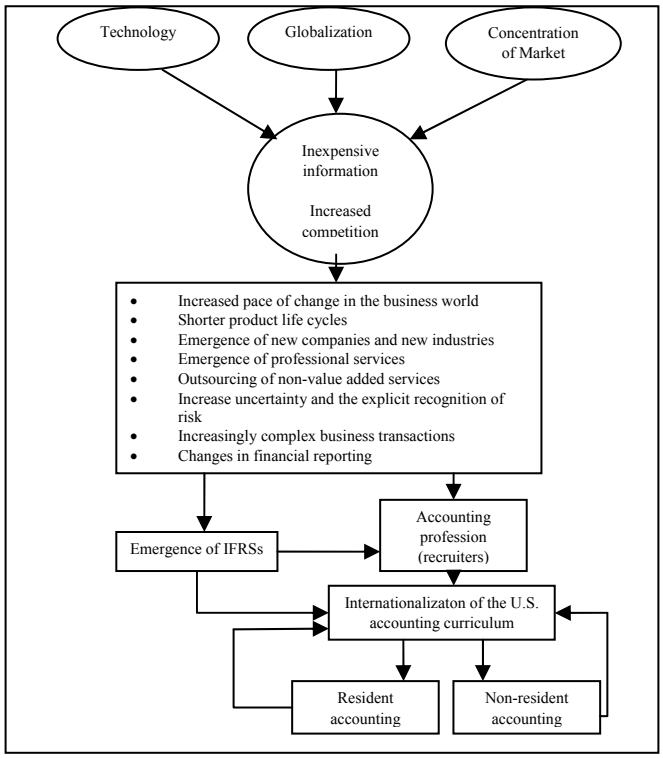
1. Infusion of international material into current coursework
2. Offering general International Business courses
3. Offering specialized International Business courses in functional fields
4. Offering non-business International topics courses

Internationalizing accounting education should involve broadening the traditionally narrow, domestic-based curricula. Today's market is demanding a different kind of accountant. Well-rounded graduates must be trained in domestic and international accounting fundamentals. They must possess good communication and analytical skills, and be able to interact with a

variety of clients. Internationalizing the accounting curriculum would increase the value and versatility of an accounting degree. A more valuable and versatile accounting degree would increase the potential pool of accounting graduates. Not only would the resident pool of accounting graduates likely increase, so too would the pool of non-residents students, since an 'international' accounting degree would hold more utility than a traditional degree focused solely on U.S. GAAP.

Exhibit 6 shows a model that conceptualizes the relationship between the changing world economy, its impact on the accounting profession, and the pressure both of these put on accounting education in the United States. This model builds off a previous model by Albrecht and Sack (2000) that shows how technology, globalization, and shifts in market power are changing the global business environment.

Exhibit 6: Impact of Modern Business on Accounting Education



Source: Albrecht and Sack (2000).

Exhibit 6 conceptualizes how the changing business landscape is driving the emergence of IFRSs and placing new demands on the accounting profession. The consequence of these changes is the need for U.S. accounting education to internationalize. The internationalization of U.S. accounting education would make a U.S. accounting degree more valuable to both resident and non-resident students, which would attract a larger, more diverse pool of accounting majors.

A larger, more diverse pool of accounting majors would help alleviate student shortages and increase competition among students. The end result should be higher quality, well-rounded, internationally educated individuals with the skills necessary to prosper in the global work place.

LIMITATIONS AND FUTURE RESEARCH

The current study was limited to students at two southwestern US universities. Future research might include additional universities. In addition, future research could solicit perspectives on international issues from accounting professionals working in public accounting, industry, and not-for-profit organizations.

CONCLUSIONS

Technology, globalization, and shifts in market power have facilitated the free flow of inexpensive and easily attainable information across markets. The accounting profession is expanding to meet the needs of this dynamic business environment. Global economic integration has given rise to international accounting standard convergence. This convergence of IFRSs, and the new responsibilities of the modern accountant are forcing accounting educators to rethink current accounting curricula.

To evaluate knowledge of future accountants regarding international accounting, a survey was made of students at two southwest U.S. universities. Based on the survey, knowledge of international accounting appears inadequate. Given the limited sample, however, the findings may not be generalizable to other accounting programs. On the other hand, if the sample is representative, then the findings suggest that coverage of international accounting issues should be expanded within the accounting curriculum.

The internationalization of U.S. accounting education is both critical and overdue. By incorporating more international coursework into current accounting curriculums, educators would increase the utility and hence the value of U.S. accounting degrees for both resident and non-resident students. The impact of such changes would be twofold: First, they would be meeting the needs of the accounting profession by improving the quality of accounting graduates. Second, they may increase the pool of available accounting students by attracting students who would not have otherwise selected accounting as a career.

Today's accountants must be dynamic and versatile enough to succeed in the global workforce. An education that involves both international and domestic aptitude would better meet the demands of the modern business world.

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THE EFFECT OF NEW INTERNATIONAL ACCOUNTING STANDARDS ON FIRMS FROM INDIA AND US

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ABSTRACT

Companies that participate in the "Global Economy" must develop accounting systems that provide the internal information required by managers to run the organization and external information needed by lenders, shareholders, and government officials in all countries in which the companies operate. Accounting systems deal with the monetary structures of countries, which are derived from local laws, socio-economic conditions, cultural standards and traditions.

Economic globalization highlights the need for common bases of understanding of financial structure. As different countries try to open up their industries and their capital markets to foreign investment, multiple GAAPs create problems of consistent reporting to potential investors. To reduce the negative effects of these differences, the International Financial Reporting Standards Board has proposed a set of common financial reporting standards (IFRS). "Converging" to a common set of reporting standards will cause short-term problems which, hopefully, will lead to long-term net benefits. Supporters of this effort hope that widespread adoption of these common reporting standards will increase investors' confidence and reduce barriers to the flow of investment capital.

This paper uses a computer program specifically developed to show how financial data can be translated from one system to another. Using this software, the paper shows how the proposed convergence to an internationally accepted set of common financial reporting standards can reduce the cost of doing business with international partners and reduce the risk of investing in international operations.

INTRODUCTION AND BACKGROUND

Accounting systems deal with the monetary structures of countries, which are derived from local laws, socio-economic conditions, cultural standards and traditions. Accommodations to cultural, legal, and socio-economic factors give accounting systems unique structures. In spite of the common framework of principles, countries integrate specific aspects of culture, socio-economic framework and legal structure into unique sets of Generally Accepted Accounting Principles or GAAPs.

Accounting standards and practices reflect the influence of legal, cultural, political and economic factors. Because these factors vary by country, the underlying goals and philosophy of national accounting systems vary dramatically (Griffin, 2009).

In common law countries like the United States and United Kingdom, accounting procedures evolve from decisions of independent standard-setting boards. Accountants in common law countries follow generally accepted accounting principles (GAAP) that provide a "true and fair" value of a firm's performance based on standards promulgated by standard-setting boards. Operating within the boundaries of GAAP, accountants can exercise professional discretion in reporting a "true and fair" depiction of a firm's performance (Griffin, 2009).

In countries which rely on code law, national accounting practices are likely to be codified rather than based on the collective wisdom of professional accounting groups. In France, for example, firms must adhere to a national chart of accounts. This accounting system dates back to the seventeenth century and reflects a long tradition of strong government control over the economy (Griffin, 2009).

In countries where accounting practices are determined by national laws, the government plays the major role in monitoring accounting practices. Common law countries rely to a greater extent on private litigation to enforce the accuracy and honesty of accounting practices.

A country's accounting system may also reflect its cultural background. Large companies in France must publish a "social balance sheet" detailing compensation of their workforces. Strong anti-inflation biases are embedded in German accounting practices as a reaction to the hyperinflation of the early 1920s (Griffin, 2009).

Accounting system structure is heavily influenced by economic and political systems also. In centrally planned economies, accounting systems are designed to provide information which shows how state funds are used and whether state-mandated production quotas are being met.

EFFECT OF ECONOMIC GLOBALIZATION

Companies that participate in the "Global Economy" must develop accounting systems that provide the internal information required by managers to run the organization and external information needed by lenders, shareholders, and government officials in all countries in which the companies operate.

Economic globalization highlights the need for common bases of understanding of financial structure. As different countries try to open up their industries and their capital markets to foreign investment, multiple GAAPs create problems of consistent reporting to potential investors. To reduce the negative effects of these differences, organizations like the International Financial Reporting Standards Board has proposed a set of common financial reporting standards (IFRS). Supporters of this effort hope that widespread adoption of these common reporting standards will increase investors' confidence and reduce barriers to the flow

of investment capital. "Converging" to a common set of reporting standards will cause short-term problems which, hopefully, will lead to long-term net benefits.

Currencies, dates and other units of measure differ significantly from one country to the next. In the U.S., the last day of 2009 would be written as December 31, 2009 and a million currency units would be written as $1,000,000.00. In India, the last day of 2009 might be written as 31 December 2009, and a million currency units might be Rs 10,00,000.00. Because of the differences in currencies and languages, companies have to make choices as to how their statements will be presented.

METHODS FOR COMPANIES TO DEAL WITH GLOBAL ACCOUNTING ISSUES

Companies whose operations or financing become globalized may not be able to ignore differences between reporting requirements at home and different reporting practices in countries where they have significant numbers of customers or investors. According to Sorensen (2007), methods for dealing with different reporting requirements include:

- Do nothing extra for foreign countries
- Convenience Translations
- Convenience Statements
- Limited Restatements
- Reconciliation to foreign country's GAAP
- Secondary Statements

Many companies provide the same reports to foreign users that they provide to domestic users. This "Do Nothing Extra" approach is reasonable for companies that are not particularly interested in attracting foreign investors. Such companies do not see enough additional benefits to justify the cost of taking any additional action to attract foreign investors.

Convenience translations represent the minimal effort on the part of companies to respond to foreign users. In a convenience translation, the preparer translates the language of the financial statements to the language of the foreign country, but the accounting principles and currency are still those of the preparer's country. In international accounting literature, the term Convenience Statement means that reports are prepared in a foreign user's language and currency, but the accounting principles remain those of the home country.

In addition to translating language and currency, Limited Restatements provide supplementary disclosures to reconcile financial statements to the user's GAAP. Reconciliation to Foreign GAAP is similar to limited restatement, but includes more complete restatements of financial information to accommodate regulations of the countries where securities are listed. Preparation of Secondary Statements means translating the home country annual report into a foreign country's language, currency, and accounting principles.

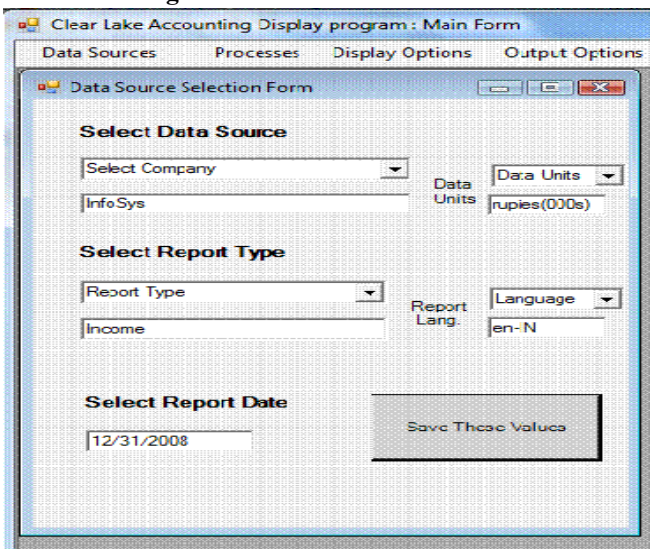
Translating home country annual report into a foreign country's language, currency, and accounting principles can be very expensive. Companies wishing to list stock on several different exchanges worldwide can use Universal Secondary Statements rather than Country-Specific Secondary Statements. In universal secondary statements, a company could use its own currency or a major international currency such as the euro or the U.S. dollar. The language of such statements would be English and the format would be in accordance with International Financial Reporting Standards.

TOOLS FOR TEACHING ACCOUNTING SYSTEMS IN A GLOBAL ENVIRONMENT

Most business schools in the United States teach accounting courses with the assistance of one or more accounting packages. Peachtree Accounting and Microsoft Dynamics (formerly Microsoft Accounting) are examples of accounting systems frequently used to teach accounting. Enterprise Resource Planning (ERP) systems have tools for selecting appropriate currencies and formats, but ERP systems introduce many new sets of problems including high license fees, complicated installations and very high maintenance costs. Some schools have added a third option for teaching accounting in a global environment. The third option is software specifically designed to demonstrate differences between different accounting systems.

At the University of Houston – Clear Lake, a software package called Clear Lake Accounting is being developed to help in teaching various accounting classes. One feature of Clear Lake Accounting is the ability to integrate data from different sources and present that data in different formats.

Figure 1 Main Selection screen

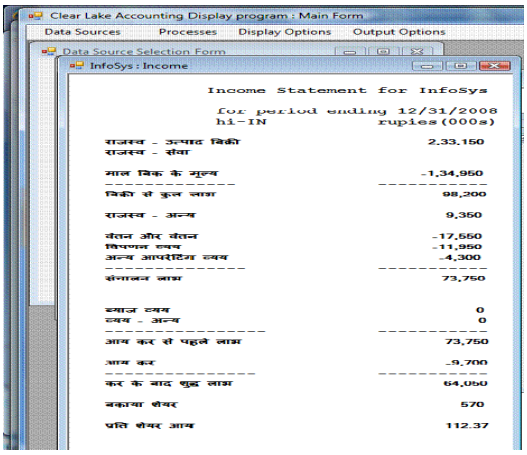


The package Clear Lake Accounting allows the user to combine different methods for converting currencies with different templates for display financial reports. Figure 1 above shows a portion of the Clear Lake Accounting which allows the user to select data for the Indian software company Infosys. Before reaching this screen, the user would have selected the mode of data entry as Text file, spreadsheet, XML file or Database.

Clear Lake Accounting can access data from text files, spreadsheets, XML files, or databases. In displaying financial reports, the user of this system can translate currencies and present reports in various languages and formats. Translation of currencies can be done in a very simple manner, using one exchange

rate for all values to be translated, or it can be done using program scripting to translate different accounts with rates from different time periods. Program scripts are also used to combine sub-accounts into aggregate accounts. Templates are used to determine the output formats of various reports. Portions of this program were specifically designed to be used to compare features of different accounting systems throughout the world.

Figure 2, below, shows the result of combining the selected data with a template for an income statement under Indian GAAP. In this example, the language is English and the currency units are rupees.



The Clear Lake Accounting Package includes provisions for simple currency conversions where only one conversion rate is applied to all currency data. Figure 3, shows the process of converting rupees into U.S. dollars using a single conversion rate.

Figure 4, shows a "convenience statement", a version of the Infosys income statement in English, after converting the currency to U.S. dollars. . This simple conversion process can be used to prepare "Convenience" statements, but may not serve the needs of foreign investors because the GAAP of the home country is maintained.

Figure 3 Conversion Screen

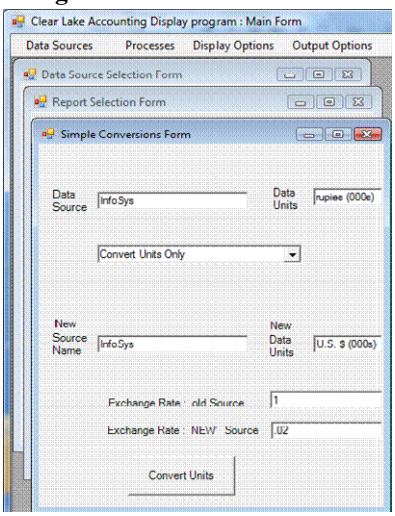
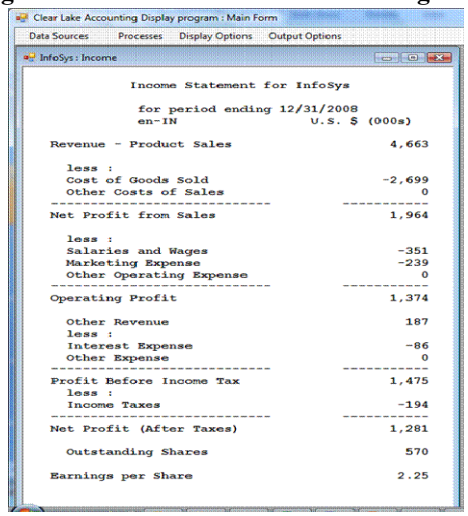


Figure 4 Convenience statement in English



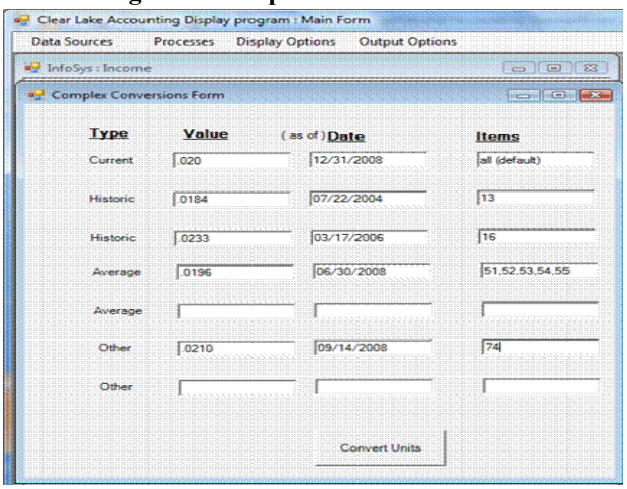
Simply converting language and currency units will not be sufficient to attract investment funds from the U.S. capital markets. Any company hoping to attract U.S. capital should provide audited statements showing compliance with U.S. GAAP. This could be very expensive. While a large company such as Infosys can afford to provide such a restatement of its financial position, most companies cannot afford such luxuries.

Even for large companies such as Infosys, there are limits to the expense which can be justified in order to provide secondary financial statements. Capital markets in Japan, China and the European Union offer excellent opportunities for companies which can afford to provide financial information in an effective manner, but providing secondary financial statements in multiple languages to satisfy the requirements of multiple GAAPs would be prohibitive for even large firms.

As an added difficulty, companies which have a major portion of their operations in a country which uses a different currency would have to account for gains and losses due to fluctuations in the value of that currency relative to the home currency of the company. This means that foreign exchange transaction risks and foreign currency translation risks would have to be considered in preparing financial statements (Sorensen, 2007).

According to the rules proposed by the International Financial Standards Board, transaction risks would be accounted for on consolidated income statements and translation risks would not be accounted for on the current income statement, but would be recognized as an adjustment to owners' equity. The difference would occur because different items would be translated using exchange rates from different time periods.

Figure 5 Complex Conversion Process

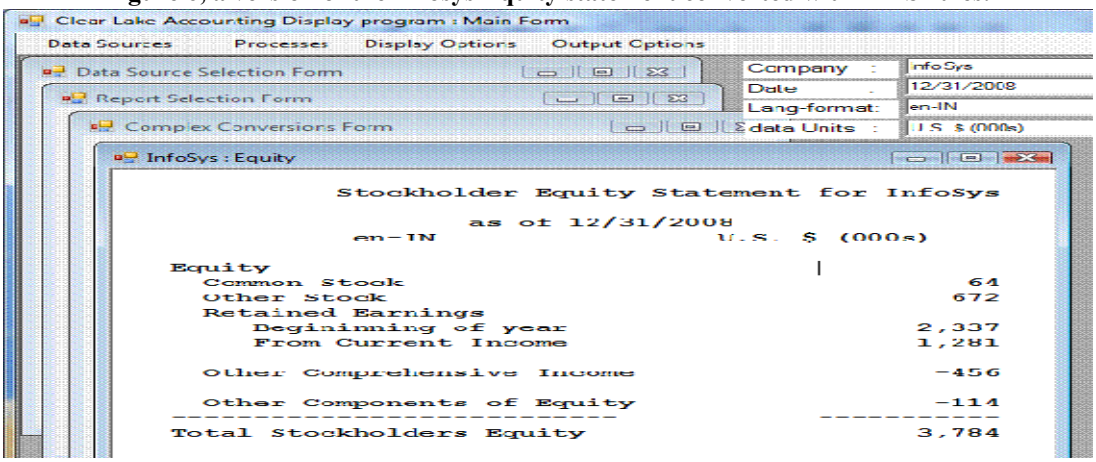


For instance, sales of merchandise, operating expenses and current liabilities would be converted at the current (reporting) date while long-term investments and long-term liabilities would be converted at historic rates. Converting items at different rates (due to different time periods) introduces translation adjustments.

These adjustments are reported as part of the "Other Comprehensive Income" category which is added to increases in retained earnings in determining Stockholder Equity. Figure 5, shows a complex process of converting rupees into U.S. dollars for several different categories of accounts.

Figure 6, shows the results of calculating Stockholder Equity which includes Currency Translation Adjustment as part of Other Comprehensive Income.

Figure 6, a version of the Infosys Equity statement converted with IFRS rules.



CONCLUSIONS

Utilizing an almost universally accepted set of international standards, even small companies could reach capital markets which previously had been unavailable to them. It is extremely important that companies act in a timely manner to take advantage of new opportunities as they become available. This means that companies which want to take advantage of newly emerging global opportunities must be ready and able to use international standards as soon as they become accepted.

Effective and wide-spread use of international standards will not occur unless educators begin immediately to provide materials which demonstrate the effects of international financial reporting standards. Upgraded accounting packages and ERP software will provide some of the tools needed to train tomorrow's business leaders. Other tools must be developed by those who are teaching accounting and finance courses today.

The tools used to teach accounting and finance courses must specifically include devices which show the effects of foreign exchange transaction risk, foreign currency translation risk, and specific effects to financial statements of currency translations made over different time periods.

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