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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.

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THE EFFECTS OF SARBANES-OXLEY ON EARNINGS FORECASTS

Ronald A. Stunda, Birmingham-Southern College

ABSTRACT

This research tests whether there is any impact on voluntary earnings disclosures released after the implementation of the Sarbanes-Oxley Act of 2002. In terms of bias and information content, findings suggest that forecasts tend to significantly differ during a post Sarbanes-Oxley environment. With increasing numbers of publicly-held firms implementing the Sarbanes-Oxley rules, these findings have practical implications on users of forecast information.

INTRODUCTION

Prior research in the study of voluntary earnings disclosures finds that managers release information that is unbiased relative to subsequently revealed earnings and that tends to contain more bad news than good news [Baginski et al.(1994), and Frankel (1995)]. Such releases are also found to contain information content [Patell (1976), Waymire (1984), and Pownell and Waymire (1989)]. Although forecast release is costly, credible disclosure will occur if sufficient incentives exist. These incentives include bringing investor/manager expectations in line [Ajinkya and Gift (1984)], removing the need for expensive sources of additional information [Diamond (1985)], reducing the cost of capital to the firm [Diamond and Verrechia (1987)], and reducing potential lawsuits [Lees (1981)].

One area that is just beginning to be researched is the ramification of the Sarbanes-Oxley Act of 2002 on such issues as audit opinions, income smoothing and impact of earnings forecasts. Ewert and Wagenhofer (2005) find that tighter accounting standards provide more relevant information to the capital market. The implication of this finding could be that tighter standards, as evidenced through Sarbanes-Oxley, result in less earnings management, and therefore, less bias and greater information content of earnings disclosures in a post Sarbanes-Oxley environment.

In addressing this research question, I rely upon literature that indicates different incentive structures that may lead to earnings management. DeAngelo (1986) shows that managers have incentives during management buyouts to manage earnings downward in attempts to reduce buyout compensation. Collins and DeAngelo (1990) show that earnings management occurs during proxy contests, and market reaction to earnings during these contests is different. DeAngelo (1990) finds that managers have incentives during merger activities to manage earnings upward so as to convey to current stockholders that the potential merger will not adversely affect their investment. Perry and Williams (1994) find that management of accounting earnings occurs in the year preceding

"going private" buyouts. Stunda (1996) finds that managers exert greater upward earnings management during mergers and acquisitions, while Stunda (2000) finds that managers tend to manage earnings upward during periods of management changes.

This study assesses whether or not there are any significant differences in management forecast credibility in a post Sarbanes-Oxley ["post"] environment versus a pre Sarbanes-Oxley ['pre"] environment. In accomplishing this, the presence of earnings forecast management is tested by using bias measures along with the market reaction to the forecasts. The study focus is on firms that have issued earnings forecasts during the period 2003-2005. Results are compared to the same firms that have released earnings forecasts during the period 1997-2001. In addition, firms that had any confounding issues during these periods (i.e., management changes, mergers, acquisitions, etc.) were eliminated from the sample. Based upon statistical analysis, conclusions are drawn that identify whether Sarbanes-Oxley becomes a factor that influences management earnings forecasts. This would have implications for voluntary disclosures in general, and specifically would indicate if such voluntary disclosures are more or less biased in a post Sarbanes-Oxley environment.

HYPOTHESIS DEVELOPMENT

Hypothesis About Bias of Management Forecast

If the same degree of earnings management (whether positive or negative) exists in both the forecast of earnings and actual earnings, the expectation is that there would be no difference in forecast error. If, however, the ability to perform earnings management is anticipated but not realized, some difference of forecast error would be present. If greater upward earnings management of the forecast occurs (or less actual earnings management), a negative forecast error should exist. If greater downward earnings management of the forecast occurs (or less actual earnings management), a positive forecast error should exist. Thus, the first hypothesis tests for the existence of forecast error. The null hypothesis tested is:

H1: Average management forecast error (actual EPS – management forecast of EPS) is not significantly different for firms in "pre" versus "post" periods.

Hypothesis About Information Content of Accounting Earnings and Management Forecasts

If investors interpret earnings forecasts as just additional noise, the market would discount this information. If, however, investors view the earnings forecast as a positive (or negative) signal from management, the market would not discount the information. The expectation for information content of management forecasts would revolve around these two notions. These alternative notions suggest the following null hypothesis:

H2: The information content of management forecasts in "pre" periods is equal to the information content of management forecasts in "post" periods.

RESEARCH DESIGN

The sample consists of management forecast point estimates made during the period 1997-2001 ("pre"), and 2003-2005 ("post"), meeting the following criteria: 1) The management earnings forecast was recorded by the Dow Jones News Retrieval Service (DJNRS). 2) Management change information was obtained from the Wall Street Journal (WSJ). 3) Security price data was obtained from the Center for Research on Security Prices (CRSP). 4) Earnings data was obtained from Compustat. The overall sample consists of firms which made at least one management earnings forecast during the "pre" and "post" periods. Table 1 provides the summary of the sample used in the study.

Table 1: Study Sample Summary

	Number of Firms
Original sample	192
Firms removed due to insufficient Compustat data	18
Firms removed due to insufficient CRSP data	7
Final overall sample	167

TEST OF HYPOTHESIS 1

The management forecasts of earnings must be related to actual earnings in order to determine if bias exists. McNichols (1989) analyzes bias through the determination of forecast error. Stated in statistical form the hypothesis is represented as follows:

$$\sum n \frac{fe_i}{} = 0$$

Where: fe_i = forecast error of firm i (forecast error = actual eps – management forecast of eps), deflated by the firm's stock price 180 days prior to the forecast.

In order to test hypothesis 1, firm forecasts are analyzed for the "pre" and "post" periods. Statistical analysis is performed on the sample in order to determine if the average forecast error is zero. McNichols (1989) and DeAngelo (1988) conduct a t-test on their respective samples in addition to a Wilcoxon signed rank test. Lehmann (1975) reports that the Wilcoxon test has an

efficiency of about 95% relative to a t-test for data that are normally distributed, and that the Wilcoxon test can be more efficient than the t-test for non-normal distributions. Therefore, this analysis consists of performing a t-test and a Wilcoxon signed rank test on the average cross-sectional differences between actual earnings per share and the management forecast of earnings per share.

TEST OF HYPOTHESIS 2

The purpose of this test is to assess the relative information content of management earnings forecasts in "pre" and "post" periods. The following model is used to evaluate information content:

$$CAR_{it} = a+b_1UE_{it}+b_2D1_{it}UE_{it}+b_3MB_{it}+b_4B_{it}+b_5MV_{it}+b_6H_{it}UE_{it}+e_{it}$$

Where:
- CAR_{it} = Cumulative abnormal return forecast i, time t
- a = Intercept term
- UE_{it} = Unexpected earnings for forecast i, time t
- $D1_{it}$ = Dummy variable, 0 for "pre", 1 for "post"
- MB_{it} = Market to book value of equity as proxy for growth and persistence
- B_{it} = Market model slope coefficient as proxy for systematic risk
- MV_{it} = Market value of equity as proxy for firm size
- H_{it} = Horizon of forecast, measured as days into year before forecast
- e_{it} = error term for forecast i, time t

The coefficient "a" measures the intercept. The coefficient b_1 is the earnings response coefficient (ERC) for all firms in the sample (during both "pre" and "post" periods). The coefficient b_2 represents the incremental ERC for "post" periods. Therefore, b_2 captures the difference in the information content for firms in "pre" and "post" periods. The coefficients b_3, b_4, b_5, and b_6 are contributions to the ERC for all firms in the sample. To investigate the effects of the information content of management forecasts on ERC, there must be some control for variables shown by prior studies to be determinants of ERC. For this reason, the variables represented by coefficients b_3 through b_6 are included in the study.

Unexpected earnings (UE_i) is measured as the difference between the management earnings forecast (MF_i) and security market participants' expectations for earnings proxied by consensus analyst following as per Investment Brokers Estimate Service (IBES) (EX_i). The unexpected earnings are scaled by the firm's stock price (P_i) 180 days prior to the forecast:

$$UE_i = \frac{(MF_i - EX_i)}{P_i}$$

For each disclosure sample, an abnormal return (AR_{it}) is generated for event days –1, 0, and +1, where day 0 is defined as the date of the forecast disclosure identified by the DJNRS. The market model is utilized along with the CRSP equally-weighted market index and regression parameters are estimated between –290 and –91. Abnormal returns are then summed to calculate a cumulative abnormal return (CAR_{it}). Hypothesis 2 is tested by examining the coefficient associated with the unexpected earnings of forecasts, b_2, during "post" periods. There are two possible conclusions; the forecast may be noisy, which in this event, $b_2 \leq 0$, or it will possess an information-enhancing signal to the investor, which will result in $b_2 > 0$.

RESULTS

Table 2 contains the results of the hypothesis 1 test. Panel A of Table 2 indicates results for the sample of 167 firm forecasts for the "pre" period. Mean forecast error for these firms is -.08 with a p-value of .05. Using the distribution-free rank test, significance is observed at the .01 level. Panel B of Table 2 indicates results for the sample of 167 firm forecasts for the "post" period. Mean forecast error for these firms is .05 with a p-value of .01. Using the distribution-free rank test, significance is observed at the .01 level. The results associated with these statistics are consistent with the notion of greater upward earnings management of the forecast for the "pre" periods, and a greater downward earnings management of the forecast for the "post" periods. Results, therefore, lead to a rejection of hypothesis 1 that average management forecast error equals zero for both periods. In fact, results indicate that management forecasts are significantly more conservative in a "post" period.

Table 3 contains the results of the hypothesis 2 test. As indicated in the table, the coefficient representing the variable which is the incremental ERC for "post" periods (b_2), has a value of .10 with a p-value of .05. The coefficient representing the overall ERC for all firms (b_1), has a value of .14 with a p-value of .04. All other control variables are not significant at conventional levels. These findings indicate that not only do forecasts contain information content, there is a difference in the information content of management forecasts in "post" versus "pre" periods. Results, therefore, suggest rejection of the hypothesis that information content of management forecasts during these two periods is equal.

CONCLUSION

This study provides empirical evidence regarding the credibility of management forecasts during pre Sarbanes-Oxley and post Sarbanes-Oxley forecasting periods. Bias results indicate that managers exerted greater upward earnings management on the forecast during a pre Sarbanes-Oxley environment, but tend to exert greater downward earnings management on the forecast in a post Sarbanes-Oxley environment. Information content results indicate the presence of incremental information content in management forecasts in a post Sarbanes-Oxley environment.

Table 2: Test of Hypothesis One

Table Entry is Average Management Forecast Error Deflated by Firm's Stock Price 180 Days Prior to Forecast

Model: $\sum_{n=0} \frac{fe_i}{}$

Panel A-management forecast error for "pre" period forecasts

Mean				Standard	
(t-statistic)	Median	Minimum	Maximum	Deviation	
-.08	-.01[b]	-.005	-.287	.0014	
(-2.23)[a]					

[a] Significant at the .05 level (two-sided test).

[b] Significant at the .01 level using the non-parametric sign rank test

fe_i = forecast error of firm i (actual eps - management forecast of eps).

n = sample of 167 firm forecasts for the period 1997-2001.

Panel B-management forecast error for "post" period forecasts

	Mean				Standard
n	(t-statistic	Median	Minimum	Maximum	Deviation
419	.05	.01[b]	.002	.348	.0011
	(2.35)[a]				

[a] Significant at the .01 level (two-sided test).

[b] Significant at the .01 level using the non-parametric sign rank test.

fe_i = forecast error of firm i (actual eps-management forecast of eps).

Table 3: Test of Hypothesis Two

Model: $CAR_{it} = a+b_1UE_{it}+b_2D1_{it}UE_{it}+b_3MB_{it}+b_4B_{it}+b_5MV_{it}+b_6H_{it}UE_{it}+e_{it}$

Table represents data for "pre" and "post" period forecasts

	Coefficients (t-statistic)							
n	a	b_1	b_2	b_3	b_4	b_5	b_6	Adj. R^2
167	.23	.14	.10	.12	-.06	.02	.18	.082
	(.88)	(2.10)[a]	(1.96)[b]	(.11)	(-.32)	(.28)	(.50)	

[a] Significant at the .04 level (one-sided test).
[b] Significant at the .05 level (one-sided test).

CAR_{it} = Cumulative abnormal return forecast i, time t
a = Intercept term
UE_{it} = Unexpected earnings for the forecast i, time t
$D1_{it}$ = Dummy variable, 0 for "pre" periods, 1 for "post" periods
MB_{it} = Market to book value of equity in proxy for growth and persistence
B^{it} = Market model slope coefficient as proxy for systematic risk
MV_{it} = Market value of equity as proxy for the firm size
H_{it} = Horizon of forecast, measured as days into year before forecast
e_{it} = error term for the forecast i, time t

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CORPORATE GOVERNANCE AND REAL EARNINGS MANAGEMENT

Gnanakumar Visvanathan, George Mason University

ABSTRACT

The role of corporate governance in financial reporting has received significant attention in recent years. In particular, researchers have examined whether certain governance factors restrain earnings management practices at companies. This research has primarily focused on accrual type earnings management. This study examines the role of corporate governance in the context of "real" earnings management where firms attempt to achieve desired earnings numbers by departing from normal operating activities. Using a sample of 6,759 firm years, the study examines several overall board characteristics and audit committee characteristics in the context of real earnings management. The study finds limited support for some of the factors that have been found to be significant in constraining accruals type earnings management. Having a higher proportion of independent directors appears to be helpful in limiting this type of earnings management, however. These results should be of interest to investors and regulators who rely on governance mechanisms to oversee the integrity of corporate financial reporting.

INTRODUCTION

The passage of Sarbanes-Oxley Act of 2002 by the U.S. Congress and the several high profile accounting restatements that occurred in recent years have focused the attention of researchers and the media on various types of earnings management undertaken by corporations and the reforms needed to minimize such actions. In this regard, considerable critical attention has been focused upon the role of the board of directors and audit committees in overseeing the activities of executives, in particular in instances of earnings manipulation. Sarbanes-Oxley Act enacted provisions that deal with rules governing corporate governance in general and board of directors in particular that should likely constrain earnings manipulation. Several research studies prior to and after Sarbanes-Oxley Act have examined the role of board of directors in constraining earnings management (for example, see Klein 2002a).

Much of the attention focuses on accrual type earnings management such as aggressive revenue recognition and misstatement of inventories or accounts receivable etc. Companies manipulate earnings not only by accruals but also by taking or postponing production or operating actions that adjusts the earnings towards the desired target. The latter type is labeled as "real" earnings management. In contrast to accruals management, real earnings management is likely to lead to value reduction by misallocation of appropriate corporate activities. Prior research has

primarily studied the role of corporate governance in the context of accruals management. This study examines whether certain characteristics of governance constrain real earnings management. Graham et al (2005) document the pervasive occurrence of earnings management through real activities and note that managers are likely to turn toward this type of earnings management in the post–Sarbanes-Oxley era because much of the media and analyst attention is focused on accrual type earnings management. In contrast to evidence and attention on accruals management the research focus on real earnings management has been scarce and relatively new. Given the importance of real earnings management as noted by Graham et al. this study seeks to answer the question whether and what type of corporate governance characteristics constrain real earnings management.

To address this issue this study uses a sample of 9,567 firm years over the period 1996 to 2002. Several data on overall board characteristics such as the number of directors in the board, whether the chief executive office and the chairmanship of the board are occupied by the same person, and the proportion of directors who are independent are used in the analysis. Similarly, characteristics of audit committees such as the size of the audit committee, the proportion of directors who are independent in the audit committee and the number of meetings held by the committee are also used. Using models developed by Roychowdury (2006), the study examines the association between proxies for real earnings management and the board and audit committee characteristics. In addition to the corporate governance variables, the models include control variables as specified in Roychowdury.

The results show that overall board independence is significantly negatively associated with occurrence of real earnings management. For most other board or audit committee variables, no significant association obtains with real earnings management proxies. Such results indicate that in contrast to results in studies that have examined accrual type earnings management and found significance for a variety of board and audit committee variables (see Klein 2002a for example), in the case of real earnings management governance variables do not appear to have a strong role. This indicates that investors, regulators, and analysts who rely on governance mechanisms to play a significant role in restraining earnings management practices may have to reexamine the appropriateness of governance provisions to address the evolving and novel means of corporate financial reporting distortions.

HYPOTHESES DEVELOPMENT

Graham et al. survey CFOs and document that managers often engage in real earnings management to meet or beat earnings expectations. They note that in the post-SOX environment managers may prefer to shift from taking accounting actions, i.e., accounting policies and estimates, to real actions to manage earnings. This is because after SOX accounting actions may be subject to increased scrutiny from auditors and regulators. Graham et al. estimate that managers' attempts to engage in earnings management destroy $150 billion of value and thus it is potentially important to identify mechanisms that may constrain real earnings management.

Roychowdhury (2006) defines real activities manipulation as "departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial goals have been met in the normal course of operations. These departures do not necessarily contribute to firm value even though they enable managers to meet reporting goals." He investigates patterns in cash flow from operations (CFO), discretionary expenses, and production costs and hypothesizes that manipulating real activities would result in abnormally *low* cash flow from operations or unusually *low* discretionary expenses, such as advertising or research and development expenses, or unusually *high* production costs. His arguments rely on the fact that real earnings management manifests through sales manipulation, reduction of discretionary expenditures, or overproduction. For example, if a firm tries to achieve higher sales by providing price discounts this will lead to lower cash flows over the life of the sales and thus will lead to lower cash flow from operations. Thus, lower cash flow from operations is a potential characteristic of real earnings management firms. Second, firms can manage earnings by reducing discretionary expenses such as R&D, advertising, and maintenance. Because these are expensed in the period they are incurred, a reduction in their spending directly flows through to increase income. Thus, another potential characteristic of firms doing real earnings manipulation is lower discretionary expenses. Last, to report higher earnings firms may lower their cost of goods sold expense by means of overproduction. By producing more than necessary, fixed overhead costs are spread over a larger number of units, which results in a decrease in total cost per unit. This in turn, decreases cost of goods sold which increases income. Thus, another potential characteristic of real earnings management firms is that they exhibit high production costs.

Board members bear costs (litigation risk and harm to reputation capital) associated with earnings management in general and thus, are expected to constrain real earnings management. Prior literature on board governance argues that certain attributes of corporate governance are associated with lower earnings management. The key attributes are discussed below:

Board characteristics

Board Size

Jensen (1993) argues that board size is negatively related to its ability to advise and engage in long term planning because of the difficulty in organizing and coordinating a large number of directors. In contrast, Klein (2002b) argues that large boards can distribute committee work and thus size increases the ability to monitor. Yermack (1996) also notes that some firms may require larger boards for effective monitoring. Thus, conflicting arguments about the relationship between board size and monitoring suggest that we can not reliably predict the direction of association between board size and real earnings management.

Board independence

Prior research argues and finds support for the notion that independent boards are more likely to monitor effectively and thus curb earnings management practices. Beasley (1996) and Dechow, Sloan, and Sweeney (1996) find that board independence is negatively related to the occurrence of financial statement fraud. Klein (2002a) finds that abnormal accruals and board independence are negatively related. Such findings suggest that board independence and real earnings management are likely to be negatively related.

CEO duality

Fama and Jensen (1983) argue that separating the positions of chief executive officer and chairman of the board would improve board monitoring and organizational performance by providing an independent check on the chief executive officer position. Thus firms that have the same person holding these 2 positions are likely to have less effective monitoring which reduces the likelihood of constraining earnings manipulation. This argument suggests that separation of chief executive officer and chairman of the board is likely to be negatively associated with real earnings management.

Audit committee characteristics

Because audit committee is the part of the board of directors that is entrusted to oversee and monitor the financial reporting process, the audit committee characteristics are important in considering the board's role in constraining real earnings management.

Audit committee size

Prior literature (see for example, Abbott et al. 2004) has found that the audit committee's effectiveness is positively related to the size of the committee. Larger committees are more likely to have greater participation in the governance process and are more likely to address controls and reporting more comprehensively. Thus a negative association between the size of the audit committee and real earnings management is predicted.

Audit committee independence

Similar to the arguments made previously regarding the effectiveness of the board the higher its independence, the audit committee's effectiveness also increases in its independence (Abbott et al. 2004). Thus a negative relationship is expected between audit committee independence and real earnings management.

Audit committee meetings

Raghunandan et al. (2001) and PriceWaterhouseCoopers/IIA (2000) argue that audit committees can be effective only if they meet frequently and also meet with internal and external auditors to be apprised of recent developments. Meeting frequency of the committee has also been used as a proxy for diligence in prior literature (DeZoort et al. 2002; Menon and Williams 1994). Such findings suggest that effective audit committees meet more often and are able to monitor better. This would imply a negative association between number of audit committee meetings and real earnings management.

SAMPLE

The data consists of 9,567 firm years over the period 1996 to 2002 for which the governance data are available in proxy statements. These consist of 1,094 firms for 1996, 1,296 firms for 1997, 1,428 firms for 1998, 1,468 firms for 1999, 1,446 firms for 2000, 1,446 firms for 2001, and 1,389 firms for 2002. While a larger number of firms have financial statement data available, the sample is reduced to 6,759 because of the required data for governance and some of the control variables. The required control variables are described in the following section.

MODELS

Testing for real earnings management directly is difficult as we do not observe the manipulations nor do we learn of them ex-post as in the case fraud investigations by the Securities and Exchange Commission. Thus the research design needs to develop proxies that would reasonably reflect the consequences of any activity based manipulation. To this end, this paper uses the approach developed by Roychowdhury. As noted before, Roychowdhury hypothesizes that manipulating real activities would result in abnormally *low* cash flow from operations or unusually *low* discretionary expenses, such as advertising or research and development expenses, or unusually *high* production costs. Following Roychowdhury, abnormal cash flow from operations (*CFO*), discretionary expenses (*DISEXP*), and production costs (*PROD*) are estimated as follows:

ACFO = Abnormal cash flow from operations, measured as deviations from the predicted values from the corresponding industry-year regression $CFO_t/A_{t-1} = a_0 + a_1*(1/A_{t-1}) + b_1*(S_t/A_{t-1}) + b_2*(\Delta S_t/A_{t-1}) + e_t$, where CFO is Cash Flow from Operations, S is Sales, and A is Total Assets;

ADISEXP = Abnormal discretionary expenses, measured as deviations from the predicted values from the corresponding industry-year regression $DISEXP_t/A_{t-1} = a_0 + a_1*(1/A_{t-1}) + b_1*(S_{t-1}/A_{t-1}) + e_t$, where DISEXP is R&D

+ Advertising + Selling, General, and Administrative expenses; as long as Selling, General, and Administrative expenses are available, Advertising and R&D are set to zero if they are missing;

APROD = Abnormal production costs, measured as deviations from the predicted values from the corresponding industry-year regression $PROD_t/A_{t-1} = a_0 + a_1*(1/A_{t-1}) + b_1*(S_t/A_{t-1}) + b_2*(\Delta S_t/A_{t-1}) + b_3*(\Delta S_{t-1}/A_{t-1}) + e_t$, where PROD equals Cost of Goods Sold + Changes in inventory.

Industry regressions for estimating deviations from predicted values are estimated at the two-digit SIC code level. *ACFO*, *ADISEXP*, and *APROD* are regressed on the governance variables considered previously, and control variables specified in Roychowdhury. The following control variables are measured as deviations from the corresponding industry-year means: income before extraordinary items scaled by lagged total assets (*NETINCOMEI*), logarithm of market value of equity (*SIZEI*), the ratio of market value of equity to the book value of equity (*MTBI*), an indicator variable set equal to 1 if there is long-term or short-term debt outstanding at the beginning of the year or at the end of the year (*HASDEBTI*), the sum of industry-year adjusted inventories and receivables as a percentage of total assets (*INVRECI*), and current liabilities excluding short-term debt, scaled by total assets (*CLI*).

Because the some of the overall board variables such as board size and board independence are highly correlated with audit committee variables, such as audit committee size and independence, we use 2 models.

The first set of models use only the overall board variables and are specified as:

$$ACFO = a_0 + a_1 BSIZE + a_2 NODUAL + a_3 BIND + a_4 NETINCOMEI + a_5 SIZEI + a_6 MTBI + a_7 HASDEBTI + a_8 INVRECI + a_9 CLI$$

$$ADISEXP = a_0 + a_1 BSIZE + a_2 NODUAL + a_3 BIND + a_4 NETINCOMEI + a_5 SIZEI + a_6 MTBI + a_7 HASDEBTI + a_8 INVRECI + a_9 CLI$$

$$APROD = a_0 + a_1 BSIZE + a_2 NODUAL + a_3 BIND + a_4 NETINCOMEI + a_5 SIZEI + a_6 MTBI + a_7 HASDEBTI + a_8 INVRECI + a_9 CLI$$

The second set of models use only the audit committee variables and are specified as:

$$ACFO = a_0 + a_1 ACSIZE + a_2 ACIND + a_3 ACMEET + a_4 NODUAL + a_4 NETINCOMEI + a_6 SIZEI + a_7 MTBI + a_8 HASDEBTI + a_9 INVRECI + a_{10} CLI$$

$$ADISEXP = a_0 + a_1 ACSIZE + a_2 ACIND + a_3 ACMEET + a_4 NODUAL + a_4 NETINCOMEI + a_6 SIZEI + a_7 MTBI + a_8 HASDEBTI + a_9 INVRECI + a_{10} CLI$$

$$APROD = a_0 + a_1 ACSIZE + a_2 ACIND + a_3 ACMEET + a_4 NODUAL + a_4 NETINCOMEI + a_6 SIZEI + a_7 MTBI + a_8 HASDEBTI + a_9 INVRECI + a_{10} CLI$$

where,

ACFO, *ADISEXP*, *APROD*, *NETINCOMEI*, *SIZEI*, *MTBI*, *HASDEBTI*, *INVRECI*, and *CLI* are as defined before, and

BSIZE = Log of total number of directors in the board;
NODUAL = A dummy variable that equals 1 if CEO is also not chairman of the board, and equals 0 otherwise;
BIND = Proportion of directors that are independent in the board of directors;
ACIND = Proportion of directors that are independent in the audit committee;
ACSIZE = Log of total number of directors in the audit committee;
ACMEET = Number of meetings by the audit committee during the year;

Because a pooled data is used and firms repeat over many years, Fama-Macbeth regressions are used to control for cross-correlation in firm observations across years.

RESULTS

Table 1 presents the results for models with overall board governance variables. Neither the size of the board, BSIZE, not the duality of chairman-chief executive officer position, NODUAL, is significant. The results for board size indicate that the number of directors is not a significant factor in limiting real earnings management. The results for NODUAL indicate that separation of roles at the top of the firm does not appear to matter for real earnings management either. The variable representing board independence, BIND, is not significant for the abnormal cash flows model. Board independence is significant in the abnormal production and abnormal discretionary expenses models, however. Specifically, firms with higher board independence have lower abnormal production costs and higher abnormal discretionary expenses. This indicates that board independence plays a constraining role on real earnings management. This evidence is consistent with prior research such as Klein (2002a) that documents a similar role for board independence in the context of accruals management. While the result does not hold for all the three models of real

earnings management but only for two of the three, it is indicative of the monitoring role played by independent directors in limiting both accruals and real type of earnings management.

Table 1: Board Governance variables and Real Earnings Management

Variable[a]	*Real Earnings Management Measures*		
	Abnormal CFO Coefficient (t-statistic)[b]	Abnormal PROD Coefficient (t-statistic)[b]	Abnormal DISEXP Coefficient (t-statistic)[b]
Intercept	0.088	-0.049	0.211
	(2.64***)	(-0.80)	(3.77***)
BSIZE	-0.007	-0.016	0.040
	(-0.44)	(-0.59)	(1.27)
NODUAL	-0.005	0.006	-0.034
	(-0.64)	(0.43)	(-1.31)
BIND	-0.027	-0.103	0.105
	(-1.30)	(-2.19**)	(2.08**)
NETINCOMEI	0.611	-1.330	2.160
	(5.34***)	(-4.45***)	(3.75***)
SIZEI	0.006	0.019	-0.067
	(2.15**)	(1.23)	(-1.15)
MTBI	-0.001	-0.001	0.001
	(-0.29)	(-0.61)	(-1.11)
HASDEBTI	-0.005	0.026	0.017
	(-0.39)	(1.10)	(0.81)
INVRECI	-0.240	0.213	-0.431
	(-2.64***)	(2.28**)	(-3.36***)
CLI	-0.085	-0.163	0.405
	(-2.10**)	(-1.43)	(2.60***)
Adj. R^2	0.40	0.43	0.45

Table 1: Board Governance variables and Real Earnings Management

[a] Specified predicted sign for the governance variables *NODUAL* and *BIND* is positive in the Abnormal CFO and Abnormal DISEXP models. Predicted sign for these governance variables is negative in the Abnormal PROD model.

[b] *t*-statistics are computed based on Fama-Macbeth regressions over the period 1996-2002. The number of observations is 6, 759.

*, ** and *** represent significances at 10 percent, 5 percent, and 1 percent levels respectively for one-tailed tests (for *NODUAL* and *BIND*) where predicted signs are specified, and for two-tailed tests (all variables other than the ones specified for one-tailed tests) otherwise.

Each model includes, but does not tabulate, 10 industry dummies based on 11 Fama-French industries. Because we consider all industries, we do not separately use a manufacturing industry variable as in Roychowdhury (2006). Real earnings management variables and controls for real earnings management are from Roychowdhury (2006).

ACFO = Abnormal cash flow from operations, measured as deviations from the predicted values from the corresponding industry-year regression $CFO_t/A_{t-1} = a_0 + a_1*(1/A_{t-1}) + b_1*(S_t/A_{t-1}) + b_2*(\Delta S_t/A_{t-1}) + e_t$, where CFO is Cash Flow from Operations, S is Sales, and A is Total Assets;

ADISEXP = Abnormal discretionary expenses, measured as deviations from the predicted values from the corresponding industry-year regression $DISEXP_t/A_{t-1} = a_0 + a_1*(1/A_{t-1}) + b_1*(S_{t-1}/A_{t-1}) + e_t$, where DISEXP is: R&D + Advertising + Selling, General and Administrative expenses; as long as Selling, General and Administrative expenses are available; advertising and R&D are set to 0 if they are missing;

APROD = Abnormal production costs, measured as deviations from the predicted values from the corresponding industry-year regression $PROD_t/A_{t-1} = a_0 + a_1*(1/A_{t-1}) + b_1*(S_t/A_{t-1}) + b_2*(\Delta S_t/A_{t-1}) + b_3*(\Delta S_{t-1}/A_{t-1}) + e_t$, where PROD equals Cost of Goods Sold + Changes in Inventory;

NETINCOMEI = Income before extraordinary items scaled by lagged total assets, expressed as deviation from the corresponding industry-year mean;

SIZEI = Logarithm of market value of equity, expressed as deviation from the corresponding industry-year mean;

MTBI = The ratio of market value of equity to the book value of equity, expressed as deviation from the corresponding industry-year mean;

HASDEBTI = An indicator variable set equal to 1 if there is long-term or short-term debt outstanding at the beginning of the year or at the end of the year;

INVRECI = The sum of industry-year adjusted inventories and receivables as a percentage of total assets and expressed as deviation from the corresponding industry-year mean;

CLI = Current liabilities excluding short-term debt, scaled by total assets and expressed as deviation from the corresponding industry-year mean

BSIZE = Log of total number of directors in the board;

NODUAL = A dummy variable that equals 1 if CEO is also not chairman of the board, and equals 0 otherwise;

BIND = Proportion of directors that are independent in the board of directors;

Among the control variables used by Roychowdhury results in table 1 indicate that variables representing profitability, NETINCOMEI, inventory and receivables, INRECI, and current liabilities, CLI, are significant. The variables for market to book ratio, MTBI, and debt, HASDEBTI, are not significant while the size variable, SIZEI, is significant in the abnormal cash flows model. The explanatory power of the models which is around 40% is comparable to results in Roychowdhury.

Table 2 presents the results for governance variables that include primarily the audit committee variables. Neither the size of the audit committee, ACSIZE, nor the proportion of independent directors in the audit committee, ACIND, is significant in any of the three models. The results for ACSIZE are consistent with the results for board size and indicate that the number of directors either in the board as a whole or in the audit committee do not appear to be associated with real earnings management. The insignificance of audit committee independence is in contrast to results for board independence as the former does not appear to be associated with real earnings management while the latter is, as results in table 1 show. The variable representing the number of audit committee meetings, ACMEET, is not significant for the abnormal cash flows and abnormal production cost models. It is significant with the correct expected sign for the abnormal discretionary expenses model, however. This indicates that audit committee meeting frequency which is considered a measure of the committee's diligence, is important in a limited fashion for constraining real earnings management.

Results for other control variables are similar to results in table 1 and the explanatory power of the models is also similar to table 1, although slightly lower.

The results in tables 1 and 2, in combination indicate that governance characteristics with a singular exception appear to be largely unassociated with occurrence of real earnings management. This could be because of several reasons. First, real earnings management is not an infraction that auditors, analysts, and other outside stakeholders focus on and thus the board may not feel compelled to direct attention on the issue. Second, unlike detection of accruals management where detection of manipulation is enabled by several analytical tools which have a long history of being used by researchers and analysts, detection of changes in business activities to achieve earnings targets is relatively more complex and has lesser tools to detect. Third, the results in the study may have a limitation to the extent there are measurement errors in identifying real management proxies and thus some of the non-significance may be attributable to this factor.

Table 2: Audit Committee Governance variables and Real Earnings Management			
Variable[a]	*Real Earnings Management Measures*		
	Abnormal CFO Coefficient (t-statistic)[b]	Abnormal PROD Coefficient (t-statistic)[b]	Abnormal DISEXP Coefficient (t-statistic)[b]
Intercept	0.058	-0.122	0.244
	(1.90*)	(-2.40*)	(2.95***)
ACSIZE	0.003	0.137	-0.001
	(0.21)	(0.60)	(-0.03)
ACIND	-0.008	--0.014	0.004
	(-0.95)	(-0.99)	(0.31)
ACMEET	0.002	0.004	0.018
	(0.88)	(-1.07)	(2.55**)
NODUAL	-0.004	0.004	-0.042
	(-0.42)	(0.90)	(-1.21)
NETINCOMEI	0.542	-1.595	2.264
	(5.60***)	(-7.10***)	(5.75***)
SIZEI	0.007	0.019	-0.058
	(1.49)	(2.50**)	(-1.53)
MTBI	0.001	-0.001	-0.001
	(0.19)	(-0.21)	(-0.64)
HASDEBTI	-0.017	0.013	-0.003
	(-1.10)	(0.53)	(-0.13)
INVRECI	-0.228	0.236	-0.376
	(-2.92***)	(2.30**)	(-3.12***)
CLI	-0.130	-0.114	0.296
	(-1.86*)	(-0.51)	(1.72*)
Adj. R^2	0.35	0.38	0.39

Table 2: Audit Committee Governance variables and Real Earnings Management

[a] Specified predicted sign for the governance variables *ACSIZE, ACIND* and *ACMEET* is positive in the Abnormal CFO and Abnormal DISEXP models. Predicted sign for these governance variables is negative in the Abnormal PROD model.

[b] *t*-statistics are computed based on Fama-Macbeth regressions over the period 1996-2002. The number of observations is 6.759.

*, ** and *** represent significances at 10 percent, 5 percent, and 1 percent levels respectively for one-tailed tests (for *ACSIZE, ACIND, ACMEET* and *NODUAL*) where predicted signs are specified, and for two-tailed tests (all variables other than the ones specified for one-tailed tests) otherwise.

Each model includes, but does not tabulate, 10 industry dummies based on 11 Fama-French industries. Because we consider all industries, we do not separately use a manufacturing industry variable as in Roychowdhury (2006). Real earnings management variables and controls for real earnings management are from Roychowdhury (2006).

ACIND	= Proportion of directors that are independent in the audit committee;
ACSIZE	= Log of total number of directors in the audit committee;
ACMEET	= Number of meetings by the audit committee during the year;
NODUAL	= A dummy variable that equals 1 if CEO is also not chairman of the board, and equals 0 otherwise;

CONCLUSIONS

The role of corporate governance is of fundamental importance in monitoring actions of executives, in particular, in the financial reporting process. Prior research has studied extensively whether certain characteristics of board of directors promote or deter earnings management practices. These studies primarily focus on accrual type of earnings management. More recently, Graham et al (2005) have documented the extensive prevalence of real earnings management that aims to achieve desired earnings target through manipulation of operating activities. This raises the empirical issue whether certain corporate governance characteristics are better at constraining this type of earnings management. This study examines this issue and finds that most overall board characteristics and audit committee characteristics that have been found to be significant in limiting accrual type earnings management are not significant in limiting real earnings management. The one characteristic that is significant (in two of the three models used) is the proportion of independent directors. Notably, prior literature on accruals management has also generally found this variable to be significant. The lack of significance for other governance variables indicates that most directors may be focused upon primarily accruals type earnings management because of the attention it derives from media and researchers, and may be less focused upon other types of

earnings management. Whether the association of governance factors with restraint over real earnings management improves over time is an interesting question that can be addressed by future research.

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THE CHANGE OF CORPORATE DOMICILE, IN THE ABSENCE OF TAX BENEFIT DIFFERENCES, LEGAL ENVIRONMENT CONTROLS

Lawrence Bajor, Bowling Green State University

ABSTRACT

This paper empirically evaluates the practitioner anecdotal evidence that good state and local tax planning dictates a Delaware or Nevada domicile for corporations in and environment in which the tax benefit of a holding company has been severely limited. It examines a sample of 142 active COMPUSTAT companies changing corporate domicile during the period 2000 through 2006. It finds that the incidence of corporations selecting a Delaware or Nevada domicile to be significantly greater than that which would be expected by chance. It also determines that Delaware is chosen with greater frequency than other states which would provide an identical tax benefit. It suggests that when tax planning and other administrative motivations present themselves they are preferred to tax benefits alone. These results support the hypothesis that taxpayers act with self-interest. This study contributes to the literature on state and local tax planning. The work has implications for business planners seeking to increase return on investment and legislators seeking to encourage investment in their respective states.

INTRODUCTION

The purpose of this study is to evaluate empirically the effect of no corporate income taxation policies and the decision to change domicile. The move to Delaware domiciles is compared to the relative lack of such movement to states such as Nevada which have no corporate income tax. This paper is important because the selection of domicile is assumed to be part of good tax planning but has not been tested empirically. Tax domicile has policy ramifications for state governments especially as revenue declines from taxes directed at businesses. It answers the question: Do taxpayers act in their best interest? When offered identical tax saving opportunities, will other administrative/legal considerations determine a direction? For decades companies have employed Delaware holding companies to minimize state taxation thorough out the U.S. The strategy's effectiveness has been under attack from Geoffrey, Inc. v. South Carolina Tax Commission (1993) to the Ohio CAT tax; however, practitioners still discuss its merits.

This paper empirically evaluates the practitioner anecdotal evidence that good tax planning dictates Delaware or other state that does not tax corporations as domicile for corporations. I examine a sample of 142 active COMPUSTAT companies changing domicile during the period

2000 to 2006. I find that the incidence of corporations selecting a Delaware or Nevada domicile to be significantly greater than that which would be expected by chance. I also find that Delaware is a much more frequent choice than Nevada or other states with no corporate income tax. This paper extends and expands on the body of work examining the question as to whether individuals/entities arrange their affairs so as to avoid taxes and improve corporate administrative/legal environment.

HISTORY

Anecdotal evidence indicates that both individuals and corporations take steps to avoid taxes. To the academic accountant the question of demonstrated tax avoidance remains a topic of ongoing interest. Cross country variation in tax rates have motivated numerous studies in the nature of how multinational corporations respond to these differences e.g., Hines (1996), Klassen et al. (1993), Harris et al.(1993), Grubert et al., (1993). These studies are limited by the heterogeneity of the corporations, the countries involved and the difficulty in procuring data. In general, these works find evidence that multinationals take steps to mitigate taxes through organizational and transaction structure.

Exploration of state income tax avoidance can be as rich an environment as that of international taxation. Of the 50 states, 45 have income taxes; each taxing jurisdiction has its own customs, history and laws. Klassen and Shackelford (1998) and others examine the trans-jurisdictional issues in a multi-state/multi-province environment. Petroni and Shackelford (1995) investigate the effects of state taxes and regulation on organizational structure decisions for expanding property-casualty insurers.

Tax rates and the manner in which capital is taxed appear to affect corporate investment decisions. Carlton (1979, 1983) found that weighted average of corporate and individual tax rates was not a factor in the location decisions of new firms. McClure (1980) shows how the apportionment factors are really separate taxes on sales, property and payroll under the guise of corporate taxes. Lightner (1999) suggests that low tax rates encourage employment growth. Goolsbee and Maydew (2000), to the contrary, find that the apportionment formula is more important than the actual tax rate, with the payroll factor weight being the most important in determining employment. Gupta and Hofman (2003), study the manner in which variations in state corporate income tax regimes affect new capital investment by business. They find that new capital expenditures by corporations are decreasing in the income tax burden on property. They use a variable that is the product of the apportionment rate and the statutory tax rate as their independent variable. They also find that the throw back rule and unitary requirements are detrimental to incremental capital investment. Omer and Shelly (2004) find that states compete for capital investment and jobs by changing tax policy. A factor yet to be empirically examined is the choice of corporate domicile. The selection of domicile can be, and normally is, independent of any movement of property, payroll or sales.

INSTITUTIONAL BACKGROUND

There are three principle limitations to the proclivity of states to tax, the Commerce Clause, the Due Process Clause of the constitution and Federal law (Public Law 86-272). The Commerce Clause prohibits the states from unduly burdening interstate commerce. The Due Process Clause requires that there be some minimum connection between the in-state activities of the taxpayer and the taxing state before the taxing authority may impose a tax. Public Law 86-272 attempts to establish a de minimis level of activity below which a tax measured by net income could not be imposed. The intent of this law was to exempt the "solicitation of orders" for the sale of tangible personal property, provided the orders are sent outside the state for acceptance and goods are delivered from a point located outside the state.

Income from intangibles such as interest, royalties, gains, dividends and gains on the sale of stock are traditionally allocated to the state of domicile through the doctrine of mobilia sequuntur personam. In Mobil Oil Corp. V Comm'r of Taxes of Vermont (1980), the United States Supreme Court rejected the view that the constitution requires taxation of intangibles by allocation to a single situs. Even with this decision in place few states have availed themselves of its potential and tax planners continued to use Delaware holding companies (DHC) as a tax planning tool as is evidenced by (Rosen 1989). For all practical purposes business acts as though the doctrine of mobilia sequuntur personam is the good law.

Rosen describes the following tax planning. Corporations operating in states that tax non-operating income have the opportunity to save substantial taxes by using a DHC. Delaware income tax law section 1902(b)(8) defines a DHC as:

> Corporations whose activities within this State are confined to the maintenance and management of their intangible investments and the collection and distribution of the income from such investments or from tangible property physically located outside this State.

The statute permits corporations, as defined above, to receive any type of income from intangible assets and investments in tangible property located outside the state tax free. The intangibles may be located anywhere. The statute terminates this tax opportunity if any operating income is earned in Delaware corporation.

A Delaware corporation is created by transferring intangibles or other property to the entity via IRC section 351. Alternately, valuable intangibles are frequently held by a parent holding company which changes domicile. The income from the intangibles is recognized by the new DHC. Royalty, rent, or loan arrangements would be made between the DHC and related operating entities in other states. Payments would be deducted by the related parties in other states but would not be taxed in Delaware. Any idle cash could also be invested by the DHC free of state tax. The DHC may also be used as the recipient of royalty and other payments from entities in other countries

assisting in tax arbitrage by a multinational firm. The payments received by the DHC avoid state tax although they may still subject to taxation at the federal level.

Creation of the DHC will result in legal and filing fees. Maintaining the DHC will require payment of an annual franchise tax. The franchise tax can be minimized by care in how the DHC is created.

MOTIVATION

Evidence is provided that property-casualty insurers structure their cross-state expansion to mitigate both state and regulatory costs. Petroni and Shackelford (1999) explore the property-casualty industry's unique state tax disclosures to determine whether insurers allocate premiums from multi-state policies to reduce total state taxes. Consistent with tax motivated income shifting, they found that the premium loss ratio is decreasing in state tax rates. The negative relationship was the greatest for insurers specializing in multi-state lines of business. My paper attempts to determine whether state tax avoidance can be generalized to other industries.

States have the jurisdiction and the propensity to tax. There is no easy escape. Statutory state income tax rates range from 0.0% to 12%. Only 5 states have a statutory income tax rate of 0.0%, Nevada, Texas, Washington, Wyoming, and South Dakota. Of these five only Wyoming and Nevada have effective corporate tax rates of zero. Washington has a gross receipts tax in lieu of an income tax and Texas taxes net taxable earned surplus. The effective tax rate on corporations, considering all corporate taxes paid in a state divided by the corporate income in that state, range from 4.22% to 2.63%. The "tax havens" under study in this paper, Delaware, has an effective tax rate of 4.34% 0% on holding companies), Wyoming, 0%, Nevada 0%.

Managers are frequently more interested in creating a product, making a business plan work than in an optimal tax plan. There are, consequently, numerous corporations that on creation did not consider tax planning. The question raised by this paper is whether or not corporations changing domicile do so in a manner consistent with potential tax avoidance? Do corporations that change domicile select Delaware or other states without a corporate income tax, or its equivalent, in a proportion greater than that expected by chance?

SAMPLE

This paper uses the entire COMPUSTAT active company data base. Foreign companies and companies in U. S. protectorates such as Samoa are dropped. Delaware has the largest number of corporate domiciles in the COMPUSTAT active list for the period 2000 and 2006. From 2000 to 2006, counting only firms with U.S. domiciles, the COMPUSTAT active list lost 994 corporations. See Table 1. All states had fewer net corporate domiciled within with the exception or Idaho (+1), Nevada (+221), Utah (+3) and West Virginia (+2). The loss of overall entities appears to be primarily the result of merger. There is little evidence of corporations seeking foreign domicile.

Almost all of Nevada's considerable gains come from the creation of new entities within the state. Only 5 of the 221 corporations newly domiciled in the state during this period migrated from elsewhere.

Table 1: Number of COMPUSTAT Active Companies Domiciled in State			
	Year 2000		Year 2006
ALABAMA	11	ALABAMA	8
ALASKA	4	ALASKA	5
ARIZONA	26	ARIZONA	18
ARKANSAS	9	ARKANSAS	9
CALIFORNIA	376	CALIFORNIA	239
COLORADO	146	COLORADO	121
CONNECTICUT	38	CONNECTICUT	26
DELAWARE	4573	DELAWARE	4148
DISTRICT OF COLUMBIA	11	DISTRICT OF COLUMBIA	11
FLORIDA	215	FLORIDA	199
GEORGIA	117	GEORGIA	88
HAWAII	13	HAWAII	5
IDAHO	6	IDAHO	7
ILLINOIS	47	ILLINOIS	39
INDIANA	96	INDIANA	79
IOWA	29	IOWA	24
KANSAS	24	KANSAS	18
KENTUCKY	22	KENTUCKY	21
LOUISIANA	31	LOUISIANA	26
MAINE	13	MAINE	8
MARYLAND	456	MARYLAND	432
MASSACHUSETTS	315	MASSACHUSETTS	276
MICHIGAN	89	MICHIGAN	75
MINNESOTA	261	MINNESOTA	194
MISSISSIPPI	15	MISSISSIPPI	18
MISSOURI	58	MISSOURI	45
MONTANA	58	MONTANA	7
NEBRASKA	12	NEBRASKA	4
NEVADA	252	NEVADA	473
NEW HAMPSHIRE	5	NEW HAMPSHIRE	5

Table 1: Number of COMPUSTAT Active Companies Domiciled in State			
	Year 2000		Year 2006
NEW JERSEY	163	NEW JERSEY	127
NEW MEXICO	11	NEW MEXICO	10
NEW YORK	338	NEW YORK	230
NORTH CAROLINA	77	NORTH CAROLINA	72
NORTH DAKOTA	1	NORTH DAKOTA	2
OHIO	179	OHIO	146
OKLAHOMA	32	OKLAHOMA	31
OREGON	67	OREGON	48
PENNSYLVANIA	193	PENNSYLVANIA	188
RHODE ISLAND	13	RHODE ISLAND	8
SOUTH CAROLINA	27	SOUTH CAROLINA	30
SOUTH DAKOTA	5	SOUTH DAKOTA	7
TENNESSEE	49	TENNESSEE	40
TEXAS	209	TEXAS	155
UTAH	64	UTAH	67
VERMONT	6	VERMONT	5
VIRGINIA	106	VIRGINIA	101
WASHINGTON	101	WASHINGTON	91
WEST VIRGINIA	9	WEST VIRGINIA	11
WISCONSIN	75	WISCONSIN	70
WYOMING	17	WYOMING	9
	9070		8076

Delaware has the largest number of corporate domiciles in the COMPUSTAT active list. From 2000 to 2006 counting only firms with U.S. domiciles, the COMPUSTAT active list lost 994 corporations. All states had fewer net corporate domiciles with exception of Idaho (1), Nevada (221), Utah (3) and West Virginia (2). The loss results from mergers and companies becoming defunct. There is little evidence of moving domicile abroad. Almost all of Nevada's gains resulted from the creation of new entities within the state rather than migration from elsewhere.

The change of domicile is typically a tax-free event at the federal level. At the state level it is a relatively immaterial event. A corporation must notify its present state of domicile and pay any taxes owed before proceeding. Changing domicile is relatively rare. I examined the COMPUSTAT variable INCORP for the year 2000 and again for the year 2006. If this variable had not changed or was missing in either year the company was not included in the sample. There is confusion with regard to the variable INCORP. This field in COMPUSTAT is presented as a static field meaning that one cannot retrieve this data for previous years. I have attempted to do so using both Research Insight and WRDS. My attempts to query S&P regarding this data item have not

been honored. I am in possession of the data CD's from Research Insight for multiple years; however, changes either in the search program or the manner in which the data is stored prevents me from accessing this information for earlier years.

Two digits sic codes for these corporations run from 10 to 99 in the sample. These codes are diverse without any pattern to them. The sample does not include firms changing domicile to the U.S. nor does it include U.S. firms moving outside the U.S. These firms have changed domicile for a variety of stated reasons, from a simple F reorganization, to the merger with another firm. Few of the domicile changes were noted in the news and of those that were most gave no reason for the change. Refer to Table 2. The three states left most frequently were Delaware, California and New York. The three most popular destination states were, in order of popularity, Delaware, Maryland and Nevada. Of the top three destination states listed only Nevada has no corporate income tax. Nine of the thirty-four entities leaving Delaware for Maryland are REIT's. Maryland wrote legislation that permitted REIT's unlimited lives and certain tax benefits. Eleven of the fifteen REIT's changing domicile went to Maryland. REIT's are not taxable at the federal level and consequently not taxable by most states. The movement of the REITS to Maryland appears to be for the administrative benefit of permanent entity status. Table 2 leaves shows that Delaware is overwhelmingly chosen as the destination for companies seeking to change domicile with 67% of those firms going there.

Table 2: States Left States Chosen

Left State	Leaving	Entered State	Entering
DELAWARE	34	DELAWARE	95
CALIFORNIA	32	MARYLAND	12
NEW YORK	20	NEVADA	5
MASSACHUSETTS	6	PENNSYLVANIA	4
NEW JERSEY	5	WASHINGTON	4
WASHINGTON	5	INDIANA	3
COLORADO	4	OHIO	3
MARYLAND	4	ILLINOIS	2
NEVADA	4	NEW YORK	2
OHIO	4	TENNESSEE	2
ILLINOIS	3	COLORADO	1
FLORIDA	2	CONNECTICUT	1
KENTUCKY	2	FLORIDA	1
NORTH CAROLINA	2	IOWA	1
PENNSYLVANIA	2	LOUISIANA	1
TEXAS	2	MASSACHUSETTS	1
ARIZONA	1	MINNESOTA	1
CONNECTICUT	1	MONTANA	1

Table 2: States Left States Chosen			
Left State	Leaving	Entered State	Entering
HAWAII	1	OKLAHOMA	1
IOWA	1	VIRGINIA	1
KANSAS	1	ALABAMA	0
LOUISIANA	1	ALASKA	0
MICHIGAN	1	ARIZONA	0
MINNESOTA	1	ARKANSAS	0
MISSOURI	1	CALIFORNIA	0
MONTANA	1	DISTRICT OF COLUMBIA	0
VIRGINIA	1	GEORGIA	0
ALABAMA	0	HAWAII	0
ALASKA	0	IDAHO	0
ARKANSAS	0	KANSAS	0
DISTRICT OF COLUMBIA	0	KENTUCKY	0
GEORGIA	0	MAINE	0
IDAHO	0	MICHIGAN	0
INDIANA	0	MISSISSIPPI	0
MAINE	0	MISSOURI	0
MISSISSIPPI	0	NEBRASKA	0
NEBRASKA	0	NEW HAMPSHIRE	0
NEW HAMPSHIRE	0	NEW JERSEY	0
NEW MEXICO	0	NEW MEXICO	0
NORTH DAKOTA	0	NORTH CAROLINA	0
OKLAHOMA	0	NORTH DAKOTA	0
OREGON	0	OREGON	0
RHODE ISLAND	0	RHODE ISLAND	0
SOUTH CAROLINA	0	SOUTH CAROLINA	0
SOUTH DAKOTA	0	SOUTH DAKOTA	0
TENNESSEE	0	TEXAS	0
UTAH	0	UTAH	0
VERMONT	0	VERMONT	0
WEST VIRGINIA	0	WEST VIRGINIA	0
WISCONSIN	0	WISCONSIN	0
WYOMING	0	WYOMING	0
	142		142

Of the top three destination states listed only Nevada has no corporate income tax. Four of the thirty-four leaving Delaware for Maryland are REITs. Maryland law permits REITs unlimited lives. Eleven of the fifteen REITS changing domicile went to Maryland. REITS are not taxable at the federal level and consequently not taxed by most states. The movement of REITs to Maryland appears to be for the feature of unlimited life Delaware shows a net gain of 61corporations.

Table 3: States Left As Percentage of Companies Domiciled in State			
Left State	Percentage	COMPUSTAT Active Companies Domiciled in State 2006	
MINNESOTA	0.0038314	ALABAMA	11
DELAWARE	0.0074349	ALASKA	4
MARYLAND	0.0087719	ARIZONA	26
FLORIDA	0.0093023	ARKANSAS	9
VIRGINIA	0.009434	CALIFORNIA	376
TEXAS	0.0095694	COLORADO	146
PENNSYLVANIA	0.0103627	CONNECTICUT	38
MICHIGAN	0.011236	DELAWARE	4573
NEVADA	0.015873	DISTRICT OF COLUMBIA	11
MISSOURI	0.0172414	FLORIDA	215
MASSACHUSETTS	0.0190476	GEORGIA	117
OHIO	0.0223464	HAWAII	13
NORTH CAROLINA	0.025974	IDAHO	6
COLORADO	0.0273973	ILLINOIS	47
NEW JERSEY	0.0306748	INDIANA	96
LOUISIANA	0.0322581	IOWA	29
IOWA	0.0344828	KANSAS	24
CONNECTICUT	0.0357143	KENTUCKY	22
ARIZONA	0.0384615	LOUISIANA	31
KANSAS	0.0416667	MAINE	13
WASHINGTON	0.049505	MARYLAND	456
NEW YORK	0.0591716	MASSACHUSETTS	315
ILLINOIS	0.0638298	MICHIGAN	89
HAWAII	0.0769231	MINNESOTA	261
CALIFORNIA	0.0851064	MISSISSIPPI	15
KENTUCKY	0.0909091	MISSOURI	58
MONTANA	0.1428571	MONTANA	58
ALABAMA	0	NEBRASKA	12
ALASKA	0	NEVADA	252
ARKANSAS	0	NEW HAMPSHIRE	5
DISTRICT OF COLUMBIA	0	NEW JERSEY	163
GEORGIA	0	NEW MEXICO	11
IDAHO	0	NEW YORK	338

Table 3: States Left As Percentage of Companies Domiciled in State			
Left State	Percentage	COMPUSTAT Active Companies Domiciled in State 2006	
INDIANA	0	NORTH CAROLINA	77
MAINE	0	NORTH DAKOTA	1
MISSISSIPPI	0	OHIO	179
NEBRASKA	0	OKLAHOMA	32
NEW HAMPSHIRE	0	OREGON	67
NEW MEXICO	0	PENNSYLVANIA	193
NORTH DAKOTA	0	RHODE ISLAND	13
OKLAHOMA	0	SOUTH CAROLINA	27
OREGON	0	SOUTH DAKOTA	5
RHODE ISLAND	0	TENNESSEE	49
SOUTH CAROLINA	0	TEXAS	209
SOUTH DAKOTA	0	UTAH	64
TENNESSEE	0	VERMONT	6
UTAH	0	VIRGINIA	106
VERMONT	0	WASHINGTON	101
WEST VIRGINIA	0	WEST VIRGINIA	9
WISCONSIN	0	WISCONSIN	75
WYOMING	0	WYOMING	17
		TOTAL	9070

This table demonstrates the companies leaving a given state in the period 2000 to 2006 as a percentage of the companies domiciled in that state at the beginning of 2006. Of the states losing companies, Delaware had the next to the smallest percentage of corporations leaving.

The reasons for leaving a given state are frequently not transparent. Sometimes there are incentives directed at a company that are not widely publicized. Sometimes legal action, such as the break up of the Rockefeller oil monopoly under the Sherman Antitrust Act resulted in the creation of six different oil companies. Each through the action of the court was mandated to be created in a different state, hence Standard Oil of Indiana, Standard Oil of New Jersey, Standard Oil of Ohio, etc.

Given the number of companies domiciled in Delaware, its loss of 34 firms still leaves it with one of the smallest percentages of loss of all of the states loosing domiciled companies. As a percentage of the COMPUSTAT active firms Delaware grew from50.419% in 2000 to 51.362% in 2006. Nevada grew from 2.778% in 2000 to 5.857% in 2006. Wyoming which is a state with an effective zero tax rate on corporations also lost companies during this time period.

Table 4: Percentage of COMPUSTAT Active Companies Domiciled in State 2000 vs 2006			
	2000 Percentage		2006 Percentage
DELAWARE	0.5041896	DELAWARE	0.5136206
MARYLAND	0.0502756	NEVADA	0.0585686
CALIFORNIA	0.0414553	MARYLAND	0.0534918
NEW YORK	0.0372657	MASSACHUSETTS	0.0341753
MASSACHUSETTS	0.0347299	CALIFORNIA	0.0295939
MINNESOTA	0.0287762	NEW YORK	0.0284794
NEVADA	0.0277839	FLORIDA	0.0246409
FLORIDA	0.0237045	MINNESOTA	0.0240218
TEXAS	0.023043	PENNSYLVANIA	0.0232789
PENNSYLVANIA	0.0212789	TEXAS	0.0191927
OHIO	0.0197354	OHIO	0.0180783
NEW JERSEY	0.0179713	NEW JERSEY	0.0157256
COLORADO	0.016097	COLORADO	0.0149827
GEORGIA	0.0128997	VIRGINIA	0.0125062
VIRGINIA	0.0116869	WASHINGTON	0.011268
WASHINGTON	0.0111356	GEORGIA	0.0108965
INDIANA	0.0105843	INDIANA	0.0097821
MICHIGAN	0.0098126	MICHIGAN	0.0092868
NORTH CAROLINA	0.0084895	NORTH CAROLINA	0.0089153
WISCONSIN	0.008269	WISCONSIN	0.0086677
OREGON	0.007387	UTAH	0.0082962
UTAH	0.0070562	OREGON	0.0059435
MISSOURI	0.0063947	MISSOURI	0.0055721
MONTANA	0.0063947	TENNESSEE	0.0049529
TENNESSEE	0.0054024	ILLINOIS	0.0048291
ILLINOIS	0.0051819	OKLAHOMA	0.0038385
CONNECTICUT	0.0041896	SOUTH CAROLINA	0.0037147
OKLAHOMA	0.0035281	CONNECTICUT	0.0032194
LOUISIANA	0.0034179	LOUISIANA	0.0032194
IOWA	0.0031974	IOWA	0.0029718
SOUTH CAROLINA	0.0029768	KENTUCKY	0.0026003
ARIZONA	0.0028666	ARIZONA	0.0022288
KANSAS	0.0026461	KANSAS	0.0022288

Table 4: Percentage of COMPUSTAT Active Companies Domiciled in State 2000 vs 2006			
	2000 Percentage		2006 Percentage
KENTUCKY	0.0024256	MISSISSIPPI	0.0022288
WYOMING	0.0018743	DISTRICT OF COLUMBIA	0.0013621
MISSISSIPPI	0.0016538	WEST VIRGINIA	0.0013621
HAWAII	0.0014333	NEW MEXICO	0.0012382
MAINE	0.0014333	ARKANSAS	0.0011144
RHODE ISLAND	0.0014333	WYOMING	0.0011144
NEBRASKA	0.001323	ALABAMA	0.0009906
ALABAMA	0.0012128	MAINE	0.0009906
DISTRICT OF COLUMBIA	0.0012128	RHODE ISLAND	0.0009906
NEW MEXICO	0.0012128	IDAHO	0.0008668
ARKANSAS	0.0009923	MONTANA	0.0008668
WEST VIRGINIA	0.0009923	SOUTH DAKOTA	0.0008668
IDAHO	0.0006615	ALASKA	0.0006191
VERMONT	0.0006615	HAWAII	0.0006191
NEW HAMPSHIRE	0.0005513	NEW HAMPSHIRE	0.0006191
SOUTH DAKOTA	0.0005513	VERMONT	0.0006191
ALASKA	0.000441	NEBRASKA	0.0004953
NORTH DAKOTA	0.0001103	NORTH DAKOTA	0.0002476
	100%		100%
Delaware, Nevada and Maryland increased their percentage of COMPSTAT active companies with domiciles in their states. California and New York suffered the largest losses.			

HYPOTHESIS DEVELOPMENT

Recall that corporations can change domicile with little additional expense. Changing domicile does not involve the movement of payroll, property, or sales activity. Since the corporate entity is a legal construction, changing domicile is a matter of form over substance. All states make the movement of domicile a rather inexpensive event. Income taxes are determined through the action of state law and the concept of nexus as defined in Public Law 86-272. Nexus describes the degree of business activity in a state. Typically states measure nexus through the averaging of three ratios, called apportionment factors, sales in state over sales everywhere, property in state over property everywhere, and payroll in state over payroll everywhere. The number of apportionment factors employed varies from state to state. Some use all three, some use sales alone, some weight

some factors more heavily than others. States continue to attempt expand their taxing authority through novel definitions not envisioned by Public Law 86-272. For example, North Dakota argued that an office supplies company had nexus because the catalogues it mailed into the state contributed to the filling of landfills within the state, see Quill v. North Dakota, 504 U.S. 198 (1992). Changing domicile will not alter nexus in the states in which corporations have property, payroll and sales. Changing domicile may give a corporation tax exposure in a state that was formerly not a factor in its tax equation. Certainly, changing domicile will add to the administrative burden of the corporate entity by exposing it to additional requirements. Why change domicile?

Delaware is a high tax state. Swenson et al rank it third over all for effective tax rate on business income. Why change domicile to Delaware? It is generally acknowledged that Delaware General Corporation Law is the most advanced and flexible business formation statute in the nation. The Delaware Court of Chancery is a unique business court that has written most of the modern U.S. corporation case law. Delaware State government is business friendly. Many other states also have well established corporate law and business friendly governments.

When corporations change domicile, although this does not alter the physical presence of assets owned by them in other states, the doctrine of mobilia sequuntur personam suggests that whatever intangible assets are owned by the corporation also change domicile. (Rosen 1989) maintains that this change in situs of intangibles and the application of Delaware state income tax law section 1902(b)(8) enables corporate groups to manage their state tax liability on a national basis. Corporations domiciled in Delaware can arrange licensing agreements with related and non-related parties for the use of various intangibles. The resulting royalty payments become deductible in states where paid and are received tax free in Delaware through the operation of section 1902(b)(8). Given this tax planning opportunity, corporations are more likely to be domiciled in Delaware. Other states, that do not have a corporate income tax or other tax which provides a similar corporate burden such as the Michigan SBT or the Ohio CAT, offer the same tax planning opportunity as Delaware. Additionally, these other states provide this opportunity without the potential for income taxation should the domiciled entity take on a physical presence in the state of domicile in addition to being a holding company. In choosing a state of domicile, corporations should favor a state that does not tax the holding company. This analysis leads to the following hypothesis:

> H_1: *If tax planning is the sole reason for choosing a state of domicile, companies changing domicile should be weighted toward states that have no corporate income or similar tax.*

I will test this hypothesis by primarily using a test of proportions, the likelihood that the observed proportion of firms changing domicile to Delaware or Nevada could happen by chance. I will also perform a variety of sensitivity tests to observe whether or not the resulting proportions are spurious.

RESULTS

I generated the variable NOTAX, which represents a 1 if Delaware, Nevada or Wyoming is selected and zero otherwise. The sample size is 142, with a mean of 0.7042 and a standard deviation of 0.4580. The mean in this case is the proportion of companies choosing either Delaware, Nevada or Wyoming as their state of domicile. If the choice of domicile were a random event, the expected proportion of firms selecting either of these 3 as their domicile should be 3/49 or 0.0612. There are 50 states and since the observed event is a change of domicile and not the selection of domicile for a newly formed corporation, the entity must already reside in a state reducing the choices available to the remaining 49 states. H_0 predicts that there should not be any difference between the observed frequency of selecting the three states and that expected by chance. Using a test of the equality of these proportions using large sample statistics permits the rejection of H_0 with a Z of 31.96 and a P of 0.0000. Clearly, states which do not tax holding companies attract more corporate domiciles than is expected by chance.

Now let us examine whether or not there is a statistical difference in the proportion of companies choosing Delaware, Nevada or Wyoming. We will create three variables DEL which is one if Delaware is chosen as a state of domicile and zero otherwise. NEV which is one if Nevada is chosen as a state of domicile and zero otherwise. WYO which is one if Wyoming is chosen as a state of domicile and zero otherwise. Wyoming was never chosen as a state of domicile by any of the firms in the study and will not be tested as part of this hypothesis.

Table 5: Results of the Test of Proportions

Variable: NOTAX			
n			142
Proportion Expected			0.0612
Proportion Found			0.7042
Reject H null expected = found: p=			0.00
null rejected: proportion of firms selecting Delaware, Nevada and Wyoming is larger than that expected by chance			
Variable: DEL v. NEV			
n	DEL = 95	NEV= 5	
Proportion DEL			0.669
Proportion NEV			0.0352
Reject H null DEL = NEV: p=			0
null rejected: proportion of firms changing domicile to Delaware is greater than the proportion choosing Nevada			

H2: There will be no difference between the proportion of corporations seeking Delaware domicile compared with the proportion of corporations seeking a Nevada domicile.

The mean of DEL is 0.66901, the mean of NEV is 0.35211 and the mean of WYO is zero. Wyoming was never chosen as a state of domicile by the sample population. A test of the null hypothesis that the proportion DEL is equal to proportion NEV is significant with z=40.97 and p = 0.0000 and can be rejected with confidence. More companies choose Delaware over Nevada as a state of domicile.

ROBUSTNESS

Because a change of domicile is a matter of legal form over substance, changing corporate domicile does not require movement of property, payroll or sales, no correlation with demographics of the states is thought to be significant nor are corporate attributes such as size, ROI, sales, market to book ratio, etc. In an effort to test these impressions the author used a variety of statistical methods to test this eventuality. None of the results were significant. These results are available on request. One may conclude that neither traditional corporate accounting variables nor demographic variables drive the decision to create a corporate domicile in Delaware.

CONCLUSION

Anecdotal practitioner data suggests that creating domicile in Delaware or Nevada would provide certain tax advantages. I find that the proportion of firms choosing Delaware and Nevada domiciles is significantly higher than that which could be expected by chance. I further find that the number of firms choosing Delaware domiciles is greater than the number of firms choosing domicile in either Nevada or Wyoming. It is theorized that the sophistication and precedence of Delaware corporate law is an added administrative factor drawing firms to Delaware.

Maryland showed a significant increase in the number of corporations making their domicile in that state. Tracking the companies making this decision found that almost all moved because of legal matters not related to taxation.

The use of the Delaware holding company (DHC) as a tax planning tool is still very much unresolved. A contentious exchange between Arthur R. Rosen of McDermott, Will, & Emery and Frank Katz, general counsel of the Multi State Tax Commission, ensures that this issue will remain unresolved for the immediate future. Rosen argued for a “bright line” nexus standard that would involve physical presence. Katz proposed a “factor presence nexus standard” for intangibles. Katz would like to minimize the ever increasing importance of intangibles in tax planning. The exchange was described as spirited.

Washington and Ohio have gross receipts tax which effectively eliminate the advantages of tax arbitrage in those jurisdictions. Should many other states adopt methods of taxing corporations other than income, the DHC may become a historical footnote in the history of tax planning. The nexus issue and research in the area of multi-state tax planning should continue to be of interest.

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THE EFFECT OF THE LEVEL OF ACCOUNTING DEGREE OBTAINED ON RECRUITERS' PERCEPTIONS OF ACCOUNTING GRADUATES

Eddie Metrejean, Georgia Southern University
Cheryl T. Metrejean, Georgia Southern University
Morris H. Stocks, University of Mississippi

ABSTRACT

Most states have a 150-hour coursework requirement to qualify to take the CPA exam or become licensed, but the requirements do not mandate a master's degree. Students planning to take the CPA exam must obtain additional hours by taking more courses, but not all students pursue a master's degree.

This study is divided into two phases. The first phase examines whether recruiters of accounting graduates pursue a student receiving a master's degree more aggressively than a student receiving a bachelor's degree. The results show no difference in how actively a graduate is recruited based on the level of degree obtained. The second phase examines the relative importance that recruiters place on certain characteristics of the recruit. The results show that recruiters feel that a master's degree is not important, but communication skills and computer skills are important.

Master's degree programs need revision to make them valuable to recruiters, and accounting programs need to broaden the goals of their curricula. The results provide useful information to administrators who are making changes to their curricula because of the 150-hour requirement. The results also provide students and companies that plan to hire accounting graduates with useful information to plan their education and recruiting tactics, respectively.

INTRODUCTION

For several years, individuals in many states have been required to earn 150 semester hours of coursework to qualify to take the CPA exam or for licensure. This 150-hour requirement has been hotly debated almost since its inception. Supporters of the 150-hour requirement argue that new accounting hires should perform their jobs better if they are required to take the extra courses before beginning their careers. By performing their jobs better, the public will be better served (Nelson, 1991). Detractors feel that some accounting students may not be willing to forego employment for another year of college (Bernard, 1996). Anecdotal evidence from accounting students at a regional university in the southeastern U.S. indicates that starting salaries for students with a bachelor's degree are not much lower than for students with a master's degree, so students might not feel that

spending another year in school is worth the small reward. Either way, the 150-hour requirement is probably here to stay in most of the jurisdictions that currently have such a requirement.

This study examines whether recruiters of accounting students perceive a difference between students who graduate with 150 hours of credit and a bachelor's degree in accounting and those who graduate with a master's degree in accounting. Prior studies regarding graduate versus undergraduate hours in accounting seem to have contradicting results. Clarifying previous results will provide useful information to administrators who plan to make changes to their curricula because of the 150-hour requirement and recent criticisms of accounting education. This study also examines the relative importance of certain characteristics of accounting graduates to recruiters. These results will provide useful information to students who plan to major in accounting and to potential employers who plan to hire accounting graduates.

According to the American Institute of Certified Public Accountants (AICPA), the purpose of requiring students to have 150 semester hours of coursework is to improve the overall quality of the work performed by CPAs (AICPA, 1999). The 150-hour requirement is one of three initiatives (the 150-hour requirement, continuing professional education (CPE) and peer review) started by the AICPA to ensure future quality of the work performed by CPAs. CPAs in today's business environment are confronted with advancing technology, an increasingly complex business environment, and a continuous demand for accounting and assurance services. In many cases, the services that society wants require specialization, technical knowledge, and general knowledge of how businesses work. To acquire the requisite knowledge, the AICPA recommends that students should take a minimum of 24 hours each of accounting and other business courses. The remainder of the hours should be as diverse as possible so that students receive the most well rounded education possible (AICPA, 1999).

The argument for requiring accounting students to have 150 semester hours of coursework certainly has its merits, but should the additional 30 hours of courses be at the graduate or undergraduate level? Some supporters of the 150-hour requirement suggest that the additional hours should be graduate hours, but currently, no jurisdictions require graduate hours.

PRIOR RESEARCH

The 150-hour requirement is not a new issue. The accounting profession first envisioned such a requirement in the 1950s, and the topic has been debated ever since. Table 1 shows a brief history of the 150-hour requirement. The 150-hour requirement progressed slowly at first, but since the late 1980s, most jurisdictions have passed legislation that requires candidates for the CPA exam to have 150 semester hours of coursework. Currently, 47 of the 54 licensing jurisdictions (87%), which include the 50 states plus Guam, Puerto Rico, the U.S. Virgin Islands, and Washington, D.C., have such a requirement in place. Also, New York has passed legislation that includes a 150-hour requirement that will go into effect in the 2009 (AICPA, 2005a).

Table 1.: A Brief History of the 150 Hour Requirement	
1959	The AICPA published *Special Coordinating Committee to Study the Report of the AICPA Commission on Standards of Education and Experience for CPAs*, which embraced a policy that a post baccalaureate education was important and should be adopted as a requirement for becoming a CPA.
1967	*Horizons of a Profession*, published by the AICPA, defined a body of knowledge that accountants should possess and suggested that accounting students should have a graduate degree to prepare them for their careers.
1969	The AICPA stated that a CPA certificate is evidence of basic competence in the body of knowledge common to all members of the accounting profession. The AICPA also stated that five years of college were needed to obtain that competence and should be the educational requirement for obtaining a CPA certificate.
1978	In *Education Requirements for Entry into the Accounting Profession*, the AICPA Council reaffirmed its support for five years of college and endorsed 150 semester hours as the minimum education requirement to take the CPA exam. The AICPA further said that the 150 hours should lead to a graduate degree.
1981	The AICPA Board of Directors authorized the appointment of a study group, the Commission on Professional Accounting Education, to gather evidence and suggest strategies to move accounting programs from four-year bachelor's degree to five-year graduate degree requirements.
1983	Florida became the first state to require applicants to have 150 semester hours of education to obtain a CPA license.
1986	The American Accounting Association issued its Bedford Report that concluded that the emphasis in education should be to teach students to learn and that accounting education should be increased from four to five years.
1987	The AICPA Council approved the *Plan to Restructure Professional Standards*, which included a provision that new members after the year 2000 have 150 hours of education.
1988	The general membership of the AICPA approved the change with 83 percent of the vote in favor of the 150-hour requirement.
1989	The Big Eight accounting firms issued *Perspectives on Education: Capabilities for Success in the Accounting Profession* (the so called White Paper) which said that to effectively meet the challenges of the business world, practitioners should develop a wide range of professional skills. This report led to the formation of the Accounting Education Change Commission.
1990s -2000s	More and more states and licensing jurisdictions began requiring the 150 hour education and requirement for CPA licensure.
Source: Background Information on the 150-Hour Education Requirement for CPA Certification and Licensure found at http://www.aicpa.org/members/div/career/150bkg.htm, retrieved October 24, 2003.	

In the late 1980s and early 1990s, the accounting profession began examining the state of accounting education. In 1990, The Accounting Education Change Commission (AECC) reported that accounting programs were not keeping up with the pace and requirements of the accounting

profession. Other studies (for example, Nelson, 1991; Novin et al., 1997; Albrecht and Sack, 2000) support this finding. Albrecht and Sack (2000) argue that the 150-hour requirement was designed to address certain areas missing from accounting curricula, such as communication, problem solving and critical thinking skills, but in many cases, accounting programs have simply added more technical instruction to their curricula.

The AECC (1990) suggested that an accounting education should have three components: skills, knowledge, and professional orientation. Accounting graduates should be able to communicate effectively, think critically, provide leadership and work in groups, possess technical accounting knowledge and general analytical skills, and address professional issues with integrity, competence, and concern for the public interest. Presumably, requiring accounting students to obtain 150 semester hours of coursework would allow them to develop these desired characteristics. Klein and Levy (1993) found that firms expect new hires with 150 hours of coursework to be better prepared than those with fewer hours of coursework.

The importance of accounting to the business world and the diversity of accounting programs have been factors in determining whether students should be required to obtain 150 semester hours of coursework. The AICPA has been at the forefront of this effort. In 1988, AICPA members voted to make such a requirement mandatory after January 1, 2000. What the AICPA does not mandate is whether the additional hours should be at the graduate or undergraduate level. Donelan and Philipich (2001) found that although the 150-hour requirement does not specify the type of degree to be obtained, a graduate degree was the most popular means of getting 150 credit hours. However, not all accounting programs offer graduate degrees. Offering only a five-year bachelor's degree could certainly affect enrollment in such programs if a graduate degree is the preferred path to becoming a CPA.

Many schools have revised their accounting curricula to reflect the additional required hours. However, according to Nelson (1991) and Sage and Sage (1990), these revisions should not eliminate a four-year bachelor's degree for students who plan to work as management accountants or who do not want to take the CPA exam. Klein and Levy (1993) found that while large CPA firms prefer the 150 hour requirement, small firms fear that they will not be able to afford accounting students who obtain master's degrees. However, the anecdotal evidence from accounting students mentioned above indicates that small firms are still competing with larger firms on the basis of salaries. Some practitioners also feel that 150 hours of courses is better than four years of courses and a two-year apprenticeship or even a master's degree (Reinstein et al., 2000). These practitioners do not appear to be sold on the idea that all accounting students should obtain a master's degree. CPAs are also evenly split in terms of their perceptions of overall satisfaction with the 150-hour requirement and whether the additional coursework improves the services offered by CPAs (Leinicke et al., 1992).

On the other hand, CPA candidates who worked for Big Five (at the time) CPA firms were more likely to have completed graduate degrees, so the bigger firms appear to prefer new hires with master's degrees (Donelan and Philipich, 2001). However, a survey completed by the Illinois CPA

Society and Illinois College found that 95 percent of Illinois' largest CPA firms would continue to hire graduates with only bachelor's degrees (Illinois Survey and Forum, 2000). In a study that examined the perceptions of recruiters in industry, Wilder and Stocks (2004) found that recruiters for entry-level accounting positions preferred a BBA in accounting to an MBA. While this study examined the perceptions of recruiters for jobs in industry, it still points to the fact that many recruiters may not perceive that a graduate degree is necessary.

An interesting aspect of this discussion is the perception of students, who are most directly affected by the 150-hour requirement. Antenucci and Heal (1999) found that accounting students do believe that the 150-hour requirement will help them in passing the CPA exam and will improve their careers in the long run. CPA firms in their study expressed only lukewarm support for a master's degree versus additional bachelor's hours, but educators in their study stressed master's degrees. Students in their study stated that they preferred more undergraduate hours to meet the 150-hour requirement, but they contradicted themselves by stating that their preferences for degrees were a Master's in Accountancy, an MBA, and a five-year bachelor's degree, respectively. Donelan and Philipich (2001) observed that new accountants who met the 150-hour requirement through bachelor's degrees were less satisfied with their accounting education than new accountants who had master's degrees. Donelan (1999) found that in Tennessee, 57 percent of CPA exam candidates had obtained graduate degrees. Interestingly, of the candidates who did not obtain graduate degrees, over ten percent attended universities that offered graduate degrees. Results from the student's perspectives are mixed at best.

The present study is designed to address these issues and is divided into 2 phases. The first phase attempts to clarify the contradicting results of previous studies by investigating whether recruiters of new accounting graduates feel that there is a difference in the attractiveness of students who obtain master's versus five-year bachelor's degrees. Accordingly, this study tests the following research hypothesis, stated in the alternative:

> *Hypothesis: The level of degree obtained (master's versus five-year bachelor's) affects recruiters' perceptions of how actively accounting graduates will be recruited.*

The second phase of the study attempts to confirm the results of this hypothesis by asking subjects to consider the importance of several characteristics that a recent accounting graduate should possess. This phase of the study also attempts to confirm the results observed by Hardin and Stocks (1995) regarding the characteristics that employers of accounting graduates feel are necessary. Specifically, this phase attempts to confirm that communication skills, both accounting and overall grade point averages (GPA), and compatible career aspirations are important criteria to recruiters while university reputation, AACSB accreditation and willingness to travel were much less so.

The characteristics in the second phase are expanded to include computer skills and qualification to take the CPA exam, which are two criteria mentioned in the research by Albrecht and Sack (2000). Technology has drastically changed our profession, and practitioners are consistently indicating that certain technology skills are critical in our curricula (Albrecht and Sack, 2000). Clearly, the importance of computer skills to potential accounting employers has increased over the past several years. This study attempts to confirm these prior research findings by including the computer skills as a characteristic in phase two.

The second characteristic added is qualification to take the CPA exam. Albrecht and Sack (2000) repeatedly stress that accounting education is not appropriate because it contains too much technical accounting content and not enough skill development. The CPA exam traditionally covered technical accounting content, but the computerization of the exam has also allowed the testing of other skills such as those mentioned by Albrecht and Sack (2000). If the accounting content has lost value, the CPA exam and brand may have also lost value with recruiters. Albrecht and Sack (2000) cite a loss in value of the CPA brand as one of the reasons that practitioners and educators would not major in accounting if they were to start their education again. The addition of the CPA qualification characteristic is designed to test the importance of future certification to recruiters.

RESEARCH METHODOLOGY

Phase One

To test the hypothesis, a research instrument was mailed to subjects drawn from two pools: recruiters for CPA firms and recruiters for companies in industry. The recruiters were asked to evaluate a potential recruit who had recently been interviewed by the respondent. The requested response was a numerical rating indicating how actively the respondent would recruit the hypothetical student. The subjects were also asked to provide data regarding the type and size of the firm for which they worked and the number of accounting professionals employed.

The research instrument for the first phase of the study was a one-page document with several characteristics of a hypothetical entry-level accounting recruit. The instrument is adapted from the Hardin and Stocks (1995) study with a few items modified to address the research questions in this study. The subjects were asked to assume that they were recruiting to hire an entry-level accountant to fill a position in their firm. They were also asked to assume that the hypothetical recruit described on the instrument had been interviewed briefly by the recruiter and that the recruiter had read the student's resume and had taken notes during the interview.

The main portion of this research instrument contained descriptions of nine characteristics of the hypothetical student. The research instruments for the first phase of the study are included in Appendices 1 and 2. The characteristics included on the research instrument were developed in previous literature examining the factors that recruiters feel are most important in their new hires (for example, Hardin and Stocks, 1995; Seigel, 2000; Baker and McGregor, 2000; Siegel and

Sorensen, 1994; Palmer et al., 1997; Dinius and Rogow, 1988; Johnson and Johnson, 1995; Lau and Rans, 1993). The characteristic regarding the final degree that the hypothetical student would obtain upon completion of coursework was added as the primary manipulation in the research instrument. For one treatment, the item stated that the student is currently in an accounting program that grants a bachelor's degree after five years of coursework and will be qualified take the CPA exam upon graduation. The other treatment stated that the student is currently in an accounting program that grants a master's degree after five years of coursework and will be qualified to take the CPA exam upon graduation. In other words, the research instruments were identical except for the level of degree obtained by the hypothetical student. The different versions of this item allowed the examination of whether the subjects perceived a difference in an accounting student who obtained a bachelor's degree versus a master's degree, each with the five years of coursework.

After reading the nine characteristics of the hypothetical student, the subjects were asked to rate how actively they would recruit the student by placing an "X" on a scale of zero to 100. The scale was shown on a line containing a scale with the numbers one through ten placed every ten dashes as points of reference. A rating of zero indicated that the subject would not recruit the hypothetical student very actively; a rating of 100 indicated that the subject would recruit the hypothetical student very actively. Once the rating task was completed, the research instrument asked the subjects to complete information regarding their firms and accounting employees.

As stated above, subjects for this study consisted of recruiters from CPA firms and from companies in industry. One hundred CPA firms were chosen at random from the membership lists of the state CPA societies or from the licensee lists from the state boards of accountancy for Alabama, Arkansas, Louisiana, Mississippi, and Tennessee. In addition, 100 businesses were chosen at random from the listings in *Ward's Business Directory* for each of the same five states. Thus, our sample consisted of 500 public accounting subjects and 500 business subjects.

Each pool of 500 subjects was then randomly assigned to three groups so that each group consisted of approximately ½ public accounting subjects and ½ business subjects. Each of the two groups used in the first phase contained 333 subjects (approximately 166 public and 166 private) and the remaining group used in the second phase contained 334 subjects (167 public and 167 private). Members of one group received the Phase One instrument that included the bachelor's degree student, members of another group received the Phase One instrument that included the masters' degree student, and members of the remaining group received the Phase Two instrument. Each of the subjects received only one instrument. For both the CPA firms and the other businesses, the research instrument was mailed to the attention of the recruiter. For this phase, 666 total instruments were mailed to the CPA firms and businesses. Of those, 184 (27.6%) completed instruments were returned.

Descriptive statistics for the respondents of both phases are presented in Table 2. CPA firm recruiters were asked to indicate the size of the firm and whether they believed their firm to be local, regional or national. Businesses recruiters were asked to indicate whether their companies were small or medium sized or large. The instruments sent to business recruiters included a definition

to help them determine the appropriate size in a consistent manner. Specifically, the instrument used the Small Business Administration's (SBA) definition of a small or medium sized business as one with fewer than 500 employees.

Table 2: Demographic Statistics for Phase One and Phase Two

	Phase One	Phase Two
CPA Firms		
Local Firms	85	37
Regional Firms	3	7
National Firms	6	0
Mean Number of Accountants	2531.2*	9.9
Number of Respondents	94	46
Companies		
Small or Medium-sized Companies	70	27
Large Companies	19	12
Mean Number of Accountants	20.3	26.7
Number of Respondents**	90	39
Total Number of Respondents	184	85

* This mean includes the responses from one CPA firm that indicated that it had 103,000 accountants, which seems unlikely. By excluding that firm's response, the mean is trimmed to 1,427.2.

** The number of responses categorized by size does not match the total because some respondents did not complete the demographics section of the instruments.

The majority of responses were from local CPA firms and small or medium sized companies for both phases. The average number of accountants working for the firm or company varied greatly. Specifically, the average number of accountants for the CPA firms in Phase One of the study was much larger than for CPA firms in Phase Two and for the companies. This is explained by the inclusion of 6 responses from national firms. The number of accountants reported by the national firm respondents ranged from 65 to 103,000. The highest number seems unlikely and may be reporting the number of employees rather than the number of accountants. Trimming the mean by removing the highest number (103,000) decreased the mean number of accountants for this group to 1,427, which is still quite large.

The public accounting respondents for both phases overwhelmingly represent local firms, with no representation from national firms in Phase Two. However, according to the AICPA (2005b), 53,760 students graduated with a bachelor's or master's degree during the 2003-2004 academic year. Of those who graduated in that year, 19,705 (36.7%) were hired by public accounting firms. Firms with fewer than 50 AICPA members (presumably local firms) hired 11,500

(58.4%) of those graduates. Fifty-eight percent of accounting graduates hired by public accounting firms, or 21.4 percent of all accounting graduates, were hired by public firms with fewer than 50 AICPA members (AICPA, 2005b). Thus, the fact that most responses to the study came from local firms should not be problematic and appears in line with trends in public accounting.

The research hypothesis was tested by comparing the respondents' ratings on the hypothetical student. Table 3 shows the results of t-tests of the average ratings by degree. The results show that the differences in the average ratings by degree obtained are not statistically significant, so the level of degree obtained does not appear to be a factor in recruiters' ratings. Therefore, the research hypothesis is not supported. The level of degree obtained was expected to be less important to the recruiters from companies, but an analysis of ratings by type of firm does not support this expectation either. The responses were also analyzed to see if the hypothetical student was rated differently by large or small firms, but no significant differences were noted.

Table 3: Rating by Degree Obtained by Recruit and Type of Respondent: Phase One

	Bachelors	Masters	p-value
Average Rating	76.385	76.632	0.95
Average by Type of Respondent			
CPA Firms	77.673	75.289	0.69
Companies	75.043	78.071	0.55

Phase Two

For the second phase the subjects were asked to rate the importance of each of the criteria used in the first phase. The research instrument was a one-page document that asked the subjects to rate ten characteristics on their importance in the recruiting process. Such a rating should indicate what characteristics of accounting graduates the recruiters look for in their new hires. Seven of these characteristics were taken from the research instrument from the Hardin and Stocks (1995) study. The characteristic regarding computer proficiency was added as described above. A characteristic stating that an applicant was qualified take the CPA exam was added to determine the extent to which employers of accounting graduates expect their accountants to become CPAs. Being qualified to take the CPA exam was included in the item with the type of degree manipulation on the research instrument for the first phase; it was not included separately because it may have confounded the results in that phase. Finally, a characteristic regarding a master's degree was added to confirm the results from the first phase of the study. The research instrument for the second phase of the study is included in Appendix 3.

Subjects were asked to allocate 100 points among the ten characteristics. The subjects were asked to assign zero points to the five items that they felt were the least important. The subjects were

to then allocate 100 points among the remaining five characteristics based on their relative importance. In employment decisions, forced choice data collection procedures result in higher validities than other formats (Bernardin and Beatty, 1984) and follow the methodology used by Lewis et al. (1983). Again, the research instrument asked the subjects to complete information regarding their firms or companies and accounting employees.

A total of 334 research instruments were mailed to CPA firm and business recruiters, as described above. Of these, 85 (25.2%) completed instruments were returned.

Table 4 indicates that the most important factors, as rated by subjects, are communication skills and computer skills. The other characteristics that are included in the "Top 5" are accounting GPA, overall GPA, and compatible career aspirations. The characteristics included in the "Top 5" are the same when analyzed by type of firm. As expected, these results are consistent with prior research, specifically Hardin and Stocks (1995).

The recruiters feel that computer skills are very important for new hires. As discussed above, technology and computer skills are increasingly important in today's business environment, and smaller firms, which are the makeup of the respondents in this study, are less likely to have a training environment and facilities available and may be unwilling to invest in such training if the skills can be "purchased" in the hiring process.

The recruiters do not indicate that a student's qualification to take the CPA exam is an important attribute in the hiring decision. The degree of this result, though, was a startling finding. One possibility is that the results are characteristic of the overwhelming number of small firms in the sample. Smaller firms may be less concerned with this characteristic because they assume that recruits who are not prepared for the CPA exam can be hired for less money than those who hope to become licensed. Alternatively, the firms may be assuming that the students are already qualified to take the exam and are discounting that item, as discussed below.

The ratings were then analyzed by separating them according to type of recruiter. Public accounting firms are expected to value different characteristics than private firms, particularly with respect to the CPA exam characteristic, even though the overall rating for this characteristic was surprisingly low. The results indicate that the only differences in ratings between CPA firm and company recruiters were for the AACSB school, computer skills, and CPA exam characteristics. As expected, the public accounting firms rated the CPA exam characteristic as being significantly more important than the private firms did (at $p<0.10$), but the rating by public accounting firms is still quite low. This may reflect the profession's acceptance of the standard attrition rate from public accounting, an expectation that the recruit will continue his or her education after employment to qualify take the CPA exam, or the decline in value of the CPA brand suggested by Albrecht and Sack (2000).

Table 4: Mean Weights Assigned for Recruiting Characteristics: Phase Two

	All Respondents		CPA Firms		Companies	
Recruiting Characteristic	Mean	Rank	Mean	Rank	Mean	Rank
Travel	2.5	8	2.2	8	2.7	9
Career	8.9	5	10.6	5	7.2	5
Communication	22.1	1	23.6	1	20.8	2
Accounting GPA	16.2	3	16.2	3	16.2	3
Overall GPA	9.6	4	11.0	4	8.2	4
Masters Degree	1.3	10	1.2	9	1.3	10
Respect	5.4	7	5.7	7	5.2	7
AACSB School	2.3	9	0.5*	10	4.5*	8
Computer Skills	21.7	2	17.5*	2	26.0*	1
CPA Exam	8.1	6	9.7**	6	6.3**	6

* Significant at $p<0.01$
**Significant at $p<0.10$

A comment from a large firm recruiter received after a presentation of this paper at a national conference may provide a more encouraging explanation for this result. According to this recruiter, if students will not be qualified to sit for the CPA exam upon graduation, they may not even be interviewed. If the students are interviewed, the firm will not pursue the candidates past that point if they do not plan to pursue CPA licensure. Recruiters in our study may have assumed that the hypothetical student was qualified to sit for the exam since the recruit had passed an initial screening to be selected for interview. In addition, other items on the form indicated that a student was completing 150 hours by graduation. Recruiters in the study may have thought the CPA exam item referred to other qualifications to sit for the exam, such as a residency requirement.

The results in the second phase of the study provide further support for the results in the first phase. The master's degree characteristic received the lowest average score. These results should be alarming to accounting academics involved in developing and administering master's degree programs. If accounting faculty want to continue selling these programs as more valuable than other routes to the 150 hour requirement, re-evaluation and change are necessary. Graduate work is generally more difficult than undergraduate elective-type classes that can also be used to fulfill the requirement. The extra effort and additional year must be perceived as valuable, or we risk losing students in our graduate programs.

Other characteristics that are unimportant to recruiters are graduation from an AACSB accredited institution, willingness to travel, and graduation from a well-respected accounting program. These results are consistent with Hardin and Stocks (1995).

Companies rated both AACSB school and computer skills significantly higher than public accounting firms (at $p<0.01$), although the company ratings for AACSB school were still quite low. The higher rating for computer skills by companies may indicate that these firms have fewer computer training opportunities available for employees and would rather hire candidates who are already trained and avoid the training investment.

Table 5 reports the frequency distributions of the ratings for the three new characteristics being directly tested in this study. The distributions in that table provide additional support for the results above. More than 90 percent of recruiters gave the master's degree characteristics a rating of zero, indicating that that they do not consider a master's degree to be one of the most important characteristics for a new hire. Only seven percent of the respondents indicate that computer skills are not important, while over 45 percent gave that characteristic a rating of greater than 20. Finally, 47 percent of respondents gave qualification to take the CPA exam a rating of zero. Again, there may have been some confounding reasons, as discussed above, why recruiters gave this characteristic such a low rating.

Table 5: Frequency Distributions of Reported Weight Placed on Recruiting Characteristics by Recruiters: Phase Two

Characteristic Weight (Out of 100)	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Masters Degree				
0	77	90.59	77	90.59
1-10	3	3.53	80	94.12
11-20	4	4.71	84	98.82
>20	1	1.18	85	100.00
Computer Skills				
0	6	7.06	6	7.06
1-10	9	10.59	15	17.65
11-20	31	36.47	46	54.12
>20	39	45.89	85	100.00
CPA Exam Qualified				
0	40	47.06	40	47.06
1-10	18	21.18	58	68.24
11-20	21	24.71	79	92.94
>20	6	7.06	85	100.00

OBSERVATIONS, LIMITATIONS AND CONCLUSION

This study examines the perceptions that recruiters have regarding levels of accounting degrees by examining whether recruiters would pursue a candidate differently if the candidate has a master's degree or a bachelor's degree assuming that both degrees contain the required coursework to take the CPA exam. The study also examines what characteristics, adapted from previous studies, are important to recruiters. The study adds three new characteristics to the existing literature: level of degree, computer skills, and qualification to take the CPA exam. The results of the study show that recruiters do not perceive a difference in a recruit with a master's degree versus a recruit with a five-year bachelor's degree. Perhaps with the shortage of accounting graduates in the post-Sarbanes-Oxley era, firms are more willing to hire almost any competent graduate that will work for them, so the degree that the graduates obtain may not matter to the firms. The results also show that computer skills are highly valued by recruiters, but qualification to take the CPA exam is not highly valued.

This study is limited by the self-selection bias inherent in any survey methodology. Those who did not return the surveys may rate these characteristics differently than our sample. Also, our sample is comprised mainly of small firms, both public accounting and businesses, and the sample for the second phase contains no large national firms. This fact may limit the external validity of the results because larger firms may value different characteristics than smaller firms. Future research could specifically target those large CPA firms to determine if their responses would be different from those reported here.

The sample was also drawn from 5 southern states. However, no reason exists to suspect that recruiters in other areas of the country would rate characteristics differently than those in our study, but these results may not extend to other geographic areas.

The research instrument also did not specify what type of master's degree was being obtained. It is possible that some recruiters were unsure of whether the graduate degree being pursued was a Master of Accounting (MAcc) or a Master of Business Administration (MBA). This study did not investigate whether recruiters perceive a difference in the value of a MAcc versus an MBA (See Wilder and Stocks (2004) for such a study.). If recruiters do perceive a difference, our results may be affected by the recruiters' assumption of which degree was being obtained. Future studies in this area should clearly specify which degree is being sought or seek to determine if recruiters value the two degrees differently.

This study was designed to address the value of a master's degree vs. a bachelor's degree with extra hours to reach the 150-hour requirement. Future research could attempt to determine whether recruiters or employers feel that the additional hours are a worthwhile investment in our profession.

Accounting academics have been re-evaluating the education we provide students for several years. Albrecht and Sack (2000) made strong statements about the problems with accounting education and the degree of change that is needed. The methodology in the current study is different

from Albrecht and Sack's but tests several of their conclusions. The results confirm that graduate accounting education is not meeting the needs of recruiters and employers. Master's degrees are not perceived to be as important to recruiters nor as valuable to students as accounting educators would like to believe, while computer and communication skills are. The academic community must re-evaluate its programs, both graduate and undergraduate. A focus on content-based education geared toward the CPA exam is perhaps no longer valuable. If master's degrees in accounting are to survive as a preparation tool for future accountants, we must work to ensure that these programs add value that recruiters and employers appreciate.

The study may also have implications for those responsible for defining the requirements to take the CPA exam. The original proposals and discussion of the 150-hour requirement indicate that the perceived benefit was in students gaining more relevant knowledge. The AICPA and state societies may want to work with recruiters and employers to define what additional skills and knowledge should be included in the additional hours. Requirements should be more specific regarding what accounting programs should be providing for their students. If graduate degree requirements for all candidates are not feasible for all schools to offer, a requirement that students have at least some graduate hours could help to address the education needs while still offering varied educational opportunities for students.

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Appendix 1

Assume that your firm is in the process of recruiting an entry-level staff accountant. In the process of your recruiting, you have conducted preliminary interviews at several mid-sized regional universities. At one of these interviews, you have met the student described below.

After briefly speaking with the student and reading the student's resume, you have made the following observations:

The student is 23 years old with a professional appearance and presence.
The student has expressed a willingness to travel.
The student's grade point average in accounting courses is 3.75 on a 4.0 scale.
The student is currently in an accounting program that grants a bachelor's degree after five years of coursework and will be qualified take the CPA exam upon graduation.
The accounting program in which the student is enrolled is well respected in the business community and has an above average academic reputation.
The student is proficient in several common microcomputer applications such as spreadsheets, word processors, and databases.
The student has expressed career aspirations that are compatible with your firm.
The student's grade point average in all courses attempted is 3.7 on a 4.0 scale.
The student has demonstrated excellent communication skills.
HOW ACTIVELY WOULD YOU RECRUIT THIS STUDENT?
Not very actively Very actively
0---------1---------2---------3---------4---------5---------6---------7---------8---------9---------10
PLEASE INDICATE YOUR ANSWER (ON A 0 – 100 SCALE) BY PLACING AN "X" ON THE ABOVE LINE.
Please classify your firm as:
_____ Local
_____ Regional
_____ National

Please indicate the number of accounting professionals in your firm. _____

Appendix 2

Assume that your firm is in the process of recruiting an entry-level staff accountant. In the process of your recruiting, you have conducted preliminary interviews at several mid-sized regional universities. At one of these interviews, you have met the student described below.

After briefly speaking with the student and reading the student's resume, you have made the following observations:

The student is 23 years old with a professional appearance and presence.
The student has expressed a willingness to travel.
The student's grade point average in accounting courses is 3.75 on a 4.0 scale.
The student is currently in an accounting program that grants a master's degree after five years of coursework and will be qualified take the CPA exam upon graduation.
The accounting program in which the student is enrolled is well respected in the business community and has an above average academic reputation.
The student is proficient in several common microcomputer applications such as spreadsheets, word processors, and databases.
The student has expressed career aspirations that are compatible with your firm.
The student's grade point average in all courses attempted is 3.7 on a 4.0 scale.
The student has demonstrated excellent communication skills.

HOW ACTIVELY WOULD YOU RECRUIT THIS STUDENT?
Not very actively Very actively
0---------1---------2---------3---------4---------5---------6---------7---------8---------9---------10

PLEASE INDICATE YOUR ANSWER (ON A 0 – 100 SCALE) BY PLACING AN "X' ON THE ABOVE LINE.

Please classify your firm as:

_____ Local
_____ Regional
_____ National

Please indicate the number of accounting professionals in your firm. _____

Appendix 3

The following is a list of attributes that are commonly sought in entry-level staff accountants.

1. Place a zero (0) in the blank for the five (5) attributes that you feel are **not** important in entry-level staff accountants.
2. Allocate 100 points among the five (5) attributes that, in your opinion, are the most important. The more important an attribute, the more points you should assign.

_____ Willingness to travel
_____ Career aspirations that are compatible with your firm
_____ Oral and written communication skills
_____ Grade point average in accounting courses
_____ Overall grade point average in all classes attempted
_____ Accounting program that grants a master's degree after five years of coursework
_____ Accounting program is well respected in the business community and has an above average academic reputation
_____ Accounting program is accredited by the American Assembly of Collegiate Schools of Business
_____ Proficiency in microcomputer applications such as spreadsheets, word processors, and databases
_____ Qualified to sit for the CPA exam upon graduation
100 TOTAL

Please classify your firm as:

_____ Local
_____ Regional
_____ National

Please indicate the number of accounting professionals in your firm. _____

THE IMPACT AND EFFECT OF THE SARBANES OXLEY ACT ON THE INTERNAL AUDIT PROFESSION: CHIEF AUDIT EXECUTIVES' PERSPECTIVES

Raymond J Elson, Valdosta State University
Michael Lynn, AXA Technology

ABSTRACT

The Sarbanes Oxley Act of 2002 (specifically Section 404) requires management to assess the effectiveness of internal financial controls and instructs auditors to report on whether the controls are adequate or have material weaknesses. The Sarbanes Oxley Act ("SOX") has increased the focus on internal audit departments as a key partner in assisting management and the board of directors (especially audit committees) in fulfilling their corporate governance activities. Using a questionnaire, we conducted a study of chief audit executives (CAEs) within the insurance industry to obtain their perspectives on the impact and effect of SOX on their departments and profession. We were primarily interested in their involvement in the initial implementation and ongoing SOX compliance efforts, and any change in their departments' missions. We were also interested in the CAEs opinions on the role of internal audit in the future especially in light of SOX.

We received feedback from 35 (35.4 percent) CAEs representing organizations and audit departments of various sizes. The results showed that most internal audit departments were impacted by SOX in that they allocated significant resources to assist management in the initial Section 404 compliance efforts. The CAEs expected to expend similar efforts on future compliance efforts. Some departments also increased their mission to include corporate governance activities such as reviewing the company's ethics and business conduct and legal and regulatory compliance; areas not previously included in audit plans. CAEs could not fully articulate the future role of internal audit and no clear vision was provided. Responses received included expecting the function to remain unchanged, assisting management and the board of directors in corporate governance activities, and becoming more involved in enterprise risk management efforts.

Clearly internal audit departments were impacted by SOX and their missions continue to change to address emerging risks in the organization. However, the future role of internal audit was not clear perhaps because organizations continue to adjust to the new regulation. We recommend that researchers continue to focus on understanding changes in the internal audit function within organizations and its continuing evolution in response to SOX and other regulations.

INTRODUCTION

The Sarbanes Oxley Act of 2002 ("the Act" or "SOX") was enacted into law by the United States Congress because of a number of corporate failures which questioned the value of the financial statement audit. SOX apply to all Securities and Exchange registrants (i.e., public companies) and their external auditors. The key sections of the law includes requirements for (a) the establishment of the Public Company Accounting Oversight Board or PCAOB, (b) Auditor Independence, (c) Corporate Responsibility, and (d) Enhanced Financial Disclosures.

The enhanced financial disclosures as noted in Section 404 of the Act requires companies to vouch for accounting controls over financial reporting and disclosure weaknesses to shareholders. More specifically, Section 404 requires management to assess the effectiveness of internal financial controls and instructs auditors to report on whether the controls are adequate or have material weaknesses (Swartz, 2005). This is achieved through mandatory reports on internal control by management and independent auditors (Lin & Wu, 2006). Most businesses believe that the costs associated with complying with section 404 are too high (O'Brien, 2006). However, 79% of financial executives included in one survey reported that complying with the Act has strengthened their internal controls (Swartz, 2005)

The Act has increased the focus on internal audit departments as a key partner in assisting management and the board of directors (especially audit committees) to fulfill their corporate governance activities. Essentially, management and the board of directors must ensure that their organizations are complying with SOX and especially with Section 404.

Carpenter, Fennema, Fretwell & Hillison (2004) surveyed corporate executives and noted that some are creating new internal audit departments, others are filling existing staffing needs, while others are ensuring that control issues are brought to the CEO and CFO's attention immediately in at attempt to fully utilize internal audit. The New York Stock Exchange (NYSE) supports this initiative since all listed companies are now required to maintain an internal audit function to provide management and the audit committee with ongoing assessment of the company's risk management processes and system of internal control (Harrington, 2004). NASDAQ does not have the same requirement but supports an internal audit function as a best practice.

Although its requirement is very clear, the NYSE has delegated the responsibility of determining what constitutes a properly structured internal audit department to each listed company. Corporate executives have some suggestions on how the internal audit departments can become more proactive especially as it relates to Section 404 compliance. Proposed actions include stop using the department as a training ground, focus more auditing resources on financial areas, have the internal audit executive report to the audit committee, and view the internal audit department as more critical to the company's success (Carpenter et al, 2004).

The regulators and managements' positions are very clear but we were interested in what was actually happening in the internal audit departments. Specially, how much are internal audit departments impacted by SOX and how involved were they in Section 404 compliance efforts. As

a result, we conducted a study of chief auditors (CAEs) to obtain their perspectives on the impact and effect of SOX on their departments. We were primarily interested in their involvement with their organization's initial implementation and ongoing compliance efforts, and any change in their departments' missions. We were also interested in the CAEs opinions on the role that internal audit might play in the future especially in light of SOX.

THE STUDY

The Chief Audit Executives (CAE) of Internal Audit Departments within the Insurance Internal Audit Group (IIAG), an industry group, was selected for this study. This is a specialized, focused group with a total population of 99 members. Contact was made with the group through a prior relationship with one of the researchers. Survey questions were developed to address the impact of SOX on the respective Internal Audit Department's (IAD). We were primarily interested in (a) their involvement in the initial implementation of SOX within the organizations, (b) any changes in their mission and/or operations as a result of SOX and (c) their views on the primary role IAD might place within their organizations after the implementation of SOX.

The survey questions were pre-tested with other experienced internal audit personnel and the final document emailed to the CAEs. Follow up e-mail and/or phone calls were placed to the chief executives to enlist their participation in the study.

RESULTS AND ANALYSIS

Positive feedback was received from 35 CAEs for a 35.4% a response rate. They represented companies of various sizes, but a slight majority (51%) worked at organizations with 1,001 to 5,000 employees, with 23% working at organizations with 10,000 or more employees. The CAEs are quite experienced with a slight majority (54%) working in Internal Audit for 16 or more years. However, a large number of CAEs (46%) were new to their current organizations having worked there for less than five years. The Internal Audit Department in which the CAEs worked are relatively small with most (86%) working in departments of less than 50 individuals. Eight CAEs (or 30%) worked in internal audit departments of less than 10 employees and one had more than 100 employees in the department.

In terms of educational achievement, the majority of CAEs (86%) earned at least a bachelors degree with an equal percentage (43%) obtaining at least a bachelors or masters degrees. Interestingly, 14% of the CAEs reported did not hold a formal college degree. Professional certification is quite important to these executives and most reported having at least certifications and a number had multiple certifications. The most important certifications in terms of total responses are the Certified Public Accountant (CPA), Certified Internal Auditor (CIA), Certified Financial Services Auditor (CFSA), Certified Information Systems Auditor (CISA) and Certified

Fraud Examiner (CFE). Further information on the background of the chief executives who responded to the study can be viewed in Table 1.

Table 1: Demographics

1. Number of years CAE worked in Internal Audit

   4 1-5 yrs 8 6-10yrs 4 11-15yrs 19 16+ yrs

2. Number of years CAE worked in your current organization

   16 1-5 yrs, 5 6-10yrs, 7 11-15yrs 7 16+ yrs

3. The total current staff size of CAE's audit department

   18 10 or less, 12 11-50 4 51-100 1 101 or more

4. The approximate number of employees in CAE's organization

   8 1,000 or less 18 1,001-5,000 1 5,001-10,000 8 10,001 or more

5. Professional designations currently held by CAE

   CPA 20 CIA 15 CFSA 8 CISA 8 CFE 5
   CMA 1 CBA 1 FLMI 4 CA 1
   Certified Cash Manager 1

6. Highest educational level attained by CAE

   No college degree 5 Bachelors 15 Masters 15 PhD/Doctorate 0

SOX Implementation

Eight CAEs reported that they worked at mutual insurance companies and were not currently subject to SOX. As a result, no current resources were expended on SOX compliance. Most CAEs (69%) reported spending their audit resources on SOX compliance efforts in 2004 and expected to dedicate resources on 404 compliance in the future. Of those organizations that are subject to SOX, 12 organizations reported spending 21% or more of their audit resources on SOX related projects during 2002. Nine CAEs anticipated spending 21% or more of their future audit resources on SOX compliance efforts.

Not surprisingly, CAEs audit and control backgrounds were critical to their organizations in the initial SOX implementation efforts and they or their audit departments were critically involved

in such efforts. CAEs reported that their involvement included providing project leadership and project management skills, serving as members of the SOX steering committee, providing internal control training to management, and serving as advisor to business in gathering control documentation. In addition, some CAEs reported that their audit departments were the primary documenters of internal controls, performed quality assurance on documentation and test plans, and as subject matter experts reviewed management's control documentation, testing plans and results.

Although the Internal Audit Departments were involved in their organizations initial 404 implementation efforts, CAEs reported that other departments would lead the maintenance and remediation efforts in the future. The responsible departments varied by organizations but they were expected to include finance, controllers, operating areas with a centralized project management office, newly created internal control departments, and in limited instances, the internal audit department.

Section 404 of the Act only requires that key controls be identified, tested and remediated as necessary by management. As a result, other controls within business processes would not be subject to management testing. We were concerned if such controls would be included in the audit department's audit plans. Twenty one CAEs reported that their audit plans would include such controls in the future.

Impact of SOX on department's mission

SOX has significantly affected the mission of most Internal Audit Department's including those not currently subject to its regulations. In fact, 27 CAEs reported that their departments are currently involved in corporate activities. This is an area not traditionally included in most IAD annual audit plan due to lack of expertise or relevance on the work of others such as the external auditor. For those organizations involved in or expanding their coverage of corporate governance activities, we requested that the CAEs indicate the top two areas in which resources would be allocated in the upcoming year. Top areas reported were ethics and business conduct, legal and regulatory compliance, and audit committee compliance with charter. One organization reported including the organization's whistle blower policy in its audit scope, while another was planning on examining the organization's conflict of interest policy.

CAEs reported that their organizations were expecting the internal audit department to lead control and risk training programs in the future. This finding is not surprising because of internal audit greater understanding of risk and control issues.

Even with the increased audit work or perhaps the change in their missions, 20 CAEs reported that their departments had adequate resources to complete the audit plan. For those CAEs expecting a staff level increase over the next twelve months, the percentage increase ranged from 10% to 66%.

Future Role of the Internal Audit Department

SOX has forced organizations to examine the mission of their internal audit departments since management is now performing certain tasks that were typically performed by internal auditors. We asked the CAEs to define the future role of Internal Audit from their perspectives. Clearly this is a question that the CAEs are struggling with since no clear consensus could be identified from the responses. Some expected no change in internal audit's role, others expected to assist management and the audit committee in performing their governance activities and some expected more involvement in enterprise risk management efforts. Some of the responses follow:

- We provide independent, objective risk assessment and evaluation of the effectiveness of risk management practices, internal control and corporate governance processes in all areas. We work with management in achieving business objectives by creating solutions to improve operations, while remaining objective and independent.
- Internal audit will support the audit committee of the Board of Directors in fulfilling their role by providing objective evaluations of management's internal control processes, Sarbanes-Oxley compliance efforts and enterprise risk management practices.
- I'm afraid that there will be significant pressure for us to become financial auditors with CPA designations due to SOX. I hope that soon there will be realization that there is a need for internal audit to provide a different track than the external auditors. It will be a sad day when operational and compliance audit takes a back seat to financial auditing, even though I understand the overlap. Our benefit to the company is far greater than tracing dollars through systems and feeding them into financial statements so our external auditors will feel comfortable with them.
- As role is better understood and valued, will be asked to do more of what most good departments have been doing all along, i.e., evaluate controls against a changing risk profile and through the process create positive change to the organization - more opportunities now exist to obtain added resources.
- I still see the value of Internal Audit in providing for independent, objective assurance and consulting activity designed to add value and improve an organization's operations. I just don't know if the paranoia of SOX will allow a quick return to these activities.
- Less consultative and more back to basics. Increased use of computer assisted audit techniques (CAAT)/continuous auditing/monitoring.
- Supporting Audit Committee and management governance responsibilities through audits, risk/control training and enterprise risk assessments.

SUMMARY AND CONCLUSIONS

The results of our study were based on responses received from insurance industry audit executives and may not represent the views of all CAEs. However, they do show that internal audit departments played an active role in their organizations initial implementation of Section 404 of the Act and would continue to be involved in the future. As expected, CAEs played leadership roles in their organizations' implementation efforts. Clearly organizations were leveraging the knowledge of risk and control identification and remediation maintained by the CAEs.

The CAEs reported spending more of their resources on corporate governance activities such as reviewing ethics and business conduct and legal and regulatory compliance. This suggest that senior management and audit committees are relying more on their internal audit functions to assist them in their oversight responsibilities under SOX. Some organizations reported increasing audit resources by as much as 66 percent which suggest support from senior management to either fill existing or new staff needs thereby providing CAEs with adequate resources to fulfill their departments' missions.

The CAEs could not reach any consensus on the future role of Internal Audit which suggests that this is an evolving role. SOX has been in effect for approximate four years and public companies have completed at least two reporting cycles of their Section 404 compliance efforts. Therefore, future research should continue to examine the role of the internal audit function within organizations and its continuing evolution.

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A COMPARISON OF RISK TOLERANCE AND RISK CAPACITY AMONG COLLEGE FINANCE STUDENTS

Kevin Bosner, Medaille College
Merouane Lakehal-Ayat, St. John Fisher College

ABSTRACT

The concept of risk aversion has been well-researched, and the prevailing wisdom for some time has been that most investors prefer to reduce the amount of risk required to obtain a given rate of return. This paper measures the difference between this aversion to investment risk (defined as risk tolerance) and an individual's capacity for investment risk. A questionnaire measuring both tolerance and capacity is given to 167 undergraduate and graduate students enrolled in a variety of Finance courses. It is hypothesized that for most participants, the risk tolerance score will be lower than the risk capacity score. It is further hypothesized that male students will have higher capacity and higher tolerance than female students, and that higher risk tolerance will be found among students enrolled in advanced finance and investing classes.

INTRODUCTION

All investors must deal with several types of risk in making their choices. One key element of financial theory is the concept of risk aversion; in other words, most people will try to minimize the amount of risk required for a given return, or conversely, maximize the return expected for a given level of risk (Gitman & Joehnk, 2005).

People differ significantly, however, in how much risk they can absorb, for reasons that are economic as well as emotional (Gollier & Pratt, 1996). These differences have broadly been categorized into risk *tolerance* and risk *capacity.* The two terms are often used interchangeably. More recently, however, Kitkes (2006) and others have stated a need to define and measure each term separately in order to obtain a more useful investor profile. Cordell (2001) proposed a tool he called RiskPACK as an instrument to separate and measure different components of an individual's attitude toward risk. Cordell defined four such components: Propensity, Attitude, Capacity, and Knowledge, thus creating the PACK acronym. Based on his further research, Cordell later suggested that risk could be usefully viewed in just two dimensions: capacity and tolerance (Cordell, 2002).

Capacity for risk can be determined somewhat objectively, based on the individual's income, age, financial stability, family situation and similar quantifiable factors. Tolerance for risk is more of an attitudinal measure, and is thus more subjective than risk capacity. Two individuals might have identical incomes, ages, etc, and therefore have identical capacity for risk. But it would not be

surprising to find that one of them can tolerate more risk, despite the similarity of their situations. Risk capacity, then, is more quantitatively measurable; risk tolerance less so. This becomes more of an issue when trying to measure both these factors simultaneously (Roszkowski, Davey & Grable, 2005).

MEASURING RISK TOLERANCE VS. MEASURING RISK CAPACITY

Risk tolerance questionnaires have been widely used since their introduction in the mid 1980's (Droms & Strauss, 2003). However, many researchers question whether such instruments provide a good measure of what they are supposed to measure. Yook and Everett (2003) found differing and sometimes contradictory results from the same pool of investors. Furthermore, Bouchey (2004) contended that many of the questions found on risk tolerance questionnaires were actually better measures of asset allocation or investment goals as opposed to true measures of risk tolerance. Roszkowski and others pointed out as long ago as 1989 (Roszkowski & Snelbecker, 1989) and as recently as 2005 the difficulties in many of the questionnaires in current use and suggested a method for improving their effectiveness.

The keys to any questionnaire's success include its validity and its reliability (Cooper & Schindler, 2006). The concept of reliability is that the better-designed the questions, the more likely results from separate administrations of the instrument will be consistent. Validity, on the other hand, refers to the questionnaire's ability to measure what it is supposed to measure. Both are required for data to be useful, and both can be tracked through the use of psychometrics, a scientific mix of psychology and statistics. (Roszkowski, Davey & Grable, 2005).

METHODOLOGY

The questionnaire chosen for this study consists of twenty questions. (Microsoft, 2006). Some of the questions are designed to measure capacity. These include questions about age, job security, living situation, number of years to retirement and so on. Also included are several questions addressing tolerance for risk. This type of question is intended to assess an emotional reaction to making an investment, level of anxiety about losing money, friends' and peers' opinions, and so on. This instrument was chosen because it combines in one document questions about both tolerance and capacity. In that way there can be a direct comparison on the same scale between an individual respondent's capacity and tolerance for risk.

However, as discussed above, simply having both items measured in the same questionnaire is not enough. So both the validity and reliability of the questions need to be tested. We tested the validity first by comparing the questions to those on other previously validated instruments of risk capacity and risk tolerance (FinaMetrica, 2007). Reliability was checked by comparing separate administrations of our instrument approximately three months apart and finding essentially identical results. The full questionnaire is included as Appendix A.

The questionnaire was administered to 167 students in a controlled classroom environment at two private colleges in Western New York. There were three groups of respondents. Group One consisted of 79 undergraduate students taking their first Finance course. Group Two consisted of 56 undergraduate students enrolled in a more advanced Finance classes such as Intermediate Financial Management, and Investments. Group Three consisted of 32 graduate students enrolled in an MBA Finance course. The three groups were chosen to represent varying levels of knowledge about investment theories. Within each group, there were some fairly minimal differences in age and income level.

Questionnaires were handed out to the students by one of the authors, who also explained the format and answered questions about the clarity of the instructions. The voluntary nature of participation was stressed, and the instructor left the classroom while students took the survey. The completed surveys were collected by a research assistant to avoid any perception of bias or pressure on the student participants.

HYPOTHESES

As mentioned, the concept of risk aversion found in much investment theory assumes that most individuals will seek to minimize the amount of risk they assume for a given amount of gain. This has led to a further assumption that most people's risk tolerance is lower than their risk capacity (Gitman & Joehnk, 2005). In other words, most people can economically handle more financial risk than they are emotionally willing to take (Nofsinger, 2005). We felt we would find the same situation here. So our first hypothesis is:

H1: The majority of individuals will score lower in their risk tolerance (TOL) than in their risk capacity (CAP).

Presumably the more people know the more intelligent decisions they can make. This ought to apply to investments too, as students learn more about the components of risk and are exposed to various methods for evaluating risk and return. So our second hypothesis is:

H2: The differences between risk capacity and risk tolerance will be highest in Group One (Introductory Finance students) and lowest in Group Three (the graduate students).

Finally, much has been written about different investment strategies favored by men and women in general. Nofsinger (2005), for example, found men to be more overconfident than women about their investment choices. Since such overconfidence relates more to risk tolerance than to capacity, this led to our third and fourth hypotheses:

H3: Across all three groups, the male respondents will show a higher tolerance for risk than female respondents.

H4: Across all three groups, the male and female respondents will show similar levels of risk capacity.

RESULTS

Nine surveys were unusable, either because of several questions being left unanswered, because a respondent chose two different answers to the same question, or because a respondent wrote in an answer that was not among the choices given.

The remaining 158 responses were keyed, machine-scored and the resulting Capacity and Risk scores were matched to each respondent. All data was double-keyed for accuracy. A summary of the survey results is shown in Appendix B.

Hypothesis 1

Of the 158 usable surveys, only 24, or 15% of the total, had Capacity scores (CAP) higher than Tolerance scores (TOL). In six cases, the capacity and tolerance scores were equal. The remaining 128 of the 158 respondents (81%) all had tolerance scores higher than their capacity scores. The mean difference between CAP and TOL scores, regardless of direction, was 4.99, with a standard deviation of 3.16. A single-factor ANOVA test was performed (see Appendix C) resulting in an F of 104.7, showing a significant difference between the two scores across the entire sample.

Thus Hypothesis H1 was not supported, and in fact, its opposite was shown to be true, at least for this sample.

Hypothesis 2

Sorting the data by group enables the testing of Hypothesis H2. Group One - the beginning Finance students - were expected to show the greatest difference between tolerance and capacity, while the graduate students were expected to show the least. Group Two, the undergraduate Intermediate and Advanced students, were expected to fall between the other two groups.

Again the data failed to support this hypothesis. The average difference between CAP and TOL scores in Group One was 5.03 points. Group Two's average difference was smaller, dropping to 4.87. Counter to our hypothesis, the sample of graduate students (Group Three) had the highest difference between CAP and TOL scores of all three groups, with an average 5.14. However, one-way ANOVA testing (see Appendix E) found that these differences ($F(2,155) = 0.07$, $p > .05$) were not significant.

Hypotheses 3 and 4

Finally, testing Hypotheses H3 and H4 was done by sorting the data according to gender. The usable surveys included 98 (62% of the total) from men, and 60 (38%) from women. Across all three groups, it was hypothesized that male TOL scores would be higher than female's. Actual results show an average male TOL score of 30.8, slightly higher than the average female TOL score of 29.08. The one-tailed t factor was 1.65 with a p = 0.001, at alpha = 0.05. This would indicate some support for H3.

H4 stated that the male and female respondents would show similar levels of risk capacity. The actual male average CAP score was 26.6, compared to an average female CAP score of 25.1. The male score was slightly higher, as it was for TOL scores. Of the 60 women, 18 (30%) had a higher CAP score than the male average. Here the two-tailed t was 1.97, with p= 0.008, at alpha = 0.05, indicating strong support for H4.

It is interesting to note that, the differences between CAP and TOL scores when subjected to ANOVA testing (see Appendix D) also showed some variation (F=0.552). This lends some credence to the presence of a gender difference.

CONCLUSIONS

Hypotheses 1 and 2 are rejected by the analysis. The majority of participants indicated a higher score for risk tolerance over their risk capacity. The results appear contradictory to Gitman and Joehnk (2005) who noted that risk tolerance is lower than risk capacity. This result provides a need for future study to understand why participants can tolerate more risk than the capacity to handle the risk.

The extent to which college students expressed tolerance for higher risk than their capacity is interesting. It may indeed be true that younger people in general have a greater tolerance of risk than their parents and grandparents did. Schooley & Worden (2003) used Federal Reserve Board Survey data from 1998 to show that so-called Gen X individuals (those born from 1960 to 1984) consistently demonstrate this higher tolerance for investment risk. It may be that because they are young, their time horizon is long enough that they feel more able to take risks. They also do not have previous generations' assumptions of Social Security or a company pension plan to guarantee them sufficient retirement income. We plan to undertake further studies of young people, those who are full time income-earners compared to, or sometimes in addition to, being full-time or part-time college students.

Hypotheses 3 and 4 have some support from the results. Male participants do appear to have a higher tolerance for risk. In addition, men indicate a higher capacity for risk. The results find support from Nofsinger (2005) who noted that men have a higher tolerance for risk.

The support for a gender difference is also of note. The fact that the male and female students showed similar capacities for risk, but significantly different tolerances, may be an indicator of

psychologically different approaches of men and women to risk. It might also be that further education of both men and women as responsible risk takers is in order. A review of current literature on gender differences in investing might yield important information which could be used to improve the financial education of our college students.

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APPENDIX A. SURVEY QUESTIONS

1. Your age is:
   - A. Under 21
   - B. 21-25
   - C. 26-30
   - D 31-40
   - E. 41 or over

2. You have saved for a big vacation. Two weeks before your departure, you lose your job. You...
   - A. cancel your vacation.
   - B. make plans for a modest vacation at the beach instead.
   - C. go as scheduled, reasoning that job hunting will go better after a good vacation.
   - D. extend your vacation and plan a real blowout; this might be your last opportunity to go first-class.

3. Your current income is:
   - A. under $25,000.
   - B. between $25,000 and $50,000
   - C. between $50,000 and $100,000
   - D. over $100,000.

4. You are financially responsible for:
   - A. only yourself.
   - B. older parents.
   - C. both children and spouse.
   - D. bills split with working spouse, no kids.
   - E. bills split with working spouse and kids that you both support.

5. Your job:
   - A. is iffy
   - B. is secure with good potential for income growth.
   - C. doesn't matter because you expect a large inheritance.
   - D. doesn't matter because you expect to go out on your own soon.

6. After you make an investment, you typically feel:
   - A. thrilled.
   - B. satisfied.
   - C. confused.
   - D. regretful.

7. You take a job at a fast-growing company, where you are offered these choices. You pick:
   - A. a five-year employment contract.
   - B. a $25,000 bonus.
   - C. a 10% pay increase on your $100,000 salary.
   - D. stock options (the opportunity to buy company stock at a set price) with a current value of $25,000 but the chance for appreciation.

APPENDIX A. SURVEY QUESTIONS

8. This statement best describes you:
   - A. I don't see any point in saving.
   - B. I'd like to save something, but there's never anything left over.
   - C. I try to save a little whenever I can.
   - D. I save 5 percent or more of my salary, regardless of other circumstances.

9. You invest $10,000 in a stock that drops 10 percent in value the following day. You:
   - A. put in another $10,000 while it's down.
   - B. sit tight because you did the research.
   - C. sell and go back to certificates of deposit.
   - D. wait for the stock to regain the $1,000 loss, then sell it.

10. Describe your investment knowledge? Choose one:
   - A. I am a knowledgeable investor who's able to explain concepts such as standard deviation and risk measurements.
   - B. I understand how mutual funds work and feel confident discussing the best funds in different categories.
   - C. I understand investment basics and the major markets, such as stocks bonds and money markets.
   - D. I have only a vague idea about financial terminology.
   - E. I never get into financial discussions because I don't understand any of the concepts.

11. How would your spouse or best friend describe you as a risk-taker?
   - A. foolhardy
   - B. willing to take risks after research
   - C. cautious.
   - D. risk averse.
   - E. afraid of your own shadow.

12. How would you describe yourself as a consumer of investment information?
   - A. I am a business news junkie, spending hours a day digesting investment information.
   - B. I regularly read "The Wall Street Journal" and at least one specialized business publication.
   - C. I spend about 20 minutes a day on the financial pages.
   - D. I watch the business news on television but don't understand much.
   - E. I use the business section to walk the dog and avoid business news whenever possible.

13. How far away are your major financial goals?
   - A. less than 2 years
   - B. 2 to 5 years.
   - C. 5 to 10 years.
   - D. more than 10 years.

14. When your are faced with a major financial decision, you:
   - A. flip a coin
   - .B. agonize
   - C. call each of your friends and ask what they would do.
   - D. go with your gut E. research the options.

APPENDIX A. SURVEY QUESTIONS

15. How do you feel when you suffer a financial loss?
   A. I think I'm a bad person.
   B. I feel guilty.
   C. I view it as a personal failure.
   D. I see it as an obstacle to be overcome.
   E. I almost never suffer losses, because I don't take risks that would lose me money.

16. Your employer offers a year's severance pay to the first 100 employees who accept the offer. You:
   A. take it immediately.
   B. take it only if you had been researching business opportunities and felt you had a good option ready to go.
   C. start looking; you can't afford to leave now, but you're not going to wait for the other shoe to drop.
   D. ignore it; you intend to spend the rest of your career with this company.

17. You invest in emerging markets, believing they will grow over the next decade. Soon they are down 20%. You:
   A. sell.]
   B. double your holdings.
   C. do nothing.
   D. wait until the end of the year to rebalance, adding to your stake if necessary to bring it back to 10 percent.

18. Your savings---including retirement plans---are:
   A. nonexistent.
   B. embryonic.
   C. equal to six months salary or less.
   D. equal to one year's salary.
   E. equal to two year's salary or more.

19. Which best describes you?
   A. living with parents.
   B. apartment with roommates.
   C. own a starter home.
   D. saving to trade up to your dream home.
   E ensconced in the home of your dreams---or close enough to it that you're prepared to stay. In other words, this is it house-wise.

20. How would you describe you overall income status?
   A. I survive paycheck to paycheck.
   B. I have a small amount of savings.
   C. I have an income of more than $50,000 and a modest portfolio of investments.
   D. I have a total income of more than $75,000, plus a retirement plan and investment portfolio.
   E. I have substantial holdings that include an investment portfolio, savings insurance and retirement accounts.

APPENDIX A. SURVEY QUESTIONS
You are: A. Female B. Male
Your Academic Major is:

APPENDIX B. SURVEY DATA			
Gender	# of Surveys	Average TOL	Average CAP
Male	98	30.80	26.64
Female	60	29.08	25.05
Grand Total	158	30.15	26.04
Group	# of Surveys	Average TOL	Average CAP
One	76	29.28	24.93
Two	53	30.74	26.92
Three	29	31.34	27.31
Grand Total	158	30.15	26.04

APPENDIX B. SURVEY DATA

Typical Scores: Based on the answer most frequently chosen to each of the 20 questions:

All respondents

Your score for risk capacity is 23

With a score between 22 and 29, you have a moderate capacity for risk. You might consider a balanced portfolio, spread between stocks and bonds. Aim for nearly half of your portfolio in bonds and a third in five to 10 year bonds. Another 25 percent might go in large company U.S. stocks and 10 to 15 percent in small company stocks. The remainder should be invested overseas with a sprinkling of it in emerging markets. Professional investors estimate that a worst-case scenario for the portfolio just described is that it would be down 11 percent in a year.

Your score for risk tolerance is 30

With a tolerance of 23 to 32, you have a moderate risk but your capacity suggest you may need to consider a more modest investment strategy. You should consider safe investments. Start with the bulk of your portfolio in short to medium term bonds. The rest of your portfolio should go into stocks, perhaps 12 to 13 percent in large cap, 9 percent in small cap and 5 or 6 percent international. The estimated worst case scenario for such a portfolio would be a 4 percent loss in a year.

Female Respondents

Your score for risk capacity is 21

With a score of 21 or less, you have a low capacity for risk at this time. You should consider safe investments. Start with the bulk of your portfolio—perhaps 75 percent—in short to medium term bonds, split evenly between one to three years, three to five years and five to 10 years. The rest of your portfolio should go into stocks, perhaps 12 to 13 percent in large cap, nine percent in small cap and five or six percent international. The estimated worst case scenario for such a portfolio would be four percent loss in a year.

Your score for risk tolerance is 29

With a tolerance of 23 to 32, you have a moderate risk tolerance but your capacity suggests you may need to consider a more modest investment strategy. You should consider safe investments. Start with the bulk of your portfolio in short to medium term bonds. The rest of your portfolio should go into stocks, perhaps 12 to 13 percent in large cap, nine percent in small cap and five or six percent international. The estimated worst case scenario for such a portfolio would be a four percent loss in a year.

Male Respondents

With a tolerance of 23 to 32, you have a moderate risk tolerance but your capacity suggests you may need to consider a more modest investment strategy. You should consider safe investments. Start with the bulk of your portfolio in short to medium term bonds. The rest of your portfolio should go into stocks, perhaps 12 to 13 percent in large cap, nine percent in small cap and five to six percent international. The estimated worst-case scenario for such a portfolio would be a four percent loss in a year.

APPENDIX C. ANOVA TEST FOR CAPACTIY VS. TOLERANCE
ANOVA: Single Factor
SUMMARY

Groups	Count	Sum	Average	Variance		
CAP	158	4114	26.04	13.68		
TOL	158	4763	30.15	11.78		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1332.91	1	1332.91	104.70	0.00	3.87
Within Groups	3997.42	314	12.73			
Total	5330.34	315				

APPENDIX D. ANOVA TEST FOR CAPACITY VS. TOLERANCE BASED ON GENDER
ANOVA
Diff between CAP and TOL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.556	1	5.556	.552	.459
Within Groups	1571.437	156	10.073		
Total	1576.994	157			

APPENDIX E. ANOVA TEST FOR CAPACITY VS. TOLERANCE BASED ON STUDENT STATUS
ANOVA
CAP vs. TOL Difference

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.523	2	.761	.075	.928
Within Groups	1575.471	155	10.164		
Total	1576.994	157			

FIRM PERFORMANCE AND STOCK RETURNS: AN EMPIRICAL STUDY OF THE TOP PERFORMING STOCKS LISTED ON SHANGHAI STOCK EXCHANGE

Jin Dehuan, Shanghai University of Finance and Economics
Zhenhu Jin, Valparaiso University

ABSTRACT

This study attempts to determine whether and to what extent stock prices in the Chinese stock market are driven by firms' operating performance. We use a sample that consists of the top 10% performers listed in the Shanghai Stock Exchange from 1996 to 2000 in terms of annual stock returns. We use several measures to proxy for the firms' operating performance. Simple and multiple regressions are performed to determine, at the firm level, whether and to what extent these variables are related to stock price changes and what portion of the stock price movements can be explained by these firm performance variables. Our results indicate that while firm performance measures had some explanatory power of the stock price changes in the first two years during our testing period, the operating performance measures' explanatory power of the stock price movements generally declined as the stock prices went up. Our results suggest that the significant stock price increases from 1998 to 2000 were not driven by firms' operating performance. Instead, they were driven by several non-performance factors.

INTRODUCTION

The relationship between a firm's stock price movements and its operating performance has been a subject of considerable research interest in recent years but the results of the studies are not conclusive. Lamont (1998), Shiller (1984), Fama and French (1988), and Sivakumar and Waymire ((1993) find that the firm's operating performance can explain a significant portion of the stock price movements but Lev (1989) conducts a review of several studies on the information content of earnings and reports that earnings changes are only weakly related to contemporaneous stock returns and that the operating performance is not significantly related to contemporaneous stock returns.

This paper extends this line of research into the Chinese stock market, which has experienced significant growth since the Shanghai Stock Exchange opened on Dec. 19, 1990. The purpose of the study is to determine whether and to what extent stock prices in the Chinese stock market are driven by firms' operating performance. This is of particular interest because the Chinese stock market is widely viewed as a very speculative, policy driven market. On the macro level, there appears to be a disconnect between the overall stock market returns and the GDP growth. From 1993 to 2003, the Shanghai Stock Exchange Composite Index experienced a cumulative increase of

79.53%, from 833.8 to 1497.04 (The annual returns of Shanghai Stock Exchange Index from 1991 to 2000 are presented in Table 1). But during the same time period, the real GDP increased from 3.46 trillion RMB to 11.66 trillion RMB, a cumulative increase of 236%. Clearly, the stock market has not been a good indicator of the macro economic development even though the number of listed companies in Shanghai Stock Exchange increased from 169 to 559 and the total trade volume increased from 64 billion shares to 231 billion shares from 1994 to 2000. In our study, we use a sample that consists of the top 10% performers listed in the Shanghai Stock Exchange from 1996 to 2000 in terms of annual stock returns. We use several measures to proxy for the firms' operating performance. These proxies are changes in earnings per share, changes in sales, profit margin, total asset turnover, returns on equity, and returns on assets. Simple and multiple regressions are performed to determine, at the firm level, whether and to what extent these variables are related to stock price changes and what portion of the stock price movements can be explained by these firm performance variables. Our results indicate that while firm performance measures had some explanatory power of the stock price changes in the first two years during our testing period, the operating performance measures' explanatory power of the stock price movements generally declined as the stock prices went up. Our results suggest that the significant stock price increases from 1998 to 2000 were not driven by firms' operating performance. Instead, they were driven by several non-performance factors.

Table 1: annual Returns of Shanghai Stock Exchange Index

Year	End of Year	Annual Change in %
1996	917.02	65.14
1997	1194.10	30.22
1998	1146.70	-3.97
1999	1366.58	19.18
2000	2073.48	51.73

The paper proceeds as follows. Section one provides a literature review on stock returns and firms' operating performance. Section two presents data, the empirical methodology, and the results. Section three summarizes the study and concludes.

LITERATURE REVIEW

Many studies have been conducted on the relationship between firms' operating performance and the stock returns but the results have not been conclusive. Lamont (1998) studies the relationship between earnings and expected returns. He reports that both dividends and earnings have the ability to forecast returns and that earnings contain information because they are correlated with business conditions. He also finds that higher volatility of earnings is not noise but related to

expected returns. Shiller (1984), and Fama and French (1988) use regressions of returns on the lagged dividends and earnings yield and find that they have explanatory power. Sivakumar and Waymire (1993) study stock price behavior in relations to earning reports by 51 NYSE firms. They find that the announced earnings are positively related to stock returns. Roll (1988) regresses individual stock price changes on contemporaneous news events and finds that less than 40% of the variance of price changes can be explained by the regressions. Fama (1990) finds that two-thirds of the variance of aggregate stock price changes can be explained by the variables proxying for corporate cash flows and investors' discount rates. Campbell and Ammer (1993) contend that the use of contemporaneous regressions to explain asset price variability is appealing though this approach does not provide much information on the channels through which macroeconomic news variables affect asset prices. Lev (1989) conducts a review of several studies on the information content of earnings and reports that earnings changes are only weakly related to contemporaneous stock returns. Su (2003) analyzes the dynamic behavior of risks and returns in the Chinese stock market and finds that the volatility of stock returns to be high in China relative to developed markets and that returns are positively auto-correlated to greater extent in Chinese stock markets than in developed markets. He also finds that some of the government policies in regards to the stock market contribute to the market volatilities. Jin and Li (2003) also study the causes of high volatility and irrational price movements in the Chinese stock market and identify poor disclosure and inaccurate financial reports by the listed firms as some of the causes for high volatility.

DATA, METHODOLOGY, AND RESULTS

Our sample consists of 10% of the firms that were listed in the Shanghai Stock Market from 1996 to 2000. The firms selected were the top 10% performers in terms of annual stock returns. The total number of listed firms in Shanghai Stock Exchange and our sample size each year during our study period are provided in Table 2. The average year-end Price/Earning ratios of the stocks listed on the Shanghai Stock Exchange from 1995 to 2000 are presented in Table 3.

Table 2: Sample size each year in the testing period

Year	# of listed firms at beginning of year	Sample size	% of total number of listed firms
1996	184	20	10.87
1997	287	30	10.45
1998	372	40	10.75
1999	425	40	9.41
2000	471	50	10.62

Table 3: Average P/E ratios from 1995-2000						
End of Year	1995	1996	1997	1998	1999	2000
Average P/E Ratio	16.32	32.65	43.43	34.38	38.14	59.14

To be included in the sample, a firm must have been listed for more than a year and some key financial measures are available.

We use the following measures as proxies for firms' operating performance:

Total Asset Turnover Ratio (TAT) = Sales / Total Assets
Change in Earnings per Share (CES) =
(Current Year Earnings per Share / Previous Year Earnings per Share) - 1
Profit Margin (PM) = Net Income / Total Sales
Return on Assets (RA) = Net Income / Total Assets
Return on Equity (RE) = Net Income / Shareholders' Equity
Change in Sales (CS) = (Current Year Total Sales / Previous Year Total Sales) - 1

We use simple and multiple regressions to test whether the above variables can, individually, or collectively, explain the annual stock returns of the sample firms in each of the five years from 1996 to 2000. To ensure the multinomial normality of the independent variables and to avoid possible multicollinearity, all the variables are tested for univariate and multivariate normality. The results indicate that no variables need to be transformed to ensure normality. The sample firms were the best performing stocks in our testing periods in terms of annual stock returns. In our regression analyses, the annual returns of the individual firms are used as dependent variables and the firm performance measures listed above are used as independent variables. We are not only interested in which variables are statistically significant but also in the R-squared, which provides some information on the explanatory power of the regression models.

Results from simple regressions indicate that return on equity (RE) had significant explanatory power in four of the five year testing period but the explanatory power dropped from 0.4009 in 1996 to 0.0985 in 1999. Our results also indicate that changes in earnings per share (CES) was significant in three of the five year testing period, 1996, 1997, and 1999. Interestingly, the explanatory power of the variable also declined over the years, from 0.4830 in 1996 to 0.1336 in 1999. Other variables, such as profit margin (PM), return on assets (RA), changes in sales (CS), and total asset turnover (TAT), were significant either in one or two of the five year testing period. These results are presented in Table 4.

Results from multiple regressions are presented in Table 5 and they indicate that different variables had significant explanatory powers in each of the four years in our testing periods. In 1996, the variable, changes in earnings, (CES), was statistically significant. In 1997, two variables, changes in sales (CS) and return on equity (RE) were significant. In 1998, Return on equity (RE)

was again the variable that was statistically significant. In both 1999 and 2000, profit margin (PM) was the only variable that was statistically significant.

Table 4: Results of Simple Regressions (Variables which are statistically significant)

Variables	Year	R^2	F	t	a
Total Asset Turnover TAT	1996	0.2652	6.4969	2.5489	0.05
Change in Earnings Per Share (CES)	1996	0.4830	16.8190	4.1011	0.01
	1997	0.1318	4.2497	2.0615	0.05
	1999	0.1336	5.8612	2.4210	0.05
Profit Margin (PM)	1999	0.2119	10.2185	3.1966	0.01
	2000	0.0770	4.0035	2.0009	0.10
Return on Assets (RA)	1996	0.2968	7.5978	2.7564	0.05
	1999	0.0890	3.7127	1.9268	0.10
Return on Equity (RE)	1996	0.4009	12.0479	3.4710	0.01
	1997	0.1516	5.0015	2.2364	0.05
	1998	0.0941	3.9490	1.9872	0.10
	1999	0.0985	4.1539	2.0381	0.05
Change in Sales (CS)	1997	0.2142	7.6331	2.7628	0.05

Table 5: Results of Multiple Regressions (Variables that are statistically significant

	1996	1997	1998	1999	2000
Sample Size	20	30	40	40	50
Explanatory Variables		CES	RE	PM	PM
R^2	0.4830	0.3312	0.0941	0.3233	0.0770
F	16.8190	6.6850	3.9490	8.8367	4.0035
t	4.1011	2.6929	1.9872	2.4672	2.0009
a	0.01	0.05	0.10	0.05	0.10

It is interesting to note that the R-squared of the multiple regressions followed the similar pattern of the simple regressions. In 1996, the R-squared of our multiple regression was 0.4830 but in 2000, it was only 0.0770. In other words, the explanatory power of the performance measures in our regression models decreased during our testing period from 1996 to 2000 while the market index

moved up, from 917 to 2073. The correlation coefficient of the R-squared and the year end indices were -0.6728(figure 1). When the market index was at 917 in 1996, the performance measures were able to explain approximately 50% of the price movements. When the stock market took off and the index soared to 2073 in 2000, the explanatory power of these variables dropped to less than 10%. This suggests that the significant increase in market valuation from 1996 to 2000 was not based on the operating performance of the firms listed on the exchange. Rather, the increase in market valuation was based on factors that were not related to the operating performance of the firms listed on the exchange. This interpretation is, in part, supported by the dramatic increase in the average price to earning ratios from 1995 to 2000. During the five years, the price to earning ratio increased from 16.32 to 59.14, an increase of 262.37%. This dramatic increase in price earning ratio clearly shows that earnings did not increase while prices soared. At the same time, the declining R-squareds from 1995 to 2000 in our regression models indicate that the important performance measures in our models had less and less explanatory power of the stock price movements. Obviously, stock prices were not driven by earning increases or other performance factors. Rather, they were driven by other factors. We believe the disconnect between the stock price and firm performance may be due to the following reasons. Starting from 1996, the benchmark one-year CD rate was cut repeatedly and a lot of savers moved their money into the stock market from their bank accounts. In 1998, scores of open-ended funds were launched and regulatory changes allowed state-owned enterprises to invest in the secondary market. All these result in a significant flow of funds into the stock market. At the same time, because the market was only established in 1991, there were only limited number listed companies. The severe imbalance between the supply and demand for stocks caused the stock price to go up significantly. In addition, the unique ownership structure of the listed companies and the trade restrictions may also have contributed to the disconnect. During our testing period, about 60% of the outstanding shares of the listed companies were owned by the state and these shares were not allowed to be traded. In addition, investors were not allowed to sell stocks short even if they believe that the stock price will go down. These institutional restrictions are not conducive to an efficient market in which market prices reflect the intrinsic value of the stock. One limitation of the study is that it only covers from 1996 to 2000. The Chinese stock market has undergone significant changes but the result of the study provides important insight on the relationship between firms' operating performance and their stock performance.

CONCLUSION

Using a sample that consists of the best performing 10% of the stocks listed on Shanghai Stock Exchange from 1996 to 2000, we study the relationship between firms' operating performance and their stock returns. We find that while firm performance measures had some explanatory power of the stock price changes in the first two years during our testing period, these firm performance measures' explanatory power of the stock price movements generally declined as the stock prices went up. Our results indicate that the significant stock price increases from 1998 to 2000 were not driven by firms' operating performance. Rather, the stock price increases were due to other macro economic factors and market imperfections.

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HOW DOES THE US EQUITY MARKET REACT TO DOMESTIC AND INTERNATIONAL STOCK-BASED COMPENSATION ACCOUNTING CHANGES?

Feng-Shun (Leo) Bin, University of Illinois at Springfield
Leonard Branson, University of Illinois at Springfield
Dar-Hsin Chen, National Taipei University

ABSTRACT

This study examines US equity market performance surrounding the announced changes in rules that account for employees' stock-based compensation plans in a corporation. We found the stock market in general reacted negatively to the issuance of SFAS 123 and its preceding exposure draft, but the observed abnormal returns were insignificant. SFAS 148 amended SFAS 123, and a 2004 exposure draft (ED) proposed additional revisions. The updated treatment of stock based compensation generally caused positive but insignificant pronouncement effects. The insignificance of price reactions to the issuance of SFAS 148 or the ED was not sensitive to a firm's size, domesticity, disclosure requirement, exchange-listing regulation or industry sector.

When the US Congress took legislative action which threatened FASB's independence and authority on the SBC accounting policy issues, the stock market reacted unfavorably, except for those foreign-based ADR-issuing firms. We also report on the market response to the latest international developments in "share-based payment" accounting reforms, including IASB's IFRS 2.

INTRODUCTION

The American and global financial accounting policy makers have been striving to improve the financial disclosures of publicly traded firms to provide better information to investors. This need for continuous improvement in accounting standards has led to ongoing updates to General Accepted Accounting Principles (GAAP). Around the world, stock-based compensation (SBC) plans have become increasingly popular for firms that attempt to tie their employees' rewards to performance. These compensation methods continue to change as firms attempt to find better ways to tie compensation to performance. The most recent developments include General Electric's introduction of "performance share units" in September 2003 that replaced the traditional stock options and restricted stocks granted to the firm's top executives (The *Wall Street Journal*, "For GE Chief Immelt, Stock Options Are a Thing of the Past," September 18, 2003, Pages B1 and B3). Correspondingly, how to update the accounting treatment for various SBC packages has been drawing increased public attention, particularly since the early 1990s.

This study examines the price performance of the US stock market when the Financial Accounting Standards Board (FASB) announces updates of US GAAP that concern firms' financial statement disclosures of their employees' SBC. Existing studies have largely focused on the interim or long-term association between stock price and stock option expense, yet few published works have examined the possible instant wealth effects associated with the pronouncements of employee stock option (ESO) accounting changes. Do the shifts in the disclosure environment regarding firms' stock options cause any new "information shocks" that might materially affect the investing public's valuation of equities of firms affected by SBC accounting changes?

Our work investigates a time frame that ranges from mid-1993 to mid-2004, in which the FASB struggled to develop and adopt Statement of Financial Accounting Standard (SFAS) No. 123 and later amended it with SFAS No. 148. While the FASB was experiencing difficulties in finalizing its requirements, the International Accounting Standards Board (IASB) experienced more success by issuing International Financial Reporting Standard (IFRS) No. 2 in less time and with much less opposition.

RECENT SBC ACCOUNTING DEVELOPMENT

During the development of SFAS 123 in the early 1990s, the FASB was constantly pressured by the competing interests of the investing public (*e.g.*, Warren Buffet), of ESO-granting industries and firms (e.g., Silicon Valley Coalition and the American Electronic Association), of reporting practitioners (e.g., The Big Six public accounting firms), and of the US Congress (e.g., U.S. House of Representatives). The investing public was concerned about the high corporate compensation paid to top executives that was not justified by the firm performance. ESO-granting industries and firms felt the only way they could attract and retain top management talent was by the use of ESO. Due to the effective lobbying of business executives, the US House of Representatives got directly involved and reversed the accounting regulators.

Young (1997) and Miller, Redding and Bahnson (1998) describe in detail the due process of SFAS 123, which eventually lead to FASB's compromise solution to "encourage, rather than require, recognition of compensation cost based on a fair value method and pursue expanded disclosures." (SFAS 123, Paragraph 378) "The Board chose a disclosure-based solution for stock-based employee compensation to bring closure to the divisive debate on this issue ¾ not because it believes that solution is the best way to improve financial accounting and reporting." (SFAS 123, Paragraph 62)

The SBC accounting issue faded away but did not die. Public concern grew dramatically following the stock market decline and a series of corporate financial scandals that occurred in the early 2000s. Investors blamed the existing financial accounting practices, which include SBC reporting rules, for being ineffective. According to Hitt and Schlesinger (2002), "In 2000, Enron issued stock options worth $155 million, according to a common method of valuing options. Had accounting rules forced the company to deduct the cost of those options from its 2000 profit, according to New York brokerage firm Bear Stearns Cos., Enron's operating profit for the year would have been 8% lower, even before Enron made its drastic restatement of earnings several

months ago. But current rules require companies to report the cost of issuing options only as a footnote in their annual reports.

Out of the stocks in the Standard and Poor's 500, only two companies ¾ Boeing Co. and Winn-Dixie Stores Inc. ¾ have chosen to count stock options as an expense in their financial reports."

The FASB picked up the momentum by issuing an exposure draft in October 2002 to amend SFAS 123, and without any significant opposition from the business community, the proposal was developed into SFAS 148 two months later. The new standard provided alternative methods of transition for a voluntary change to the fair-value-based method of accounting for SBC. It also required "prominent disclosures in both annual and interim financial statements" about the method of SBC reporting and the effect on reported results.

On the other hand, the IASB made steady progress in developing its international standard for SBC accounting. The board introduced a discussion paper in July 2000, voted to build an SBC accounting standard in July 2001, openly invited comments from the international business community in September 2001, published a related exposure draft in November 2002, and issued the final standard (IFRS 2, "Share-Based Payment") in February 2004. Unlike SFAS 123 and 148, IFRS 2 explicitly requires "an entity to reflect in its profit/loss and financial position the effects of share-based payment transactions, including expenses associated with share options granted to employees." The new standard took effect beginning on January 1, 2005.

Feeling the pressure from IASB's accomplishment, the FASB attempted to reestablish its plan for SBC accounting changes. In March 2004 (one month after the issuance of IFAS 2), the FASB published an exposure draft, specifying: "The Board believes that this proposed Statement addresses users' and other parties' concerns by requiring enterprises to recognize an expense in the income statement for employee services received (and consumed) in exchange for the enterprises' equity instruments …… By requiring the fair-value-based method for all public companies, this proposed Statement would eliminate an alternative accounting method …… Finally, requiring the use of fair-value-based method is convergent with IFRS 2." However, once again the political opposition and intervention grew swiftly, with the climax being that in July 2004, the U.S. House of Representatives voted overwhelmingly to pass legislation, "The Stock Options Accounting Reform Act," which specifically prohibits the FASB from mandating the deduction of most ESO as expenses.

LITERATURE REVIEW

Even though policy makers strive to update GAAP and provide investors with transparent accounting information, whether and how the changes in a specific accounting rule affect a reporting firm's market value remains an open question. Some major changes in managerial accounting systems, such as activity-based costing (ABC) adoptions in the US, do not cause significant stock market reactions (*e.g.*, Gordon & Silvester, 1999). As for financial accounting changes, existing evidence is mixed concerning whether the issuance and adoption of a more "transparent" reporting standard will cause negative or positive wealth effects. One hypothesis assumes that more accounting disclosure brings "bad news" or "negative shocks" to the market, causing investors to

re-evaluate firm liabilities, expenses and net profits, and then adjust their estimate of stock value downwards. The opposite hypothesis predicts that more accounting disclosure should benefit the investing public with increased transparency regarding firms' financial fundamentals, thus reaffirming investors' confidence and boosting stock performance.

Kren and Leauby (2001) found that stock prices reacted negatively to the issuance of SFAS 106 that requires the accounting for postretirement benefits other than pensions. Cornett, Rezaee and Tehranian (1996) examined the impact of twenty-three pronouncements related to the proposed fair value accounting rules on stock prices of financial institutions, and found that pronouncements signaling an increased (decreased) likelihood of new rule enactment caused negative (positive) abnormal price reactions.

On the other hand, Brown and Thapa's (2003) event-study found that S&P 500 firms' stocks on average responded positively to the final adoption of SFAS 133, which requires firms to record derivatives as assets and/or liabilities and to expense them. Bin, Branson and Chen (2004) found evidence of a *positive* valuation impact on firm values when the FASB announced a series of derivative accounting updates, which include the issuances of exposure drafts (ED) and final standards related to SFAS 119, 133, 137, 138 and 149. It appears to us that although new or proposed GAAP updates generally aim to improve reporting transparency, the sign and/or magnitude of valuation impact of such accounting changes are firm, industry or rule-specific.

Numerous empirical studies have also been conducted to examine the wealth effects of SBC accounting changes. Many firms oppose such changes because they fear that further disclosure of SBC in their financial statements, particularly the recognition of SBC as an operating expense (labor resource costs), will negatively affect their reported earnings and equity values. However, since a firm's SBC functions to stimulate employees for better future performance and to reduce potential agency problems, the disclosure and recognition of SBC could instead cause positive signaling effects to the investors. The improved disclosure could result in an upward adjustment of a firm's future earnings prospects and stock price.

Yermack (1997) found that firms tend to grant stock option awards to their CEOs when the favorable corporate news becomes imminent, implying such options are issued when their economic benefits to the issuing firms outweigh their costs. Aboody, Barth and Kasznik (2003) and Li (2002) document that on average 1) a firm's stock price is negatively correlated with its outstanding ESO intrinsic values and expected ESO expenses; 2) the stock price reacts negatively to an increase in ESO expenses disclosed under SFAS 123 around firms' 10-K filings with the SEC; and 3) the predicted future earnings are positively associated with its decision to voluntarily expense ESO in accordance with SFAS 123. Bell *et. al.* (2002) indicate that for profitable computer software companies, the US stock market treated their ESO favorably as "intangible assets" rather than "expenses".

Daniel, Kale and Naveen (2003) and Elayan, Pukthuanthong and Roll (2004) found that during the 2002-2003 period, US firms deciding to expense their ESO on average experienced a significant stock price gain during a six-day window around the pronouncement. At the same time, their industry/size/performance-matched counterparts suffered a significant wealth loss, implying that the market favors transparent accounting while penalizing evasive reporting.

Dechow, Hutton and Sloan (1996) concentrated their study on the stock price performance related to FASB's due process for developing SFAS 123. Three relevant dates were selected for their event studies: 1) the FASB voted to propose the required expensing of employee stock options; 2) the FASB issued the exposure draft; and 3) the FASB voted to drop the mandatory option expensing proposal. Also they focused on three specific sample groups: (i) firms in industries that intensively issue ESO; (ii) firms in the biotechnology industry; and (iii) firms that submit comment letters to protest FASB's ESO expensing proposal. Dechow, Hutton and Sloan (1996) claim "opposition to expensing ESO is concentrated in firms that use options extensively for top executives rather than in firms with high overall levels of option usage." However, they found no significant stock price reactions to the announcement events for those three sample groups of firms, implying that the investors do not consider these FASB actions as informative or value-relevant.

Existing studies examine both the US and foreign equity markets for possible valuation effects of accounting information. A firm's financial decisions, such as to issue its equity in a foreign market, could be significantly affected by the accounting disclosure environment. Findings suggest that foreign firm values might also be sensitive to the accounting practices that they employ. The US stock market includes not only "domestic" American firm equities but also "foreign" non-American company shares that are issued and traded within the US, such as American Depository Receipts (ADRs). Foreign companies that desire US capital have become increasingly inclined to conform to US GAAP when reporting their earnings. On the other hand, American firms listed in foreign markets are subjected to foreign or international GAAP, including those issued by the IASB. Some American firms listed in the US might be indirectly influenced by the IASB accounting progress, which inevitably exerts pressure on the FASB for further improvements.

We hypothesize that both FASB's and ISAB's extended requirements in SBC accounting transparency are likely to materially affect equity values of both American companies and ADR-issuing foreign firms. Yet, no published works have examined the wealth effects of SBC accounting disclosure on the ADR market. Our study attempts to fill in this gap by investigating the price reactions of both American equities and ADRs to some of the 1993-2004 FASB and ISAB developments. Selected events are summarized in Table 1, and the event dates are collected from the *Wall Street Journal* (WSJ) Index, the FASB publication, "Financial Accounting Series: Exposure Drafts," and various web sources (*e.g.*, http://www.fasb.org/news/newspg.shtml; http://www.isag.org/news/).

DATA AND METHODOLOGY

Time series of equity portfolio daily returns are pre-categorized by industry (and other criteria) in Yahoo! Finance website (http://finance.yahoo.com/indices) and can be directly downloaded from its "Historical Prices" section. Other data in this study were obtained from: (i) Returns for the US market portfolio benchmark are obtained from the Center for Research in Security Prices (CRSP) database; (ii) The data of S&P-ADR Index, as the proxy for foreign firms that are fully bound by US GAAP, is obtained from Standard and Poor's which introduced this index on January 1, 1998; (iii) As for foreign firms that are only required to meet minimal US GAAP compliance, we screened the online database of ADR programs sponsored by the Bank of New York

(http://www.adrbny.com) and then obtained 28 Level-I ADRs which originated no later than January 1, 1998 and for which a complete trading history was available. The daily closing price data of these Level-I ADRs were downloaded from the "Historical Prices" section of the Yahoo! Finance online database, and then weighted into daily portfolio returns based on their market capitalizations. Descriptive statistics of daily returns for various equity portfolios are presented in Table 2.

Table 1: Stock-Based Compensation Accounting Update Events Studied

Event	Date	Description
I.	April 26, 1993	The FASB voted and decided new rules should be developed to account for stock-based employee compensation.
II.	Jun 30, 1993	The FASB issued an exposure draft, which proposed that companies be required to report SBC at fair value and recognize SBC as an expense in their financial statements.
III.	May 03, 1994	The US Senate passed (88-to-9) a non-binding resolution calling for the FASB to withdraw the options expensing plan.
IV.	October 06, 1994	A coalition led by Senator Joseph Lieberman introduced the "Accounting Standards Reform Act," proposing that all new accounting changes need affirmative approval from the SEC.
V.	December 14, 1994	The FASB voted (5-to-2) and decided to compromise, announcing a modified version of new SBC standard.
VI.	October 11, 1995	The FASB published SFAS 123, "Accounting for Stock-Based Compensation," which required footnote disclosure of employee stock options outstanding but did not mandate expensing them.
VII.	August 27, 1999	Federal Reserve chairman Alan Greenspan openly expressed his concern about the high-flying overpriced stock market. He specifically remarked that overestimate of earnings occurred "as a result of the distortion in the accounting for stock options", which included "not charging their fair value against income."
VIII.	July 31, 2001	The IASB voted for developing an international standard for SBC accounting.
IX.	November 07, 2002	The IASB issued an exposure draft, which proposed that companies be required to account for all share-based payments at fair value and recognize them as an expense.
X.	October 04, 2002	The FASB issued an exposure draft, which proposed an amendment of SFAS 123.
XI.	December 31, 2002	The FASB published SFAS 148, "Accounting for Stock-Based Compensation—Transition and Disclosure—an amendment of FASB Statement No. 123." The new standard provides alternative methods of transition for a voluntary change to the fair-value-based method of accounting for SBC, and it also requires prominent disclosures in both annual and interim financial statements about the method of SBC reporting and the effect on reported results.
XII.	February 19, 2004	The IASB published IFRS 2, "Share-Based Payment," requiring an entity to reflect in its profit/loss and financial position the effects of share-based payment transactions, including expenses associated with share options granted to employees.
XIII.	March 31, 2004	The FASB issued an exposure draft, "Share-Based Payment—an amendment of FASB Statements No. 123 and 95," which generally would require that SBC transactions be accounted for at fair values and recognized as an expense.

Table 1: Stock-Based Compensation Accounting Update Events Studied		
Event	Date	Description
XIV.	July 20, 2004	The US House of Representatives passed (312-to-111) the "Stock Options Accounting Reform Act." Companies would be required to expense *only* stock options granted to the top five executives, with exemptions for small businesses and companies within three years of an initial public offering.

Table 2: Summary Statistics of Daily Returns on Various Equity Portfolio Indices							
Index Portfolio	Collected Time Series	Mean (%)	S.D. (%)	Minimum (%)	Maximum (%)	Kurtosis	Skewness
CRSP Value-Weighted	01/01/92-12/31/03	0.143	1.012	-3.438	4.220	4.750	0.629
Russell 1000	12/10/92-12/31/03	0.127	0.945	-3.105	4.949	3.990	0.109
Russell 2000	01/01/92-12/31/03	0.316	2.376	-4.420	6.267	5.476	0.378
S&P 500	01/01/92-12/31/03	0.133	1.298	-2.740	5.640	4.791	0.433
S&P ADR (Level-2&3)	01/01/98-12/31/03	0.180	1.126	-2.855	7.046	4.946	0.490
Level-1 ADR	01/01/98-12/31/03	0.126	1.643	-3.510	6.134	6.428	0.592
NYSE Composite	01/01/92-12/31/03	0.160	1.333	-2.309	2.765	2.848	0.113
NASDAQ Composite	01/01/92-12/31/03	0.191	1.958	-5.156	5.220	6.505	0.059
Industrials (NASDAQ)	01/01/92-12/31/03	0.240	2.325	-3.420	6.293	6.663	0.420
Utilities (NYSE)	01/01/92-12/31/03	0.114	1.191	-1.940	3.017	4.852	0.097
Transportation (NASDAQ)	01/01/92-12/31/03	0.087	1.693	-1.741	2.185	3.005	0.269
Banks (NASDAQ)	01/01/92-12/31/03	0.224	1.993	-2.319	4.550	5.023	0.338
Insurance (NASDAQ)	01/01/92-12/31/03	0.198	2.102	-4.562	3.039	3.675	-0.159
Biotech (NASDAQ)	11/01/93-12/31/03	0.325	3.420	-6.292	5.078	4.854	-0.375
Computers (NASDAQ)	11/01/93-12/31/03	0.256	2.423	-3.365	4.805	2.947	0.264

Table 2: Summary Statistics of Daily Returns on Various Equity Portfolio Indices							
Index Portfolio	Collected Time Series	Mean (%)	S.D. (%)	Minimum (%)	Maximum (%)	Kurtosis	Skewness
Telecom (NASDAQ)	05/13/96-12/31/03	0.289	3.095	-3.102	5.222	2.729	0.861
Internet (AMEX)	10/04/95-12/31/03	0.306	3.149	-4.820	4.173	6.108	-0.090
Networking (AMEX)	10/21/94-12/31/03	0.293	2.644	-3.927	3.100	5.226	-0.355
Pacific Exchange Technology	01/01/92-12/31/03	0.275	2.158	-3.464	4.475	3.103	0.264
Philadelphia Semiconductor	01/01/92-12/31/03	0.317	3.010	-4.023	3.982	4.016	-0.630
Note: The return for Day *t* is in the natural logarithm form $lnP_t - lnP_{t-1}$.							

To estimate the stock price impact of FASB's or ISAB's SBC accounting change pronouncements, we employed a Multivariate Regression Model similar to those in Dechow, Hutton and Sloan (1996). This model is built upon a system of portfolio return equations for multiple events:

$$R_{j,t} = a_j + b_{1j}R_{m,t-2} + b_{2j}R_{m,t-1} + b_{3j}R_{m,t} + b_{4j}R_{m,,t+1} + b_{5j}R_{m,t+2} + \sum_{k=1}^{K} c_{kj}D_{j,t} + e_{j,t}, \qquad (1)$$

where $R_{j,t}$ = the return on the *j*th equity portfolio on day *t*;

$R_{m,t-2} \sim R_{m,t+2}$ = the return on the CRSP equally-weighted index on day *t –2* through *t + 2*, respectively;

a_j = an intercept coefficient for the *j*th portfolio;

$b_{1j} \sim b_{5j}$ = market risk coefficients for the *j*th portfolio;

c_{kj} = the price reaction of the *k*th event on the *j*th portfolio (k = 1, 2, …, K for the development process in each accounting standard, corresponding to the dates of board voting, exposure draft issuance, final standard publication, and/or announced political intervention, respectively);

$D_{k,t}$ = dummy variable, equal to 1 during the period of the *k*th event and 0 otherwise;

$e_{j,t}$ = normally distributed error terms in the *j*th equation.

To circumvent problems associated with asymmetry in return distributions, daily returns are in the logarithm form $ln P_t - ln P_{t-1}$. Contemporaneous market return $R_{m,t}$ is employed to adjust for each equity sample's systematic risk, while lead and lag market returns are also added as explanatory variables to reduce the errors associated with non-synchronous trading. For portfolio *j*, the value of event-date dummy coefficient (c_{kj}) is estimated by the Seemingly Unrelated Regression (SUR) method, which takes into account contemporaneous covariance.

The cross-section market-adjusted performance of twenty-one equity portfolios with different firm and industry specific characteristics were jointly estimated using daily returns series over trading days beginning 120 days prior to the board voting for a newly proposed SBC accounting update. We tested the following hypotheses:

H0: $c_{kj} = 0$ across *j*; the abnormal return for portfolio *j* equals zero surrounding event *k*. The stock market does not react significantly to the announcement of event *k*. (2a)

Ha: $c_{kj} \neq 0$ across *j*; the stock market does react significantly to the announcement of event *k*. (2b)

For testing similar hypotheses, a large-sample SUR model typically uses an asymptotic *t*-test to measure the statistical significance of abnormal return coefficient c_{kj}.

REGRESSION RESULTS

We expected that pronouncements which signal an increased (decreased) likelihood of a new rule enactment should cause negative (positive) abnormal price reactions, especially for technology firms. Cornett, Rezaee and Tehranian (1996) found bank stock performance to be associated with proposed fair-value accounting updates. The SUR estimates presented in Tables 3a and 3b, however, indicate that stock prices for all sample portfolios do not significantly react to the FASB's issuance of SFAS 123 (Events I, V and VI) , SFAS 148 (Event XI) or their respective preceding EDs (Events II and X). No statistically significant abnormal returns were identified surrounding the announcement dates of those accounting change events. Moreover, as Table 3c indicates, in 2004 when the FASB announced its new plan of further SBC accounting developments by issuing a new ED that requires SBC expensing (Event XIII), still none of the twenty equity portfolio indices exhibited significant price reactions. These results held regardless of firm size (Russell 1000, Russell 2000), domesticity (S&P 500, S&P ADRs, Level-1 ADRs), exchange-listing requirements (NYSE Composite, NASDAQ Composite), or industry categories (Industrials, Utilities, Financials, Technology, etc.). Our findings on such a broad range of firms surrounding a variety of not only US but also international SBC accounting policy updates are consistent with Dechow, Hutton and Sloan's (1996) findings.

Table 3a: Test of Hypothesis that the Abnormal Return for Each Equity Portfolio Equals Zero Surrounding each Event Announcement related to SFAS 123

Panel A: Portfolio AR (in %)		Events related to SFAS 123					
		Event I	Event II	Event III	Event IV	Event V	Event VI
	Russell 1000	-0.425 (0.396)	-0.338 (0.695)	-0.064 (0.814)	-0.729 (0.153)	-0.052 (0.854)	-0.193 (0.702)
	Russell 2000	0.268 (0.613)	-0.612 (0.316)	-0.376 (0.571)	-1.061 (0.088)*	-0.140 (0.842)	0.708 (0.162)
	S&P 500	-0.219 (0.557)	-0.359 (0.213)	0.166 (0.799)	-0.685 (0.181)	-0.618 (0.300)	-0.124 (0.734)
	S&P ADR	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Level-1 ADR	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	NYSE Composite	-0.317 (0.482)	-0.224 (0.786)	0.562 (0.206)	-0.636 (0.257)	-0.069 (0.840)	-0.244 (0.525)
	NASDAQ Composite	-0.153 (0.675)	-0.435 (0.800)	-0.625 (0.255)	-0.840 (0.113)	0.133 (0.640)	-0.568 (0.393)
	Industrials (NASDAQ)	-0.211 (0.600)	-0.508 (0.331)	0.056 (0.875)	-0.255 (0.466)	-0.063 (0.844)	-0.257 (0.304)
	Utilities (NYSE)	-0.528 (0.286)	0.226 (0.877)	-0.353 (0.426)	-0.412 (0.308)	-0.184 (0.577)	-0.406 (0.284)
	Transportation (NASDAQ)	0.434 (0.328)	-0.177 (0.638)	-0.151 (0.712)	0.071 (0.849)	-0.306 (0.482)	0.252 (0.639)
	Banks (NASDAQ)	-0.235 (0.574)	-0.284 (0.767)	-0.220 (0.364)	-0.488 (0.312)	0.451 (0.701)	-0.509 (0.411)
	Insurance (NASDAQ)	0.097 (0.735)	-0.584 (0.513)	0.348 (0.765)	-0.563 (0.417)	-0.527 (0.375)	-0.725 (0.430)
	Biotech (NASDAQ)	n.a.	n.a.	0.271 (0.566)	-0.555 (0.244)	0.498 (0.280)	-0.112 (0.318)
	Computers (NASDAQ)	n.a.	n.a.	0.640 (0.431)	-0.038 (0.881)	-0.615 (0.309)	0.051 (0.782)
	Telecom (NASDAQ)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Internet (AMEX)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Networking (AMEX)	n.a.	n.a.	n.a.	n.a.	0.376 (0.686)	-0.194 (0.878)
	Technology (Pacific Exchange)	-0.369 (0.714)	-0.622 (0.246)	0.032 (0.893)	-0.892 (0.095)*	-0.007 (0.942)	-0.459 (0.720)
	Semiconductor (Philadelphia)	n.a.	n.a.	n.a.	-1.214 (0.062)*	0.359 (0.479)	-0.466 (0.318)
Panel B: Wald Test c^2-value		5.848 (0.492)	3.950 (0.266)	7.011 (0.183)	4.427 (0.343)	3.572 (0.408)	5.110 (0.278)

Table 3b: Test of Hypothesis that the Abnormal Return for Each Equity Portfolio Equals Zero Surrounding each Event Announcement related to SFAS 148 and IFRS 2

Panel A: Portfolio AR (in %)		Events related to SFAS 148			Events related to IFRS 2		
		Event VII	Event X	Event XI	Event VIII	Event IX	Event XII
	Russell 1000	-0.298 (0.600)	0.310 (0.459)	0.162 (0.804)	0.357 (0.529)	-0.586 (0.275)	-0.384 (0.550)
	Russell 2000	-0.784 (0.087)*	0.653 (0.410)	0.714 (0.205)	-0.243 (0.710)	0.423 (0.350)	0.098 (0.825)
	S&P 500	-0.733 (0.295)	0.128 (0.681)	0.264 (0.530)	0.490 (0.365)	-0.555 (0.231)	-0.697 (0.172)
	S&P ADR	-0.475 (0.262)	0.273 (0.495)	0.366 (0.435)	-0.127 (0.801)	0.630 (0.198)	1.323 (0.040)**
	Level-1 ADR	-0.185 (0.372)	0.641 (0.366)	-0.030 (0.723)	-0.300 (0.523)	0.329 (0.508)	0.947 (0.075)*
	NYSE Composite	0.226 (0.632)	0.465 (0.347)	0.285 (0.666)	-0.162 (0.735)	0.067 (0.923)	0.132 (0.792)
	NASDAQ Composite	-0.903 (0.082)*	0.118 (0.806)	0.471 (0.604)	0.312 (0.545)	0.143 (0.740)	-0.143 (0.765)
	Industrials (NASDAQ)	-0.523 (0.177)	0.320 (0.547)	-0.086 (0.622)	0.227 (0.735)	0.309 (0.468)	-0.275 (0.633)
	Utilities (NYSE)	-0.231 (0.529)	-0.052 (0.784)	0.080 (0.719)	0.078 (0.856)	0.254 (0.502)	-0.153 (0.802)
	Transportation (NASDAQ)	-0.208 (0.711)	-0.020 (0.802)	-0.074 (0.859)	-0.206 (0.655)	0.009 (0.976)	0.265 (0.590)
	Banks (NASDAQ)	-0.524 (0.162)	0.388 (0.561)	0.512 (0.429)	0.354 (0.630)	-0.085 (0.855)	-0.502 (0.311)
	Insurance (NASDAQ)	-0.309 (0.271)	0.280 (0.455)	0.250 (0.683)	0.290 (0.535)	0.251 (0.684)	0.175 (0.744)
	Biotech (NASDAQ)	-1.020 (0.048)**	0.528 (0.660)	0.486 (0.293)	-0.110 (0.734)	-0.253 (0.444)	-0.429 (0.397)
	Computers (NASDAQ)	-0.523 (0.302)	0.673 (0.295)	0.419 (0.214)	0.257 (0.699)	-0.200 (0.592)	0.032 (0.925)
	Telecom (NASDAQ)	-0.660 (0.153)	0.720 (0.168)	0.380 (0.627)	0.482 (0.620)	-0.224 (0.620)	-0.154 (0.730)
	Internet (AMEX)	-0.754 (0.116)	0.718 (0.204)	0.649 (0.433)	0.075 (0.912)	0.057 (0.881)	0.098 (0.882)
	Networking (AMEX)	-0.846 (0.089)*	0.587 (0.458)	0.437 (0.391)	-0.103 (0.870)	-0.290 (0.625)	-0.222 (0.536)
	Technology (Pacific Exchange)	-0.790 (0.093)*	0.841 (0.132)	0.656 (0.239)	0.336 (0.509)	-0.437 (0.265)	-0.488 (0.301)
	Semiconductor (Philadelphia)	-0.929 (0.038)**	0.615 (0.280)	0.402 (0.496)	0.128 (0.707)	-0.279 (0.387)	-0.359 (0.464)
Panel B: Wald Test c^2-value		14.220 (0.045)**	6.835 (0.496)	5.824 (0.482)	3.127 (0.723)	6.037 (0.409)	10.253 (0.057)*

Table 3c: Test of Hypothesis that the Abnormal Return for Each Equity Portfolio Equals Zero Surrounding each Event related to FASB's 2004 Share-Based-Payment ED			
Panel A: Portfolio AR (in %)		Events related to FASB's March 2004 ED	
		Event XIII	Event XIV
	Russell 1000	0.510 (0.348)	-0.433 (0.369)
	Russell 2000	0.195 (0.748)	-0.529 (0.208)
	S&P 500	0.663 (0.250)	-0.735 (0.126)
	S&P ADR	0.717 (0.172)	1.265 (0.026)**
	Level-1 ADR	0.368 (0.510)	0.382 (0.620)
	NYSE Composite	0.276 (0.523)	-0.453 (0.680)
	NASDAQ Composite	0.280 (0.542)	-0.688 (0.189)
	Industrials (NASDAQ)	0.162 (0.753)	-0.620 (-0.287)
	Utilities (NYSE)	0.024 (0.964)	-0.077 (0.826)
	Transportation (NASDAQ)	-0.190 (0.835)	0.029 (0.962)
	Banks (NASDAQ)	0.285 (0.521)	-0.321 (0.555)
	Insurance (NASDAQ)	0.400 (0.422)	-0.120 (0.783)
	Biotech (NASDAQ)	0.186 (0.453)	-1.391 (0.038)**
	Computers (NASDAQ)	0.510 (0.337)	-0.544 (0.380)
	Telecom (NASDAQ)	0.329 (0.552)	-0.209 (0.612)
	Internet (AMEX)	0.133 (0.798)	-0.451 (0.493)
	Networking (AMEX)	0.286 (0.635)	-0.702 (0.130)
	Technology (Pacific Exchange)	0.104 (0.877)	-0.860 (0.046)**
	Semiconductor (Philadelphia)	0.079 (0.913)	-0.999 (0.084)*
Panel B: Wald Test c^2-value		5.003 (0.492)	16.210 (0.041)**

Notes for Tables 3a-3c:

(1) Coefficients are SUR estimates. (2) In parentheses are *p*-values. (3) *, **, *** denotes significance at the 0.10, 0.05 and 0.01 level, respectively. (4) "n.a." denotes the situation in which the corresponding data is not available (*e.g.*, some equity indices were not yet introduced to the market for trading when an event occurred).

There were no significant stock price reactions to FASB's specific development process of SFAS 123 even for firms that have a tendency to issue employees' stock options. It appears to us that investors do not generally consider these FASB accounting policy changes as informative or value-relevant. Either the market has already anticipated the occurrences of such accounting changes and incorporated them into prices prior to announcements, or because the market merely regards the proposed changes as "neutral," *i.e.*, the negative and positive wealth effects of SBC disclosure (operating expense increase *vs.* agency cost reduction) could cancel each other.

Although most of the observed abnormal returns are statistically insignificant, we still find some interesting phenomena:

1) When SFAS 123 and its preceding ED are issued by the FASB, only utility firms have positive abnormal returns for the day on which the FASB introduces the ED (Table 3a, Event II), and only transportation and computer firms exhibit positive abnormal returns for the day on which the final standard is published (Table 3a, Event VI). The majority of portfolio indices experience value losses surrounding those FASB actions, even though they are statistically insignificant at the 0.10 level.
2) About seven years later, however, most of those indices gain slightly in their values when SFAS 148 and its preceding ED are issued. Surrounding the ED issuance (Table 3b, Event X), all portfolios except "utilities" and "transportations" indices show positive abnormal returns. Surrounding the final standard publication (Table 3b, Event XI), all portfolios except Level-1 ADRs, industrial and transportation firms yield positive abnormal returns. Moreover, when the FASB makes a new attempt at SBC accounting changes by issuing a new ED in March 2004 (Table 3c, Event XIII), all sample portfolios but transportation firms show insignificant price gains. The gains ranged from 0.079 percent for Semiconductor stocks to 0.717 percent for S&P ADRs. This suggests, although not strongly, that investors' concern for and favor of SBC accounting transparency has increased slightly. This could be due to the corporate financial scandals that occurred in the early 2000s.
3) The international community has led the way in SBC accounting by the introduction of IFRS 2 by the IASB between 2001 and 2004. The price reactions in US stock market to this development are mixed; most of the equity portfolio indices do not have a significant abnormal return. However, the foreign-based ADR-issuing firms yield significant price gains for the day on which the final standard is issued (Table 3b, Event XII). S&P ADRs and Level-1 ADRs on average earn 1.323 percent (significant at the 0.05 level) and 0.947 percent (significant at the 0.10 level), respectively. It appears to us that the enhanced SBC accounting transparency in foreign countries has made their equities more attractive to US investors.

4) Somehow, ironically, while the market remains generally insensitive to an FASB SBC decision announcement, investors appear to react when politicians intervene by proposing legislative action against FASB's independence on the SBC accounting policy issues. The introduction of "Accounting Standards Reform Act" in October 1994 (Table 3a, Event IV) caused an observable value loss on several of the portfolio indices, including Russell 2000 (-1.061 percent), Pacific Exchange Technology (-0.892 percent) and Philadelphia Semiconductor (-1.214 percent). Investors seem to be particularly sensitive to reporting transparency in technology sectors in which the SBC method is heavily relied upon for attracting management talent.

In July 2004, with the House passing the "Stock Options Accounting Reform Act," the US Congress took new legislative action to overcome FASB's efforts in SBC accounting changes (Table 3c, Event XIV). The stock market did not respond favorably to Congress' attempt to "save the Corporation America from the FASB." Instead, nearly all of the twenty equity indices showed negative abnormal returns on the announcement day, with Biotech, Pacifica Exchange Technology and Philadelphia Semiconductor losing 1.391 percent, 0.860 percent and 0.999 percent, respectively (significant at the 0.05 – 0.10 level). The only exceptions were the ADR-issuing firms, with S&P ADRs gaining 1.265 percent (significant at the 0.05 level) and Level-1 ADRs gaining 0.382 percent, insignificant at the 0.10 level). One possible explanation is that many foreign-based ADRs, subject to the new IFAS 2's SBC accounting transparency requirement in their home countries, become relatively more attractive to investors who were disappointed by the US Congress' "politics" that put corporative interests above the investing public's right to know.

SUMMARY

Our study examines the price performance of various equity portfolios traded in the US stock market when the FASB and the IASB announce their newest developments in the reporting requirements for corporate stock-based compensation. Our findings indicate that the US stock market in general reacted negatively to the issuance of SFAS 123 and its preceding exposure draft, but the observed abnormal returns were insignificant. SFAS 148, and a new exposure draft issued in 2004, both of which amend SFAS 123, generally caused positive but insignificant pronouncement effects. The insignificance of price reactions to SFAS or ED issuance is not sensitive to a firm's size, domesticity, disclosure requirement, exchange-listing regulation or industry sector.

Our findings, are consistent with the findings of Dechow, Hutton and Sloan (1996) who looked only at SFAS 123 However, we go beyond Dechow, Hutton and Sloan (1996) by finding that when the US Congress takes legislative action threatening FASB's independence and authority on SBC accounting policy issues, the stock market reacts unfavorably. The exception is foreign-based ADR-issuing firms which are regulated by the more transparent SBC accounting rules (e.g., IFAS 2) in their home countries. The investing public might not (yet) appreciate FASB or IASB's efforts to improving SBC accounting transparency, but it appears to us that they appreciate Congressional intervention even *less*.

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NEW DEVELOPMENTS IN INNOCENT SPOUSE RULES

John Leavins, University of St. Thomas
Darshan Wadhwa, University of Houston-Downtown
Charles Smith, University of Houston-Downtown

ABSTRACT

Both spouses are usually liable for taxes owed to the IRS on a joint tax return. However, the "innocent spouse doctrine" offers relief to a spouse when it would be inequitable to hold that spouse liable for taxes created by the other spouse. The innocent spouse laws have gone through numerous changes over the years and Congress made a major revision to the law in 1998. The revised law has made it easier to obtain innocent spouse relief when inequitable situations arise. This article traces the development of the innocent spouse provisions in the literature with emphasis on the legislative history. The article then explains the current innocent spouse rules and discusses the implications of Code Section 6015. Finally, the article summarizes new developments in the innocent spouse provisions with particular emphasis on a recent Tax Court decision in 2006 that deals with innocent spouse rules in community property states.

INTRODUCTION

An innocent spouse is someone who has filed a joint return with his or her spouse and is being held accountable for a tax liability because of an erroneous tax return filed by the other spouse. The innocent spouse must prove that he or she had no knowledge of the error or omission and that it would be unfair to hold him or her accountable for the tax liability, penalties and interest. There are three different types relief available for these types of situations. These are innocent spouse relief, relief by separation of liabilities, and equitable relief. The type of relief available to an individual varies depending on various factors and circumstances, such as tax filing status, marital status and community property laws. This paper provides a review of the legislative history of the law, discusses the innocent spouse provisions, and looks at recent developments in the law.

LEGISLATIVE HISTORY OF JOINT AND SEPARATE RETURNS

Prior to 1918, joint returns were not allowed and each spouse was required to file his and her return separately. The Revenue Act of 1918 enacted provisions that permitted married couples to file joint tax returns. The law was unclear as to whether married couples could still file separately until Congress passed the Revenue Act of 1921. This Act clarified that a husband and wife may either file separate returns or a joint return. Initially, the IRS took the position that when a joint return is filed, both husband and wife have joint and several liability for the entire tax due on the

return. The IRS viewed the joint return as pertaining to one taxable unit and thus both were responsible for the entire amount of the tax liability.

Many taxpayers disagreed with this approach and in 1935 a case involving the issue of joint and separate liability of tax was heard by the Ninth Circuit Court of Appeals. The case of *Cole v. Commissioner* centered on an attempt by the IRS to collect a joint return liability from the estate of a wife. The IRS argued that because a joint return does not segregate the respective income and expenses of each spouse, it is impossible to determine the respective tax liabilities of the individual spouses. The IRS also argued that joint and several liability is the price that a married couple pays for the privilege of filing a joint return. The Ninth Circuit Court of Appeals rejected these arguments for joint and several liability and ruled that it is possible to separate the tax liability of the respective spouses.

Disputes between the IRS and taxpayers continued due to the ambiguity of the issue and Congress attempted to clarify the issue further with passage of the Revenue Act of 1938. That Act clearly established the principle of joint and several liability on a joint tax return. This provision is still in place and is found in Code section 6013(d).

Prior to 1948, married couples filing jointly used the same income tax computation schedule as couples filing separately. This tax structure created an incentive for couples to file separately because with a progressive income tax, a married couple could often reduce their combined tax liability by filing separately. This enabled couples to split their total income between the two spouses and thus lower their tax rates. The Revenue Act of 1948 created a separate tax schedule for a joint return filing status. This new schedule introduced a marriage bonus into the tax law and since that time most married couples file jointly.

HISTORICAL BACKGROUND OF THE "INNOCENT SPOUSE" PROVISIONS

Over the next few decades, it became apparent that the joint and several liability doctrine imposed an unfair burden on many taxpayers who filed joint returns. There were cases where a joint return was filed and one spouse was guilty of grossly understating income and thus the tax liability. The other spouse often had no knowledge of the intentional erroneous filing. Congress was concerned about the injustice imposed by joint and several liability in such cases. To address this problem, Congress amended the code and enacted IRC Sec. 6013(e) in 1971.

This provision provided relief from joint and several liability for "innocent spouses" in certain limited circumstances. The provision set forth three tests for determining whether innocent spouse relief should be available: (1) the income omitted had to exceed 25 percent of the gross income reported on the return, 2) the innocent spouse must prove that he or she did not know of the omission from income and, (3) the innocent spouse did not benefit from the items omitted from gross income. The provision focused on providing relief for an innocent spouse when income was understated. It did not address situations where deductions and tax credits were taken to which the taxpayer was not entitled. In addition, many high-income couples fell short of the requirement that the omission must exceed 25% of gross income.

Congress significantly altered the structure of the innocent spouse rules with the Deficit Reduction Act of 1984. Congress amended Sec. 6013(e) to alleviate what it perceived to be

inequities in the law. One common situation, which often occurred, involved a spouse overstating business deductions in order to avoid paying tax while the other spouse was unaware that the deductions were erroneous. The Deficit Reduction Act of 1984 liberalized the circumstances under which innocent spouse relief can be granted by extending that relief to situations in which a substantial understatement of tax was attributable to claims of deductions, credits, and bases for which there is "no basis in fact or law". The revised statute removed the requirement that the innocent spouse must show that he or she did not benefit from the effects of the grossly erroneous items.

The act also changed the substantial understatement threshold. It established $500 as the amount of substantial understatement required before relief can be granted. In addition, the tax liability had to exceed a certain percentage of the innocent spouse's gross income. If the innocent spouse's adjusted gross income was $20,000 or less, relief would only be granted if the understatement exceeded 10% of the adjusted gross income. This change made it easier for an innocent spouse to obtain relief if the other spouse's income was relatively high. The Act also expanded the innocent spouse provisions to include tax relief due to improper deductions as well as unreported income. Congress was concerned about situations where one spouse claimed improper deductions in order to avoid paying tax and the other spouse did not know that the deductions were improper.

THE IRS RESTRUCTURING AND REFORM ACT OF 1998

The number of innocent spouse claims continued to increase and Congress once again responded. As part of the IRS Restructuring and Reform Act of 1998, the requirements for obtaining innocent spouse relief were relaxed. The prior rule that an understatement had to be "substantial" was changed so that all tax understatements qualified for innocent spouse relief. In addition, the prior rule that omitted income items had to be "grossly erroneous" was changed so that they only had to be "erroneous". The easing of the restrictions on innocent spouse relief made the determination of eligibility for relief simpler. The basic provisions of the 1998 Act are still in place.

CURRENT INNOCENT SPOUSE RELIEF PROVISIONS

In order to qualify for traditional innocent spouse relief there are currently five requirements that must be met. These requirements are: (1) spouses have filed a joint return for a taxable year, (2) there is an understatement of tax on the return due to erroneous items of one of the spouses filing the return (3) the innocent spouse establishes that when signing the return he/she did not know of the understatement (4) it is inequitable to hold the innocent spouse liable for the deficiency in tax because of the understatement, and (5) within 2 years of when the IRS begins collection activities, the innocent spouse must properly elect relief.

One of the main determinations that the IRS must take into account when determining the facts and circumstances of a case is whether or not it would be unfair to hold the innocent spouse responsible for the understated tax, penalties, and interest of their spouse. IRS Publication 971 gives several examples of factors that the IRS will take into consideration in determining unfairness. One

of these is whether or not the innocent spouse received a "significant benefit" from the understatement of tax. By taking into consideration the facts and circumstances involved in an innocent spouse case, the IRS can best determine whether an individual knew or had reason to know of an understatement, and whether or not it would be fair to hold the innocent spouse liable.

An example of an understatement of tax in an innocent spouse situation is the case of *Linda Evans and Estate of Robert C. Evans, Jr., Deceased, Linda Evans, Executrix v. Commissioner*. In this case the petitioner, Ms. Linda Evans, argued that she was an innocent spouse and should not be held liable for over $55,000 in understated taxes and penalties due to improper deductions and unreported income from 1989 to 1991. Ms. Evans and the late Mr. Robert C. Evans Jr. received royalties from an oil and gas company and deducted certain amounts of these royalties because he said they were reported as income on an estate in bankruptcy return. The trustee of the estate never received any royalties or reported any income from them on the estate's tax returns. Mr. Evans also ran, as a sole proprietor, a ranching business that Ms. Evans had knowledge of. In 1989, Mr. Evans sold some of the cattle from his ranching business for $60,247 and recorded the transaction in the business sales journal, which neither he nor the trustee of the estate reported for federal income tax purposes. All of the tax returns in question were prepared by an accountant and signed by Ms. Evans without her reviewing or questioning them. Ms. Evans knew where all of the personal and business financial records were kept and had access to them.

The court ruled that Mr. and Ms. Evans were not entitled to the deductions they took because they failed to prove that they did not own or receive the royalties that they claimed were a loan from the trustee of the estate. The court also ruled that Mr. and Ms. Evans were responsible for the income from the sale of cattle that they failed to report in 1989 since they failed to prove that the cattle was sold by secured creditors of Mr. Evans.

Ms. Evans claimed that she was an innocent spouse and should not be held liable for the additional tax and penalties. She did not review the returns because she assumed that, since the accountant prepared them, that they were prepared correctly. Ms. Evans also maintained that even if she had reviewed the returns she would not have understood them without the assistance of an advisor. Ms. Evans also requested that the non-qualifying deductions be considered unreported income. The court refused to consider the deductions as an unreported income issue since Ms. Evans and her late husband included the income on their 1040 for the years in question and took deductions on this income. The court also did not agree with Ms. Evans that she had no knowledge or reason to know of the understatement of income due to the 1989 sale of cattle. The court ruled that Ms. Evans did not meet the requirement for innocent spouse relief because she had knowledge of her husband's business activities and the couple's finances. The court also pointed out that even if she did not know of the understatement of income, she took no steps to determine the accuracy of the return, which a reasonable person in this position would have done. The court stated that Ms. Evans could have easily discussed the returns with her late husband before signing the returns. The court held that Ms. Evans was not an innocent spouse in any of the years in question.

RELIEF BY SEPARATION OF LIABILITY

If individuals do not meet all the requirements for traditional innocent spouse relief, a second source of relief is available, which is relief by separation of liability. In order to be eligible to make the election for separation of liability under IRS Code Sec. 6015(c) one of the following two conditions must be met: (1) at the time of election, the individual filing the election is no longer married to, or is legally separated from the individual with whom the joint return was filed, or (2) the individual was not a member of the same household as the individual with whom the joint return was filed during the 12-month period ending when the election was filed.

Relief by separation of liability will not be granted if the IRS shows proof that the property was transferred as part of a "fraudulent scheme." Additionally it will not be granted if the IRS can prove the spouse filing the claim had actual knowledge of the "erroneous items." Finally, it will not be granted if the property was transferred from one spouse to the other for the purpose of avoiding tax or reducing the tax liability. Relief will only be granted if the spouse filing the claim did not have actual knowledge of the erroneous items. The IRS does not have to prove that the spouse knew how the income was originated. It only has to prove that the spouse knew of the existence of the income. Additionally the spouse cannot use the defense of not having actual knowledge of the items if the basis of that defense is that they did not know how to report the item on the jointly-filed tax return.

An example of separation of liability can be seen in *Joan Phyllis Levy v. Commissioner*, This case dealt with tax deficiencies for several years and ruled that for the 1979 tax return, Mrs. Levy did not qualify as an innocent spouse under IRC section 6015(b), because she was unable to prove that a reasonable person would not be expected to know there was a tax deficiency. However, the court overruled the IRS and granted separation of liability under section 6015(c). Section 6015(c) applies when the income which accounts for the tax liability would have been properly allocated to the other spouse if they had filed separate tax returns instead of a joint tax return.

During Dr. And Mrs. Levy's marriage, Mrs. Levy was a full-time homemaker and although she knew that her husband did practice medicine, she was not involved with any of the financial dealings of the household. All household bills where paid by her husband, and furthermore, she did not have access to the checking account where her husband deposited the money. She was provided cash by her husband as needed for expenses and did not live a lifestyle that was unreasonable in light of the amount expected by the income reported on their tax returns. The family took no expensive vacations and she did not furnish their house with expensive items. Additionally, she did not have a credit card until 1999. After separating from her husband in 1994, he still paid the household bills for the condominium that she resided in and provided cash or a check for living expenses that she deposited into her own checking account.

The court pointed out that Dr. Levy testified that he invested in a tax shelter and that Mrs. Levy did not participate or have knowledge of the tax shelter. The record also showed that she did not participate in his medical practice and barely had any knowledge of his financial transactions. Even though Ms. Levy did not qualify as an innocent spouse, she qualified for relief under the separation of liability rules. Additionally, with separation of liability, unlike innocent spouse, the burden of proof for actual knowledge is shifted from the taxpayer to the Internal Revenue Service.

This case illustrates the difference that can result between asserting the doctrine of innocent spouse versus that of separation of liability.

EQUITABLE RELIEF

An innocent spouse may also qualify for relief under the equitable relief provisions. Under this type of relief, one may request to be relieved of the responsibility of tax, interest, and penalties. This relief applies to any tax liability arising after July 22, 1998 and any tax liability arising on or before the date but remaining unpaid as of that date. Equitable relief differs from innocent spouse relief and separation of liability because it allows an individual relief from an understatement of tax or an underpayment of tax. An underpayment of tax by definition "is an amount of tax one properly reported on a tax return but has not paid." If the taxpayer satisfies the required conditions for equitable relief, then the IRS is obligated to evaluate the positive and negative factors to determine whether full or partial relief should be granted the taxpayer.

An equitable relief ruling can be seen in the continuation of the case of *Joan Phyllis Levy v. Commissioner*. As stated previously, this case dealt with extensive tax liabilities that included the tax returns for 1979 and 1991 through 1999. The court ruled in favor of Mrs. Levy and granted separation of liability for the tax year 1979, but did not grant separation of liability for years 1991 through 1999. The court justified this decision by pointing out that the agreement was reached through both parties' attorneys and Mrs. Levy had no reason to know at that time that Dr. Levy planned to file bankruptcy to avoid payment of the taxes.

The court determined that the divorce settlement entered into in August 2002 put all legal responsibility on Dr. Levy to pay the unpaid taxes for years 1991-1999. In determining if she qualified under the economic hardship factor, the court ruled that she did not qualify because her children were no longer dependents. She was also entitled to $4,400 per month in alimony payments from Dr. Levy. Additionally she owned the condominium which was valued at $350,000, and only had a $60,000 mortgage against it. The court ruled that she was not at or near the poverty level and would not suffer economic hardship upon paying the tax liabilities.

Regarding the question of whether Mrs. Levy had knowledge or reason to know that the tax liability would not be paid by Dr. Levy, the court reached a split decision for the years 1991 through 1999. The court determined that for the tax years between 1991 though 1995, Mrs. Levy had no knowledge or reason to know that Dr. Levy would not pay the tax liability. But the court determined that on May 22, 1997, Mrs. Levy signed a tax waiver for the unpaid taxes from 1979. Therefore the court determined that she had reason to doubt if Dr. Levy would pay the tax liability for all tax years following that time.

In considering whether Mrs. Levy received significant benefit from the unpaid tax liabilities, the court ruled that living expenses do not qualify as a significant benefit. However, the college tuition paid by Dr. Levy for the education of their three children did qualify. The final ruling of the court granted separation of liability for the 1979 tax year, and granted equitable relief for the tax liability for years 1991 through 1995. For the tax years 1996 through 1999, the court ruled that Mrs. Levy did not qualify for any relief under Sec 6015.

COMMUNITY PROPERTY

Community property laws can have an impact in determining if a taxpayer is able to qualify for innocent spouse relief and what type of relief may be available. Community property is defined as property:

(1) That you and/or your spouse acquired during marriage while living in a community property state.
(2) That was converted to community property, from separate property, by agreement by the taxpayer and their spouse.
(3) That can't be identified as separate property.

A taxpayer may have community property if the taxpayer is married and has lived in a community property state during the tax year. The idea of community property is tied to the taxpayer's permanent home. For instance, if a taxpayer is living, working, and earning a living in a non-community property state but their permanent home is in a community property state, then all income earned is considered community property.

There are special circumstances that allow a taxpayer to report community property income separately. Income can be reported separately by the spouse that earned the income if the couple (1) lived apart the whole year, (2) did not file a joint return, and (3) had earned income that is community property and did not transfer any of the income between themselves before year end. One of the most recent rulings involving the community property laws and the innocent spouse rules was the case of *Lois E. Ordlock v. Commissioner*, which was decided in January 19, 2006. In that case, a taxpayer's husband underreported the couple's income and understated the couple's tax liabilities. The spouse was granted innocent spouse relief and relieved of the husband's tax liability. In subsequent years, the husband continued to underreport income and taxes. The husband paid the IRS those assessments from community property.

The innocent spouse in the case filed for a refund of that portion of the tax that was paid from community property income. Her reasoning was that she was innocent of the tax liability. She further reasoned that the payments made by the husband were from community property and consequently her share of the community property that was used to pay the taxes should be refunded. The court ruled that the innocent spouse was not entitled to a refund. It pointed out that this precedent could lead to extremely complex problems of sorting out what part of the payments are would be considered community property. In addition, an innocent spouse could pay all of the tax liability and then file a claim for a refund by claiming the payment was community property.

CONCLUSION

The innocent spouse provisions are a significant topic in tax law due to the number of taxpayers affected and the principle that the tax laws should be applied in an equitable manner. Understanding the application of the rules is extremely important since many unsuspecting spouses have been left with large assessments because of erroneous actions of the other spouse. The

determination of relief under Section 6015 consists of an extensive process of investigation required by both the filing spouse and the IRS to provide proof of whether the spouse qualifies for relief. The granting of relief is possible under three different situations and it important that taxpayers and practitioners understand the options available. Community property laws also affect the innocent spouse rules. Tax practitioners who are knowledgeable in this area of the tax law should be able to maximize tax savings for clients under the innocent spouse rules.

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A COMPARISON OF LOW-RISK INCOME PRODUCING RETIREMENT STRATEGIES

Janice L. Klimek, University of Central Missouri
Jo Lynne Koehn, University of Central Missouri

ABSTRACT

Historically, sources of retirement income have typically included private pensions, Social Security and personal savings. Unfortunately, recent developments are impacting all three sources, making a retirement free of financial worries less probable. Securing retirement savings has challenges for fixed income savers and equity investors. Low interest rates have reduced income levels for fixed income investors. Equity investors are being advised to lower expectations. Retiring employees are discovering that pension benefits may not be distributed as promised.

Recent research suggests that investing in government bonds is a viable strategy for accumulating retirement savings due to low risk and ease of investing. However, the previous focus has been on accumulation of retirement savings rather than on distribution management, which takes place after retirement. This article evaluates two important income withdrawal strategies available to households looking for low-risk retirement income: the purchase of fixed annuities and planned withdrawals of savings bond investments.

INTRODUCTION

For most wage earners, the main reason that saving for retirement is important is to replace earnings lost upon retiring from the workforce. Sources of retirement income have typically included private pensions, Social Security and personal savings. However, in the last 25 years, challenges have arisen for each of these potential sources of retirement income.

Only about 50 percent of the workforce participates in employer-sponsored retirement plans. As late as 1980, a majority of those workers participated in defined benefit (DB) plans where the employer contributes and all covered employees automatically earn benefits, usually based on years of service. Today, however, the most prevalent plan has changed to a defined contribution (DC) plan. In 2006, only 20 percent of the workforce participated in DB, while 43 percent participated in DC plans. Approximately 12 percent of workers participated in both types of plans. (Purcell and Whitman, 2007)

The result of such a shift in type of employer-sponsored plan is that employees approaching retirement are now discovering that pension benefits they were counting on for retirement income may not be secure, or may not be fully distributed as promised. Reports now show that there is a significant under-funding of many corporate pensions. The Pension Benefit Guaranty Corporation (PBGC), which helps pay benefits when corporations are unable to fulfill their defined benefit pension obligations, is showing signs of stress due to this under-funding. Congressional research

staffers have recently estimated that the PBGC faces a shortfall of more than $120 billion dollars over the next decade due to the rising number of corporate bankruptcies. (Borrus, 2005)

Additionally, large companies such as International Business Machines Corp. and Verizon Communications Inc. have recently announced the freezing of their defined benefit pension plans. (Schultz, 2006) A study conducted on such activities found that almost one in ten companies offering defined benefit pension plans have frozen their plans. (Schroeder, 2005) When pension plans are frozen, those vested in the plans will receive reduced monthly benefits relative to the benefits previously estimated.

For those workers who are not part of a DB plan, the responsibility for securing an adequate retirement income lies solely with the individual. In 2006, 20 percent of workers with DC plans available through their employers chose not to participate. (Purcell and Whitman, 2007) Those who do participate risk funding at less than adequate levels, and also risk making bad investment decisions. For both groups, there exists a substantial threat that retirement income from employer-sponsored plans will fall short of retirement needs.

A second source of retirement income, Social Security, does not appear to be the answer to the retiree's financial concerns. Though Social Security reform is currently not the hot-button legislative issue that it was in early 2005, at some point Congress must reconsider the need for changes to the Social Security system. There is a definite possibility that the monthly benefit checks received by future retirees will be reduced if Social Security reform measures require scaling back on monthly benefits in the interest of system solvency. (Gleckman, 2005)

Even if one assumes the Social Security system is solid, benefits received account for only about 41 percent of the average wage earner's career-average earnings. For high-wage earners, the amount is closer to 27 percent. It seems quite obvious that Social Security should not be the only source of income relied upon by retirees.

The third source of retirement income, private retirement savings, has challenges for both fixed income savers and equity investors. For the past several years, low interest rates have reduced income levels for retirees primarily dependent on fixed income investments. In late 2004 average rates for one-year certificates of deposits (CD's) were hovering around 2 percent. More recently, fixed income investments are providing better yields, from 5.35 to 5.6 percent depending on time to maturity, but such volatility greatly affects the funds available to retirees from year to year. In addition, even in this period of rising interest rates, retirees face challenges in deciding the optimal term for fixed investments, whether those are in CD's or bonds.

Those investing in equities are being advised that return expectations may need to be revised downward. Using Fama and French research data found at *http://moneychimp.com,* the total stock market return for the twenty year period, 1987-2006, was 11.35 percent before inflation. For the ten years, 1997-2006, the return declined to 8.09 percent. Forecasters anticipate returns to decline further in the coming years. For example, financial advisors at Standish Mellon forecasted equity returns for U.S. large and small cap stocks in the 8 to 9 percent range. (Ladd, Fahey and Chittim, 2006) Annual savings requirements are highly sensitive to return assumptions, so lower anticipated returns will put much more stress on a retiree's private savings.

Apparent threats to a secure retirement are escalating and those threats are coming from numerous sources. Changes that will take place with regard to Social Security are still unknown.

What is known is that the majority of future retirees will not have defined benefit pension plans available to them through an employer, and less than half of the workforce takes advantage of the defined contribution plans offered.

So, are workers saving through the use of Individual Retirement Accounts (IRA's)? It seems the answer is "no". As of 2004, less than one-third of working households held IRA's. (Purcell and Whitman, 2007) Researchers have found that retirement planning is lacking due to financial illiteracy. In fact, many households lack even the very basic knowledge necessary to make sound retirement savings decisions. (Lusardi and Mitchell, 2007)

Other research suggests that working households fail to plan for retirement because of a more pressing need to fund day-to-day expenses. Tufano and Schneider (2005) found that only about 22 percent of households meet the financial planner's standard of having the equivalent of six months of living expenses saved for emergency purposes. Such families do not feel comfortable locking funds into retirement accounts because of the difficulty that may arise if funds are later needed to cover an emergency.

It has recently been suggested that the government begin to "reinvent" savings bonds. (Tufano and Schneider, 2005) The benefits of bonds for those who have very little private savings are numerous. Bonds may be purchased in small denominations without risk of principal loss. They are relatively easy to obtain and purchases require no fees while offering competitive interest rates. More importantly, bonds may be redeemed quickly, if necessary, as the Treasury Department will waive the one year holding period in the case of a qualified emergency.

With the resurgence of research on bonds as a viable investment alternative, it is important to review how bonds compare to other conservative investment alternatives. Arak and Rosenstein (2004) compared Series EE bond returns to six-month certificates of deposit (CDs), Treasury Bills and intermediate-term Government bonds over the period 1954 to 2000. They found that Series EE bonds yielded higher returns than T-bills with less volatility. Although returns for six-month CDs were slightly higher, the coefficient of variation for Series EE bonds was lower, which again indicated that bonds were superior to CDs over the 6-month time interval. These results were present even before considering the benefits associated with tax deferral of bond interest.

Furthermore, a comparison of Series EE bonds to the newer Series I bonds showed that I bonds have yielded higher interest rates since their inception in September, 1998. (Boes and Bezik, 2004) Series I bonds have also been compared to Treasury Inflation-Protected Securities (TIPS). Although TIPS generally produce higher yields, the tax deferral and early redemption options available with I bonds make them an attractive alternative for long-term investors who take advantage of the multiple switching opportunities available to I bond holders. In summary, bonds seem to be a very viable alternative for investors due to low risk and ease of investing.

While bonds have been compared to a number of conservative investment vehicles, the previous focus has been on accumulation of retirement savings rather than on distribution management, which takes place after retirement. More specifically, bonds have not been measured up to annuities as a method of securing retirement income. Retirees need an appropriate withdrawal strategy to ensure that they do not outlive their retirement savings.

In this paper, we have two main objectives. The first, which is particularly important to individual investors, is to detail the features of annuities and savings bonds and then compare their

relative advantages and disadvantages. The second is to evaluate two important income withdrawal strategies available to households looking for low-risk retirement income: the purchase of fixed annuities and planned withdrawals of savings bond investments.

In section two, we provide a review of annuities of savings bonds alternatives available to investors. In section three, we compare the income stream of an immediate fixed annuity to the income stream produced by a strategy of laddering savings bond purchases over time and then selling bonds periodically during retirement. If these planned withdrawals are managed appropriately, sufficient retirement income should be provided for the life of the retiree. In section four, we present an analysis of our results. Our conclusions are presented in section five.

REVIEW OF ANNUITIES AND SAVINGS BONDS

Annuities

There are two broad categories of annuities: fixed and variable. Fixed annuities are offered by insurance companies that typically guarantee both earnings and principal. Purchasers earn a fixed interest rate while their principal is growing, and later receive a fixed dollar payment each period over an agreed upon number of years. Purchasers choose to receive payments for either a definite number of years or until death.

Variable annuities are another alternative. These instruments offer the purchaser a choice of investment options, usually mutual funds, and thus provide a variable rate of return dependent on choice of investment. There are many different types of variable annuity benefits offered including guaranteed withdrawal benefits, income benefits and accumulation benefits. However, according to Glenn S. Daily, a New York based, fee-only insurance consultant, there is a lack of complete information available related to these insurance products. (Opiela, 2007) This leads to difficulty in conducting a thorough and accurate product analysis, and obviously makes comparisons to other investment vehicles inadvisable.

Daily's advice is to "wait and see" with regard to use of variable annuities in a retirement plan because regulations that require additional disclosure have yet to be developed in the United States. (Opiela, 2007) Given Daily's reservations associated with variable annuities and the related potential for loss due to lack of product information, variable annuities do not meet the "low risk" requirement proposed in this paper. Therefore, the focus of this paper will be on fixed annuities.

Fixed annuities are insurance products. A fixed amount of prior savings is invested in an instrument that guarantees a fixed future payment month after month. The fixed payment is based on either a set number of years or on the life expectancy of the annuitant for an annuity that pays until death. Near-retirees who place a high value on safety often feel comfortable with the annuity concept. Purchasers may choose from immediate or deferred payments.

One might prefer to invest funds now to earn a fixed return and then begin payments at a later date, for example, upon retirement in five years. Since earnings are fixed, it is easy to determine the investment needed today to achieve the desired periodic payment to the annuitant upon retirement. Tax on earnings is due only when purchasers begin to receive the periodic

payments. Also, the dollar amount of investment in annuities is not limited by statute, so large lump-sums can be invested without restriction.

United States Savings Bonds:

Savings bonds are issued by the U.S. Treasury Department and are non-marketable securities. Investors may not sell savings bonds to, or buy them from, anyone except an issuing and paying agent authorized by the Treasury Department. There are about 40,000 financial institutions in the U.S. that are currently authorized paying agents. Savings bonds are registered securities, meaning they are owned exclusively by the person or persons named on them.

Series I inflation-indexed Savings Bonds (I Bonds) and Series EE Savings Bonds (EE Bonds) are accrual securities. Interest on these bonds is accrued monthly and compounded semiannually. An investor receives the bond's interest earnings at redemption. Savings bond rates are announced every 6 months on May 1 and November 1.

The I Bond interest rates are a composite rate consisting of a fixed rate that applies over the life of the bond, plus an inflation adjusted add-on rate that adjusts every 6 months. The rate effective on the date of an EE Bond's purchase is now fixed (issuances after 5/1/05) for the bond's duration. In the past, EE Bond interest rates were variable and adjusted every 6 months.

I Bonds and EE Bonds reach final maturity and stop earning interest after 30 years. Bond owners are not required to hold bonds until maturity; however, bonds must generally be held for 12 months from the issue date before they can be redeemed. Note that an exception to the initial holding period rule may apply if the Treasury Department announces a special disaster waiver for people living in areas affected by disasters. If bonds are redeemed earlier than five years from the purchase date, then an early redemption penalty applies that is equal to the last three months of earned interest.

The fixed interest rate over the term of the bond makes the EE Bond less desirable for investors concerned about inflation. Given the need to control for purchasing power loss risk, the savings bonds strategy outlined in this article favors using I Bonds. A single investor may purchase up to $30,000 of paper I Bonds and $30,000 of electronic I Bonds per year. Bonds purchased as gifts or in a fiduciary capacity are not counted in a purchaser's annual limit.

Electronic I Bonds were introduced in October 2002 and may be purchased at www.treasurydirect.gov for any amount (one author recently tested this feature by purchasing an electronic I Bond for $100.01). In 2003 the government announced that it would cease selling paper savings bonds, forcing all purchasers to the electronic format. However, the government continues to sell paper savings bonds but does state online that it is the Treasury's long-term goal to stop issuing paper securities. Paper I Bonds sell at face value and come in eight denominations, $50, $75, $100, $200, $500, $1,000, $5,000, and $10,000.

Contrast of Two Income Production Strategies:

Table 1 contrasts the salient features of immediate fixed annuities with I Bonds. As shown in the table, both products can offer steady income streams but differ with respect to fees, risks of longevity and investment limits.

Table 1: Costs/Benefits of Low-Risk Investment Strategies

Immediate Fixed Annuities	I Bonds (Savings Bonds)
Advantages:	**Advantages:**
• Fixed and predictable income stream	• Steady income stream with some variability in interest earned due to regular inflation-indexed rate adjustments
• No investment limits	• Interest accrual until bond matures (30 years from date of issue)
• Requires little planning prior to purchase as long as sufficient funds accumulated by retirement	• Inflation protection built in
• Only one investment payment required	• Unredeemed savings bonds transferable to heirs/estate
• May purchase "period certain" option extending payments beyond life of annuitant	• No fees
Disadvantages:	• Bonds can be redeemed as early as 12 months from date of purchase (with penalty if held less than 5 years)
• Inflation protection not standard, must be purchased as extra feature of annuity	• Bond principal and interest payments guaranteed by full faith and credit of government
• Risk of dying before recovering amount invested	**Disadvantages:**
• Potential front load and annual management fees explicit or embedded in product	• Purchases limited to $60,000 per year
• Risk contingent on solvency and stability of insurance company	• Bonds must be held 5 years from date of purchase or penalty equal to interest earned over preceding 3 months applies
• Typically irrevocable beyond an "inspection period"	• Laddering bonds requires multi-year investment payments and commitment to strategy for several years prior to implementation
• Surrender charges apply if product terminated early	
• Borrowing against fixed annuities not allowed	

EXAMPLE METHODOLOGY

Laddering I Bonds Strategy:

An investor concerned with generating steady income during retirement may want to consider a rarely discussed strategy for providing income in retirement through laddering purchases of I Bonds. For illustration purposes we assume:

An investor purchases $1,500 in I Bonds each month. We assume that five $100 I Bonds and two $500 I Bonds are purchased every month starting six years prior to the anticipated retirement date.

Retirement begins at age 65.

The approximate average interest rate earned for the 99-05 interval was 5.9 percent (see Appendix Table A1). Since future interest rates are non-specified and uncertain, we rely on this prior six year average to project possible income scenarios using the I Bond strategy.

The value of the I Bonds at retirement equals $126,062 (see Table 2). This value results from monthly purchases of savings bonds over the period 1/1/1999 to 1/1/2005. The Savings Bond Wizard, available at http://www.treasurydirect.gov/indiv/tools/tools_savingsbondwizard.htm calculates this value by applying the then prevailing interest rates and accruals to the monthly bond purchases in the portfolio over the given six year period.

To achieve the bond redemption amounts referenced in row two of Table 2, the investor must redeem selected bonds with values approximating the desired monthly income. The retiree will use discretion in deciding which bonds in the portfolio to redeem. The bonds purchased will have varying yields so the investor can choose to redeem the lowest yielding bonds in any given month (from those that satisfy the necessary five year holding period) to provide monthly income.

Immediate Fixed Annuity Strategy:

As an alternative to the previous savings bond strategy, an investor concerned with generating steady income during retirement can purchase an immediate fixed annuity to provide monthly income once retired. For illustration purposes we assume:

Prior to retirement the investor has accumulated cash equal to $126,062 to invest for production of monthly income.

At age 65, when retirement begins, the investor purchases an immediate fixed annuity using the $126,062.

The illustrated monthly payouts were obtained by using an annuity quote site at http://www.immediateannuities.com.

ANALYSIS OF RESULTS

By equating the contract amount of the immediate fixed annuity to the value of I Bond portfolio at retirement, it is possible to provide a head-to-head comparison of the monthly income generated by the respective strategies. Table 2 provides contrasts based on strategy, gender and payout options.

Although amounts invested were held constant for each type of retiree, it should be noted that the value of the monthly annuity payout varies with gender and single versus joint coverage. For example, a 65 year old male investing $126,062 in an immediate fixed single life annuity could generate an approximate monthly annuity payment of $825 whereas a 65 year old female, with a longer life expectancy, would receive only approximately $776. The value at death for bonds also varies due to differences in life expectancy among the groups examined, $89,612 compared with $76,798 for males versus females. Recall that the annuity product does not have any residual value.

This illustration provides a single strategy comparison of annuities to bonds. Note that monthly payments (annuity product) and interest accruals (savings bonds) will vary with choice of annuity providers and prevailing economic conditions that determine the relevant savings bonds interest rates.

Given that mortality assumptions are averages, it is always possible that a client could live longer than the mortality tables predict. The most significant risk of the bond portfolio income production strategy is that the retiree could fully deplete the bond portfolio through monthly withdrawals before death. As documented in the table, a male that retires at age 65 and lives only to the predicted mortality age of 75.4 years will still have a substantial bond portfolio balance at death. However, if that male retiree lives beyond 88.4 years, the bond portfolio balance will be fully exhausted. Similarly, a female could deplete her savings bond portfolio at 91.9 years. To mitigate this concern, the amount of withdrawal could be adjusted downward.

Our illustration also provides a limited sensitivity analysis regarding bond portfolio full depletion ages. Results for interest rates earned by the bond portfolio are reported at 4.9 percent and 6.9 percent in addition to the assumed 5.9 percent. With a reduction in interest rates earned, age at depletion is reduced. In contrast, with an increased interest rate, age at depletion increases dramatically. For example, when assuming a higher rate of 6.9 percent, the joint-lives bond portfolio may never deplete. In fact, earnings from the savings bond portfolio exceed the assumed joint life payout of $683 per month.

Note that the purchaser of a fixed annuity locks in a payment stream at the prevailing interest rate at the time of purchase. Subsequent changes in the interest rate environment may reward the purchaser if interest rates decline, given that the monthly payments are constant over the annuitant's

life. However, if interest rates rise, then the annuitant will be locked into receiving payments that are less than could be earned at the market's prevailing rate.

Table 2: Monthly Income Generation by Strategy with Sensitivity Analysis

	Immediate Fixed Annuity (male 65	**)Immediate Fixed Annuity (female 65)**	**Immediate Fixed Annuity**	**Savings Bonds Equivalent Payout (male 65)**	**Savings Bond Equivalent Payout (female 65)**	**Savings Bond Equivalent Payout (joint lives)**
Amount invested at age 65	$126,062	$126062	$126,062	$126,062	$126,062	$126,062
Monthly payment/bond redemption	$825	$776	$683	$825	$776	$683
Value of investment if death occurs at predicted mortality age	$0 Benefits cease with single life annuity – mortality assumed age 75.4[a] years	$0 Benefits cease with single life annuity – mortality assumed age 80.5 years	$0 Benefits cease with deaths of both recipient and surviving spouse – average joint mortality 77.6 years	$89,612[b] Remaining approximate value of bond portfolio at age 75.4 years	$76,798 Remaining approximate value of bond portfolio at 80.5 years	$110,667 Remaining approximate value of bond portfolio at age 77.6 years
Year when bond portfolio is fully depleted	Benefits continue for life	Benefits continue for life	Benefits continue to surviving spouse for life	≈ 88.4 years	≈ 91.9 years	≈ 104.7 years[c]
Sensitivity of savings bond portfolio depletion to interest rate				4.9% ≈ 84.8 years 5.9% ≈ 88.4 years 6.9% ≈ 95.1 years	4.9% ≈ 87.2 years 5.9% ≈ 91.9 years 6.9% ≈ 103.4 years[c]	4.9% ≈ 93.4 years 5.9% ≈ 104.7[c] years 6.9% - does not deplete - monthly earnings > payout[c]

[a] 2003 life expectancy of Americans varies by ethnicity: white male (75.4 years), black male (69.2 years), white female (80.5 years), and black female (76.1 years)
Overall average life expectancy: 77.6 years (Source: National Center for Health Statistics, www.cdc.gov)

[b] Assumes 5.9% average interest rate over analysis period (see Table A1)

[c] Assumes as bonds mature after 30 years they are redeemed and funds are reinvested in alternate investments with a similar yield

CONCLUSION

As stated earlier, the main advantage of the fixed annuity strategy is that lifetime income is assured; however, there is no protection against inflation. The savings bond strategy using I-Bonds better addresses the inflation issue for retirees, but savings bond investors do not have a guarantee of lifetime income and on-going portfolio management is required.

The market place has recognized a need for blending the advantages of these two basic approaches. Equity indexed annuity products now being marketed offer a steady payment stream that can potentially increase if inflation warrants. Other annuity products address the disadvantage associated with loss of principal by guaranteeing an extended payment period (i.e. 20 years) if death occurs prior to the end of the guaranteed term. Therefore, an immediate fixed annuity can be enhanced by add-on features that address many concerns a retiree might have regarding generating income in retirement.

However, such enhancements will incur larger fees than a standard fixed annuity. A prospective buyer of an enhanced product is well-advised to research best case and worst case scenarios for the product in question because the formulas supporting the newest annuity products are very complex. A buyer should also keep in mind that disclosures currently required by law do not provide the detail needed to reach an informed decision, so acquiring the information necessary to make an optimal decision may prove difficult, if not impossible.

In financial planning, every client's needs are unique. Therefore, the best income generation strategy for each client will depend on the individual situation. The two basic strategies compared in this paper are not equally suitable for all retirees. For example, the I Bond strategy detailed above requires a client that is willing to commit to a regular savings regimen for six years prior to retirement.

In addition, a check or direct deposit will not magically appear in the retiree's bank account each month after retirement. The retiree will have to actively manage which bonds (and in what denominations) should be redeemed to maximize earnings given prevailing interest rates. There is no guarantee of lifetime income with the savings bond approach. However, there are no fees to the savings bond strategy and, more importantly, the retiree does not lose principal associated with unredeemed bonds at the time of death. This can result in substantial assets remaining at death for distribution to heirs.

Another retiree may not prefer as much involvement with the income generation process on a month-to-month basis during retirement. A one-time purchase of an immediate fixed annuity upon retirement (or perhaps an enhanced annuity insurance product) may be appealing. Even though fees, surrender charges, and inflation-related risks exist, the retiree will gain the security of a lifetime income stream. Risk-averse retirees may be willing to exchange their savings for an annuity with such an income assurance.

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APPENDIX

Table A1: I-Bond Historical Interest Rates	
November 1998-April 1999	6.94%
May 1999-October 1999	6.94%
November 1999-April 2000	7.04%
May 2000-October 2000	7.24%
November 2000-April 2001	7.04%
May 2001-October 2001	6.63%
November 2001-April 2002	5.62%
May 2002-October 2002	5.62%
November 2002-April 2003	5.21%
May 2003-October 2003	4.70%
November 2003-April 2004	4.70%
May 2004-October 2004	4.60%
November 2004-April 2005	4.60%
May 2005-October 2005	4.80%
November 2005-April 2006	6.73%
Source: Bureau of Public Debt	
Average 6 month I-Bond rate from November 1998-April 2006	5.90%

INTERNATIONAL BOND MARKETS: A COINTEGRATION STUDY

G. Wayne Kelly, Mississippi State University
Kevin E. Rogers, Mississippi State University
Kristen N. Van Rensselaer, University of North Alabama

ABSTRACT

This study examines the relationships among government bond returns for the G-7 countries to identify possible diversification opportunities. Using cointegration and error correction models, there is evidence of common trends between these government bond returns. Recursive cointegration test results suggest that the stability of this relationship varies over time. The empirical evidence indicates that the available diversification benefits from investing across these markets are limited.

INTRODUCTION

With the increasing globalization of financial markets, investors face a greater opportunity set with which to address investment goals and strategies. The widening array of available investments extends investors' choices across assets that reflect firm, industry, and even economy wide characteristics. This study addresses one aspect of diversification opportunities across major international bond markets. Specifically, its objective is to determine whether government bond returns of the seven countries collectively known as the G-7 countries share long-run relationships using cointegration techniques.

A long-term relationship between the total returns of these bonds would provide insights into investment possibilities and tactical choices investors make among these securities. As barriers to capital flows erode, weak-form market efficiency would suggest increasing similarities in the behavior of bond returns in combined markets. Dissimilar long-term bond returns could indicate the existence of valuable international diversification opportunities for investors and fund managers who, by rule or choice, hold significant amounts of government securities in their portfolios.

The G-7 countries, Canada, United States (U.S.), United Kingdom (U.K.), France, Germany, Italy, and Japan have enjoyed relatively low capital barriers over a long period. If the lack of impediments to capital flows contributes to market efficiency, these countries can provide a good example of government bond markets across which returns follow similar patterns. That could further provide a preview of government bond markets on a greater scale in the face of the liberalization of capital flows that accompany increasingly global economic activity.

For the purpose of this study, another motivation for selecting this group of government bonds is that the bonds of the G-7 comprise more than ninety percent of the total of all outstanding sovereign debt. Their dominance of the market for sovereign debt instruments is longstanding and

their high volume relative to other government bonds raises the likelihood that they are the most widely distributed and liquid of all such bonds. For the interval between 1990 and 1999, inclusive, U.S. Treasury securities made up an average of 47.8% of the total followed by Japanese bonds with an average share of 21.8%. The smallest average shares among these bonds over the same interval are those of U.K. (2.7%) and Canada (2.9%), each about double the largest share of non-G-7 nations.

For government bonds of different countries to provide effective diversification, the government bond market in one country should not share the same trends as the government bond market in another country. In other words, if two markets are cointegrated, then the markets share systematic risk. In addition, if two markets are cointegrated, profitable arbitrage opportunities may exist between them (Chan, Gup, & Pan, 1997). The absence of such similarities would indicate long-term diversification opportunities across government bond markets.

Numerous studies have explored the possibility of long-run relationships, using cointegration tests, for international interest rates and international stock market indexes. DeGennaro, Kunkel, & Lee (1994) find little evidence of cointegration between interest rates of Canada, Germany, Japan, and the United States. However, using the same data set of DeGennaro, et al., Hsueh & Pan (1998) find that interest rates among these five countries are fractionally cointegrated. Throop (1994) studies whether real interest rates of Canada, Germany, Japan, and U.K. are integrated with the U.S. More specifically, he tests for cointegration between short-term interest rates and long-term interest rates in the U.S. and each of the other four countries. Throop finds evidence of integration between short-term and long-term real interest rates in the U.S. and Japan and only long-term rates for U.S. and Germany.

Kanas (1998) investigates the potential for linkages between the U.S. stock market and the stock markets in U.K., Germany, France, Switzerland, Italy, and the Netherlands. Using pair-wise or bivariate cointegration tests, Kanas concludes that the U.S. does not share long-run relationships with any of these countries. Gerrits & Yuce (1999) find contrasting evidence to that of Kanas (1998). According to their study, the U.S. stock market is cointegrated with the stock markets in Germany, U.K., and the Netherlands and has a significant impact on the stock market movements in these three countries.

Few studies have focused on the potential long-run relationships between international bond markets. Clare, Maras, & Thomas (1995), CMT hereafter, used total return bond indexes for United Kingdom, United States, Germany, and Japan. The CMT perspective was that of the United Kingdom investor, since the indexes are sterling adjusted. During the 1978 to 1990 time period, CMT conclude that the returns in these bond markets move independently of one another thus providing potential diversification benefit to the U.K. investor.

This study differs from the CMT study in several ways. The present study includes three additional countries for a later period of similar length, testing for cointegration within the entire group and pair-wise between the U.S. and each of the 6 remaining countries. Recursive cointegration tests are also applied to the data to see if the integration of these bond markets increased over time.

DATA

The data are Merrill Lynch government bond total return indexes obtained from Bloomberg. The total return indexes reflect interest income plus price appreciation for government bonds with maturities greater than one year. The total return index is expressed in U.S. dollars and in local currencies. This allows the comparison of relationships for investors that hedge currency risk and for those that do not. The emphasis of the analysis will be placed on the U.S. investor where the return is expressed in U.S. dollars, implying that the total return index for Canada, France, Germany, Italy, Japan, and the United Kingdom also considers the return investors would receive from currency fluctuation. For more details on the Merrill Lynch indexes, see the Merrill Lynch Indexes: Rules and Definitions (1997). The weekly data spans the period from October 1, 1993 to December 29, 2000. The availability of weekly data for Italy begins on October 1, 1993. The other countries, except for the U.S., have weekly data available beginning January 5, 1990. The weekly availability of the US index began November 6, 1987. All of the indexes were converted to natural logs.

Table 1 displays average weekly returns, standard deviations, and coefficients of variation for each country in both local currencies and the U.S. dollar. Returns were calculated by differencing the natural log of the indexes. Perhaps the most surprising aspect of these statistics is the apparent poor risk-return trade-off that exists with international bond investments. Comparing the bond returns and risk denominated in local currency, the Italian bond market offered the most favorable risk-return trade-off. Comparing the U.S. dollar denominated returns and risk, the U.S. government bond market returns appear to dominate the other government bond returns. Of these seven countries, the U.S. has the lowest and Japan has the highest risk per unit of return. From a stand-alone investment perspective, U.S. investors that do not hedge currency risk would have been wise to select the U.S. government bonds over this time period. Of course, this pair-wise comparison ignores any diversification potential.

Table 1: Weekly returns, standard deviations, and coefficient of variation (CV)

	Local Currencies			U.S. Dollar		
	Weekly Return	Standard Deviation	CV	Weekly Return	Standard Deviation	CV
Canada	0.16%	0.72%	4.50	0.12%	1.14%	9.50
France	0.13%	0.55%	4.23	0.08%	1.45%	18.13
Germany	0.12%	0.45%	3.75	0.06%	1.49%	24.83
Italy	0.18%	0.66%	3.67	0.11%	1.53%	13.91
Japan	0.09%	0.54%	6.00	0.07%	1.89%	27.00
U.K.	0.17%	0.81%	4.76	0.17%	1.34%	7.88
U.S.	0.12%	0.63%	5.25	0.12%	0.63%	5.25

Table 2 reports correlation coefficients between the weekly returns. From the perspective of short-term relationships, the U.S. has the strongest relationship with Canada and weak

relationships with the remaining countries. Considering the close economic and geographic ties shared between these two countries, a higher correlation between returns would be expected. For the U.S., the weakest relationship is with Japan, suggesting that U.S. investors would benefit the most by including Japanese government bonds in their portfolio. The bond returns in Japan are more highly correlated with the European countries than with U.S. and Canada. All of the European countries share a high correlation between monthly returns. This is not surprising given the strong ties between these countries. It is important to remember that the correlation coefficients shown in Table 2 are measuring the contemporaneous short-term relationships in weekly returns and do not detect long-run relationships between total returns in different markets.

Table 2: Correlation coefficients for weekly returns: October 1993 through December 2000

Panel A: Local Currency

	Canada	France	Germany	Italy	Japan	U.K.
Canada	1.00					
France	0.49	1.00				
Germany	0.52	0.87	1.00			
Italy	0.38	0.69	0.61	1.00		
Japan	0.14	0.19	0.23	0.05	1.00	
U.K.	0.53	0.72	0.74	0.53	0.11	1.00
U.S.	0.76	0.56	0.58	0.35	0.18	0.59

Panel B: U.S. Dollars

	Canada	France	Germany	Italy	Japan	U.K.
Canada	1.00					
France	0.06	1.00				
Germany	0.04	0.94	1.00			
Italy	0.15	0.67	0.62	1.00		
Japan	-0.02	0.32	0.37	0.14	1.00	
U.K.	0.21	0.56	0.53	0.41	0.10	1.00
U.S.	0.48	0.23	0.21	0.18	-0.07	0.41

METHODOLOGY

The methodology for this study consists of three steps. First, the data are tested for nonstationarity using standard techniques as described by Dickey & Fuller (1979, 1981) and Phillips & Perron (1988). After establishing that each series is integrated of order one or *I*(*1*), cointegration tests are used to determine whether long-run relationships exist between the returns in the U.S. government bond market and any of the other G-7 government bond markets. In addition to

pairwise cointegration tests, multivariate cointegration tests are conducted on the entire G-7 group, using the procedures outlined by Johansen (1988) and Johansen & Juselius (1990). Last, if evidence of cointegration is found, error correction models will be developed to explore the short-term nature of the relationship.

Cointegration tests determine whether a linear combination of the nonstationary variables results in a stationary error term. The Johansen (1988) and Johansen & Juselius (1990) multivariate cointegration test will be used to detect possible cointegration

Two additional tests will be conducted to examine the long-run relationships between these return series. Recursive cointegration tests will indicate if the G-7 government bond markets have become more integrated over time. Exclusion tests will indicate if all seven of the government bond markets are important in the long-run relationships.

If evidence of cointegration is found, then error correction models (ECM) will be estimated. If returns in two markets are cointegrated, this means the returns share the same common trend or risk factor. When the returns depart from the long-run relationship, one or both of the returns must adjust to the departure to sustain the long-run relationship. ECMs indicate how the long-run relationship is maintained in the short-run and can specify which market corrects to divergences in the long-run relationship. To estimate error correction models, the first difference of each variable is regressed upon the error correction term and lagged values of the first difference of each variable. If evidence of cointegration is not found, then the G-7 government bond markets do not share a long-run relationship. Investors would be able to achieve diversification benefits by investing in these markets.

Error correction models also allow for the testing of Granger causality. In a cointegrated system, to say that the first variable "Granger causes" the second variable two conditions must be met. The error correction term must be statistically insignificant in the first variable's ECM but statistically significant in the second variable's ECM. This means that the first variable does not react to errors in the long-run relationship and the second variable does the "correcting" to deviations in the relationship. Second, the lagged values of the first variable must be statistically significant in the ECM for the second variable. The second condition requires that the second variable react to past changes in the first variable. If both conditions are satisfied it can be said that the first variable Granger causes the second variable (Enders, 1995).

EMPIRICAL RESULTS

Table 3 gives the results for the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) unit root tests. Lag lengths were selected by starting with a twelve-period lag and paring down the lag lengths until a significant length was found using the Akaike Information Criterion (AIC). The ADF and PP test confirm one another when the lag length is other than zero. This allows greater confidence in the results. The outcomes of the unit root tests were insensitive to the choice of lag length. The model used for the tests includes a time trend and drift and was selected after visual inspection of the graphs of each series. It is common to include a trend and drift term when working with index data. However, the conclusion of the test was not affected by excluding the time trend or constant from the model. For each of the series, it can be concluded that the series are

nonstationary or integrated of order one or higher at the five-percent level. To determine if the order of integration of each series is greater than one, the data is first differenced and the unit root tests are conducted again. While the results are not reported here, each of the series was found to be stationary after first differencing.

Table 3: Results of unit root tests

	Local Currency			U.S. Dollar		
Variable	Lag	ADF	PP	Lag	ADF	PP
Canada	0	-1.51	-1.51	0	-2.02	-2.02
France	3	-1.39	-1.11	0	-1.50	-1.50
Germany	0	-1.20	1.20	0	-1.73	-1.73
Italy	0	-0.48	-0.48	0	-1.04	-1.04
Japan	2	-1.70	-1.45	0	-2.66	-2.66
U.K.	3	-2.48	-2.16	1	-1.62	-1.68
U.S.	0	-2.57	-2.57	3	-2.66	-2.55

The MacKinnon (1991) critical value rejecting the null hypothesis of a unit root or nonstationarity is -3.45 at the five- percent level of significance.

Table 4 reports the results of the pair-wise Johansen Cointegration test. The lag lengths were determined by selecting the lag length that minimized the AIC for each of the bivariate vector autoregressions. The model chosen for the cointegration test allows for a deterministic trend in the data and a constant in the cointegration equation. The test statistic reported is the Trace test statistic (see Johansen, 1988 and Johansen & Juselius, 1990). The null hypothesis for the Trace test in a bivariate relationship is no cointegration or no common trends among the variables.

Table 4: Results of the Johansen cointegration test

	Local Currencies		U.S. Dollar	
	Lag	Trace Test Statistic	Lag	Trace Test Statistic
U.S. and Canada	2	4.28	2	4.56
U.S. and France	4	7.01	2	5.97
U.S. and Germany	2	9.56	1	6.59
U.S. and Italy	1	4.00	4	6.89
U.S. and Japan	1	14.35	2	4.70
U.S. and U.K.	2	11.67	2	4.12

The null hypothesis is no cointegration and the 5% critical value is 15.41 (Osterwald-Lenum, 1992).

The null hypothesis of no cointegration cannot be rejected at the five-percent level for any of the countries, whether the returns are given in local currency or denominated in U.S. dollars. At the ten percent level of significance, the null hypothesis of no cointegration can be rejected for the returns for the U.S. and Japan government bond markets. The inability to reject the null hypothesis indicates that the returns between the U.S. and the other six countries of the G-7 do not share a long-run relationship or risk factor on a pair-wise basis. This result suggests that U.S. investors can achieve diversification benefits by forming a portfolio of U.S. government bonds with bonds of any one of the other six countries in the G-7.

Bivariate cointegration tests can overlook more complex relationships between these countries. To provide a more comprehensive test for the possibility of long run relationships, the G-7 is tested as a group. Table 5 shows the results for the multivariate cointegration test. The null hypothesis of no cointegration (none) is rejected at the five percent critical value, indicating that the bond markets of the G-7 share a long-run relationship. Given that only one long-run relationship appears to exist among these seven countries, the relationship is not very stable.

Table 5: Results of the multivariate Johansen cointegration test for G-7 countries

	Local Currency	U.S. Dollar	
Hypothesized Number of Cointegrating Vectors	Trace Test Statistic	Trace Test Statistic	Critical Value (5%)
None	132.88*	124.56*	124.24
One	90.81	82.51	94.15
Two	58.55	56.50	68.52
Three	38.53	36.82	47.21
Four	20.09	19.42	29.68
Five	7.35	6.39	15.41
Six	1.27	0.29	3.76

* Indicates statistical significance at the 0.05 level.

It is possible that the nature of the relationship has changed over the time period under study. It is commonly argued that with increased globalization and technological improvements, financial markets will become more integrated over time. Bremnes, Gjerde, & Saettem (1997) find in their study of currency yields on U.S. dollars, U.K. pounds, German marks, French francs, and Japanese yen that the number of cointegrating vectors increases over time.

As the number of cointegrating vectors increase, the cointegrated system is considered more stable or integrated. As in Dickey, Jansen, & Thornton (1991), cointegrating vectors reflect economic constraints imposed on the movements of variables in the system in the long run. As a result, a system is more stable when it has a greater number of cointegrating vectors.

While only one cointegrating vector was found using both local currency and U.S. dollar denominated return indexes, it is possible to determine if there have been periods of increased

stability in the relationship among the G-7 government bond markets using recursive cointegration tests. Employing the methodology for recursive cointegration tests outlined by Bremnes, Gjerde, & Saettem (1997), as many as three cointegrating vectors were found. While it is possible with seven variables to have as many as six cointegrating vectors, there is no evidence of more than three cointegrating vectors. The results indicate that the G-7 government bond markets have experienced periods of increased integration but there is no evidence of progressive integration. The results of the recursive cointegration tests can be found in Figures 1 through 4 in Appendix A.

The evidence of cointegration implies that long-run trends exist between at least some of the countries. The cointegration detected for these seven countries could be a shared relationship between any subset of two or more countries. It is possible to determine which countries "belong" in the cointegrating equation via formal testing through parameter restrictions. The parameter exclusion test is a likelihood ratio test and is discussed in Johansen & Juselius (1990). The test statistic is distributed chi-squared with one degree of freedom since only one parameter is being restricted. Table 6 reports the results of the restriction tests. The null hypothesis for the test is that the selected variable can be restricted to zero, implying that the variable does not belong in the cointegrating vector. Rejection of the null means that the restriction is not binding and that the variable is statistically significant in the cointegrating equation. For the returns denominated in local currencies, the null hypothesis not rejected for Italy and U.K. According to this evidence, all the countries belong in the cointegrating equation except for Italy and the U.K. Looking at the U.S. dollar denominated return indexes, these results indicate that Canada, Japan, and the U.K. are not significant in the cointegrating equation. This implies a long-term relationship between the government bond returns for France, Germany, Italy, and the U.S

Table 6: Tests for exclusion of variables in the cointegrating vector

	Local Currency	U.S. Dollar
	Test Statistic	Test Statistic
Canada	8.44*	2.30
France	7.58*	15.70*
Germany	8.42*	16.33*
Italy	3.71	13.99*
Japan	4.72*	3.34
U.K.	1.30	0.41
U.S.	10.08*	4.28*

* Indicates significance at the 0.05 percent level

To investigate the short-run dynamics involved with the long-run relationships, Tables 7 and 8 show the results of the ECM for the returns in local currency and U.S. dollar respectively. In Table 7, the error correction term is significant for France and the U.S. In Table 8, the error correction term is significant only for Italy.

Table 7: Results of the error correction model for Canada, France, Germany, Italy, and U.S. (Local Currency)

Regressor	Regressand				
	Canada	France	Germany	Japan	U.S.
Error	-0.024	-0.037	-0.017	-0.015	-0.049
Correction	(-1.760)	(-3.592)*	(-1.943)	(-1.416)	(-4.204) *
Constant	0.001	0.001	0.001	0.001	0.001
	(3.584)*	(4.729)*	(5.245)*	(3.130)*	(3.744)*
$Canada_{-1}$	0.075	-0.071	-0.028	-0.024	0.058
	(0.933)	(-1.157)	(-0.535)	(-0.400)	(0.842)
$France_{-1}$	0.163	-0.101	0.023	-0.125	-0.024
	(1.181)	(-0.965)	(0.258)	(-1.195)	(-0.119)
$Germany_{-1}$	-0.128	0.124	-0.064	0.152	0.085
	(-0.746)	(0.954)	(-0.584)	(1.169)	(0.574)
$Japan_{-1}$	0.122	-0.048	-0.013	0.074	0.037
	(1.704)	(-0.892)	(-0.290)	(1.370)	(0.609)
$U.S._{-1}$	-0.156	0.048	0.018	-0.041	-0.223
	(-1.593)	(0.650)	(0.295)	(-0.546)	(-2.647)*
Adj. R^2	0.010	0.025	-0.003	0.003	0.051

* Indicates statistical significance at the 0.05 level. The t-statistics are given in parenthesis.

Table 8: Results of the error correction model for France, Germany, Italy, and U.S. (U.S. Dollar)

	France	Germany	Italy	U.S.
Error	0.003	0.002	-0.007	0.002
Correction	(1.305)	(0.581)	(-2.687)*	(1.710)
Constant	0.001	0.000	0.001	0.001
	(0.839)	(0.524)	(1.243)	(3.990)*
France-1	-0.172	-0.010	-0.072	0.058
	(-0.979)	(-0.056)	(-0.392)	(0.759)
Germany-1	0.165	0.013	0.161	-0.029
	(1.040)	(0.078)	(0.969)	(-0.424)
Italy-1	-0.040	-0.053	-0.084	-0.023
	(-0.587)	(-0.743)	(-1.163)	(-0.776)
U.S.-1	0.141	0.121	0.146	-0.124
	(1.143)	(0.949)	(1.129)	(-2.305)
Adj. R^2	0.004	-0.008	0.015	0.008

* Indicates statistical significance at the 0.05 level. The t-statistics are given in parenthesis.

Turning to the lagged relationships, it is interesting to see that regardless of the currency, there are no significant lagged relationships between the weekly returns for the countries. This means that past returns in these markets do not influence current returns in other countries. The absence of significant lagged relationships is evidence of weak-form efficiency for these bond markets.

CONCLUSIONS

The object of this study is an examination of total returns to government bonds of the G-7 countries in light of long-term relationships. The results of the pair-wise tests provide preliminary results that can be interpreted as diversification opportunities for U.S. investors with government securities of the G-7. The only country that stands in exception is Japan. Further investigating the G-7 as a group reveals that the group shares a long-run relationship regardless of whether the returns are denominated in local currency or U.S. Dollars. This evidence diminishes the potential for diversification benefits to U.S. bond investors considering these markets for their bond portfolios.

Using cointegration tests, the possibility of comovements or long-run relationships between the U.S. government bond market and the remaining G-7 government bond markets was explored. The bivariate cointegration tests indicate that the U.S. government bond market does not share common risk factors or comovements with any of the other government bond markets in the G-7 countries with perhaps Japan being an exception. Further cointegration testing was conducted to determine whether the G-7 government bond markets share a more complex relationship. Cointegration tests, along with exclusion tests, indicated that Canada, France, Germany, Japan, and the U.S. bond markets share a common trend when local currencies are considered. For the U.S. investor that is exposed to currency risk, the nature of the relationship changes. In this case, the U.S. government bond market shares a long-run relationship with France, Germany, and Italy. The ECM revealed the complexity of the relationship among these bond markets.

Three overall implications are suggested by the above results for investors in G-7 country bonds, particularly those who hold U.S. bonds. First, pair-wise results suggest that there are possible diversification benefits for holders of U.S. bonds. Second, investors seeking diversification benefits by investing in both U.S. government bonds and multiple government bonds of the G-7 countries should use caution since the cointegration of these bond markets implies a shared risk factor. Third, there is little evidence that these markets have become more integrated over time.

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Appendix A: Results of Recursive Cointegration Tests

Figure 1: Recursive Cointegration Test for G-7: Zero Cointegrating Vectors

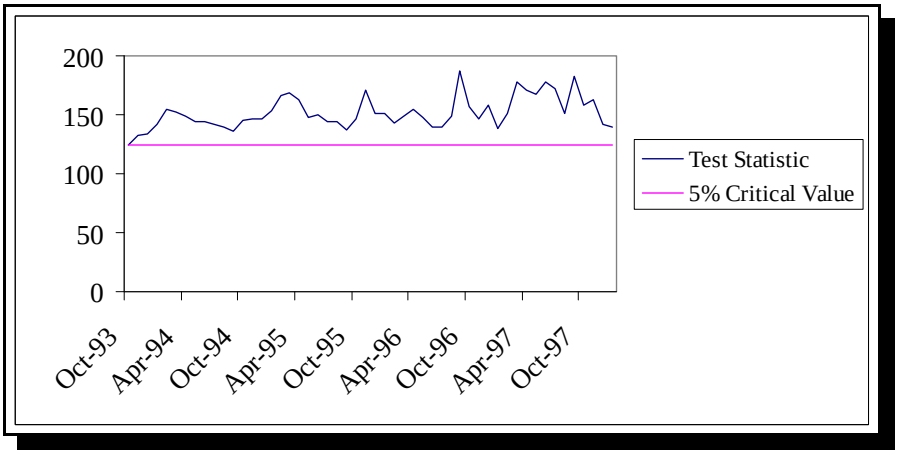

Figure 1 shows the Trace Test Statistic for zero cointegrating vectors for the government bond market returns denominated in U.S. dollars. The figure indicates that the null hypothesis of zero (no cointegration) cointegrating vectors can be rejected for all periods. There is at least one cointegrating vector for the returns in the G-7 government bond markets.

Figure 2: Recursive Cointegration Test for G-7: One Cointegrating Vector

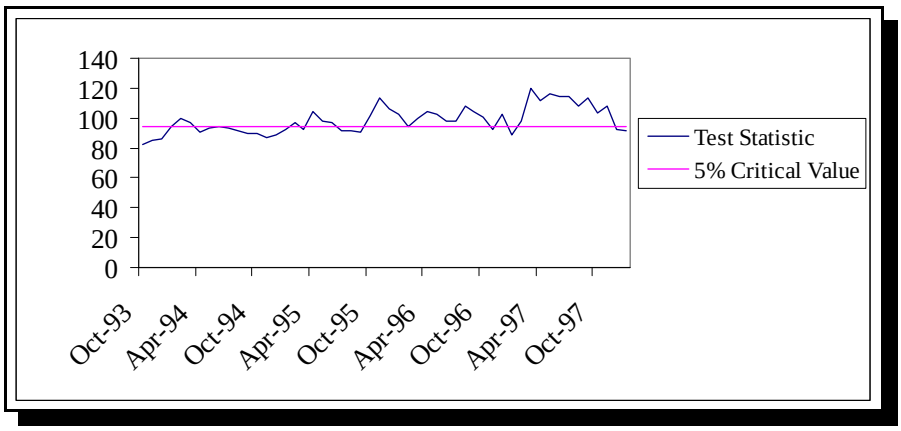

Figure 2shows the Trace Test Statistic for one cointegrating vector for the government bond market returns denominated in U.S. dollars. The figure shows that the null hypothesis of one cointegrating vector is rejected for most periods, indicating the existence of at least two cointegrating vectors.

Figure 3: Recursive Cointegration Test for G-7: Two Cointegrating Vectors

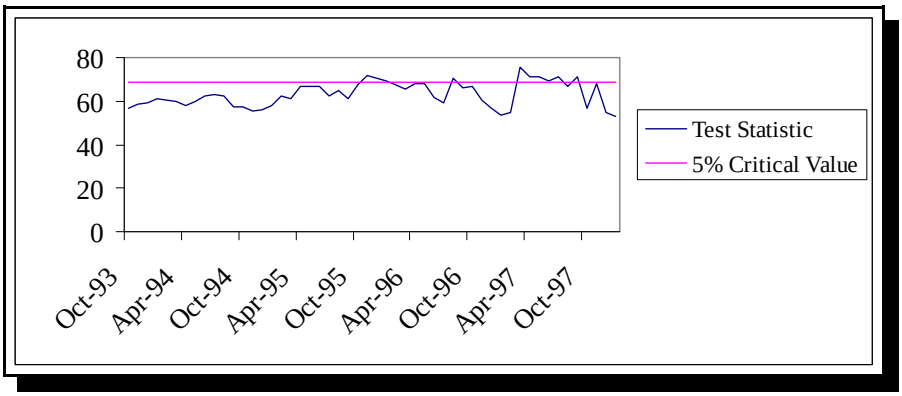

Figure 3 shows the Trace Test Statistic for two cointegrating vectors for the government bond market returns denominated in U.S. dollars. The figure shows that the null hypothesis of two cointegrating vectors is rejected for some periods, indicating the existence of at least three cointegrating vectors.

Figure 4: Recursive Cointegration Test for G-7: Three Cointegrating Vectors

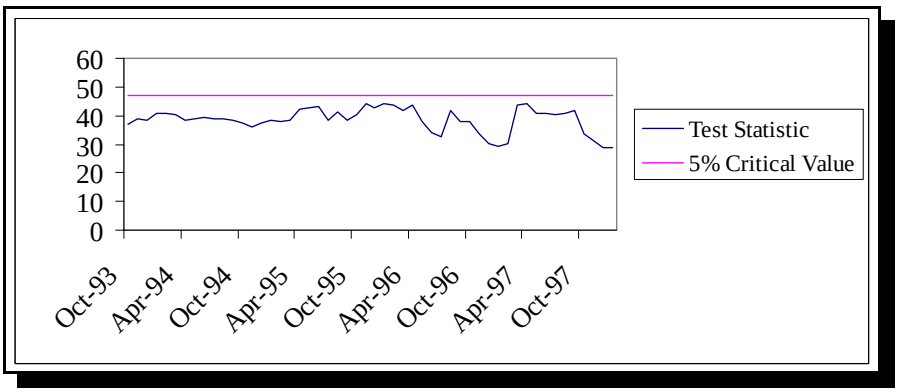

Figure 4 shows the Trace Test Statistic for three cointegrating vectors for the government bond market returns denominated in U.S. dollars. The figure indicates that the null hypothesis of three cointegrating vectors cannot be rejected over any period periods. There are never more than three cointegrating vectors over the period under study.