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Marianne James
California State University, Los Angeles

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EDITORIAL REVIEW BOARD

TABLE OF CONTENTS

VALUE, GROWTH, SIZE AND PERFORMANCE ALONG MAJOR MARKET TRENDS: EVIDENCE FROM THE U.S. SEMICONDUCTOR FIRMS

Anthony Yanxiang Gu, State University of New York, Geneseo

ABSTRACT

Growth stock outperformed value stock, and small stock outperformed large stock over the bullish period September 1998 – March 2000; value stock outperformed growth stock, and small stock again outperformed large stock over the bearish period March 2000 – October 2002. Reversal of performance differences between typical types of stock may signal reversal of the bullish trend. Granger causality tests show that secondary value stock and large stock lead the trend (only in timing), followed by blend stock and medium stock during the bullish market period; growth stock and large stock lead the trend during the bearish market period. These results help to explain why researchers have reported conflicting opinions in the literature.

INTRODUCTION

Researchers and investors have always been interested in finding predictors of returns of stocks with different features. Basu (1977, 1983) examined stocks listed on the New York Stock Exchange from December 1962 through 1978 and finds that portfolios of high E/P ratio stocks have higher average returns than portfolios of low E/P ratio stocks. Reinganum (1988), and Famma and French (1992) also show that value stocks perform better than growth stocks. Specifically, Famma and French (1998) examined value stocks of thirteen countries from 1975 to 1995 and report consistent evidence that value stocks on average generated higher returns than growth ones in the period, they (1992) also report that stocks with the highest book-to-market value ratio (value stock) had a significantly higher average monthly return than stocks with the lowest book-to-market value ratio (growth stock) during the period July 1963 through December 1990. Recently, Chan and Lakonishok (2004) review and update the literature of value and growth investing; they report "value investing generates superior returns." To the contrary, studies found the opposite evidence. Nancy Beneda (2002) reports that "growth stocks outperform value stocks over the long term." Meanwhile, researchers have been trying to explain the value-growth phenomenon. Fama and Campbell (2000) provide extensive surveys of the theoretical issues related to the debate over growth-value investing. Bhushan (1989) find that growth stocks attract more analyst reports and media coverage, and analysts like to recommend successful stocks to generate trading commissions and money managers tend to avoid stocks with recent lackluster performance. These considerations may make growth stocks over priced and value stocks underpriced relative to their fundamentals which may result in poor performance of the growth and better performance of the value in the

following period. Jegadeesh and Titman (1993) find a tendency that bad or good performance of certain stocks continues over time. This tendency would make the poorly performing stocks value stocks and the well performing ones growth stocks. Morrin et al (2002) suggest that sizable group preferences for either growth stocks (e.g., momentum investors) or value stocks (e.g., contrarian investors) could presumably cause such assets' price levels to deviate from rational values.

Ferson and Harvey (1999) used conditioning information to predict the value premium, and find that conditioning variables, such as value and momentum, can explain larger returns. Piotroski (2000) used financial statement data to find better performing value stocks. Hirshleifer (2001) finds investor psychology contributes to the value premium. Contrarily, White (2000) find that economic fundamentals affect variation in P/E ratios over time, thus growth stocks are not over priced and value stocks are not undervalued relative to their fundamentals. Hence, value stocks are not necessarily better investments.

Recently, researchers are trying to find reasons for the growth/value effect. Lettau, M., and J. Wachter (2007), Chen, Petkova, and Zhang (2008), and Campbell, Polk, and Vuolteenaho (2010) argue that growth and value stocks perform differently because they have different sensitivities to macroeconomic risks, and the risks vary over time. Hwang et cent (2010) show that the value effect can be explained by stockholders' limited liability, as their sensitivity to default risk becomes smaller as size increases and as value decreases. Piochoski and So (2012) agree that returns of growth (value) stocks reflect systematically optimistic (pessimistic) expectations and document that revisions to market expectations are predictably concentrated (absent) among stocks with biased (unbiased) market expectations.

Fama and French (2011) report that there are value premiums in North America, Europe, Japan, and Asia Pacific in average stock returns, and except for Japan, the premium decreases with size. Researchers noted the size effect several decades ago. Banz (1981) analyzed stocks from 1936 to 1975, Keim (1983) analyzed stocks from 1963 to 1979, followed by Blume and Stambaugh (1983), they all report that small firm stocks have higher average returns than large firm stocks; Reinganum (1983) notices that small firms experience the highest returns in January. Hwang et cent (2010) show that the size effect can be explained by stockholders' limited liability, as their sensitivity to default risk becomes smaller as size increases and as value decreases. Mathijs (2011) point out that the size premium in the U.S. has been positive and large in recent years, while we know little about the remarkable shifts in the size premium in the past few decades.

However, because of the limit of their sample periods there is no report in the literature on which type of stocks performs better during a major market trend, and more importantly, which type of stocks leads a major market trend. Moreover, no research in the literature has tried to control the distortion caused by different performances of firms in different industries.

The recent strong trends of the U.S. stock market provide an opportunity for this study. From September 1998 to March 2002, the U.S. stock market experienced one of the

largest bullish trends in the history, the S&P 500 Index increased from 957 to 1,527 from August 31, 1998, to March 24, 2000; the NASDAQ Index increased from 1,499 to 5,049 from August 31, 1998 to March 10, 2000, followed by one of the most severe bearish trends in the history, the S&P 500 Index declined to 777, and the NASDAQ Index declined to 1,114 from March 2000 to October 9, 2002. The Dow Jones Industrial Average slid from its intraday peak of 11,750 on Jan. 14, 2000 to an intraday low of 7,181 on Oct. 10, 2002. In order to find if a pattern of return behavior of certain type of stocks in the bullish trend repeat itself in the next bullish trend, we also examine returns of the stocks in the following bullish trend from October 2002 to early 2004 in which, the S&P 500 Index peaked at 1158 on February 11, the NASDAQ Index peaked at 2,154 on January 26 and the DJIA peaked at 10737 on February 11.

In this study we examine the relative performance of stocks with different features, such as value and growth, small and large. It is generally recognized that companies in different sectors or industries have different characteristics in operation and face different factors in their markets, and therefore their stocks behave differently in terms of timing and growth rates. To minimize the distortion caused by performance differences of firms in different industries, we analyze stocks from a single sector, the semiconductor sector. The companies in this sector are generally similar in the sense of their operation and the market factors they face.

We obtained data of daily close, price to book value (P/B) ratio and total asset for 103 semiconductor firms. Data of P/B ratio and total asset as of the beginning of the market trend would be ideal for the categorization, i.e., P/B ratio and total asset as of the end of August 1998 for the bullish market period and data as of the middle of March 2000 for the bearish market period. Since only year-end data is available, we have to use the 1998 year-end data for the bullish market period and the 1999 year-end data for the bearish market as approximations, and we believe that a quarter's difference will not affect the purpose and results of this study.

We divide our sample of semiconductor stocks into two groups, one group is based on size, measured by total assets of the firm, and the other is based on value/growth, measured by P/B ratio. We use total assets to measure firm size because market capitalization or total market value of a firm is directly related to its share price. Each group is then further subdivided into five quintiles, the first quintile in the size group includes the smallest 20 percent of stocks…, the fifth quintile includes the largest 20 percent of stocks. The first quintile in the value/growth group includes the lowest 20 percent based on P/B ratios (value stocks),…, the fifth quintile includes the highest 20 percent of stocks based on P/B ratios (growth stocks).

PERFORMANCE OF THE STOCKS

We begin with a hypothesis that value stocks do not outperform growth stocks. This is a challenge to the majority of the reports in the literature. Then we test the hypothesis by examining the performance of the growth and value portfolios along major market trends

before drawing any conclusion. Performance is measured by cumulative return during a trend, which is calculated as:

$$\text{Cumulative Return} = \ln(\text{price}_{ti}) - \ln(\text{price}_{t0})$$

$$i = 1,2,3,\ldots.n$$

where, price_{ti} is the i^{th} trading day's closing price, price_{t0} is the closing price of the day before the trend, e.g., August 31, 1998 for the NASDAQ for the bullish trend, and price_{tn} is the closing price of the day of the end of the trend, e.g., March 10, 2000 for the NASDAQ for the bullish trend.

Charts 1a through 6b and Table 1 display the performance of the stocks, based on their cumulative return over each sub-period, and differences between the performances of different types of stocks. As shown in Charts 1a and 1b, and Table 1, growth stocks on average exhibited higher cumulative return than value stocks over the bullish market period, cumulative returns of stocks in the fifth quintile (growth) are the highest for about half of the bullish period then surpassed by stocks in the fourth quintile, or the secondary growth stocks that exhibited the highest cumulative return by the end of the period. In contrast, value stocks offered the lowest cumulative return for most of the period, even negative for almost half of the period, although stocks in the second quintile or the secondary value stocks offered the second highest cumulative return by the end of the period. Hence, value-growth is not consistently related to stock performance during the bullish market period.

Charts 2a and 2b demonstrate the performance of stocks with different sizes in the bullish period, from which and Table 1 one can see small stocks performed the best by the end of the period although did the worst for about half of the time; large ones performed the best for most of the time in the period but being left behind at the end. Stocks in the second quintile were the best performers at the end. Hence, firm size is not consistently related to stock performance during the bullish market period.

During the bullish market period, the performance difference between stocks in different quintiles of the P/B ratio group were the largest in December 1998, the difference narrowed in early 1999 and then widened somewhat through the end of the period. For example, the natural logarithm differential between quintile five growth and quintile one value stocks is 0.6372 = 0.4518 – (– 0.1854), or 196 percentage points, that is, prices of the growth stocks increased by 157 percent (= $e^{0.4518}$), while prices of the value stocks decreased by 16.92 percent (= $e^{-0.1854} - 1$) at the time. At the end of the bullish period, cumulative returns between the fourth quintile stocks, the best, and the first quintile stocks, the worst, is 164 percentage points, or the natural logarithm differential is 0.4915 = 1.6948 – 1.2033. For the size group, performance differences between stocks in different quintiles were the largest in August 1999.

During the bearish market period, as displayed in Chart 3a, 3b and Table 1, value stocks declined the least, followed by stocks in the second quintile, while growth stocks declined the most. As shown in Charts 4a, 4b and Table 1, medium size stocks declined

the most, followed by large stocks, while stocks in the second quintile declined the least. The results indicate no clear relationship between performance and firm size. However, this evidence proves the opposite against the traditional opinion that large firm stocks are safer in bearish market trend.

Along the bearish trend, the difference between value and growth stock returns increased sharply through the period, the natural logarithm differential between value and growth stocks reached 1.23 (= -1.585 – -2.8154) by the end of the period, or price of value stocks declined 79.5 percent (= $e^{-1.585}$ -1), while the price of growth stocks declined by 94 percent (= $e^{-2.8154}$ – 1) during the bearish period. However, the gap between large and small stock returns exhibited significant fluctuations. The natural logarithm differential between returns of large stocks and small ones bottomed at -0.4 (= -1.003 – -0.6019) on October 15, 2000, peaked at 0.4063 (= -1.0344 – -1.4407) on March 10, 2002, then declined to -0.001 at the end of the period. The largest difference occurred between returns of quintiles 2 and 1, or the secondary small and small stocks on May 17, 2002, which is 0.624 (= -0.9191 – -1.543) or price of the secondary small stocks declined 60.11 percent (= $e^{-0.9191}$ -1), while price of small stocks declined by 78.6 percent (= $e^{-1.543}$ – 1) as of March 10, 2002. This evidence further indicates no relationship between stock size and performance.

Along the bullish trend from October 2002 to January 2004, value stocks exhibited the highest returns, followed by stocks in the second quintile, then blend stocks. And, medium size stocks performed the best, followed by stocks in the second quintile, then by large stocks. These patterns of performance are different from the previous bullish trend fall 1998 -- spring 2000.

There seems to be some signal of market trend reversal. The performance differences between growth and value (see Chart 1b), and between large and small stocks (see Chart 2b) turned to be negative from being significantly positive since January 2000, just two months before the reversal of the bullish trend. The reversal of the performance difference may signal the reversal of the strong bullish trend.

LEADERS AND FOLLOWERS ALONG THE MARKET TRENDS

To determine whether any particular type of stocks leads the way along a market trend, or if they provide a signal to a major market trend, we conduct Granger causality tests[1]. Granger (1969) proposed a test to determine whether or not a series x_t "causes" changes in the series y_t. A critical implication of Granger causality tests is that they do not prove causality in the general sense; rather they illustrate Granger-causality. That is the use of Granger causality tests reveal whether or not current and or lagged values in the series x_t improve our ability to forecast changes in y_t. The standard bi-variate Granger causality test is based on OLS regressions of the following two equations:

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \alpha_2 y_{t-2} + ... + \alpha_p y_{t-p} + \beta_1 x_{t-1} + \beta_2 x_{t-2} + ... + \beta_p x_{t-p} + u_t \quad (1)$$

[1] For more discussion about Granger-causality see Hamilton (1994) or Enders (1995).

$$x_t = \alpha_0 + \alpha_1 x_{t-1} + \alpha_2 x_{t-2} + ... + \alpha_p x_{t-p} + \beta_1 y_{t-1} + \beta_2 y_{t-2} + ... + \beta_p y_{t-p} + u_t . \quad (2)$$

The test for whether or not *x* Granger causes *y* is based on the results of an F-test on the joint hypothesis:

$$H_0 : \beta_1 = \beta_2 = ... = \beta_p = 0 .$$

If the null hypothesis is rejected, we conclude that *x* Granger-causes *y*. The same test is also applied to test whether *y* Granger-causes *x*. From the above regressions there are four potential outcomes, i.e. *x* Granger-causes *y*, *y* Granger-causes *x*, or causality runs in both directions, and finally neither *y* Granger-causes *x* or vice versa. Perhaps the most useful results would be where causality runs in only one direction, which would imply for example that by knowing past values of *x*, the forecasts of *y* are improved.

There are two potential issues to be considered when using Granger-causality tests. First, the data for both series must be transformed to eliminate autocorrelation, for example, first differencing of each series. Second, the choice of lag length may play an important role. Generally, longer lag lengths are preferable to allow for the effect of all relevant past information on *x (y)* to have an effect on *y (x)*. In our specific case the use of p = 10 includes the information from two full business weeks.

Results of the Granger-causality tests are reported in Tables 2 through 4. The tests reveal that, during the September 1998 – March 2000 bullish market period, the most significant leadership is by stocks in the second quintile of the P/B ratio group, followed by stocks in the third, fifth, fourth and first quintiles. According to the test results we reject the null hypothesis that the second quintile does not Granger cause the first, third and fourth quintiles with F-statistics of 3.86, 2.19 and 1.92, respectively. That is, stocks in the second quintile lead stocks in the first, third, and fourth quintiles or secondary value stocks lead the value, blend and secondary growth stocks. Furthermore, stocks in the third quintile (blend) also lead those in the first quintile, or value stocks, and fourth quintile, or secondary growth stocks, with F-statistics of 3.52 and 2.4. For each of the pairings the direction of Granger-causality runs in only one direction, except the pairing of V2 and V3.

The pattern repeated during the October 2002 – January 2004 bullish market period, particularly, stocks in the second and third quintiles of the P/B group lead stocks in the first quintile (value) stocks, the F-statistics are 2.18 and 1.9, respectively. Growth stocks in the fifth and fourth quintiles also show some leadership to first quintile (value) stocks. For each of the pairings the direction of Granger-causality runs in only one direction.

For the size category, during the September 1998 – March 2000 bullish market period, large stocks lead medium and small ones, i.e., stocks in the fifth and fourth quintiles, or the large and secondary large stocks, lead both the third quintile (medium) and first quintile (small) stocks. We reject the null hypothesis that the fifth and fourth quintiles do not Granger-cause the third and first quintiles, where the F-statistics are 4.46 and 2.73, and 2.18 and 2.64, respectively. For these pairings the direction of causality runs in only

one direction, as we fail to reject the null that the first and third quintiles do not Granger-cause the fifth and fourth quintiles.

This pattern of the size category did not repeat itself as the value/growth category did during the October 2002 – January 2004 bullish market period, in which, stocks in the second quintile, or secondary small stocks displayed the most significant leadership. Stocks in the second, fourth, fifth and third quintiles lead small stocks in the first quintile, with F-statistics of 3.48, 3.26, 2.92 and 2.6, respectively. Stocks in the second quintile also lead stocks in the fourth quintile, with an F-statistic of 1.84. For each of the pairings the direction of Granger-causality runs in only one direction.

During the bearish market period growth stocks lead the trend. The most significant leadership is by stocks in the fourth quintile of the P/B ratio group, followed by stocks in the fifth quintile. These two quintiles lead both the first and second quintiles' value stocks. The Granger-causality test indicates that we reject the null hypothesis that the fourth and fifth quintiles (growth stocks) do not Granger-cause the first and second quintiles (value stocks), with calculated F-statistics of 4.32, 3.44, 3.41 and 2.39, respectively. For the P/B group we also reject the null hypothesis that the second and third quintiles do not Granger-cause the first quintile, based on F-statistics of 3.4 and 3.24, respectively. The results also show some leadership of stocks in the first quintile to stocks in other quintiles, but the F-statistics are much less significant than the F-statistics for the opposite direction.

When the stocks are categorized based on size, the results indicate that large stocks in the fifth and fourth quintiles still lead small ones in the first and second quintiles in the bearish market period as was the case during the September 1998 – March 2000 bullish market period. We reject the null hypothesis that the fifth and fourth quintiles do not Granger-cause the second and first quintiles based on calculated F-statistics of 4.17, 3.86, and 3.57, respectively. In addition, stocks in the third quintile, or medium-size stocks, also lead the first quintile small stocks during the bearish market period. Based on the calculated F-statistics of 3.15 we reject the null hypothesis that the third quintile does not Granger-cause the first quintile. In all six cases where we reject the null hypothesis the direction of Granger-causality runs in only one direction. This evidence again shows the opposite against the traditional opinion that large firm stocks are safer in bearish market trend.

CONCLUSION

This study reveals that firms within the semiconductor sector categorized by size and price/book ratios exhibit different performances during both bullish and bearish market trends. Growth stock and small stock outperformed value stock and large stock along the bullish trend from September 1998 to March 2000, but value stock and medium-size stock became outperformers along the October 2002 – January 2004 bullish trend. During the bearish market period from March 2000 to October 2002, value stock outperformed growth stock and small stock performed better than medium and large stock. Neither value-growth nor firm size is consistently related to stock performance along the market trends, which indicates that one may find different results using data of different time periods and of different investment horizons. The evidence we have found help to explain why researchers

report conflicting findings in the literature. Some researchers argue that growth and value stocks perform differently because they have different sensitivities to macroeconomic risks, and the risks vary over time (Lettau, M., and J. Wachter, 2007, Chen, Petkova, and Zhang, 2008, and Campbell, Polk, and Vuolteenaho, 2010).

There seems to be some signal of market trend reversal. The performance differences between growth and value, and between large and small stocks turned from being significantly positive to being negative two months before the beginning of the bearish market trend.

Granger-causality tests show that secondary value and blend shares lead the trend in both bullish market periods, growth stock lead the trend during the bearish market period, large stock lead the trend in both the bullish and the bearish market periods from September 1998 to October 2002, and medium size shares lead small ones in the second bullish market period.

We are examining shares of different industries/sectors and the initial results do not show the same pattern. Further research on stocks of different industries is needed in order to reveal potential patterns of return behavior and to find the reasons for the return behaviors.

REFERENCES

Banz, Rolf. "The Relationship between Return and Market Value of Common Stocks." *Journal of Financial Economics* 9 (March 1981), pp. 3−18.

Basu, Sanjoy. "The Investment of Performance of Common Stocks in Relation to Their Price-Earnings Ratios: A Test of the Efficient Market Hypothesis." *Journal of Finance* 32 (June 1977), pp. 663−82.

_____. "The Relationship between Earnings Yield, Market Value, and Return for NYSE Common Stocks: Further Evidence." *Journal of Financial Economics* 12 (June 1983), pp.129−56.

Beneda, Nancy. "Growth Stocks Outperform Value Stocks over the Long Term." *Journal of Asset Management*, (Sep 2002), 3: 112-124.

Bhushan, Ravi. "Firm Characteristics and Analyst Following." *Journal of Accounting and Economics*, (July 1989) 11: 255-274.

Blume, Marshall E., and Robert F. Stambaugh. "Biases in Computed Returns: An Application to the Size Effect." *Journal of Finance Economics*, 1983, pp. 387−404.

Campbell, John Y. "Asset Pricing at the Millennium." *Journal of Finance*, (August 2000) 55(4): 1515-1567.

Campbell, J., C. Polk, and T. Vuolteenaho. 2010. Growth or Glamour? Fundamentals and Systematic Risk in Stock Returns. *Review of Financial Studies*, 23:306–44.

Chan , L. K.C., and Lakonishok, J. "Value and Growth Investing: Review and Update." *Financial Analysts Journal*, (Jan/Feb 2004), 60: 71-87.

Chen, L., R. Petkova, and L. Zhang. 2008. The Expected Value Premium. *Journal of Financial Economics*, 87:269–80.

Enders, W., Applied Econometric Time Series, John Wiley & Sons, Inc. 1995.

Fama, Eugene F. "Market Efficiency, Long-term Returns, and Behavioral Finance." *Journal of Financial Economics*, 1998, 49(3)" 283-306.

Fama, Eugene F. and Kenneth R. French. "The Cross Section of Expected Stock Returns," *Journal of Finance*, (June1992), 427-765.

Fama Eugene F. and Kenneth R. French. "Value versus Growth: The International Evidence." *Journal of Finance* (December 1998), 53(6): 1975-1999. 1998

Fama, Eugene F. and French, Kenneth R., Size, Value, and Momentum in International Stock Returns (June 21, 2011). Fama-Miller Working Paper; Tuck School of Business Working Paper No. 2011-85; Chicago Booth Research Paper No. 11-10.

Ferson, Wayne E. and Campbell R. Harvey. "Conditioning Variables and the Cross Section of Stock Returns." *Journal of Finance*, (August 1999) 54(4): 1325-1360.

Granger, C.W.J., "Investigating Causal Relations by Econometric Models and Cross-Spectral Methods." *Econometrica* 1969, 37: 424-38.

Hamilton, J.D., Time Series Analysis, Princeton University Press, 1994.

Hirshleifer, David. "Investor Psychology and Asset Pricing." *Journal of Finance* (August 2001) 56(4): 1533-1597.

Hwang, Y.-S., H.-G. Min, J.A. McDonald, H. Kim, and B.-H. Kim, Using the credit spread as an option-risk factor: size and value effects in CAPM, *Journal of Banking and Finance*, 2010, 34, 2995–3009

Jegadeesh, Narasimhan and Sheridan Titman. "Returns to Buying Winners and Selling Losers: Implications for Stock Marke Efficiency." *Journal of Finance* (March 1993) 48, 65-91.

Keim, Donald B. "Size Related Anomalies and Stock Return Seasonality: Further Empirical Evidence." *Journal of Financial Economics* 12 (June 1983), pp.13−32.

Lettau, M., and J. Wachter. 2007. Why Is Long-horizon Equity Less Risky? A Duration-based Explanation of the Value Premium. *Journal of Finance*, 62:55–92

Mathijs A. van Dijk, Is size dead? A review of the size effect in equity returns, *Journal of Banking & Finance*, 2011, 35(12): 3263-3274.

Morrin, Maureen; Jacob Jacoby; Gita Venkataramani Johar; Xin He; Alfred Kuss, and David Mazursky, 2002, Taking stocks of stockholders: exploring momentum versus contrarian investor strategies and profiles. *Journal of Consumer Research*, 29(2): 188-198.

Piotroski, Joseph. "Value Investing: The Use of Historical Financial Statement Information to Separate Winners from Losers." Journal of Accounting Research 2000, 38(Supplement): 1-41.

Piotroski Joseph and Eric So. Identifying Expectation Errors in Value/Glamour Strategies: A Fundamental Analysis Approach, *Review of Financial Studies*, 2012, 25(9): 2841-2875.

Reinganum, Marc R. "The Anomalous Stock Market Behavior of Small Firms in January: Empirical Tests for Tax-Loss Effects." *Journal of Financial Economics* 12 (June 1983), pp. 89−104.

Reinganum, Marc R. "The Anatomy of a Stock Market Winner," *Financial Analysts Journal*, March-April 1988, 272-284

White, Barry. "What P/E Will the U.S. Stock Market Support?" Financial Analysts Journal, 2000, 56: 30-38.

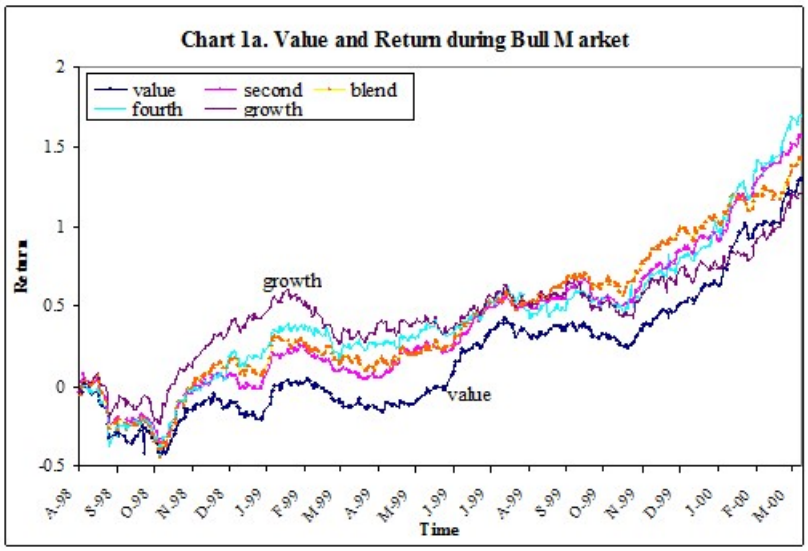
Chart 1a. Value and Return during Bull M arket
value
second
blend
fourth
growth
Return
growth
value
Time

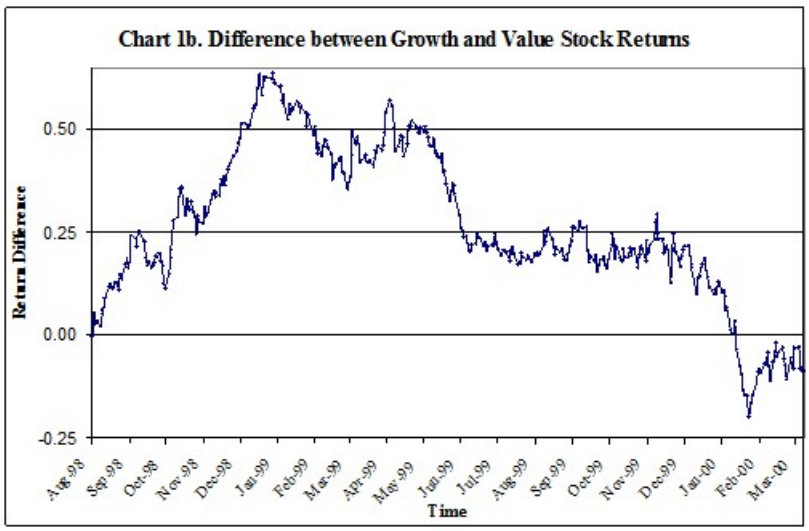
Chart 1b. Difference between Growth and Value Stock Returns
Return Difference
Time

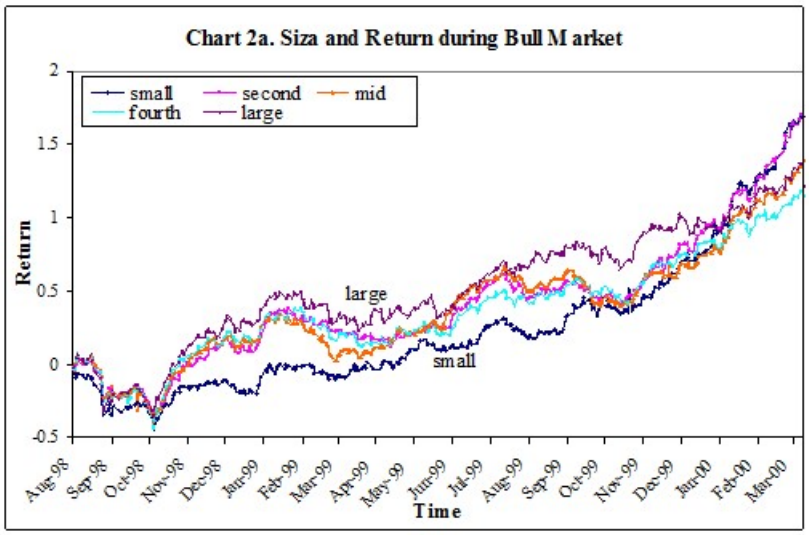
Chart 2a. Siza and Return during Bull M arket
small
second
mid
fourth
large
Return
2
1.5
1
0.5
0
-0.5
large
small
Aug-98
Sep-98
Oct-98
Nov-98
Dec-98
Jan-99
Feb-99
Mar-99
Apr-99
May-99
Jun-99
Jul-99
Aug-99
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Nov-99
Dec-99
Jan-00
Feb-00
Mar-00
Time

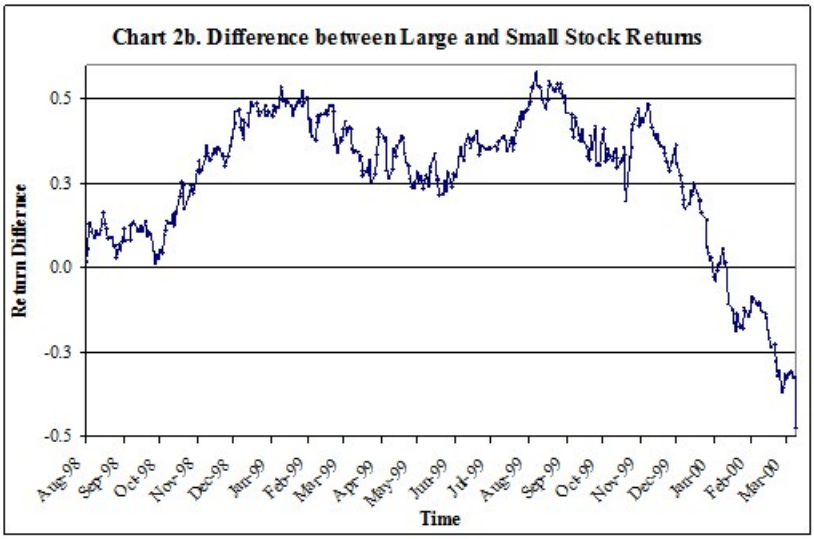


Chart 2b. Difference between Large and Small Stock Returns
Return Difference
0.5
0.3
0.0
-0.3
-0.5
Aug-98
Sep-98
Oct-98
Nov-98
Dec-98
Jan-99
Feb-99
Mar-99
Apr-99
May-99
Jun-99
Jul-99
Aug-99
Sep-99
Oct-99
Nov-99
Dec-99
Jan-00
Feb-00
Mar-00
Time

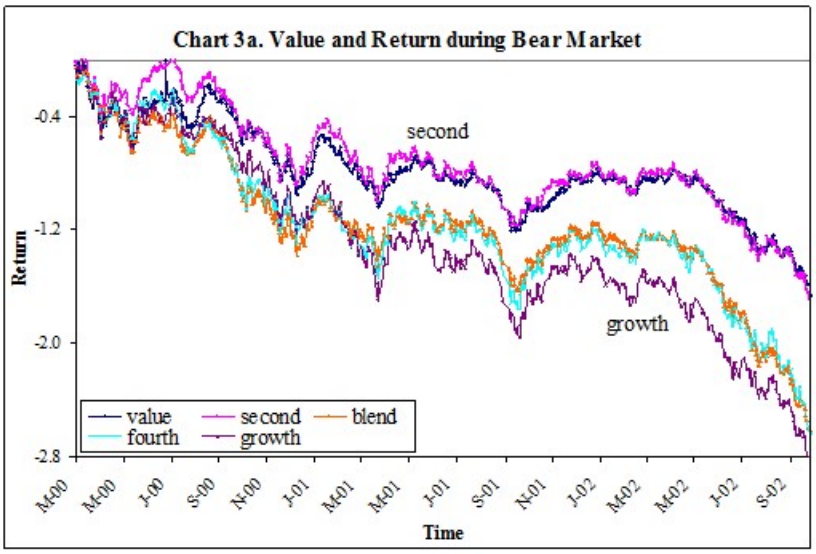


Chart 3a. Value and Return during Bear Market
Return
-0.4
-1.2
-2.0
-2.8
second
growth
value
second
blend
fourth
growth
M-00
M-00
J-00
S-00
N-00
J-01
M-01
M-01
J-01
S-01
N-01
J-02
M-02
M-02
J-02
S-02
Time

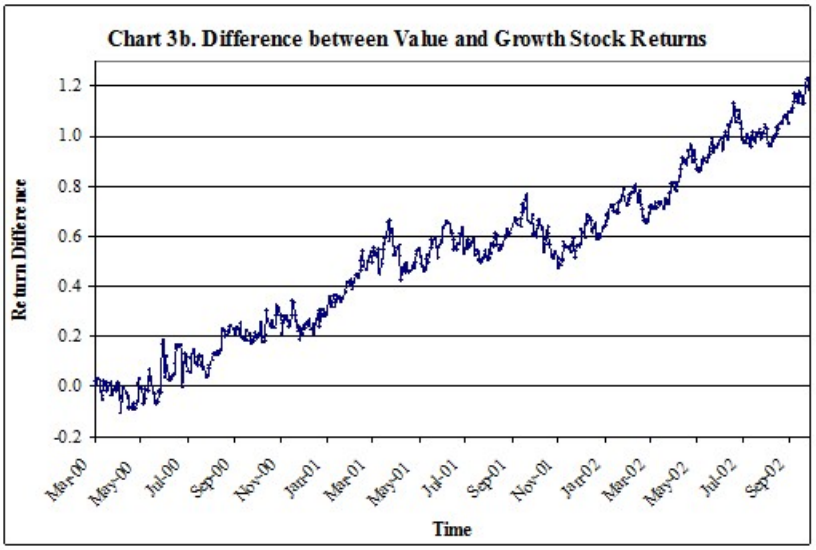


Chart 3b. Difference between Value and Growth Stock Returns
Return Difference
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
Mar-00
May-00
Jul-00
Sep-00
Nov-00
Jan-01
Mar-01
May-01
Jul-01
Sep-01
Nov-01
Jan-02
Mar-02
May-02
Jul-02
Sep-02
Time

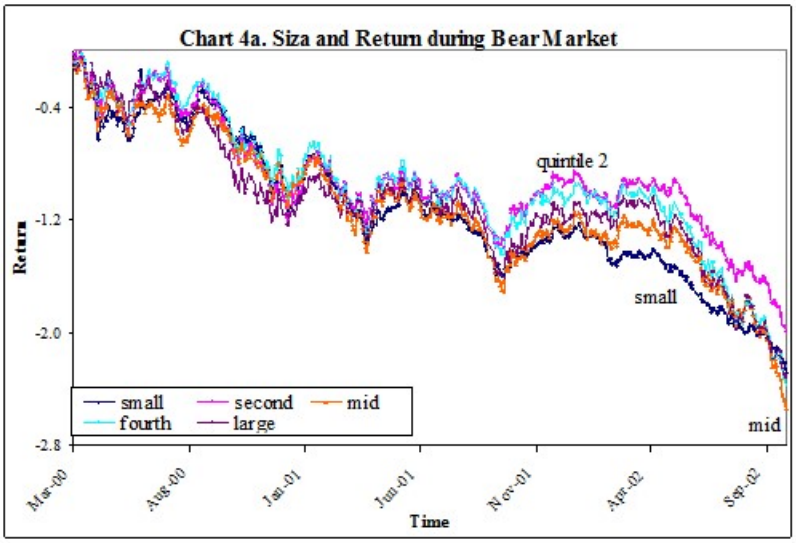


Chart 4a. Siza and Return during Bear Market
Return
-0.4
-1.2
-2.0
-2.8
quintile 2
small
mid
small
second
mid
fourth
large
Mar-00
Aug-00
Jan-01
Jun-01
Nov-01
Apr-02
Sep-02
Time

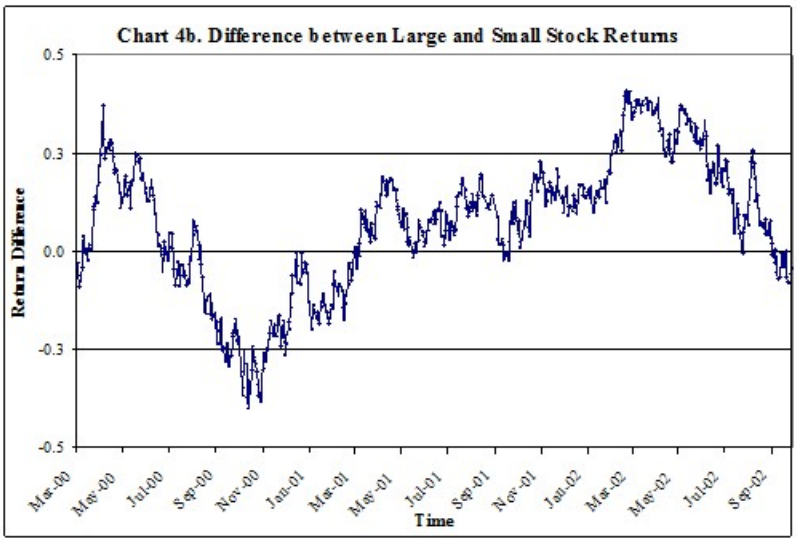


Chart 4b. Difference between Large and Small Stock Returns
Return Difference
0.5
0.3
0.0
-0.3
-0.5
Mar-00
May-00
Jul-00
Sep-00
Nov-00
Jan-01
Mar-01
May-01
Jul-01
Sep-01
Nov-01
Jan-02
Mar-02
May-02
Jul-02
Sep-02
Time

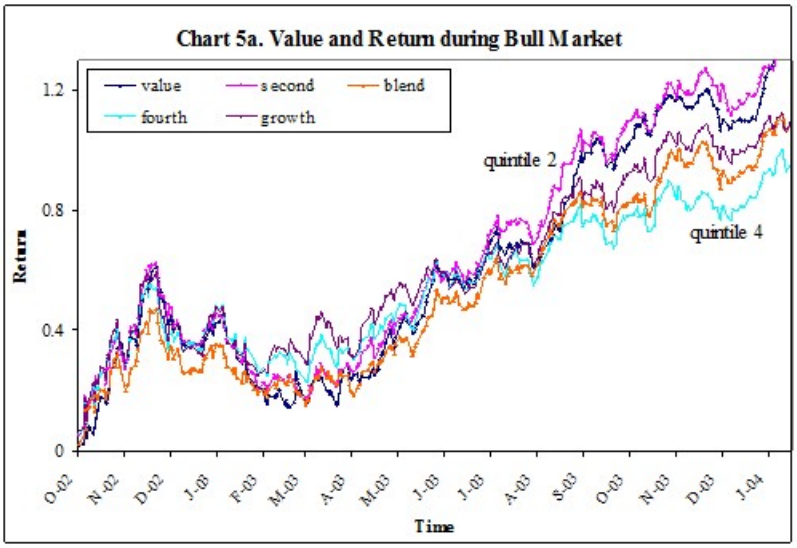


Chart 5a. Value and Return during Bull Market
value
second
blend
fourth
growth
quintile 2
quintile 4
Return
Time
1.2
0.8
0.4
0
O-02
N-02
D-02
J-03
F-03
M-03
A-03
M-03
J-03
J-03
A-03
S-03
O-03
N-03
D-03
J-04

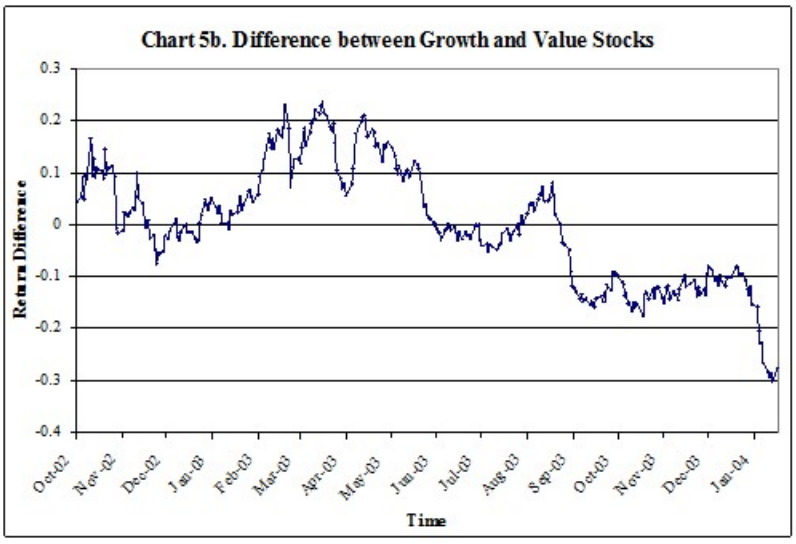


Chart 5b. Difference between Growth and Value Stocks
Return Difference
Time
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
Oct-02
Nov-02
Dec-02
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Dec-03
Jan-04

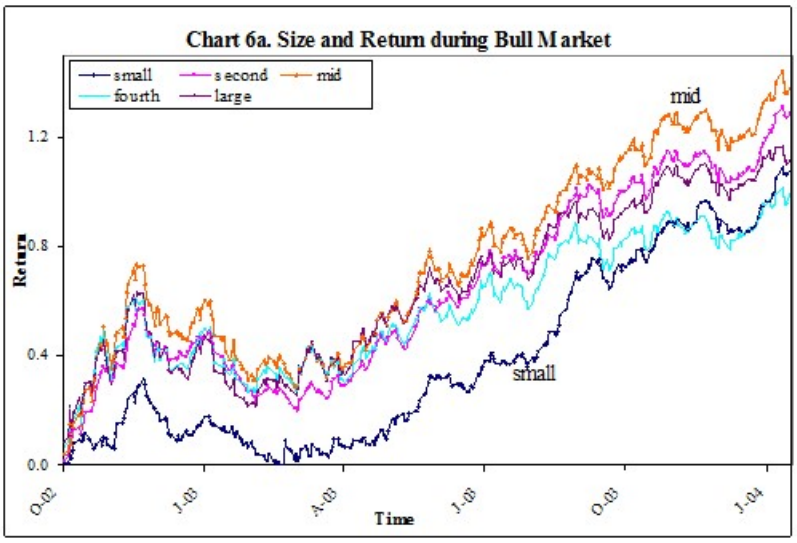


Chart 6a. Size and Return during Bull Market
small
second
mid
fourth
large
mid
small
1.2
0.8
0.4
0.0
Return
O-02
J-03
A-03
J-03
O-03
J-04
Time

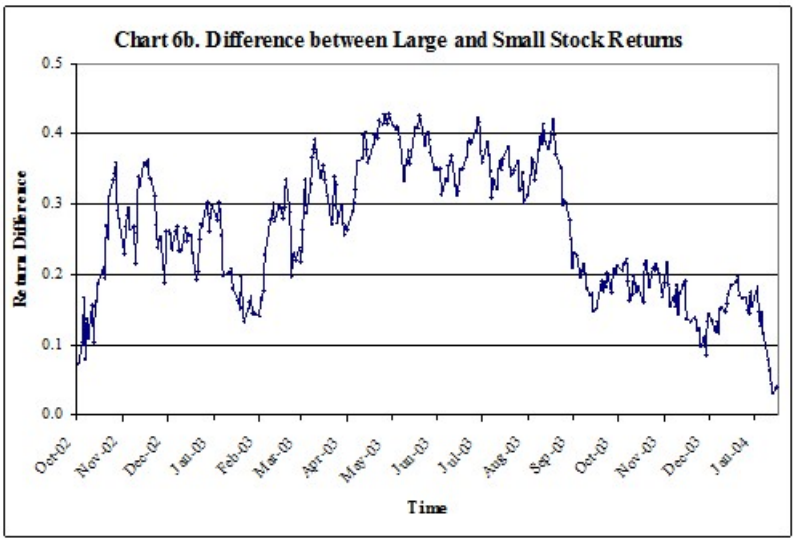


Chart 6b. Difference between Large and Small Stock Returns
0.5
0.4
0.3
0.2
0.1
0.0
Return Difference
Oct-02
Nov-02
Dec-02
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Dec-03
Jan-04
Time

Table 1. Performance of the Stocks

September 1998 to March 2000					
	Cumulative	Return			Difference[1]
value		blend		growth	Z-Value
1.2033	1.575	1.4352	**1.6948**	1.215	8.307***
smallest		medium		largest	
1.69	**1.7**	1.3888	1.1418	1.215	1.457*
March 2000 to October 2002					
value		blend		growth	
-1.6681	-1.6984	-2.6263	-2.639	**-2.851**	19.234***
smallest		medium		largest	
-2.2799	-1.991	**-2.5395**	-2.3717	-2.3229	7.566***
October 2002 to January 2004					
value		blend		growth	
1.3784	1.3553	1.0789	0.9555	1.1006	2.865***
smallest		medium		largest	
1.0765	1.2864	**1.3811**	0.993	1.1164	7.250***

1. Only the largest and smallest returns are compared in order to save space. Bold numbers indicate the largest absolute values.

*** Significant at 1 percent level

* Significant at 10 percent level

Table 2. Results of the Granger-Causality Tests for the Bullish Period

Null Hypothesis: Value-Growth S 1998 - M 2000	Observations Trading days	F-Statistic	Probability
V2 does not Granger Cause V1	399	3.85652	5.4E-05
V1 does not Granger Cause V2		0.80060	0.62826
V3 does not Granger Cause V1	399	3.51915	0.00018
V1 does not Granger Cause V3		1.20355	0.28689
V4 does not Granger Cause V1	399	3.02112	0.00109
V1 does not Granger Cause V4		0.96735	0.47150
V5 does not Granger Cause V1	399	2.03124	0.02932
V1 does not Granger Cause V5		0.81156	0.61767
V3 does not Granger Cause V2	399	1.80614	0.05792
V2 does not Granger Cause V3		2.18657	0.01798
V4 does not Granger Cause V2	399	0.73980	0.68686
V2 does not Granger Cause V4		1.92125	0.04107
V5 does not Granger Cause V2	399	0.89979	0.53342
V2 does not Granger Cause V5		1.54581	0.12117
V4 does not Granger Cause V3	399	0.79721	0.63154
V3 does not Granger Cause V4		2.40176	0.00895
V5 does not Granger Cause V3	399	0.88789	0.54461
V3 does not Granger Cause V5		1.46945	0.14863
V5 does not Granger Cause V4	399	2.65322	0.00386
V4 does not Granger Cause V5		1.08836	0.36990
Size Sep 1998—March 2000			
S2 does not Granger Cause S1	399	1.39490	0.18033
S1 does not Granger Cause S2		1.95401	0.03718
S3 does not Granger Cause S1	399	1.62547	0.09730
S1 does not Granger Cause S3		1.25458	0.25471
S4 does not Granger Cause S1	399	2.64083	0.00403
S1 does not Granger Cause S4		1.57245	0.11268
S5 does not Granger Cause S1	399	2.17701	0.01854
S1 does not Granger Cause S5		0.50603	0.88579
S3 does not Granger Cause S2	399	1.48811	0.14148
S2 does not Granger Cause S3		2.78293	0.00248
S4 does not Granger Cause S2	399	1.57668	0.11137
S2 does not Granger Cause S4		1.16762	0.31125
S5 does not Granger Cause S2	399	1.53106	0.12611
S2 does not Granger Cause S5		0.46092	0.91451
S4 does not Granger Cause S3	399	2.73434	0.00293
S3 does not Granger Cause S4		1.19356	0.29352
S5 does not Granger Cause S3	399	4.46209	5.8E-06
S3 does not Granger Cause S5		1.18137	0.30176
S5 does not Granger Cause S4	399	1.79912	0.05913
S4 does not Granger Cause S5		0.73592	0.69057

V1 = value, V3 = blend, V5 = growth

S1 = small, S3 = medium, S5 = large

Table 3. Results of the Granger-Causality Tests for the Bearishish Period

Null Hypothesis: Value-Growth M 2000 – O 2002	Observations Trading days	F-Statistic	Probability
V2 does not Granger Cause V1	663	3.40146	0.00024
V1 does not Granger Cause V2		1.70288	0.07640
V3 does not Granger Cause V1	663	3.24429	0.00043
V1 does not Granger Cause V3		1.86363	0.04735
V4 does not Granger Cause V1	663	4.32405	7.2E-06
V1 does not Granger Cause V4		1.67281	0.08334
V5 does not Granger Cause V1	663	3.44091	0.00021
V1 does not Granger Cause V5		1.80166	0.05709
V3 does not Granger Cause V2	663	3.00789	0.00100
V2 does not Granger Cause V3		1.08653	0.37001
V4 does not Granger Cause V2	663	3.40715	0.00023
V2 does not Granger Cause V4		1.30316	0.22473
V5 does not Granger Cause V2	663	2.39226	0.00864
V2 does not Granger Cause V5		0.72012	0.70590
V4 does not Granger Cause V3	663	1.44853	0.15496
V3 does not Granger Cause V4		1.23282	0.26630
V5 does not Granger Cause V3	663	1.79599	0.05802
V3 does not Granger Cause V5		1.33020	0.21014
V5 does not Granger Cause V4	663	1.33674	0.20673
V4 does not Granger Cause V5		1.13624	0.33217
Size March 2000 – Oct 2002			
S2 does not Granger Cause S1	663	1.98428	0.03260
S1 does not Granger Cause S2		0.50281	0.88852
S3 does not Granger Cause S1	663	3.14650	0.00061
S1 does not Granger Cause S3		0.77558	0.65253
S4 does not Granger Cause S1	663	3.56690	0.00013
S1 does not Granger Cause S4		0.54472	0.85857
S5 does not Granger Cause S1	663	3.85979	4.3E-05
S1 does not Granger Cause S5		0.54264	0.86012
S3 does not Granger Cause S2	663	1.52873	0.12487
S2 does not Granger Cause S3		0.40884	0.94268
S4 does not Granger Cause S2	663	2.74621	0.00255
S2 does not Granger Cause S4		1.34852	0.20070
S5 does not Granger Cause S2	663	4.16677	1.3E-05
S2 does not Granger Cause S5		1.29465	0.22947
S4 does not Granger Cause S3	663	1.00365	0.43868
S3 does not Granger Cause S4		0.91851	0.51543
S5 does not Granger Cause S3	663	1.24856	0.25653
S3 does not Granger Cause S5		0.59212	0.82105
S5 does not Granger Cause S4	663	2.18683	0.01706
S4 does not Granger Cause S5		0.69911	0.72578

V1 = value, V3 = blend, V5 = growth

S1 = small, S3 = medium, S5 = large

Table 4. Results of the Granger-Causality Tests for the Bullish Period

Null Hypothesis: Value-Growth O 2002 – J 2004	Observations Trading days	F-Statistic	Probability
V2 does not Granger Cause V1	318	2.17858	0.01907
V1 does not Granger Cause V2		0.82471	0.60505
V3 does not Granger Cause V1	318	1.90565	0.04401
V1 does not Granger Cause V3		1.22146	0.27643
V4 does not Granger Cause V1	318	1.27881	0.24165
V1 does not Granger Cause V4		1.19204	0.29565
V5 does not Granger Cause V1	318	1.37726	0.18992
V1 does not Granger Cause V5		0.94264	0.49423
V3 does not Granger Cause V2	318	0.91095	0.52333
V2 does not Granger Cause V3		1.01685	0.42898
V4 does not Granger Cause V2	318	0.99306	0.44940
V2 does not Granger Cause V4		1.28329	0.23908
V5 does not Granger Cause V2	318	0.80146	0.62744
V2 does not Granger Cause V5		0.79951	0.62932
V4 does not Granger Cause V3	318	1.27327	0.24485
V3 does not Granger Cause V4		1.57219	0.11407
V5 does not Granger Cause V3	318	1.16947	0.31102
V3 does not Granger Cause V5		1.41759	0.17149
V5 does not Granger Cause V4	318	0.61066	0.80460
V4 does not Granger Cause V5		0.95241	0.48539
Size Oct 2002 – Jan 2004			
S2 does not Granger Cause S1	318	3.48335	0.00024
S1 does not Granger Cause S2		1.37162	0.19261
S3 does not Granger Cause S1	318	2.60040	0.00487
S1 does not Granger Cause S3		1.20354	0.28803
S4 does not Granger Cause S1	318	3.26347	0.00051
S1 does not Granger Cause S4		1.01323	0.43206
S5 does not Granger Cause S1	318	2.92004	0.00166
S1 does not Granger Cause S5		0.53489	0.86496
S3 does not Granger Cause S2	318	1.38439	0.18654
S2 does not Granger Cause S3		1.88242	0.04716
S4 does not Granger Cause S2	318	1.41510	0.17258
S2 does not Granger Cause S4		1.84383	0.05285
S5 does not Granger Cause S2	318	1.58618	0.10981
S2 does not Granger Cause S5		0.83168	0.59836
S4 does not Granger Cause S3	318	0.60403	0.81022
S3 does not Granger Cause S4		1.14998	0.32474
S5 does not Granger Cause S3	318	1.15380	0.32202
S3 does not Granger Cause S5		1.17436	0.30765
S5 does not Granger Cause S4	318	1.20841	0.28484
S4 does not Granger Cause S5		1.04589	0.40474

V1 = value, V3 = blend, V5 = growth
S1 = small, S3 = medium, S5 = large

THE HIGH COST OF GRADUATE SCHOOL LOANS: LESSONS IN COST BENEFIT ANALYSIS, BUDGETING AND PAYBACK PERIODS

Liz Mulig, University of Dallas

ABSTRACT

Graduate school costs are increasing, as is the amount of interest accrued on any federal loan borrowed for graduate school. Many graduate students borrow money during their programs. They need to consider whether this "investment" in their future is worth the cost. Will they make enough extra by earning a graduate degree to justify the cost? Will they make enough to be able to pay the money back within a reasonable period of time? What do these students see as a reasonable payback period? When considering going to graduate school, students should conduct a cost/benefit analysis including all costs of attending graduate school.

INTRODUCTION

Student debt for students receiving advanced degrees is about one third of the total student debt, and the number of graduate students incurring loans is on the rise. Due to subsidized Stafford loans no longer being available to graduate students (starting Summer, 2012), the graduates' portion of the total debt will no doubt rise (Andriotis, 2012).

Many graduate students borrow money during their programs. They need to consider whether this "investment" in their future is worth the cost.

BACKGROUND

Expected lifetime earnings for students receiving advanced degrees (masters and doctorates) are higher than those who receive no degrees or only graduate degrees (Carnevale, Rose and Cheah, 2011). However, the amount of increase with a graduate degree over just an undergraduate degree is not always a significant amount, depending on the field and also on the actual position secured after graduation (Andriotis, 2012).

While having a degree does often assist an individual in earning more money, "student debt can also negatively impact an individual's ability to take on other consumer debt – and therefore place a drag on the national economy" (Student Loan Debt Statistics, 2012). An example of this happening occurred in 2011 when first-time home buyers, with a median age of 31, fell to the smallest percentage of total home purchasers since 2006" ("Profile of Home Buyers and Sellers," 2011).

Some very positive thinking people, for instance Shawn O'Connor, Forbes Contributor, make it seem really easy to get a high paying position and make as much money in 20 yrs as those with just undergrads make in 40 yrs, making it very easy to pay back your loans, and recover from going to business grad school and losing two years of salary in the workplace. He obviously believes that graduate school is well worth the money (O'Connor, 2012). However, not all people secure such high paying positions and enjoy such favorable outcomes.

Enrollment in degree granting schools is now at approximately 21 million students. Of that number, about 60% borrow each year to help cover the costs of their education ("U.S. Department of Education, National Center for Education Statistics," 2012).

Among students who earned graduate degrees in 2007-08:

1. 26% had no education debt at all.
2. 14% had undergraduate debt but no graduate school debt.
3. 7% had borrowed $80,000 or more for graduate school.
4. 5% had borrowed between $60,000 and $79,999 ("Student Loan Debt Statistics, " 2012; "Trends in High Education Series. Trends in Student Aid ," 2012).

Also at issue is the rising cost of tuition. Andriotis (2012) highlights reasons for these costs being on the increase:

> *Quantifying the financial benefits of a graduate degree has become even harder in recent years as colleges raise tuition costs. Since the recession, tuition has risen 11%, to nearly $22,000, on average for private nonprofit graduate programs, about in line with tuition hikes for undergraduate students, according to the National Center for Education Statistics. At public colleges, tuition for grad students rose 25%, to $9,247, outpacing tuition hikes at the undergraduate level.*
>
> *Schools are raising these costs even as enrollment continues to soar. Between 2007 and 2010, enrollment in graduate programs grew 11%, to an all-time high of 2.9 million students, according to the latest data from the NCES. One reason costs are climbing, says [Mark] Kantrowitz [publisher of FinAid.org], is a controversial practice called "differential tuition," whereby colleges charge higher tuition for programs that are more popular. Public colleges are also receiving less funding from cash-strapped state governments."*

The highest priced private business schools have MBA tuition and fees of $53,000 - $60,000/yr , while the lowest priced private business schools have tuition and fees of $11,000 - $35,000/yr (Wecker, 2012). The highest priced public business schools have yearly (in state) tuition and fees for their master's programs that range from $25,000 - $45,000 (Lytle, 2011), and the lowest priced public business schools have in state yearly costs of $5,400 - $12,000 (Burnsed, 2011).

According to the CollegeBoard, graduate students rely much more heavily on loans than undergraduate students. In 2009–10, 69 percent of graduate students' costs were financed with federal loans, and the average student had about $15,888 in federally subsidized loans ("Trends in High Education Series. Trends in Student Aid," 2012). Now, however, graduate loans are not subsidized.

Under the Stafford loan program, the largest of the government's school-financing plans, most full-time grad students have been able to borrow up to $20,500 a year at 6.8 percent interest, $8,500 of which would be subsidized. ("Subsidized" means that the government pays the interest while the student is in school and for six months after graduation.) If students require more money, they can turn to Plus loans, which are unsubsidized and have an interest rate of 7.9

percent. Repayment of Stafford loans may be deferred for six months after graduation, though the unsubsidized portion accrues interest while the student is in school; repayment of a Plus loan begins after just 60 days (“The U.S. Department of Education offers,” n.d.).

With the federal government no longer subsidizing graduate Stafford loans, the rules have changed and graduate students will immediately start accumulating interest on all debts. “A student who took out just the $8,500 a year in subsidized loans would have repaid $46,953 over the next 10 years. Unsubsidized loans would add an extra $6,385 in interest payments.” (“Obama to Grad Students," 2012) Many students, though, take out substantially more in loans than $8,500.

Another issue with trying to judge the impact and extent of student loans is that students are not the only ones borrowing money to finance their education. “Student loans support the education of millions of students nationwide, yet much is unknown about the student loan market. Relevant data are limited and, for the most part, anecdotal. Also, sources tend to focus on recent college graduates and do not reveal much information about the indebtedness of parents, graduate students, and those who drop out of school” ("Grading Student Loans,” n.d.).

Also at issue is, as just mentioned, that sources tend to focus on recent college graduates yet students with federal loans are allowed 10-25 years to pay back those loans (Clark, n.d.).

DISCUSSION

Budgeting

Students are borrowing money not just for tuition but as much as they can borrow. Are they perhaps not looking forward to the actual repayment amounts and length of time? Those who are working and going to school, especially, should consider tightening their budgets vs borrowing the maximum amounts in loans. Many borrow the maximum in Stafford loans and then also borrow from other sources. Even those students who are not working should consider ways to budget and cut expenses versus simply borrowing more money.

The necessity of budgeting in order to reduce loan amounts is even greater because, even though enrollments are increasing, so are tuitions. In the case of business schools, they often help fund the other colleges, so that is part of the reason for increase tuitions, but regardless of the reasons, this translates to higher costs for students and with so many of them borrowing the money, that translates to even higher loan amounts owed.

Payback Periods

Paying back student loans means that one cannot buy other things. This makes graduates not actually realize as much the higher salary they are earning, and it also doesn’t help put money into the economy as the graduates don’t have as much free spending money, money for housing costs, etc. Considering the ages of undergraduate students paying back loans, the graduate school students are likely the same age or older. Add to that the fact that loans can be paid back in 10-25 yrs, and students are looking at a very long payback period.

Since there is usually no penalty for paying the loans back earlier, students should consider doing so as quickly as possible to avoid additional interest expenses. This is especially important for graduate students who will be paying interest on accrued interest, since their Stafford loans are no longer subsidized while they are in school.

Cost/Benefit

Graduate degrees afford graduating students the opportunity to earn more money over their lifetime. However, this varies greatly by field and type of position, even in traditional business school careers. Despite very positive endorsement (by some) of the significantly higher earnings with a graduate degree, students need to consider the job market in the area where they plan to live to decide if they feel they can actually secure a position that warrants the cost of graduate school.

Students should look at the additional salary they stand to earn versus the cost of the degree to determine if the benefits (additional amount earned) exceed the costs. The cost should include more than just tuition, fees and books. It should also include interest on any loans and also, if a student is going to school full time, the opportunity cost of not having a salary for those two years.

Business grad schools can cost from $5400/yr full time for tuition and fees to $60k/yr for an expensive private school. As mentioned above in relation to the payback period for a student loan, the subsidized Stafford loan program no longer applies to graduate students. Therefore, graduate students will incur more interest costs on their unsubsidized Stafford loans. The interest will accrue while they are in school instead of starting after graduation, and will accrue at the higher unsubsidized rate. This, along with higher tuition, needs to be factored into their cost/benefit decision about graduate school.

CONCLUSION

Many graduate students borrow money during their programs. At issue is the magnitude of the amount borrowed. Graduate school tuition costs are rising, and also interest is now accrued on federal loans for graduate school during the time the student is still actually in school. In order to minimize the amount borrowed, students should budget better so that they can borrow less.

When considering going to graduate school, students should conduct a cost/benefit analysis including all costs of attending graduate school. This would include money on hand that will be use, loans and interest on those loans, and foregone salary if they choose not to work during their program. As part of this analysis, they should also ask themselves several questions, including the following: Will they make enough extra by earning a graduate degree to justify the cost? Will they make enough to be able to pay the money back within a reasonable period of time? What do they consider as a reasonable payback period?

Students need to consider whether the total graduate school “investment” in their future is worth the cost.

REFERENCES

Andriotis, A. (2012, May 16). Grad school: Higher degrees of debt; as congress searches for ways to alleviate the loan burden for undergrads, graduate students are sinking deeper into debt. *SmartMoney.Com,* Retrieved August 1, 2013from http://search.proquest.com/docview/1013734532?accountid=7106

Burnsed, B. (2011, 07). 10 least expensive public business schools for in-state students. *U.S.News & World Report,* , 1. Retrieved August 1, 2013 from http://search.proquest.com/docview/884456386?accountid=7106

Carnevale, Anthony P., Stephen J. Rose and Ban Cheah (2011). The College Payoff Education, Occupations and Lifetime Earnings *The Georgetown University Center On Education And The Workforce*

Clark, Kim. Paying back your student loans. *CNN Money*. N.d. Retrieved August 1, 2013 from http://money.cnn.com/101/college-101/student-loan-payment.moneymag/index.htm

Grading Student Loans - Liberty Street Economics. *Liberty Street Economics*. N.p., n.d. Retrieved August 1, 2013 from http://libertystreeteconomics.newyorkfed.org/2012/03/grading-student-loans.html

Lytle, R. (2011, 07). 10 most expensive public business schools for in-state students. *U.S.News & World Report,* , 1. Retrieved August 1, 2013 from http://search.proquest.com/docview/884435212?accountid=7106

O'Connor , Shawn . (2012, April 5). Grad School: Still Worth the Money? *Forbes.*

Profile of Home Buyers and Sellers, Exhibit 1-9 (2011). *National Association of Realtors.*

The U.S. Department of Education Offers Low-interest Loans to Eligible Students to Help Cover the Cost of College or Career School. *Subsidized and Unsubsidized Loans*. Federal Student Aid. An Office of the U.S. Dept of Education N.p., n.d. Retrieved August 1, 2013 from http://studentaid.ed.gov/types/loans/subsidized-unsubsidized

Obama to Grad Students: Pay Up. N.p., 04 Apr. 2012. Retrieved August 1, 2013 from http://www.villagevoice.com/2012-04-04/news/obama-to-grad-students-pay-up/

Student Loan Debt Statistics (2012). N.p. Retrieved August 1, 2013 from http://www.asa.org/policy/resources/stats/default.aspx

The U.S. Department of Education Offers Low-interest Loans to Eligible Students to Help Cover the Cost of College or Career School." *Subsidized and Unsubsidized Loans*. Federal Student Aid. An Office of the U.S. Dept of education N.p., n.d. Retrieved August 1, 2013 from http://studentaid.ed.gov/types/loans/subsidized-unsubsidized

Trends in High Education Series. Trends in Student Aid (2012). *CollegeBoard Advocacy and Policy Center.*

U.S. Department of Education, National Center for Education Statistics. (2012). *Digest of Education Statistics, 2011* (NCES 2012-001), Chapter 3.

Wecker, M. (2012, 06). 10 lowest-priced private business schools. *U.S.News & World Report,* , 1. Retrieved August 1, 2013 from http://search.proquest.com/docview/1027875098?accountid=7106

THE ANTITAKEOVER LAWS AND CORPORATE CASH HOLDINGS

Hongchao Zeng, University of Nevada Reno

ABSTRACT

The takeover-deterrence effects of corporate cash holdings have been documented in prior studies. Using the presence of business combination (BC) laws to proxy for the monitoring strength of the takeover market, we examine how an active takeover market affects the level and valuation of corporate cash holdings. After accounting for potential endogeneity of state incorporation, we find that firms incorporated in states without BC laws hold significantly more cash than those incorporated in states with BC laws. However, the value of cash holdings used by firms to defend themselves against unwanted takeovers in the presence of an active takeover market is not discounted by investors.

JEL Classification: G31; G34

Keywords: Cash holdings; Value of cash; Takeover market; State antitakeover laws; Business combination (BC) laws;

1. INTRODUCTION

The literature on corporate governance and corporate cash policies can be traced to the agency costs of free cash flow theory developed by Jensen (1986), which focuses on the conflicts of interest between managers and shareholders over cash payouts. The conflict occurs as a result of entrenched managers wishing to hold excess cash and engage in value-decreasing activities at the expense of shareholders. Jensen stresses the importance of the compensating monitoring roles played by a firm's internal control system and the external market for corporate control as the disciplining power of the product and factor markets weakens.

While the effectiveness of any corporate governance mechanism is evaluated conventionally by its ability to force managers to disgorge excess cash, the empirical evidence is rather mixed not only on the relations between the levels of cash holdings and corporate governance, but also on the effects of large cash reserves on shareholder wealth. Regarding the levels of cash holdings, Dittmar, Mahrt-Smith, and Servaes (2003) and Pinkowitz, Stulz, and Williamson (2006) find international evidence that weaker shareholder rights are associated with higher cash holdings. In contrast, Harford, Mansi, and Maxwell (2008) show that U.S. firms with weaker corporate governance structures tend to have smaller cash reserves.[1] Mikkelson and Partch (2003) find no evidence that high cash firms have greater incentive problems. Regarding the negative valuation effects of large cash reserves, Pinkowitz, Stulz, and Williamson (2006) find

[1] The positive relationship between governance and cash reserves is supported by the spending hypothesis, which predicts that poorly governed managers will quickly spend excess generated cash flows (Jensen and Meckling (1976)), leading to lower levels of observed cash reserves for firms with weaker corporate governance structures.

that cash is valued less in countries with poor investor protection and Dittmar and Mahrt-Smith (2007) show that the value of cash in poorly governed firms is significantly lower than in well-governed firms. Similarly, Harford (1999) and Harford, Mansi, and Maxwell (2008) find that firms with large cash reserves tend to make value-decreasing acquisitions. In contrast, Mikkelson and Partch (2003) find that persistently high cash holdings do not lead to worse firm performance and Bates, Kahle, and Stulz (2009) show that the continuing increase in U.S. firms' cash holdings from 1980 to 2006 does not destroy the value of cash.

Although there is a large amount of literature examining the relationship between cash holdings and corporate governance, there is little analysis of the impact of the market for corporate control on cash holdings. Jensen's free cash flow theory (1986) argues that since firms with large amounts of free cash flow are likely to engage in value reducing mergers and other activities that reduce corporate value, these firms are also likely to be targeted by the takeover market. Harford (1999) finds consistent evidence that acquisitions by cash rich firms are value decreasing. However, Harford as well as Pinkowitz (2002) find that excess cash holdings actually lower the likelihood of an acquisition by reducing the probability that a firm will be targeted through channels like repurchases tender offers, employing the "Pac Man defense" or paying cash to shareholders. Thus, whether the takeover market monitors or promotes corporate cash holdings is an unresolved empirical issue.

In this paper, we analyze two interrelated issues. First, we examine the effect of an active takeover market on the level of corporate cash holdings. Since it has been shown that business combination (BC) laws are the most stringent second-generation antitakeover laws, we use the existence these laws to proxy for the monitoring strength of the takeover market. Thus, if a firm is incorporated in a state without (with) BC laws, it is presumed to operate in an active (inactive) takeover market. We are using this proxy to test a substitution effect between legal antitakeover protection and firms' use of cash for protection.

After controlling for firm-specific characteristics and firm-level corporate governance through institutional ownership, we find support for the takeover-deterrence hypothesis, which predicts that an active takeover market incentivizes managers to hold more cash to protect against hostile takeover attempts. While our results are robust to different model specifications and subsample periods, the employment of additional control variables, and the exclusion of Delaware as the state of incorporation, there are two important concerns about our methodology. First, the state of incorporation could be endogenous due to selection bias. If firms holding excess cash self-select into states without BC laws, our results could be biased and inconsistent. We address this concern using the Heckman two-stage treatment effect model. After accounting for the potential endogeneity of state incorporation using lagged non-BC industry density and lagged non-BC state density as instruments, we still find that non-BC firms hold significantly more cash than BC firms. Second, our results could be driven by possible permanent differences between non-BC and BC firms, and such differences could cause non-BC firms to hold higher levels of cash holdings even before the passage of BC laws. To address this concern, we use an earlier sample period in our analysis and find evidence that the levels of cash holdings in non-BC firms are lower relative to BC firms before the enactment of BC laws.

Second, we examine whether the excess cash held by non-BC firms as acquisition protection leads to value destruction. Specifically, we employ two methods to analyze the marginal value placed by shareholders on a firm's cash holdings. First, following Faulkender and Wang (2006), we use excess stock returns to proxy for the market valuation of a firm, and evaluate how a change in the firm's cash holdings affects the firm's market value. Second, we utilize the methodology in Fama and French (1998) and use market-to-book ratios to proxy for market value and to assess the value of excess cash to shareholders. Both methods generate the result that shareholders do not appear to discount the value of cash held by firms for takeover-deterrence purposes in non-BC states.

Our paper contributes to the literature in the following ways. First, to the best of our knowledge, we are the first to directly test the effects of the takeover market on corporate cash holdings, finding evidence that the takeover market contributes to excess cash holdings. Second, we find that while firms in non-BC states hold more cash, the market does not appear to discount the value of cash, indicating that the excess cash holdings are not necessarily dissipated in destructive ways.

The remainder of this paper is organized as follows. Section 2 briefly discusses the state antitakeover laws. Section 3 describes data selection and sample construction, and presents summary statistics. Section 4 presents and discusses our findings. Section 5 concludes.

2. BRIEF DESCRIPTION OF STATE ANTITAKEOVER LAWS

The regulation of hostile takeovers has been a focus of U.S. corporate laws. The first generation antitakeover statutes were initially adopted in Virginia, and then followed in 36 other states during the 1970s. In 1982, the Supreme Court declared a first generation antitakeover statute, the Illinois antitakeover law, to be unconstitutional. In response, many states enacted second generation antitakeover laws, which embody five standard types: 1) control share acquisition statutes require a hostile bidder to put its offer to vote before proceeding with it. Failure to do so may cause the loss of control rights over the shares it purchases; 2) fair price statutes require a bidder who has succeeded in gaining control to pay the remaining minority shareholders the same price paid for shares acquired through its bid; 3) business combination statutes prevent a bidder who gains control from merging the target with its own assets;[2] 4) poison pills allow shareholders to purchase shares at a discount in the event that any acquirer obtains a significant block without the approval of the board; and 5) constituencies permit managers to take into account the interests of non-shareholders in defending against a takeover (Bebchuk and Cohen (2003)).

Among the second generation antitakeover statutes, business combination (BC) laws are considered to have the most stringent effect on hostile takeovers as sheltering from takeover market monitoring allows managers more freedom to pursue their own interest, thereby increasing

[2] This is done by imposing a moratorium on certain kinds of transactions, including merges and asset sales for a period of up to five years. This moratorium hinders corporate raiders from gaining access to the target firm's assets for the purpose of paying down acquisition debt, thus making hostile takeovers more difficult and often impossible (Betrand and Mullainathan (2003)).

agency costs.[3] In this paper, we use BC laws to measure the monitoring strength of the takeover market. Non-BC states are considered to contain strong takeover markets while BC states are considered to have weak takeover markets.

3. DATA AND SUMMARY STATISTICS

3.1 Data Selection and Sample Construction

We obtain our data from multiple sources. We begin with all U.S. publicly traded firms listed on merged CRSP/Compustat files from 1990 to 2000 and exclude all financial firms (SIC codes 6000-6999) and utilities (SIC codes 4900-4999). We then delete all firm-year observations where total assets or sales are either missing or non-positive. Details regarding variable construction are in Appendix A.

Our analyses use institutional ownership to proxy for the monitoring function played by the presence of large shareholders. We obtain data on institutional holdings from Thomson Financial, and calculate this measure as the sum of all shares owned by institutional investors as a percentage of the firm's total number of shares outstanding. Higher institutional ownership is expected to reflect better corporate governance.

To study the impact of the takeover market on cash holdings, we define the dummy variable non-BC as 1 if a firm is incorporated in a state without BC laws and 0 otherwise. Both states of incorporation and states of locations are from Compustat. We obtain the year in which a state adopted its business combination (BC) law from Bertrand and Mullainathan (2003).

To gauge the effect of excess cash holdings on the value of cash, we follow the methodology in Faulkender and Wang (2006) and examine the variation in excess stock returns over the fiscal year. Data on stock returns are from CRSP while break points for the 25 portfolios formed on size and BE/ME are from Kenneth R. French's web page and the factor monthly returns are from the Fama French & Liquidity Factors on WRDS. We calculate the benchmark return using the value-weighted monthly return of the actual portfolio a firm belongs to each month.[4] The excess stock return is the annual realized stock return less the benchmark return.

We winsorize all variables at the top and bottom one percentile to mitigate the influence of outliers. To be included in our initial sample, a firm-year observation must have non-missing values for all variables. The above selection criteria results in 33,596 firm-year observations.

[3] Event study evidence shows that business combination laws result in the biggest stock price drop. In contrast, fair price laws result in negative but insignificant stock price changes, while control share acquisition laws cause some movements in stock prices (Karpoff and Malatesta (1989)).

[4] Given that the Fama and French 25 portfolios are formed at the end of each June while the fiscal year-end of a firm could be any month during the year, a firm could belong to two portfolios in any year *t*. Therefore, following Faulkender and Wang (2006), we adjust the benchmark return by annualizing the monthly returns of the portfolio the firm belongs to each month.

3.2 Descriptive Statistics

We divide our sample into non-BC and BC subsamples based on whether BC laws were passed at the time in question in the state of incorporation. Table 1 presents the summary statistics of the most commonly used control variables in the cash holdings analyses. The number of firms incorporated in non-BC states is much smaller than those in BC states, consistent with the findings in Bebchuk and Cohen (2003) that states offering strong antitakeover laws are substantially more successful both in retaining in-state firms and in attracting out-of-state incorporations.

On average, firms incorporated in non-BC states not only have higher cash holdings, but are also larger than firms incorporated in BC states. The mean difference between the size of non-BC and BC firms is significant at the 5% significance level, suggesting that the non-BC subsample is not dominated by financially constrained firms, characterized as small, young firms with large cash holdings. The mean institutional holdings for non-BC firms is 28% but 34% for BC firms and this 6% difference is significant at the 1% level with a *t*-statistics of 16.45, suggesting weaker institutional monitoring in non-BC firms. In addition, the two subsamples differ significantly in the amount of net working capital, capital expenditures, leverage, industry sigma, and R&D. Since the marginal impact on cash holdings will need to be determined after controlling for all the above differences, we perform multivariate analyses in Section 4.

4. EMPIRICAL RESULTS

In this section, we first analyze how an active takeover market affects the levels of corporate cash holdings. We then investigate whether shareholders value differently the excess cash held by firms incorporated in non-BC states. In our analyses, we account for the potential endogeneity of state incorporation caused by selection bias using the Heckman two-stage treatment effect model.

4.1. The Takeover Market and the Levels of Cash Holdings

We test the impact of an active takeover market on corporate cash holdings using the following specification:

$$\begin{aligned} Cash_{i,t} = {} & \beta_0 + \beta_1(\text{Non-BC}_{i,t}) + \beta_2(MB_{i,t}) + \beta_3(SIZE_{i,t}) + \beta_4(CF_{i,t}) + \beta_5(NWC_{i,t}) + \beta_6(CAPEX_{i,t}) \\ & + \beta_7(LEV_{i,t}) + \beta_8(SIGMA_{i,t}) + \beta_9(RD_{i,t}) + \beta_{10}(DIV_{i,t}) + \beta_{11}(HOLDING_{i,t}) + \bar{y}_{jt}^{(i)} + \bar{y}_{lt}^{(i)} + \epsilon_{i,t} \quad (1) \end{aligned}$$

where the dependent variable is the natural log of cash holdings to total assets ratio. Non-BC is a dummy variable equal to 1 if a state passed a BC law and 0 otherwise. We follow Opler et al. (1999) and control for firm-specific characteristics that include the market-to-book ratio, firm size, cash flows, net working capital, capital expenditures, the book leverage ratio, industry sigma, R&D expense, and a dividend dummy equal to 1 if a firm pays a dividend in year t and 0 otherwise. Following the literature on cash holdings and corporate governance (e.g., Dittmar and Mahrt-Smith (2007) and Harford, Mansi, and Maxwell (2008)), we use the proportion of institutional ownership (HOLDING) to proxy for investor oversight over management's use of corporate resources. As

in Qiu and Yu (2009), we use $\bar{y}_{jt}^{(i)}$ and $\bar{y}_{lt}^{(i)}$ to control for industry shocks and state shocks, respectively, where $\bar{y}_{jt}^{(i)}$ denotes the average logarithm of cash holdings in year t across all firms in industry j, excluding firm i, based on the 48 Fama and French (1997) industry definition, while $\bar{y}_{lt}^{(i)}$ depicts the average logarithm of cash holdings in year t across all firms located in state l, excluding firm i.

One potential concern for our model specification in Equation (1) is that firms with higher cash holdings may self-select into non-BC states, thus biasing our estimates. We therefore endogenize firms' decisions of where to incorporate using a Heckman two-stage treatment effect model to correct for this potential endogeneity of state incorporation.

In the first stage, we estimate the following probit model predicting the probability of a firm incorporating in a state without BC laws:

$$Y_i^* = \alpha_0 + \alpha_1(MB_{i,t}) + \alpha_2(SIZE_{i,t}) + \alpha_3(CF_{i,t}) + \alpha_4(NWC_{i,t}) + \alpha_5(CAPEX_{i,t}) + \alpha_6(LEV_{i,t}) + \alpha_7(SIGMA_{i,t}) + \alpha_8(RD_{i,t}) + \alpha_9(DIV_{i,t}) + \alpha_{10}(HOLDING_{i,t}) + \alpha_{11}(\bar{y}_{jt}^{(i)}) + \alpha_{12}(\bar{y}_{lt}^{(i)}) + \alpha_{13}(\text{Non-BC State-density}_{t-1}) + \alpha_{14}(\text{Non-BC Industry-density}_{t-1}) + \epsilon_i$$

and

$$Y_i = \begin{cases} 1 \ if \ Y_i^* \geq 0 \\ 0 \ if \ Y_i^* < 0 \end{cases} \quad (2)$$

where the dependent variable Y_i^* is a latent continuous variable reflecting the propensity of a firm to incorporate in a state without BC laws. Y_i is a binary indicator which equals 1 if the firm incorporates in a non-BC state and 0 otherwise. The firm-level control variables are the exogenous independent variables from Equation (1). We use lagged non-BC state-density and lagged non-BC industry-density as instrumental variables, computing non-BC state-density as the average annual value of the non-BC dummy for all firms headquartered in firm i's state, excluding firm i. Similarly, we calculate non-BC industry-density as the average annual value of the non-BC dummy for all firms in firm i's industry, excluding firm i, where industry is based on the 48 Fama-French (1997) industry definition. We achieve identification with sufficient variations in non-BC density by state of location and industry.

Table 2 presents the estimated coefficients from Equation (2). The coefficients on the instrumental variables are highly significant, suggesting that the instruments strongly explain whether a firm chooses to incorporate in a state without BC laws. To control for potential selection bias, we obtain the inverse Mill's ratio and use it as an additional control variable in Equation (1), which becomes the second-stage estimation of the Heckman treatment effect model. We report the estimation results in Table 3.

Our variable of interest is non-BC, where a positive and statistically significant coefficient indicates that the takeover market incentivizes managers to hold more cash. Table 3 column 1 presents the coefficients estimated from a cross-sectional regression without controlling for firm and year fixed effects. We find that an active takeover market is associated with higher corporate cash holdings. In column 2, we use a panel data model to control for both firm and year fixed effects and find, consistent with the cross-sectional result, that the coefficient on non-BC is positive and significant. Although all firm-level control variables are significant at the 1% level

in the pooled OLS regression, we note that the coefficients on institutional ownership and the inverse Mill's ratio become insignificant after we control for the firm and year fixed effects. These results suggest that firm-level corporate governance as proxied by institutional ownership does not affect the level of corporate cash holdings and self-selection bias is unimportant.

In columns 3 and 4 we report robustness tests, examining the impact of the takeover market on cash holdings during different sample periods (1990-1996 and 1997-2000), as Subramanian (2004) argues that the effect of the state antitakeover law disappeared in Delaware from 1996. We find that the positive and significant association between the takeover market and the corporate cash holdings still holds in the second subsample period. In column 5, we exclude firms incorporated in Delaware as they account for more than half of the full sample. This resulting positive and significant association between the takeover market and corporate cash holdings demonstrates that our findings are not driven by the Delaware effect.

4.2. The Level of Cash Holdings before the Passage of the BC Laws

While our findings in the previous section indicate that an active takeover market incentivizes managers to hold more cash, it is possible that there are significant permanent differences between non-BC and BC firms, and such differences may cause non-BC firms to hold higher levels of cash even before the passage of BC laws. To address this concern, we examine the level of cash holdings in non-BC firms relative to BC firms before the passage of the BC laws. Since firms get reincorporated infrequently, our analyses are not likely to be affected by the changes in the state of incorporation.

In Table 4 Column 1, we present the estimation results for the sample period 1980 – 1984, which is a 5-year period before the first adoption of the BC laws by New York in 1985. The coefficient on non-BC is significantly negative at the 1% level, indicating that non-BC firms hold significantly less excess cash before the passage of the BC laws. Column 2 shows that during the passage of the BC laws, non-BC firms no longer have lower levels of cash holdings relative to BC firms due to the impact of the BC laws. Column 3 reports the estimation results for the period 1980 – 1989 and shows that the level of cash holdings is significantly lower for non-BC firms compared to BC firms 10 years before 1990, suggesting that the permanent differences between non-BC and BC firms, if there are any, could not drive our results.

4.3. The Impact of the Takeover Market on the Value of Cash

The empirical evidence in the previous subsections suggests that the presence of an active takeover market induces firms to hold more cash. In this subsection, we investigate whether excess cash holdings for takeover-deterrence purposes lead to value destruction. We adopt the Faukender and Wang (2006) method to evaluate the marginal value of cash from the shareholders' perspective:

$$r_{i,t} - R^{B}_{i,t} = \lambda_0 + \lambda_1 * \text{Non-BC}_{i,t} + \lambda_{2*}\text{non-BC}_{i,t} * \frac{\Delta C_{i,t}}{M_{i,t-1}} + \lambda_3 \frac{\Delta C_{i,t}}{M_{i,t-1}} + \lambda_4 \frac{\Delta E_{i,t}}{M_{i,t-1}} + \lambda_5 \frac{\Delta NA_{i,t}}{M_{i,t-1}} + \lambda_6 \frac{\Delta RD_{i,t}}{M_{i,t-1}} + \lambda_7 \frac{\Delta I_{i,t}}{M_{i,t-1}} + \lambda_8 \frac{\Delta D_{i,t}}{M_{i,t-1}} + \lambda_9 \frac{C_{i,t-1}}{M_{i,t-1}} + \lambda_{10} \frac{NF_{i,t}}{M_{i,t-1}} + \lambda_{11} LEV_{i,t} + \lambda_{12} \frac{C_{i,t-1}}{M_{i,t-1}} * \frac{\Delta C_{i,t}}{M_{i,t-1}} + \lambda_{13} LEV_{i,t} * \frac{\Delta C_{i,t}}{M_{i,t-1}} + \lambda_{14} * HOLDING_{i,t} + \bar{y}^{(i)}_{jt} + \bar{y}^{(i)}_{lt} + \epsilon_{i,t} \quad (3)$$

The excess stock return, $r_{i,t} - R^{B}_{i,t}$, is the dependent variable, where $r_{i,t}$ is the stock return for firm i during fiscal year t and $R^{B}_{i,t}$ is firm i's benchmark return during year t. The dummy variable non-BC captures the effects of the takeover market on the value of cash. Institutional ownership (Institutional holdings) controls for the monitoring of large shareholders. The remaining independent variables are firm specific characteristics that control for potential sources of value that are correlated with cash holdings, including the cash holdings of firm i in year t ($C_{i,t}$), earnings before interest and extraordinary items ($E_{i,t}$), total assets net of cash ($NA_{i,t}$), R&D expenditures ($RD_{i,t}$), interest expenses ($I_{i,t}$), total dividends ($D_{i,t}$), the firm's net financing during year t ($NF_{i,t}$), and market leverage ($L_{i,t}$). ΔX represents a one year change in variable X. Following Qiu and Yu (2009), we use $\bar{y}^{(i)}_{jt}$ and $\bar{y}^{(i)}_{lt}$ to control for industry shocks and state shocks, respectively. $\bar{y}^{(i)}_{jt}$ denotes the average excess stock return in year t across all firms in industry j, excluding firm i and $\bar{y}^{(i)}_{lt}$ depicts the average excess stock return in year t across all firms located in state l, excluding firm i.

Table 5 contains the results based on Equation (3). Column 1 uses pooled OLS regressions while column 2 presents results from panel data regressions controlling for both firm and year fixed effects. For the takeover market to have a negative impact on the value of cash, we would expect the coefficient on the interaction between non-BC and the change in cash to be negative and significantly related to the excess stock return. However, the results in both columns 1 and 2 show that the value placed by shareholders on a dollar of cash for firms incorporated in non-BC states is not lower than for firms incorporated in BC states. In columns 3 and 4, we test the impact of the takeover market on the value of cash for two time periods using the same split as before. For the time period from 1997 to 2000, the coefficient on the interaction term between non-BC and change in cash becomes negative but is insignificant. Column 5 shows that our findings still hold after we exclude firms incorporated in Delaware. Again, the estimated coefficients on the inverse Mills ratios are insignificant across all model specifications, indicating that self-selection is unimportant. Taken together, our results are consistent with a takeover market that does not negatively impact the value of cash holdings.

For a robustness check, we also employ the Fama and French (1998) methodology to determine the impact of the takeover market on the value of cash. The primary specification is as follows:

$$\frac{MV_{i,t}}{NA_{i,t-1}} = \beta_0 + \beta_1 * \text{Excash}_{i,t} + \beta_{2*}\text{Non-BC}_{i,t} * \frac{\text{Excash}_{i,t}}{NA_{i,t}} + \beta_3 * \text{Non-BC}_{i,t} + \beta_4 \frac{E_{i,t}}{NA_{i,t}} + \beta_5 \frac{E_{i,t-2}}{NA_{i,t}} + B_6 \frac{RD_{i,t}}{NA_{i,t}} + B_7 \frac{RD_{i,t-2}}{NA_{i,t}} + B_8 \frac{I_{i,t}}{NA_{i,t}} + B_9 \frac{I_{i,t-2}}{NA_{i,t}} + \beta_{10} \frac{D_{i,t}}{NA_{i,t}} + \beta_{11} \frac{D_{i,t-2}}{NA_{i,t}} + \beta_{12} * HOLDING_{i,t} + \bar{y}^{(i)}_{jt} + \bar{y}^{(i)}_{lt} + \epsilon_{i,t} \quad (4)$$

The dependent variable is the market-to-book ratio ($\frac{MV_{i,t}}{NA_{i,t-1}}$). The control variables include earnings before interest and extraordinary items (E_t), R&D expenditures (RD_t), interest expense (I_t), total dividends paid (D_t), institutional ownership (HOLDING), industry effects ($\bar{y}_{jt}^{(i)}$), and state effects ($\bar{y}_{lt}^{(i)}$). Excess cash at year t is defined as the residual of the following cash holding regression:

$$\text{Ln}\left(\frac{\text{Cash}_{i,t}}{\text{Assets}_{i,t}}\right) = \gamma_0 + \gamma_1(\text{Market-to-book}_{i,t}) + \gamma_2\,(\text{Firm size}_{i,t}) + \gamma_3\left(\frac{\text{Cash flow}_{i,t}}{\text{Assets}_{i,t}}\right) + \gamma_4\left(\frac{\text{NWC}_{i,t}}{\text{Assets}_{i,t}}\right) + \gamma_5\left(\frac{\text{Capex}_{i,t}}{\text{Assets}_{i,t}}\right) + \gamma_6\,(\text{IndustrySigma}_{l,t}) + \gamma_7\,(\text{Book leverage}_{i,t}) + \gamma_8\frac{\text{RD}_{i,t}}{\text{Sales}_{i,t}} + \gamma_9\,(\text{Dividend Dummy}_{i,t}) + \alpha_i + \rho_t + \epsilon_{i,t} \quad (5)$$

Table 6 displays the results based on Equation (4). The estimated coefficients on the inverse Mills ratios are significantly negative, indicating the presence of a self-selection bias. To be specific, the variables that cause firms to get incorporated in non-BC states are negatively correlated with the market-to-book ratio. However, the presence of the active takeover market does not have a negative impact on the value of cash holdings: the coefficient on the interaction term between non-BC and excess cash is consistently positive and insignificant.

5. CONCLUSIONS

Using business combination (BC) laws to proxy for the monitoring strength of the takeover market, we directly test for the relation between the takeover market and corporate cash holdings and find that the takeover market incentivizes managers to hold more cash.

We investigate the marginal value of cash holdings and find that although firms incorporated in states with a strong takeover market hold more cash for takeover-deterrence purpose, the value of the cash reserves is not discounted by the market. One possible explanation for the lack of value-destroying evidence is that excess cash holdings shelter managers from external takeover pressure, thus allowing managers to focus on long-term investments rather than short-term earnings management.

REFERENCES

Bechuk, Lucian A., and Cohen, Alma, 2003, Firms' decisions where to incorporate. *Journal of law and economics* 46, 383-425

Bertrand, Marianne, and Mullainathan, Sendhil, 2003, Enjoying the quiet life? Corporate governance and managerial preferences. *Journal of political economy* 111, 1043-1075.

Bates, Thomas, Kathleen Kahle, and Rene M. Stulz, 2009, Why do U.S. firms hold so much more cash than they used to? *Journal of Finance* 64, 1985-2021

Dittmar, Amy, and Jan Mahrt-Smith, 2007, Corporate governance and the value of cash holdings, *Journal of Financial Economics* 83, 599-634.

Dittmar, Amy, Jan Mahrt-Smith, and Henri Servaes, 2003, International corporate governance and corporate cash holdings, *Journal of Financial and Quantitative Analysis* 38, 111-133.

Fama, Eugen F., and Kenneth R. French, 1997, Industry costs of equity, *Journal of Financial Economics* 43, 153-193.

Fama, Eugene F., and Kenneth R. French, 1998, Taxes, financing decisions, and firm value, *Journal of Finance* 53, 819-843.

Faulkender, Michael, and Rong Wang, 2006, Corporate financial policy and the value of cash, *Journal of Finance* 61, 1957-1990.

Francis, Bill B., Iftekhar Hasan, Kose John, and Maya Waisman, 2010, The effect of state antitakeover laws on the firm's bondholders, *Journal of Financial Economics* 96, 127-154

Harford, Jarrad, 1999, Corporate cash reserves and acquisitions, *Journal of Finance* 54, 1969-1997.

Harford, Jarrad, Sattar Mansi, and William Maxwell, 2008, Corporate governance and a firm's cash holdings, *Journal of Financial Economics* 87, 535-555.

Jensen, Michael C., 1986, Agency costs of free cash flow, corporate finance and takeovers, *American Economic Review* 76, 323-329.

Jensen, Michael, and William H. Meckling, 1976, Theory of the firm: Managerial behavior, agency costs and ownership structure, *Journal of Financial Economics* 3, 305-360.

Karpoff, Jonathan M. and Paul H. Malatesta, 1989. The wealth effects of second-generation state takeover legislation, *Journal of Financial Economics*, 25, 291-322.

Mikkelson, Wayne H., Megan M. Partch 2003, Do persistent large cash reserves hinder performance? *Journal of Financial and Quantitative Analysis* 38, 275-294.

Opler, Tim, Lee Pinkowitz, René M. Stulz, and Rohan Williamson, 1999, The determinants and implications of corporate cash holdings, *Journal of Financial Economics* 52, 3-46.

Pinkowitz, Lee, 2002, The market for corporate control and corporate cash holdings, Working paper, Georgetown University.

Pinkowitz, Lee, Renè M. Stulz, and Rohan Williamson, 2006, Do firms in countries with poor protection of investor rights hold more cash? *Journal of Finance* 61, 2725-2751.

Qiu, Jiaping, and Fan Yu, 2009, The market for corporate control and the cost of debt, *Journal of Financial Economics* 93, 505-524.

Subramania, Guhan, 2004, The disappearing Delaware effect. *Journal of Law, Economics and Organization* 20, 32-59

APPENDIX A: VARIABLE DEFINITIONS

Variables	
Cash / assets	Cash and equivalents (CHE) / total assets (AT)
Total debt	Short-term debt (DLC) + long-term debt (DLTT)
Market equity	Stock's closing price at the fiscal year-end (PRCC_F) * number of shares (CSHO)
Market-to-book	[Market equity + total debt + preferred stock liquidating value (PSTKL) – deferred taxes and investment tax credits (TXDITC)] / total assets (AT)
Cash flow / assets	[Operating income (OIBDP) – interest expense (XINT) – taxes (TXT)] / total assets (AT)
NWC / assets	[Current assets (ACT) – current liabilities (LCT) – cash and equivalents (CHE)] / total assets (AT)
Firm size	Ln(total assets (AT)), where total assets are measured in 1983 dollars
Book leverage	[Short-term debt (DLC) + long-term debt (DLTT)] / total assets (AT)
Market leverage	Total debt / [total debt + Stock price (PRCC_F) * common shares outstanding (CSHO)]
Capex / assets	Capital expenditure (CAPEX) / total assets (AT)
R&D / sales	R&D expenditure (XRD) / sales (SALE) Missing values are set to zero.
Dividend dummy	Equal to 1 if a firm paid a positive dividend and 0 otherwise
Industry sigma	Average of prior 10 year standard deviations of cash flow ratios (CF / assets) for firms in the same industry defined by 2 digit SIC codes
Net assets	Total assets (AT) – Cash and equivalents (CHE)
Institutional ownership	Sum of all institutional ownership / total shares outstanding
Excess return	Stock return – benchmark stock return
Non-BC	Dummy variable set equal to 1 if a firm is incorporated in a state without BC laws and 0 otherwise
Earnings	Income before extraordinary items (IB) + Interest expense (XINT) + Deferred tax (TXDI) + Investment tax credits (ITCI)
Net financing	Equity issuance (SSTK) – Equity repurchases (PRSTKC) + Long-term debt issuance (DLTIS) – Long-term debt reduction (DLTR)

Table 1
Descriptive statistics

This table presents summary statistics for the sample. The data set includes 7,281firms and 33,596 firm-year observations over the period 1990-2000. All variables are winsorized at the 1st and 99th percentiles to avoid the influence of extreme values. Variable definitions are in Appendix A. We proxy excess cash by the residuals from the following regression equation:

$$\text{Ln}\left(\frac{\text{Cash}_{i,t}}{\text{Assets}_{i,t}}\right) = \gamma_0 + \gamma_1(\text{Market-to-book}_{i,t}) + \gamma_2(\text{Firm size}_{i,t}) + \gamma_3\left(\frac{\text{Cash flow}_{i,t}}{\text{Assets}_{i,t}}\right) + \gamma_4\left(\frac{\text{NWC}_{i,t}}{\text{Assets}_{i,t}}\right) + \gamma_5\left(\frac{\text{Capex}_{i,t}}{\text{Assets}_{i,t}}\right) + \gamma_6(\text{IndustrySigma}_{l,t}) + \gamma_7(\text{Book leverage}_{i,t}) + \gamma_8\frac{\text{RD}_{i,t}}{\text{Sales}_{i,t}} + \gamma_9(\text{DividendDummy}_{i,t}) + \alpha_i + \rho_t + \epsilon_{i,t}$$

For the first three columns, medians are reported in parentheses. Column 4 represents the two-tailed *t*-test for the differences in mean values between BC and non-BC firms. Column 5 presents z-statistics of the Wilcoxon test for differences in distribution between BC and non-BC firms. *t*-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Variables	Full sample	BC firm-years	Non-BC firm-years	t-test	z-test
	(1)	(2)	(3)	(4)	(5)
Cash holdings	0.147	0.146	0.150	0.004*	9.729***
	(0.065)	(0.060)	(0.085)	(1.83)	
Ln(Cash)	-2.883	-2.923	-2.706	0.218***	9.726***
	(-2.732)	(-2.809)	(-2.464)	(10.07)	
Excess cash	0.074	0.036	0.241	0.205***	10.581***
	(0.288)	(0.234)	(0.492)	(10.83)	
Total assets	1,306.48	1,069.08	2,349.10	1,280***	1.982**
	(129.93)	(129.83)	(130.45)	(10.42)	
Market-to-book	1.736	1.738	1.723	-0.016	-0.355
	(1.142)	(1.143)	(1.134)	(-0.61)	
Firm size	18.409	18.385	18.514	0.129***	1.60
	(18.254)	(18.255)	(18.238)	(4.28)	
Cash flow/assets	0.031	0.031	0.029	-0.002	-4.957***
	(0.078)	(0.079)	(0.072)	(-0.84)	
NWC/assets	0.111	0.116	0.085	-0.031***	-12.788***
	(0.107)	(0.115)	(0.070)	(-10.16)	
Capex/assets	0.717	0.069	0.083	0.013***	12.447***
	(0.051)	(0.049)	(0.058)	(12.35)	
Book leverage	0.244	0.246	0.233	-0.013***	-3.335***
	(0.211)	(0.211)	(0.208)	(-4.48)	
Industry sigma	0.099	0.099	0.098	-0.0004	-0.582
	(0.098)	(0.097)	(0.098)	(-0.66)	
R&D/sales	0.044	0.045	0.039	-0.007***	-8.410***
	(0.000)	(0.000)	(0.000)	(-5.75)	
Dividend dummy	0.326	0.321	0.347	0.026***	3.959***
	(0.000)	(0.000)	(0.000)	(3.91)	
Institutional ownership	0.325	0.335	0.278	-0.057***	-18.068***
	(0.286)	(0.304)	(0.209)	(-16.45)	
Obs.	33,596	27,365	6,231		

Table 2
Probit regression predicting the likelihood of incorporating in a non-BC state

This table presents the first-stage estimation results of the Heckman treatment effect model. The dependent variable is 1 if the firm is incorporate in a non-BC state and 0 otherwise. The sample includes 33,596 firm-year observations from 1990 – 2000. Non-BC state-density is computed as the annual average value of the non-BC dummy for all the firms headquartered in firm i's state, excluding firm i. Non-BC industry-density is computed as the annual average value of the non-BC dummy for all the firms in firm i's industry based on the 48 Fama-French (1997) industry definition, excluding firm i. We adjust *t*-statistics for clustering at the firm level and denote significance at the 10%, 5%, and 1% levels by *, **, and ***, respectively.

Variables	Coefficients	*t*-stats
Market-to-book	-0.006	-1.01
Firm size	-0.099***	-11.14
Cash flow/assets	0.202***	3.28
NWC/assets	0.168**	3.04
Capex/assets	0.294**	2.00
Book leverage	-0.236***	-4.18
Industry sigma	-0.944*	-2.88
R&D/assets	-0.158	-1.03
Dividend dummy	0.178***	6.35
Institutional ownership	-0.350***	-5.85
Industry effects	0.025	1.47
State effects	0.166***	7.73
Non-BC industry density	2.969***	34.62
Non-BC state density	3.929***	81.20
Log likelihood	-8,630.44	
Prob > Chi^2	0.0000	
Pseudo R^2	0.155	
Obs.	33,596	

Table 3

The takeover market's impact on corporate cash holdings

This table presents the second-stage estimation results of the Heckman treatment effect model. The full sample covers 1990-2000 and consists of 33,596 firm-year observations. Column 1 presents the pooled OLS regression results. Column 2 utilizes a panel data model controlling for both firm and year fixed effects. Columns 3 and 4 incorporate two time periods. Column 5 reports results after excluding firms incorporated in Delaware. We adjust standards errors for heteroscedasticity and serial correlation while *t*-statistics are in parentheses under each coefficient estimate. We denote significance at the 10%, 5%, and 1% levels by *, **, and ***, respectively.

Variables	Pooled OLS	Random effects	1990-1996	1997-2000	Excluding Delaware
	(1)	(2)	(3)	(4)	(5)
Non-BC	0.130***	0.091***	0.112***	0.120***	0.158***
	(7.28)	(2.74)	(2.66)	(3.01)	(3.78)
Market-to-book	0.154***	0.104***	0.160***	0.068***	0.151***
	(8.96)	(4.37)	(4.66)	(2.75)	(4.10)
Firm size	-0.050***	-0.039***	-0.022*	-0.063***	-0.038***
	(-8.99)	(-4.00)	(-1.82)	(-5.50)	(-2.84)
Cash flow/assets	0.128**	0.189***	0.286***	0.181**	0.151
	(2.55)	(3.29)	(3.40)	(2.51)	(1.61)
NWC/assets	-0.923***	-1.200***	-0.598	-1.658***	-0.622
	(-3.50)	(-3.26)	(-1.15)	(-4.38)	(-1.11)
Capex/assets	-5.132***	-2.402	-5.995**	-0.155	-5.727**
	(-3.91)	(-1.32)	(-2.33)	(-0.08)	(-2.06)
Book leverage	-1.937***	-2.101***	-1.463***	-2.442***	-1.718***
	(-7.32)	(-5.66)	(-2.78)	(-6.36)	(-3.06)
Industry sigma	1.003***	3.402***	3.509***	2.815***	3.393***
	(4.71)	(9.62)	(7.00)	(6.67)	(6.89)
R&D/sales	1.499***	0.662***	0.704***	0.924***	0.021
	(14.65)	(5.22)	(3.77)	(5.79)	(0.09)
Dividend dummy	-0.122***	-0.118***	-0.145***	-0.111***	-0.032
	(-6.90)	(-3.98)	(-4.16)	(-2.96)	(-0.77)
Institutional ownership	1.471***	0.439	1.811*	-0.360	1.581
	(2.99)	(0.65)	(1.88)	(-0.51)	(1.53)
Industry effects	0.488***	0.258***	0.411***	0.216**	0.389***
	(7.03)	(2.67)	(3.02)	(2.14)	(2.65)
State effects	-0.679*	-0.022	-0.926	0.613	-0.863
	(-1.88)	(-0.04)	(-1.31)	(1.17)	(-1.13)
Inverse Mills ratio	-3.072***	-0.870	-3.798*	-0.360	-3.507
	(-2.71)	(-0.55)	(-1.71)	(-0.51)	(-1.46)
Firm fixed effects	No	Yes	Yes	Yes	Yes
Year fixed effects	No	Yes	Yes	Yes	Yes
R^2	0.374	0.370	0.341	0.413	0.281
Obs.	33,596	33,596	19,443	14,153	33,596

Table 4
Levels of cash holdings in non-BC firms before the passage of BC laws

The full sample covers 1980-1989 and consists of 19,094 firm-year observations. Column 1 reports the results for the sub-sample period 1980-1984. Column 2 presents the results for the sub-sample period 1985-1989. Column 3 presents the results using the full sample. We adjust standards errors for heteroscedasticity and serial correlation while *t*-statistics are in parentheses under each coefficient estimate. We denote significance at the 10%, 5%, and 1% levels by *, **, and ***, respectively.

Variables	1980-1984	1985-1989	Full sample
	(1)	(2)	(3)
Non-BC	-0.100***	-0.012	-0.086**
	(-2.61)	(-0.26)	(-2.57)
Market-to-book	0.089***	0.110***	0.097***
	(5.51)	(7.53)	(8.51)
Firm size	-0.060***	-0.024*	-0.032***
	(-4.33)	(-1.72)	(-2.73)
Cash flow/assets	0.814***	0.562***	0.541***
	(4.86)	(4.63)	(4.84)
NWC/assets	-1.963***	-1.321***	-1.531***
	(-17.64)	(-13.52)	(-17.70)
Capex/assets	-2.036***	-1.465***	-1.721***
	(-9.75)	(-6.68)	(-10.96)
Book leverage	-2.878***	-2.272***	-2.437***
	(-24.12)	(-19.94)	(-26.14)
Industry sigma	1.598*	2.493***	2.229***
	(1.86)	(3.94)	(3.80)
R&D/sales	0.729	0.966***	0.628**
	(1.36)	(2.87)	(2.05)
Dividend dummy	-0.081**	-0.162***	-0.102***
	(-2.07)	(-4.07)	(-3.25)
Institutional ownership	0.254**	0.386***	0.319***
	(2.44)	(3.86)	(3.87)
Industry effects	0.167***	0.232***	0.213***
	(5.66)	(7.71)	(9.40)
State effects	0.134**	0.160***	0.138***
	(2.51)	(2.87)	(3.02)
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
R^2	0.258	0.255	0.253
Obs.	9,597	9,497	19,094

Table 5
Impact of the takeover market on the value of cash

This table presents the results from estimating Equation (3). The full sample includes 40,268 firm-year observations from 1990 – 2000. The dependent variable ($r_{i,t} - R^{B}_{i,t}$)is the excess stock return, where $r_{i,t}$ is the annual stock return of firm i and $R^{B}_{i,t}$ is firm i's benchmark portfolio return both during time t. Cash is cash plus marketable securities, Earnings is income before extraordinary items plus interest, deferred tax credits, and investment tax credits, Net assets is total assets net of cash, Interest is interest expense, Dividends is common dividends paid, and Net financing is total equity issuance minus repurchases plus debt issuance minus debt redemption. R&D expenditures are set to zero if missing. We deflate all the above independent variables by the lagged market value of equity. Leverage is the market leverage. Δ denotes the 1-year change in variables. Non-BC is a dummy variable set equal to 1 if the firm is incorporated in a state without BC laws and 0 otherwise. We cluster standard errors at the state of incorporation level while *t*-statistics are in parentheses under each coefficient estimate. We denote significance at the 10%, 5%, and 1% levels by *, **, and ***, respectively.

Variables	Pooled OLS (1)	Random effects (2)	1990-1996 (3)	1997-2000 (4)	Excluding Delaware (5)
ΔCash/ME	1.372***	1.371***	1.305***	1.484***	1.345***
	(26.04)	(25.48)	(19.67)	(16.23)	(15.86)
Non-BC*ΔCash	-0.029	-0.025	0.037	-0.156	0.038
	(-0.45)	(-0.38)	(0.46)	(-1.37)	(0.46)
Non-BC	-0.034***	-0.036***	-0.030**	-0.044***	-0.035**
	(-3.25)***	(-3.58)	(-2.43)	(-2.62)	(-2.49)
ΔEarnings/ME	0.379***	0.377***	0.378***	0.382***	0.364***
	(21.52)	(21.03)	(17.73)	(11.95)	(13.31)
ΔNet assets/ME	0.167***	0.162***	0.181***	0.134***	0.178***
	(17.23)	(16.38)	(17.73)	(7.72)	(11.97)
ΔR&D/ME	0.733***	0.686***	0.693***	0.769**	0.228
	(4.02)	(3.72)	(3.07)	(2.37)	(0.80)
ΔInterest/ME	-0.912***	-0.796***	-1.225***	0.048	-0.797***
	(-6.91)	(-5.74)	(-7.26)	(0.19)	(-3.78)
ΔDividends/ME	1.579***	1.483***	2.078***	0.41	1.736***
	(4.56)	(4.21)	(5.07)	(0.66)	(3.67)
Net financing/ME	0.016	0.030	0.008	0.054*	0.011
	(0.91)	(1.58)	(0.37)	(1.73)	(0.37)
Lagged cash /ME	0.269***	0.314***	0.253***	0.362***	0.293***
	(14.68)	(15.31)	(11.14)	(9.79)	(9.96)
Market leverage	-0.483***	-0.544***	-0.472***	-0.621***	-0.532***
	(-37.43)	(-39.66)	(-28.56)	(-27.40)	(-27.96)
Leverage * ΔCash	-0.978***	-0.983***	-0.963***	-1.060***	-1.187***
	(-10.90)	(-10.70)	(-8.40)	(-6.94)	(-8.63)
Lagged cash * ΔCash	-0.501***	-0.486***	-0.493***	-0.448***	-0.422***
	(-7.76)	(-7.47)	(-6.34)	(-3.59)	(-4.13)
Institutional ownership	0.004	0.005	-0.011	0.032	0.001
	(0.35)	(0.43)	(-0.74)	(1.53)	(0.07)
Industry effects	0.491***	0.485***	0.427***	0.545***	0.437***
	(32.66)	(29.74)	(20.08)	(22.87)	(19.34)
State effects	0.291***	0.264***	0.244***	0262***	0.328***
	(11.02)	(8.75)	(6.24)	(5.78)	(7.96)
Inverse Mills ratio	-0.004	-0.003	0.007	-0.017	-0.002
	(-0.65)	(-0.57)	(1.08)	(-1.99)	(-0.36)
Firm fixed effects	No	Yes	Yes	Yes	Yes
Year fixed effects	No	Yes	Yes	Yes	Yes
R^2	0.204	0.205	0.192	0.226	0.203
Obs.	40,268	40,268	25,460	14,808	19,631

Table 6

Impact of the takeover market on the value of cash using the FF methodology

This table presents the results from estimating Equation (4). The full sample includes 24,585 firm-year observations from 1990 – 2000. All variables are scaled by total assets net of cash (NA). The dependent variable is market-to-book ratio, where book assets are net of cash. Excess cash is from the residuals obtained by estimating Equation (5). Earnings, Net assets, Dividends, and R&D are scaled by net assets. Leverage is book leverage. Non-BC is a dummy variable set equal to 1 if the firm is incorporated in a state without BC laws and 0 otherwise. We cluster standard errors at the state of incorporation level while *t*-statistics are in parentheses under each coefficient estimate. We denote significance at the 10%, 5%, and 1% levels by *, **, and ***, respectively.

Variables	Pooled OLS (1)	Random effects (2)	1990-1996 (3)	1997-2000 (4)	Excluding Delaware (5)
Excess cash	0.221***	0.143***	0.162***	0.144***	0.146***
	(17.69)	(9.18)	(9.18)	(6.13)	(6.08)
Non-BC*Excess cash	-0.022	0.047	0.027	0.013	0.057
	(-0.74)	(1.36)	(0.69)	(0.21)	(1.46)
Non-BC	-0.160***	-0.124	-0.058	-0.212	-0.05
	(-3.04)	(-1.18)	(-0.53)	(-1.504)	(-0.37)
Earnings/Assets	-2.188***	-1.006***	-0.934***	-1.322***	-0.782***
	(-9.99)	(-3.75)	(-3.01)	(-3.53)	(-1.99)
ΔL2 Earnings/Assets	2.958***	1.764***	1.519***	2.045***	1.930***
	(13.48)	(12.90)	(6.36)	(6.32)	(6.04)
R&D/Assets	6.432***	7.165***	7.688***	6.877***	6.951***
	(15.86)	(12.90)	(10.96)	(9.88)	(7.26)
ΔL2 R&D/Assets	7.037***	1.669***	0.459	3.517***	1.345
	(9.84)	(2.68)	(0.48)	(4.29)	(1.32)
Interest/Assets	-0.382	-1.315***	-2.125	2.839	-3.401
	(-0.30)	(-0.823)	(-0.96)	(1.16)	(-1.51)
ΔL2 Interest/Assets	-3.155***	-3.511***	-3.699***	-3.678	-4.523***
	(-2.14)	(-2.79)	(-2.49)	(-1.47)	(-2.30)
Dividends/Assets	16.283***	11.919***	7.638***	14.924***	8.465***
	(15.36)	(5.12)	(3.51)	(4.31)	(3.72)
ΔL2 Dividends/Assets	8.633***	3.751*	6.606***	-3.116	6.064***
	(3.77)	(1.92)	(2.95)	(-0.93)	(2.19)
Institutional ownership	0.846***	1.890***	1.271***	2.059***	1.310***
	(12.63)	(13.77)	(8.83)	(11.93)	(7.99)
Industry effects	0.342***	0.426***	0.364***	0.459***	0.315***
	(19.75)	(14.89)	(10.83)	(12.04)	(9.38)
State effects	0.122***	0.165***	0.080*	0.186***	0.088*
	(5.17)	(4.48)	(1.93)	(3.99)	(1.93)
Inverse Mills ratio	-0.148***	-0.249***	-0.107*	-0.307***	-0.242***
	(-4.32)	(-3.81)	(-1.65)	(-3.28)	(-2.74)
Firm fixed effects	No	Yes	Yes	Yes	Yes
Year fixed effects	No	Yes	Yes	Yes	Yes
R^2	0.473	0.452	0.450	0.494	0.319
Obs.	24,585	24,585	14,639	9,946	12,102

THE EFFICIENCY OF THE RUSSIAN STOCK MARKET: A REVISIT OF THE RANDOM WALK HYPOTHESIS

Ali Said, Strayer University
Alan Harper, South University

ABSTRACT

This study determines whether the Russian stock market is weak form efficient by examining if the stock returns follow a random walk. Following previous studies, we use autocorrelation, the Box-Ljung test statistics and the variance ratio test and find that the Russian stock market was not efficient in the weak form during the testing period. The results suggest that the stock prices in Russia do not reflect all the information from past stock prices and abnormal returns can be achieved by investors by capitalizing on market inefficiency. This is also brings into question of the Russian stock market ability to efficiently redistribute capital to the different segments of the Russian economy.

INTRODUCTION

The Russia economy is expected to be one of fastest growing economies in terms of economic development. According to a report issued by Sberbank CIB, one of the top investment banks in Russia, it is estimated that the Russian consumer market will be the largest in Europe by 2020 and the fourth largest in the world (Jason, 2013). In addition, the Russian stock market will have significant effects on Russian economic development due to the stock market's ability to facilitate the efficient redistribution of capital between the different segments of the Russian economy.

In order to examine the efficiency of the Russian stock market, this study analyzes the daily index returns from 2003 to 2012 by testing the random walk hypothesis to determine whether the Russian stock market is a weak form efficient. The Russian stock market has received less attention in the academic literature than other emerging markets. Our research intends to fill this void.

The remainder of the paper is structured as follows. In section 2, we discuss a brief review of the literature. In section 3, we present data, and in section 4 we discuss the methodology adopted for our paper. Our main empirical results are presented in section 5. Section 6 offers our concluding remarks.

LITERATURE REVIEW

Fama (1970) argued that stock prices will always incorporate the available internal and external information about the company in the capital markets. Therefore, the Efficient Market Hypothesis (EMH) assumes that stock prices react quickly to newly available information, and as a result, current prices reflect both intrinsic and extrinsic prices. Fama (1970), characterize the

Efficient Market Hypothesis into three forms: strong form, semi-strong efficiency and weak efficiency.

The weak form efficiency supports the hypothesis that the current price of stocks incorporates all the information from past stock prices. In an efficient market, investors cannot use past stock prices to earn abnormal returns which makes technical analysis useless (Fama, 1970).

Several studies have analyzed the weak form efficiency based on Fama's argument. For instance, Hamid, Muhammad, Syad, and Rana (2010), studied Pakistan, India, SriLanka, China, Korea, Hong Kong, Indonesia, and the Malaysian stock market's from 2004-2009. The researchers used auto-correlation, runs test, unit root test and variance ratio. They found that all markets were weak form inefficient during the testing period.

Saif Sadiqui and P.K.Gupta (2010) evaluated the Indian stock market from 2000-2008. The study used the runs test, K-S Test, auto-correlation, auto –regression, and ARIMA tests. The results from their study indicated that the Indian stock market does not exhibit weak form efficiency. In a prior study Abrosimova, Natalia, Dissanaike, Gishan and Linowski, Dirk, (2002), used daily and monthly data to study the Russian equity market from 1995-2001. Using the ARIMA and GARCH models, as well as Unit Root Test, auto-correlation and variance ratio tests, their findings indicated that the random walk hypothesis could not be rejected for the monthly data; however, it could be rejected for daily data. In a more recent study, Francesco Guidi, Gupta and Maheshwari (2010), examined the equity markets in Poland, Hungary, the Czech Republic, Slovakia, Romania, Bulgaria, and Slovenia. Covering the periods from 1999-2009, and employing autocorrelation, runs test, variance ratio, and GARCH-M, they found that Central and Eastern Europe countries are not weak form efficient.

The next form of market efficiency is semi-strong efficiency, which states that all public information is already embedded into the value of the security. In a semi-strong efficient market, fundamental analysis, based on public information, is useless (Fama, 1970). One of the studies that tested the semi-strong form is Guttler, Meurer, Da Silva (2007). They examined whether the Brazilian stock market is efficient in reacting to new information surrounding public macroeconomic data announcements. The researchers found the Brazilian stock market to be inefficient in the semi-strong form, which aligned with most of results from other emerging markets. Findings from the study also indicated that a long run relationship existed between selected macroeconomic variables of the Brazilian economy and its stock market index.

Akbar and Baig (2010) analyzed the semi-strong form of market efficiency by examining the reaction of stock prices to dividend announcements. The study examined cash, stock, and simultaneous cash and stock dividend announcements of 79 companies listed on the Karachi Stock Exchange from July 2004 to June 2007. Using the *t*-Test and Wilcoxon signed rank test to rank the abnormal returns from the market, they found companies that listed on the Karachi Stock Exchange to be statistically significant and rejected the semi-strong form of market efficiency of the KSE. Groenewold and Kang (1993) also tested the semi-strong form of the efficient-markets hypothesis by using data on the Australian stock market for the period of 1980s. The study employed macroeconomic data for the semi-strong efficiency tests. The findings from the study were shown to be consistent with the EMH.

Lakshmi, VDMV and Roy, Bijan (2013), tested the correlation between P/E ratios and equity returns in Indian stock market based on the monthly stock returns of 90 companies. The study covered the period of 2006 to June 2012. To examine the strength of the semi strong-form of the efficient market hypothesis, they used the Jensen, Sharpe and Treynor measures. These measures are based on Sharpe-Linter Capital Asset Pricing Model, (CAPM) which examines risk adjusted returns. The findings from their study indicated that the performance of low P/E portfolio's performed better than the high P/E portfolio's in the semi-strong form.

The next form of market efficiency is the strong form efficiency which states that all information is impounded in the price of the stock. Also, the strong form of the efficient market hypothesis is considered to be the most difficult to validate as it needs the use of non-public information. Some studies that have examined the strong form hypothesis would be Tomasz Potocki and Tomasz Swist (2012), who analyzed the strong form of market efficiency. The researchers based their idea on the premise that the institutions giving recommendations had access to information unattainable to the community of investors. The sample of the study consisted of 3,270 recommendations for the period of 1 January 2005 to 31 March 2010 by 63 financial entities listed in the WIG 20 index. The findings from the study provided evidence for the hypothesis that the strong form efficiency is characteristic of the WIG 20 index shares listed on the Warsaw Stock Exchange.

Khan and Ikram (2011) examined the Indian capital market to determine whether the Indian stock market follows strong form market efficiency. The study researched the performance of mutual funds from 1st April 2000 to 30th April 2010. The study used risk and return analysis, Sharpe's performance measure (SHP), Treynor's measure**,** and Jensen's measure to analyze the performance of mutual funds against the benchmark to assess the efficiency of Indian Capital Market. The results of study revealed that the mutual funds outperform the market. Hence, the strong form market efficiency does not exist in the Indian capital market.

Oke & Azeez (2012) tested if the Nigerian capital market exists in the strong-form efficiency. The study employed the autoregressive conditional heteroscedascity (ARCH) and generalized autoregressive conditional heteroscedascity (GARCH) models. Data were obtained from the Nigerian Stock Exchange and Central Bank of Nigeria Statistical Bulletin. The study covered the period of 1986 to 2010. The findings from the study showed that the Nigerian capital market is weak-form efficient and the strong form market efficiency does not exist.

DATA

The data used in this study consisted of index returns for the Russian Trading System Index (RTSI) stock exchange. The data are retrieved from the Russian Trading System Index (RTSI). Daily data are collected from July 2003 to December 2012. The data is then transformed to natural logs of the index with a one period lag.

$$R_t = Log_{pt} / Log_{pt-1}$$

Where, R_t is the return at time t on, $\text{Log}_{\text{pt}}$is the logarithmic price at time t and Log_{pt-1} is the logarithmic at time $t-1$. The reason for transforming time series is to ensure that the data is stationary. Working with non-stationary data can cause model misspecifications.

METHODOLOGY

In testing the market efficiency of the Russian Trading System Index, an auto-correlations and variance ratio tests are employed. Both the auto-correlations test and variance ratio test are used to examine if time series exhibit randomness. This study is similar to Harper and Jin (2012). However, this study is different with respect to the time frame examined, the databases used, the statistical tests employed, and the different stock markets involved. Harper and Jin (2012) evaluated daily stock prices from January 2000 to April 2011 of shares listed on the Bombay Stock Exchange using auto-correlations and runs tests. Their data was retrieved from Yahoo! Finance. Our study uses daily prices from July 2003 to December 2012 retrieved from the Russian Trading System Index. Our study is also different in respect to the statistical tests used and the stock market examined. We use auto-correlations and variance ratio tests and examine the Russian Trading System Index. We seek to test the hypothesis that the series of returns are *i.i.d.* (independently and identically distributed) random variables. If significant auto-correlations are found in times series data, stock returns may not follow a random walk and the market can be classified as a weak form inefficient. However, if stocks returns do follow a random walk, then investors may not be able to successfully predict future returns and the market may be characterized as a weak form efficient.

EMPIRICAL RESULTS

Table 1 illustrates the calculation of a summary of 2,481 daily statistics. The mean daily return is -.00249. The daily returns range from -09.2% to 08.77%, and exhibit more kurtosis than a normal distribution with a sample standard deviation of .00978. The returns have a positive skewness of .499 and a reported kurtosis of 13.942. A Kurtosis of 3 is considered to be associated with a normal distribution. In this case, the Kurtosis indicates probable tail risk in the time series data. Tail risk is the risk that occurs infrequently; however, when tail risk does occur, the returns are often associated with significant volatility. Kurtosis explains where the standard deviation originates.

Table 1: Summary of Statistics

	RESID
Mean	0.000249
Median	0.000926
Maximum	0.087745
Minimum	-0.092068
Std. Dev.	0.009780
Skewness	-0.498640
Kurtosis	13.94223
Sum	0.618744
Sum Sq. Dev.	0.237189
Observations	2481

Table 2 illustrates the results of the auto-correlations test. There are 16 lag periods associated with the auto-correlation test. The first lag depicts an auto-correlation of .135, a standard error of.020 and a Box-Lung value of 45.178 and is significant at the 99% confidence level. This indicates that the stock returns of the Russian Trading System Index do not follow a random walk. Lags 3, 5, 8, 9, 10 and 15 all exhibits negative auto-correlations with a P-value of .000 and are significant again at the 99% confidence level which indicates that stock returns on the Russian Trading System Index are not random. Our results are different from the results of McGowan (2011) who finds the Russian stock market is weak form efficient during their testing period.

Table 2: Autocorrelations
Series: Russian Stock Market

Lag			Box-Ljung Statistic		
	Autocorrelation	Std. Error[a]	Value	df	Sig.[b]
1	.135	.020	45.178	1	.000
2	.012	.020	45.549	2	.000
3	-.039	.020	49.346	3	.000
4	.021	.020	50.484	4	.000
5	-.002	.020	50.496	5	.000
6	.014	.020	50.955	6	.000
7	.020	.020	51.911	7	.000
8	-.062	.020	61.514	8	.000
9	-.019	.020	62.419	9	.000
10	-.012	.020	62.771	10	.000
11	.033	.020	65.457	11	.000
12	.021	.020	66.523	12	.000
13	.063	.020	76.286	13	.000
14	.032	.020	78.896	14	.000
15	-.011	.020	79.175	15	.000
16	.031	.020	81.619	16	.000

a. The underlying process assumed is independence (white noise).
b. Based on the asymptotic chi-square approximation.

Table 3 shows the results from the variance ratio test. The table is divided into two components. The first part of the table shows the joint test while the second part of the table

displays the individual tests. The maximum Z-statistic of 5.888503 is associated with the Chow Denning test at period 2 and is significant. Since the P-value is significant we can conclude that the Russian Trading System Index does not follow a random walk and can be classified as a weak form inefficient. The second part of the table displays the individual tests for different periods. As seen all periods are significant and we can also conclude that the Russian Trading System Index is a weak form inefficient. The bottom portion of the table displays the output for the variance ratio calculations of the mean, individual variance and the observations associated with each calculation.

Table 3: Variance Ratio Test
Included observations: 2481 (after adjustments)
Standard error estimates assume no Heteroskedasticity
Use biased variance estimates
User-specified lags: 2 4 8 16

Joint Tests	Value	df	Probability
Max |z| (at period 2)*	5.888503	2481	0.0000
Wald (Chi-Square)	35.33646	4	0.0000

Individual Tests

Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	1.118220	0.020076	5.888503	0.0000
4	1.166780	0.037560	4.440400	0.0000
8	1.205107	0.059387	3.453735	0.0006
16	1.214950	0.088371	2.432367	0.0150

*Probability approximation using studentized maximum modulus with parameter value 4 and infinite degrees of freedom

Test Details (Mean = 0.000574248673672)

Period	Variance	Var. Ratio	Obs.
1	0.00051	--	2481
2	0.00057	1.11822	2480
4	0.00059	1.16678	2478
8	0.00061	1.20511	2474
16	0.00062	1.21495	2466

CONCLUSION

Many studies have been done to test the efficiency of the Russian stock market in the weak form but the results have been inconclusive. Some studies find the market efficient in the weak form but others find the market inefficient in the weak form. In this study, we use auto-correlation and variance ratio test to analyze daily index returns of the Russian Stock Exchange from July2003 to December 2012. The results of the auto-correlation and variance ratio test indicate that the Russian stock market is not efficient in the weak form during our testing period and implies that it

is possible to achieve abnormal returns by predicting the future price movements based on past stock price movements. Furthermore, this brings into question the ability of the Russian stock market to efficiently redistribute wealth to different segments of the Russian economy. Future research should examine what impact inefficient markets may impose on the redistribution of capital to various segments of the Russian economy.

REFERENCES

Abrosimova, Natalia, Dissanaike, Gishan and Linowski, Dirk, (2002).Testing Weak-Form efficiency of Russian Stock Market", *EFA 2002 Berlin Meetings Presented Paper*.

Fama, E. F., (1970). Efficient capital markets: a review of theory and empirical work. *Journal of Finance, 25*(2), 383–417.

Francesco Guidi, Rakesh Gupta and Suneel Maheshwari, (2010). Weak-form market efficiency and calendar anomalies for Eastern Europe equity markets, *MPRA Paper*, No. 21984.

Groenewold, N. and Kang, K. C. (1993). The Semi-Strong Efficiency of the Australian Share Market. *Economic Record*, 69, 405–410. doi: 10.1111/j.1475-4932.1993.tb02121.x

Guttler Caio, Meurer, Roberto and Da Silva, Sergio (2007), *Informational inefficiency of the Brazilian stock market*, MPRA Paper No. 1980.

Harper, A., and Jin, Z. (2012). Examining market efficiency in India: an empirical analysis of the random walk hypothesis. *Journal of Finance and Accountancy, (10), p. 68-73.*

Jason, B. (Feb 5, 2013). Reuters. In Consumers to power Russian economy, stock market-study. Retrieved July 9, 2013, from http://www.reuters.com/article/2013/02/05/russia-consumers-idUSL5N0B587R20130205.

Khan, A. Q. and Ikram S. (2011). Testing Strong Form Market Efficiency of Indian Capital Market: Performance Appraisal of Mutual Funds", *International Journal of Business & Information Technology*, (1), 151-161.

Lakshmi, VDMV and Roy, Bijan (2013), Price Earnings Ratio Effect: A Test of the Semi Strong Form of Efficient Market Hypothesis in Indian Stock Market . XI Capital Markets Conference, 21-22 December 2012, Indian Institute of Capital Markets (UTIICM). Available at SSRN: http://ssrn.com/abstract=2255389 or http://dx.doi.org/10.2139/ssrn.2255389

McGowan, C.B., (2011). An analysis of the technical efficiency of the Russian stock market. *International Business & Economics Research Journal, 10(10),* 31-44.

Muhammad Akbar & Humayun Habib Baig, (2010). Reaction of Stock Prices to Dividend Announcements and Market Efficiency in Pakistan. *Lahore Journal of Economics, 15*(1), 103-125.

MuhammadT.S., Syad Z.A., and Rana S., (2010). Testing the Weak form of Efficient Market Hypothesis: Empirical Evidence from Asia-Pacific Markets, *International Research Journal of Finance and Economics, 58,*121-133.

Oke, Micheal Ojo & Azeez B.A. (2012). Test of Strong-Form Efficiency of the Nigerian Capital Market. *Business Systems Review, 1*(1), 2280-3866.

Russian Stock Exchange web site, hrrp://www.rts.ru

Saif Sadiqui and P.K.Gupta (2010), Weak Form of Market Efficiency- Evidences from selected NSE indices : http://ssrn.com/abstract=1355103.

Tomasz Potocki &Tomasz Świst, (2012). Empirical Test of the Strong form Efficiency of the Warsaw Stock Exchange: The Analysis of WIG 20 Index Shares. *South-Eastern Europe Journal of Economics, 2,* 155-172.

SMART MONEY AND MARKET STATES

Steve Nenninger, Sam Houston State University

ABSTRACT

This paper examines the performance of mutual funds in different states of the investing market. Past studies related to "smart money" have found that investors tend to chase past above-average returns. This paper examines portfolios of funds and reveals that the most consistent positive returns are actually from the top performing funds formed during poor market states and from past poorly performing funds during good market states. Evidence suggests that trend-chasing behavior may be more profitable following market declines rather than good markets.

INTRODUCTION

Investors tend to chase the returns of highly performing mutual funds in an attempt to earn above average returns. This paper tests whether investing in top performing funds is a successful investment strategy by examining the best-performing quintile of funds against the lowest quintile for a three-year tracking period. Past evidence is conflicting, as Gruber (1996) finds investors can boost return by 1% per year by moving from the bottom decile to the top, while Frazzini and Lamont (2005) find that investors reduce their wealth by reallocating to prior period top performing funds. Results show that the most consistent positive returns are from portfolios formed from the top performing funds following *poor* market states. This implies that seeking out the best funds may be potentially more profitable when doing so after a poor market. However, other studies have shown that flow to performance sensitivity is higher for all classes of funds during *good* markets (Nenninger, working paper). For the portfolios of funds formed following good market states, the bottom quintile outperformed the top for most tracking periods. This suggests a contrarian philosophy following a good year may be more profitable. Not only may investors be more successful by seeking out relatively good performers during down markets, they should be cautious about investing in top funds after good years as returns tend to fall in the next few years.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Is Investing Based On Past Returns Rational?

Since the overall relation of flows to performance has been established, a question arises of whether investing in recent over-performing funds is a successful investment strategy. Several studies examine the performance of funds which attract proportionately greater flows. Zheng (1999) finds that funds that receive money subsequently perform better, suggesting that investors are able to make buying and selling decisions based on good assessments of short-term future performance. Gruber (1996) describes actively managed funds as investment vehicles that allow sophisticated investors to invest in good funds while divesting of poor, enabling them to earn positive returns compared to the market. He posits that investors can boost return by 1% per year by moving from the poorest decile of funds to the best. However, since sophisticated investors

compose a minority of the investor population, overall performance of mutual funds is still below the market. Ippolito (1992) also argues that allocating money to the latest best performing fund is rational given that poor performers persist. In the absence of transaction costs, choosing a recent good performer dominates a strategy of random investing. However, Frazzini and Lamont (2005) find that retail investors reduce their wealth in the long run by reallocating to prior period top performing funds. The authors examine funds' underlying stocks, and find that investors moved their money into funds which invested in stocks that had low future returns.

Hypothesis Development

The central question of this paper is whether past performance has any impact of the future performance of a mutual fund. That is do the past winner remain winners and do the past losers remain losers. Further, do winners and losers change when the state of the market shifts from good to bad? This idea is summarized in Hypothesis 1 below:

H 1 *The future returns generated by "winning" and "losing" mutual funds are dependent upon the market state when the mutual fund is selected.*

SAMPLE AND METHODOLOGY

Share Class Definition

Mutual funds generally fall under one of four different classes of shares: no-load, A, B, and C. There are other classes, such as those available only to institutional investors or through retirement plans, but the categories are not standardized for the industry and are therefore excluded from this study. This study is concerned only with class A share and with no-load shares. Class A shares charge investors an upfront sales charge usually in the range of 3 to 6 percent, and are primarily sold through professional financial advisors. These shares also charge an annual 12b-1 fee of around 25 basis points which is used for distribution and marketing related services. No load funds have no upfront sales charge and 12b-1 fees are typically 0. They are generally available directly from a fund company rather than being sold through brokers.

Data

Data are collected from the CRSP survivor-bias free mutual fund data base for the period of January 1991 through December 2007 for domestic equity funds with assets greater than $10 million. Sector funds are excluded, and any fund involved in a merger is removed from the sample for the year of the merger. The funds are divided into share class categories following Nanda, Wang, and Zheng (2009) by examining the name of each fund, the vast majority of which include the share class. Separate share classes are therefore treated as separate funds. Load charges are also checked and 12b-1 fees reported in CRSP to remove potentially mislabeled funds.

Table 1: Summary Statistics for No-load, Class A, Class B, and Class C Funds

This table reports annual summary statistics for all funds in the sample. The sample includes 24,859 fund year observations and 4278 unique domestic equity funds from the CRSP survivor-bias free mutual fund data base from January` 1991 through December 2007. Sector funds and funds with less than $10 million are excluded, and any fund involved in a merger is removed from the sample for the year of the merger. For each year, the number of funds in each class as well as medians for the following measures are reported: total net assets, expense ratio, 12b-1 fee (first available in 1993), management fee (first available in 1993), annual return, excess objective return, and standard deviation of monthly return. Dollar amounts are in millions.

Year	Number of funds	TNA	Exp ratio	12b1 fee	Mgmt fee	Fund ret	Excess obj ret	Std dev of return
1991	248	242.26	0.0110	n/a	n/a	0.3148	-0.0068	0.0475
1992	411	156.26	0.0100	n/a	n/a	0.0701	-0.0005	0.0255
1993	436	197.71	0.0118	0.0012	0.0100	0.1159	0.0022	0.0234
1994	550	147.99	0.0119	0.0017	0.0100	-0.0286	-0.0002	0.0303
1995	677	171.38	0.0125	0.0024	0.0100	0.3352	0.0030	0.0212
1996	825	183.08	0.0131	0.0025	0.0103	0.1781	-0.0024	0.0320
1997	1018	165.19	0.0140	0.0025	0.0106	0.3004	0.0079	0.0447
1998	952	146.55	0.0150	0.0025	0.0102	0.0782	-0.0034	0.0687
1999	1384	129.85	0.0150	0.0025	0.0103	0.1363	-0.0270	0.0454
2000	1562	113.15	0.0158	0.0030	0.0103	-0.0139	-0.0101	0.0578
2001	1789	98.10	0.0154	0.0030	0.0101	-0.1417	-0.0049	0.0603
2002	2009	65.50	0.0157	0.0035	0.0103	-0.2828	-0.0060	0.0583
2003	2309	79.50	0.0162	0.0035	0.0108	0.2227	-0.0110	0.0362
2004	2534	84.10	0.0167	0.0035	0.0111	0.0943	-0.0035	0.0284
2005	2633	80.90	0.0158	0.0035	0.0108	0.0858	-0.0049	0.0290
2006	2762	84.30	0.0151	0.0032	0.0104	0.0931	0.0015	0.0244
2007	2760	83.50	0.0147	0.0026	0.0101	0.0365	-0.0036	0.0306
full period		101.00	0.0150	0.0025	0.0103	0.0365	-0.0036	0.0363
fund years	24859							
unique funds	4278							

The final sample includes 24,859 fund-year observations drawn from 4278 unique funds. No-load funds account for 5263 (21.2%) of the observations. The much higher proportion of load funds is due to many funds having multiple share classes, each of which is reported as a different fund. Class A share funds make up 38.0% of the observations, and B and C shares are excluded from the final analysis. Specific data collected include monthly total net assets, monthly return, fund expenses, and fund investment objective. Annual standard deviation of monthly return and excess objective return are calculated for each fund.

Descriptive statistics are shown in Table 1, which includes the summary for the full sample. Data for Class A funds and no-load funds are very similar and summary tables are available from the author. Since many of the means involving size are skewed to the right, the medians are reported for all variables. The median fund size for sample funds has fallen over the sample period, due the addition of new funds and new share classes.

RESULTS

Portfolios Based Upon Prior Year Performance

Previous studies have shown (Nenninger, working paper) that flows are more sensitive to performance for load funds over no-load funds. A question that follows is whether the past 12 months of return is actually related to future performance. If so, this would justify the flow-performance relationship that seems to be more important to financial professionals than to individuals. To examine this, the sample of all no-load and class A funds are divided into quintiles each year based upon raw return, with quintile 1 the lowest return and 5 the highest. The following 3 years of performance are ten tracked, treating each quintile as a portfolio of funds, with equal weighting for each fund. This is done for class A and no-load separately to check for differences in returns for the two groups. Results are shown in Table 2. The date in row 1 indicates the year-end in which the portfolio is formed (i.e. the year of data used to determine quintile rank). For example, the 1991 column uses returns from 1991 to form quintiles, then tracks performance for 1992-1994. The returns listed for each quintile are the total compounded monthly raw returns over the 3 year period. The CRSP value-weighted index returns for the 3-year portfolio tracking period are also reported.

Differences between the top and bottom quintiles are reported in the lower half of Table 2 Panel A. The full period results are similar to Carhart (1997) in that the difference in raw return between the top and bottom quintiles for the full period is not significant. However, examining each 3-year tracking period provides additional insight. A positive difference indicates the top quintile portfolio performed better than the lowest during the three-year tracking period. Of the nine years in which the difference between the top and bottom quintile is significant, there is a nearly even split of 5 instances of the top quintile outperforming and 4 in which the lower does better. Further, for 4 of the 5 periods in which the upper quintile outperformed the lower, the portfolios were formed following years defined as bad market states. This means that selecting top performing funds immediately after a below average market year led to over-performance during the following three years. Further, all four of the periods in which the bottom quintile outperformed the top began with portfolios formed after a good year. There is only one instance

Table 2: Quintile Three Year Raw Return.

This table reports performance by quintile of all class A funds from the sample. Quintiles are formed each year based upon previous year raw return, with quintile 1 the lowest return and 5 the highest. Trailing 3-year performance is reported, treating each quintile as a portfolio of funds, with equal weighting for each fund. The date in row 1 indicates the year-end in which the portfolio is formed (i.e. the year of data used to determine quintile rank). Differences between the top and bottom quintiles are reported in the lower half of each table.

	Portfolio Formation Year-End							
	1991	1992	1993	1994	1995	1996	1997	1998
3-year index	0.208	0.502	0.631	1.142	0.931	0.996	0.363	-0.011
Quintile								
High -5	0.114	0.532	0.536	0.996	0.550	0.744	0.271	-0.078
4	0.115	0.501	0.517	1.051	0.714	0.589	0.201	-0.062
3	0.165	0.462	0.504	1.119	0.713	0.670	0.315	0.055
2	0.154	0.390	0.526	1.029	0.738	0.741	0.365	0.078
Low -1	0.234	0.379	0.542	1.005	0.581	0.729	0.370	0.253
5-1	-0.120	0.153	-0.006	-0.009	-0.031	0.015	-0.100	-0.331
significance	< 5%	< 1%					< 1%	< 1%
initial state	good	bad	bad	bad	good	good	good	good
N	110	160	125	160	170	180	200	240

Table 2 Continued

	Portfolio Formation Year-End						
	1999	2000	2001	2002	2003	2004	All years
3-year index	-0.375	-0.065	0.191	0.615	0.410	0.338	0.329
Quintile							
High -5	-0.498	0.011	0.250	0.653	0.365	0.248	0.291
4	-0.409	-0.043	0.063	0.567	0.337	0.293	0.270
3	-0.342	-0.232	-0.025	0.480	0.330	0.244	0.254
2	-0.228	-0.305	-0.049	0.452	0.305	0.239	0.252
Low -1	-0.100	-0.352	-0.107	0.489	0.265	0.231	0.255
5-1	-0.399	0.362	0.357	0.165	0.100	0.017	0.035
significance	< 1%	< 1%	< 1%	< 1%	< 1%		
initial state	good	bad	bad	bad	good	neutral	
N	295	300	335	335	505	525	3640

Table 3: Quintile Three Year Raw Return.

This table reports performance by quintile of all no load funds from the sample. Quintiles are formed each year based upon previous year raw return, with quintile 1 the lowest return and 5 the highest. Trailing 3-year performance is reported, treating each quintile as a portfolio of funds, with equal weighting for each fund. The date in row 1 indicates the year-end in which the portfolio is formed (i.e. the year of data used to determine quintile rank). Differences between the top and bottom quintiles are reported in the lower half of each table.

	Portfolio Formation Year-End							
	1991	1992	1993	1994	1995	1996	1997	1998
3-year index	0.208	0.502	0.631	1.142	0.931	0.996	0.363	-0.011
Quintile								
High -5	0.111	0.542	0.498	1.038	0.669	0.798	0.260	-0.063
4	0.255	0.435	0.572	1.147	0.888	0.647	0.276	0.067
3	0.217	0.527	0.573	1.107	0.731	0.735	0.281	0.095
2	0.258	0.479	0.583	1.086	0.656	0.701	0.276	0.164
Low -1	0.256	0.422	0.565	1.062	0.611	0.742	0.664	0.222
5-1	-0.145	0.120	-0.068	-0.024	0.059	0.057	-0.404	-0.285
significance							1%	1%
initial state	good	bad	bad	bad	good	good	good	good
N	55	95	60	75	85	100	110	125

Table 3 Continued

	Portfolio Formation Year-End						
	1999	2000	2001	2002	2003	2004	All years
3-year index	-0.375	-0.065	0.191	0.615	0.410	0.338	0.329
Quintile							
High -5	-0.436	0.139	0.285	0.600	0.329	0.264	0.310
4	-0.377	-0.016	0.106	0.567	0.360	0.253	0.297
3	-0.271	-0.193	0.014	0.466	0.356	0.245	0.271
2	-0.158	-0.247	-0.053	0.440	0.301	0.250	0.254
Low -1	-0.067	-0.333	-0.129	0.547	0.258	0.219	0.268
5-1	-0.369	0.472	0.414	0.053	0.070	0.045	
significance	1%	1%	1%		1%		
initial state	good	bad	bad	bad	good	neutral	
N	170	185	220	240	355	375	2250

of a “good” market year resulting in the top quintile portfolio outperforming the bottom over the following three year period. The pattern becomes more defined after 1997. This may have been caused by a significant change in the equity market in 2000. A trend of 5 years of strong performance ended, and a string of 3 consecutive years of negative market returns began.

Portfolios formed from the upper quintile of funds at the end of 1997, 1998, and 1999 lagged behind portfolios formed from the lower quintiles for the 3-year tracking periods covering 1998 through 2002, each of which includes at least one bad market state. The largest differences are in the tracking period of 2000 through 2002 for portfolios formed at the end of 1999. In contrast, those portfolios formed from the upper performing quintile at the end of 2000, 2001, 2002, and 2003 produced returns that were greater than the portfolios from lower performing funds for the tracking periods including 2001 through 2006. It appears that for periods since 1997, investors would have profited from a strategy of investing in the top performing funds immediately following bad market states and by investing in lower performing funds following good market states. However, results outlined previously in this paper reveal that performance sensitivity is stronger during good states than bad. Investors actually seek out the top performing funds more actively in good states, when bad states may present a more consistent record of top funds outperforming. This behavior is strongest for load-fund investors and weakest for no-load investors.

Table 3 reports the results for no-load funds, which follow the same basic pattern as the class A shares. It appears that any differences in sensitivity between no load and load funds are not caused by a history of differences in performance. That is, the 3-year returns do not appear to provide a basis for load investors being more sensitive to performance.

One possible explanation for the pattern in returns is market rotation from one objective to another. For example, large growth funds produced an average return of 20.1% in 1999 while income and growth funds averaged of 3.1%. Subsequently, in 2000, growth funds lost 1.7% on average while growth and income produced a 5.8% mean return. Income and growth funds moved from the lower quintiles toward the top over the tracking period. However, style rotation cannot explain the full extent of the difference since results are very similar when forming portfolios based on excess objective return.

CONCLUSIONS

This paper tests the success of a strategy of investing in past top performing funds using a simple method of examining a portfolio of upper performing funds against a portfolio of lower performing funds for a three year tracking period. Results indicate that the most consistent positive returns are from the top performing portfolios formed in poor market states and from past poorly performing funds formed during good market states. This is somewhat contrary to previous results that show flow to performance sensitivity is higher for all classes of load funds during *good* markets. The evidence on the differences between investor classes can be used to better evaluate the sophistication of investor classes, as well as guide brokers to better advice clients on portfolio selection.

REFERENCES

Carhart, Mark M, 1997, On persistence in mutual fund performance, Journal of Finance 52, 57-82

Frazzini, Andrea and Owen Lamont, 2005, Dumb money: Mutual fund flows and the cross-section of stock return, NBER working Paper no. W11526.

Gruber, Martin J., 1996, Another puzzle: The growth in actively managed mutual funds, Journal of Finance 51, 793-810

ICI (Investment Company Institute), 2008, 2007, Investment Company Fact Book, http://www.ici.org

Ippolito, Richard, 1992, Consumer reaction to measures of poor quality: Evidence from the mutual fund industry, Journal of Law and Economics, vol. 35, pp45-70

Nanda, Vikram, Z. Jay Wang, and Lu Zheng, 2009, The ABCs of mutual funds: On the introduction of multiple share classes, Journal of Financial Intermediation, vol. 18, p329-361

Nenninger, Steve A, and David Rakowski, Time-Varying Flow-Performance Sensitivity and Investor Sophistication, working paper.

Zheng, Lu, 1999, Is money smart? A study of mutual fund investors' fund selection ability, Journal of Finance, 54, p901-933

CFO RANKINGS AND TRADING VOLUME

Mike Cudd, Mississippi College
Marcelo Eduardo, Mississippi College
Lloyd Roberts, Mississippi College

ABSTRACT

Extant literature submits that executive celebrity may have an undesirable impact on a company's liquidity by negatively impacting its trading volume. As strange as it may sound, the supposition is that positive external recognition of top executive performance may not be good news for shareholders. Trading volume is generated by differences in analyst opinions concerning the value of a stock. Prior studies show that as new information is disclosed, the narrower the variation in how the information is interpreted by investors, the lower will be the trading volume in those companies. We explore this hypothesis by examining the pattern in trading volume following the July 2012 announcement of the inaugural Wall Street Journal rankings of the top twenty-five finance chiefs of SP500 corporations. After controlling for scale effects, trends in the overall market's trading volume, company-specific variance in trading volume, and cross-correlation in the t-statistic, we observe no significant change in trading volume following the rankings announcement for the twenty-five ranked companies. To the extent that the rankings announcements enhanced the convergence of analyst opinions in those stocks, the statistical results do not support a change in the market liquidity of the shares.

INTRODUCTION

There is an extensive body of extant literature on the impact of new information disclosure on trading volume. Two dimensions of influence on trading volume address the variations in investor interpretations of the new information, and the role of investor consensus. The *differential interpretation* theory suggests that greater variation in the interpretation of new information, results in an increase in trading volume. In essence, there is greater trading activity as a product of investors rebalancing their beliefs and market positions in response to the new information. Conversely, greater congruity in the interpretation of new information should result in a decrease in trading volume. The *consensus effect theory* suggests that the greater the disparity in investor beliefs concerning asset values, the greater will be the level of ensuing trading volume. Conversely, the greater the alignment of investor beliefs, the lower will be the level of subsequent trading volume.

We focus on the change in trading volume of the companies represented in the recent list of "Best CFOs" published by the *Wall Street Journal* to examine these two theories. We submit that inclusion of a company's CFO in the top-twenty-five list will be subject to minimal variation in interpretation, and will also serve to increase consensus among investors concerning the value of the companies represented in the list. That is, investors will unilaterally interpret inclusion in the list as a reflection of quality management and good news for the represented companies.

The *Wall Street Journal's* publicly disclosed its list of "Best CFOs" in its July 31, 2012, issue of the paper. Since the *Wall Street Journal* has the highest circulation of any financial news publication in the world, we contend he public announcement of the top finance chiefs among the SP500 companies provides an excellent scenario to test the relationship between analyst consensus and interpretation of new information, and trading volume. After controlling for trading volume trends in the general market and company-specific trading volume variance, we observe a significant decrease in trading volume for the twenty-five companies on the *Best CFO* list for the six-month period following the announcement. Our findings are consistent with prior theoretical and empirical studies examining the impact on trading volume surrounding earnings announcements and other public disclosure events.

LITERATURE REVIEW

Several prior studies address how new information disclosure affects trading volume. Theoretical models submit that the reaction of trading volume to new information can be divided into three drivers (Karpoff, 1986; Varian, 1989; and Holthausen and Verrecchia , 1990). The *differential interpretation theory* addresses the disparity in how the new information is interpreted by market analysts, suggesting that greater dispersion in the interpretation of new information is positively associated with higher trading volume. *The posterior beliefs theory* indicates that greater dispersion in posterior earnings forecasts is associated with higher trading volume after the news disclosure. The *consensus effect theory* notes that the degree to which the new information causes analyst forecasts to converge is inversely related to trading volume. The differential interpretation effect and the consensus effect are shown to be separate and distinct influences on trading volume surrounding the disclosure of new information (Atiase, Ajinkya, Dontoh, and Gift, 2011). All three drivers imply that a greater change in investor beliefs produces increased trading volume as investors engage in a greater revision of their market positions. Empirical support is found in some studies for all three reaction drivers (Karpoff, 1986; Varian, 1989; and Holthausen and Verrecchia , 1990).

The impact of the three drivers is observed to be affected by several other influences. The magnitude of the surprise around earnings announcements is likely to magnify the impact of the three drivers (Beaver, 1968; Kim and Verrecchia, 1991; and Atiase and Bamber, 1994). The impact of new information on trading volume is observed to be influenced by the degree to which investors revise their beliefs about asset values (Karpoff, 1986; and Varian, 1989). The impact of the consensus effect may be partially mitigated by the influence of trading costs (Barron and Karpoff, 2004). One study finds a positive association between EPS forecast dispersion and trading volume, although the effects of differential interpretation of information and the consensus effect are not controlled in that study (Ajinkya, Atiase, and Gift, 1991). Another observes the presence of the differential interpretation effect, even when stock prices do not react to the public announcement (Kandel and Pearson, 1995). Trading volume surrounding earnings announcements is positively associated with the complement of the correlation between analysts' relative positions and the change in earnings dispersion (Bamber, Barron, and Stober, 1997), also observing that the presence of speculative traders increases the ability of informed traders to camouflage their trades when they interpret information differentially. One weakness of rational models is the lack of

differentiation between pre-announcement information and event-period information (Kim and Verrecchia, 1997). The informational content of a public announcement is higher with higher prior price dispersion (Dontoh and Ronen, 1993).

Other influences on trading volume are also suggested. Addition of a stock to the SP500 index is observed to result in increased trading volume (Lin, 2010), although that is not a material concern in the current study since none of the twenty-five sample stocks experience a change in their index membership surrounding the model formulation or observation periods. Overconfidence is observed to be positively related to trading volume, and found to be more prevalent among private investors than institutional investors (Yung, Sun, and Rahman, 2011). Finally, stock return is found to predict trading volume in both bear and bull markets (Chen, 2012).

The current study examines a proxy for the combination of the differential interpretation and consensus effects. We propose that inclusion of a company in the *Wall Street Journal's* list of Top Twenty-Five CFOs should involve a relatively common interpretation by analysts. For example, there is no pre-existing disparity as would be inherent in an earnings announcement that would be compared to prior earnings forecasts. Likewise, if inclusion in the rankings is interpreted as a positive reflection on the quality of the company's management, the listing should have more of a converging, than diverging, influence on investor outlooks. Both effects should result in decreased trading volume following the announcement. Earlier studies have observed that if new information causes investor beliefs to converge, that induces a decrease in trading volume (e.g., Holthausen and Verrecchia, 1990).

SAMPLE

The study sample is comprised of the twenty-five corporations represented by CFOs making the inaugural Top Twenty-Five list published by the *Wall Street Journal* on July 31, 2012. The *Wall Street Journal* states that its CFO rankings involve an extensive analysis of qualitative and quantitative factors. In addition to analysis of publicly available data, the process includes extensive interviews with finance recruiters and market analysts. The *Journal* submits that its goal is identification of financial managers who excel at financial management and are major contributors to establishing their respective company's corporate strategy. Consideration for inclusion in the ranking requires that the CFO's company have a market capitalization of at least $5 billion, and the CFO must have been in the post for at least three years.

The chief financial executives (CFOs) included in the Journal's Top 25 list and their respective companies are presented in Table 1. A few of the cited companies also appear in other rankings of high-performing executives.[1] Descriptive characteristics for each company and the SP500 index are displayed in Table 2.

[1] For example, see: https://www.iiresearch.net/customerService/VoterGiveBack/2012AllAmericaExecutiveTeamLeadersTable.pdf

METHODOLOGY

Each company's monthly trading volume is initially scaled to the trading volume of the SP500 to produce an index that captures the overall market trend in trading volume. Each company's trading volume index is then normalized again relative to that company's historical variance in the trading volume index to incorporate the company-specific pattern in trading volume volatility. These two steps permit the measure of trading volume to control for overall market trends in trading volume, and to control for each company's typical variance in trading volume.

The first step, indexing each company's monthly trading volume to that of a proxy of the entire market, is found by dividing each company's the monthly trading volume by the monthly trading volume of the SP500 index. This is performed for every month before and after the public announcement of the *Wall Street Journal* rankings:

$$VI_{it} = (V_{it})/V_{SP500_t} \qquad (1)$$

where VI_{it} is the trading volume index for company *i* for month *t*,
V_{SP500_t} is the trading volume of the SP500 index for month *t*, and
V_{it} is the trading volume for company *i* for month *t*.

The second step is to scale each company's mean trading volume index to the trading volume index volatility over the estimation period, which is achieved by dividing each company's historical mean trading volume index by that company's historical standard deviation of the trading volume index:[2]

$$\overline{PreSVI_i} = [(\sum_{t=-60}^{-1} VI_{it})/60]/s_i \qquad (2)$$

where $\overline{PreSVI_i}$ is the mean value of the scaled trading volume index for company *i* for the sixty months prior to the public announcement of the *Wall Street Journal* rankings, and

s_i is the sample standard deviation of the trading volume index for company *i* for months *t=-60* to *t=-1*, where *t=0* is the announcement month.

Likewise, the mean value of the scaled average trading volume index for each company *i* is determined for each of the six monthly observation periods *j* following the rankings announcement, as follows:[3]

$$\overline{PostSVI_{ij}} = \left[\left(\sum_{j=0}^{5} VI_{it}\right)/6\right]/s_i \qquad (3)$$

[2]This is performed for the sixty months prior to the month the *Wall Street Journal* rankings are announced.
[3] This is actually performed and subsequently reported for multiple event windows ranging from one to six months inclusive of the rankings announcement month.

where $\overline{PostSVI_{ij}}$ is the mean value of the scaled trading volume index for company *i* for observation period *j* following the public announcement (*j*=0 is the month of the *Wall Street Journal* announcement).[4]

The difference between the mean post-announcement scaled trading volume index and the pre-announcement scaled trading volume index for each company *i* and each observation period *j* is expressed as:

$$\Delta SVI_{ij} = PostSVI_{ij} - PreSVI_i \quad (4)$$

Using the measure applied by Boehmer, Musumeci, and Poulsen (1991) in return models, the *t*-statistic is determined for the sample of twenty-five companies for each observation period *j* to test the null hypothesis that the change in the scaled trading volume index is equal to zero, as follows:

$$t_{\Delta SVI_j} = \frac{\overline{\Delta SVI}_j}{s_{n_j}/\sqrt{n-1}} \quad (5)$$

where $\overline{\Delta SVI_J}$ is the mean change in the scaled trading volume index for the sample for observation period *j*,

s_{n_j} is the sample standard deviation of the mean change in the scaled trading volume index for observation period *j*, and

n is the number of companies in the sample (*n*=25).

This form of the *t*-statistic, however, does not control for cross-correlation effects associated with a common or clustered event date, and can lead to an understatement of the sample's cross-sectional standard deviation and false rejection of null hypotheses. The problem is addressed by applying the Kolari and Pynn*ö*nen (2010) correction to the *t*-statistic, as follows:

$$t_{\Delta SVI_j} = \frac{\overline{\Delta SVI}_j}{s_{n_j}/\sqrt{n-1}} \sqrt{\frac{1-\bar{r}}{1+(n-1)\bar{r}}} \quad (6)$$

where $\bar{r}$ is the average of the correlations of the monthly scaled trading volume index values among the sample companies over the estimation period.[5]

[4] Note that both the pre-announcement average and the post-announcement average are scaled to the pre-announcement standard deviation, which is consistent with scaling procedures in prior treatments of event effects (e.g., see Boehmer, Musumeci and Poulsen, 1991).

[5] Calculated as the average bivariate Pearson correlation of scaled indexed trading volume for the estimation period for all possible unique pairs of ranked companies, the average sample correlation is found to be 0.25003.

The cumulative incremental scaled trading volume index is then defined as:

$$\Delta CSVI_{ji} = \sum_{j=0}^{5} \Delta SVI_i \qquad (7)$$

where $\Delta CSVI_{ji}$ is the cumulative incremental scaled trading volume index for company *i* for observation period *j* (ranging from *j*=0,0 to *j*=0,+5).

The corresponding t-statistic for cumulative incremental scaled abnormal returns is then similarly defined as:

$$t_{\Delta CSVI_j} = \frac{\overline{\Delta CSVI}_j \sqrt{n}}{s_{\Delta CSVI_j}} \sqrt{\frac{1-\bar{r}}{1+(n-1)\bar{r}}} \qquad (8)$$

Consistent with Kolari and Pynnönen (2010) for multiple-period event windows, the *t*-statistic is adjusted by replacing the mean incremental scaled trading volume index and standard deviation of incremental scaled trading volume index with the mean scaled cumulative incremental scaled trading volume index and the standard deviation of scaled cumulative incremental scaled trading volume index, respectively. Kolari and Pynnönen note that the cross-sectional correlation for multiple periods is the same as the one-period correlation.

ANALYSIS OF RESULTS

If the *Wall Street Journal* rankings announcement has a converging influence on analyst opinions either in the form of a more narrow interpretation of the information conveyed in the announcement (i.e., the *differential interpretation theory*), or a greater consensus in investor beliefs (i.e., the *consensus theory*), this would be evidenced by a reduction in trading volume following the announcement. Findings for the change in the cumulative scaled trading volume index ($\overline{\Delta CSVI_i}$) are displayed in Table 3. Results are generated for various observation windows ranging from one to six months following the announcement. Before adjustment for cross-correlation, each of the six event windows produces a significant decrease in the trading volume index for the sample following the public announcement. Correction for cross-correlation, however, renders all six *t*-values statistically insignificant. Consequently, we find no association between the *Wall Street Journal's* announcement of the top twenty-five CFOs, and subsequent shareholder liquidity.

The importance of the Kolari and Pynnönen (2010) correction for cross-correlation is noteworthy. Without the adjustment, the current findings would be in agreement with other studies lacking the cross-correlation adjustment (e.g., Karpoff, 1986; Varian, 1989; and Holthausen and Verrecchia , 1990). Studies of executive celebrity often involve nested or common event dates, for which cross-correlation effects may be problematic. The currently observed importance of the cross-correlation adjustment to significance findings raises questions concerning the validity of

other studies of executive celebrity and shareholder liquidity that lack the cross-correlation adjustment.

CONCLUSIONS

This study examines the impact on trading volume of the announcement of the July 2012, *Wall Street Journal* inaugural rankings of the top twenty-five finance chiefs of SP500 corporations, and finds no association between the *Wall Street Journal's* announcement of the top twenty-five CFOs, and subsequent shareholder liquidity. Because the study involves a common event date associated with executive celebrity, the *Wall Street Journal* rankings announcement, it is necessary to apply the Kolari and Pynn*ö*nen (2010) adjustment to the *t*-statistic for cross-correlation. The impact of the cross-correlation adjustment on significance findings is striking. Without the adjustment, the current study's findings are consistent with several prior studies in observing an inverse relationship between executive celebrity and shareholder liquidity. With the adjustment applied, however, the findings are statistically insignificant. Consequently, the impact on significance findings raises questions about the validity of prior similar studies lacking the adjustment for cross-correlation.

Table 1
Best CFOs*

Rank	Name	Company
1	Mark Loughridge	IBM
2	Carol Tome	Home Depot
3	Karen Hoguet	Macy's
4	Stacy Smith	Intel
5	Paul Clancy	Biogen Idec
6	Kim Foster	FMC
7	James Sawyer	Praxair
8	Daniel Comas	Danaher
9	Dan Florness	Fastenal
10	Richard Galanti	Costco Wholesale
11	Neil Williams	Intuit
12	Jack Hartung	Chipotle Mexican Grill
13	Jeff Edwards	Allergan
14	Patricia Yarrington	Chevron
15	Rob Knight	Union Pacific
16	Ann Marie Petach	BlackRock
17	Byron Pollitt	Visa
18	Bill Giles	AutoZone
19	James Bloem	Humana
20	Ted Crandall	Rockwell Automation
21	Judy Brown	Perrigo
22	Patricia Bedient	Weyerhaeuser
23	David Wajsgras	Raytheon
24	David Goulden	EMC
25	Mark Dentinger	KLA-Tencor

*Source: *Wall Street Journal*, July 31, 2012.

Table 2
Sample Characteristics

Average monthly trading volume[6]			
	Pre-Announcement		Post-Announcement
Company or Index Name	Mean	s	Mean
SP500	4806.006	3575.724	1065.646
IBM	7.479	4.178	2.470
HomeDepot	17.021	8.276	6.023
Macy's	9.941	5.662	3.063
Intel	65.563	50.475	16.431
Biogen	3.092	1.191	1.244
FMC	1.702	0.732	0.791
Praxair	2.017	1.146	0.732
Danaher	4.328	3.567	1.197
Fastenal	3.196	2.124	1.355
Costco	4.393	2.570	1.757
Intuit	3.577	1.861	1.059
Chipotle	0.749	0.866	0.263
Allergan	2.278	1.791	0.653
Chevron	11.569	6.192	3.837
UnionPacific	4.661	1.903	1.749
Blackrock	0.766	0.747	0.416
Visa	8.326	2.926	5.983
Autozone	0.746	0.535	0.362
Humana	2.591	2.037	1.235
Rockwell	1.586	1.195	0.500
Perrigo	1.087	0.702	0.394
Weyehaeuser	3.850	4.666	1.896
Raytheon	3.141	1.805	0.828
EMC	28.270	19.736	9.782
KLA-Tencor	4.024	2.373	1.211

[6] Pre-announcement period includes the sixty months prior to the public announcement of the *Wall Street Journal* rankings of the top twenty-five CFOs. Post-announcement period includes the month of the announcement and the following five months.

Table 3
Event Period Results

Notation is defined as: incremental scaled trading volume index ($\Delta CSVI_j$) for observation period *j*, the BMP (1991) *t*-statistic without adjustment for cross-correlation (t_B), the t-statistic with the Kolari – Pynnönen (2010) adjustment for cross-correlation (t_{AB}), and *j*=0 represents the month the CFO rankings are announced by the *Wall Street Journal*. The mean correlation of estimation period incremental scaled abnormal return pairs ($\bar{r}$) is 0.25003.

Mean / (t-value) n = 25 companies Event Window	$\Delta CSVI_j$ / ($s_{\Delta CSVI_j}$)	t_B	t_{AB}
j=0,0	-0.591 / (0.912)	-3.177 **	-1.040
j=0,+1	-0.591/ (0.795)	-3.642 **	-1.192
j=0,+2	-0.452/ (0.865)	-2.563 *	-0.839
j=0,+3	-0.424/ (0.810)	-2.564 *	-0.839
j=0,+4	-0.476/ (0.744)	-3.130 **	-1.024
j=0,+5	-0.467/ (0.746)	-3.068 **	-1.004

**p<.01
*p<.05

REFERENCES

Ataise, R., B Ajikya, A. Dontoh, and M. Gift (2011), The fundamental determinants of trading volume reaction to financial information: evidence and implications for empirical capital market research, *Journal of Financial Research* 34, 61-101.

Ajinka, B., R. Ataise, and M. Gift (1991), Volume of trading and the dispersion in financial analysts' earnings forecasts, *The Accounting Review* 66, 389-401.

Ataise, R., and L. Bamber (1994), Trading volume reactions to annual accounting earnings announcements: the incremental role of predisclosure information asymmetry, *Journal of Accounting and Economics* 17, 309-329.

Bamber, L., O. Barron, and T. Stober (1997), Trading volume and different aspects of disagreement coincident with earnings announcements, *The Accounting Review* 72, 575-597.

Barron, O., and J. Karpoff (2004), Information precision, transaction costs, and trading volume, *Journal of Banking and Finance* 28, 1207-1223.

Beaver, W. (1968), The information content of annual earnings announcements, *Journal of Accounting Research* 6, 67-92.

Boehmer, E., J. Musumeci, and A. B. Poulsen (1991), Event study methodology under conditions of event influenced variance, *Journal of Financial Economics* 30, 253-72.

Chen, S. (2012), Revisiting the empirical linkages between stock returns and trading volume, *Journal of Banking and Finance* 36, 1781-1788.

Dontoh, A. and J. Ronen (1993), Information content of accounting announcements, *The Accounting Review* 66, 857-869.

Holthausen, R., and R. Verrecchia (1990), The effect of informedness and consensus on price and volume behavior, *The Accounting Review* 65, 191-208.

https://www.iiresearch.net/customerService/VoterGiveBack/2012All-AmericaExecutiveTeamLeadersTable.pdf

Kandel, E. and N. Pearson (1995), Differential interpretation of public signals and trade in speculative markets, *Journal of Political Economy* 103, 831-872.

Karpoff, J. (1986), A theory of trading volume, *Journal of Finance* 41, 1069-1087.

Kim, O. and R. Verrecchia (1991), Trading volume and price reactions to public announcements, *Journal of Accounting Research* 29, 302-321.

Kim, O. and R. Verrecchia (1997), Pre-announcement and event period private information, *Journal of Accounting And Economics* 24, 395-419.

Kolari, James, and Pynnönen (2010), Event study testing with cross-sectional correlation of abnormal returns, *The Review of Financial Studies* 23, 3996-4025.

Lin, E. (2010), Changes in trading volume and return volatility associated with S&P500 index additions and deletions, *Research in Finance* 26, 127-154.

Varian, H. (1989), Differences of opinion in financial markets, in C.C. Stone, ed. : *Financial Risk: Theory, Evidence and Implications* (Kluwer, Dordrecht, Netherlands), 3-36.

Yung, K., Q. Sun, H. Rahman (2011), Trading volume and overconfidence with differential information, and heterogeneous investors, *Journal of Behavioral Studies in Business* 4, 1-31.

THE EFFECTS OF BOARD AND AUDIT COMMITTEE CHARACTERISTICS ON REAL EARNINGS MANAGEMENT: DO BOARDS AND AUDIT COMMITTEES PLAY A ROLE IN ITS PROMOTION OR CONSTRAINT?

Sarah Garven, Ohio University

ABSTRACT

This study, using a unique, hand-collected dataset of board and audit committee characteristics from the post-SOX period, examines the effects of corporate governance structures on real earnings management (REM). Results from logistic regression analysis of 148 REM and 148 non-REM firms indicate there is some support for the expectation that audit committee and board characteristics are associated with the probability of REM activity. Specifically, I find that the number of audit committee meetings and independent board members' stockholdings are negatively associated with REM. Additionally, the number of outside directorships held by audit committee members, the number of outside directorships held by independent board members, and non-independent board members' stockholdings demonstrate a positive association with REM. The results offer some potentially valuable information to policymakers seeking to enhance the effectiveness of corporate governance mechanisms, as well as highlight the need for additional governance reform.

INTRODUCTION

This study investigates the effects of board and audit committee characteristics on real earnings management (REM). Specifically, I examine whether audit committee and board characteristics that have previously been examined in association with another form of earnings management, accrual earnings management (AEM), are associated with the presence of REM. As factors that may affect board and audit committee members' motivation to monitor management (e.g., reputational harm, litigation risk, and monetary gain) are the same for both types of earnings management, the expectation is that some of these characteristics will be found to be associated with real earnings management.

Unlike AEM, in which managers manipulate earnings by taking advantage of the accounting discretion in GAAP, REM involves the manipulation of earnings via real business activities (Xu, Taylor & Dugan, 2007). Examples include reducing discretionary expenditures, offering price discounts to increase sales, and overproducing inventory (Roychowdhury, 2006). Given that recent research indicates REM has real economic costs to the firm (Graham, Harvey & Rajgopal, 2005; Leggett, 2008; Bhojraj, Hribar, Picconi & McInnis, 2009) and has increased since the passage of the Sarbanes-Oxley Act of 2002 (Graham et al., 2005; Cohen, Dey & Lys, 2008), there is a need to understand the role boards and audit committees play in its promotion or constraint.

Using logistic regression on a matched-sample of 296 firm-year observations for the period 2005 to 2007, I examine whether any significant associations exist between audit

committee and board characteristics and the occurrence of REM, controlling for various factors previous research suggests as being associated with earnings management and/or audit committee and board characteristics. Specifically, the audit committee characteristics I examine are number of meetings, tenure, stock ownership, outside directorships, financial expertise, and number of directors. I examine the same characteristics for the board of directors with the exception of financial expertise and with the addition of CEO/Chair duality and independence. Following Leggett (2008), REM firms are defined as those with income increasing abnormal discretionary expenditures that are used to avoid reporting a loss.

The results indicate some support for the expectation that audit committee and board characteristics are associated with the probability of REM activity. I find that the number of audit committee meetings and independent board members' stockholdings are negatively associated with REM, suggesting that audit committees that meet frequently are better able to monitor management's actions, and stock ownership by independent board members appears to align their interests with those of the company's shareholders. Additionally, I find that the number of outside directorships held by audit committee members, the number of outside directorships held by independent board members, and non-independent board members' stockholdings demonstrate a positive association with REM. This suggests the time demands associated with additional directorships may reduce audit committee and other independent directors' ability to effectively monitor management and stock ownership by non-independent board members does not reduce underlying agency problems.

The current study makes several contributions to the real earnings management and corporate governance literature. First, it extends previous studies relating corporate governance characteristics to real earnings management by examining a more comprehensive set of audit committee and board of director characteristics, by examining a period after the passage of SOX, and by using a more aggressive approach to identifying firms engaging in REM.[1] Second, its findings provide insights to policymakers seeking to enhance the effectiveness of corporate governance mechanisms and highlight the need for additional governance reform. Third, this study accepts Graham et al.'s (2005) call for future researchers to place more attention on the improvement of corporate governance by focusing on managers' real business decisions. Based on their study's evidence that managers are now using real activities manipulation to a greater extent than accounting actions to meet earnings benchmarks, they suggest additional studies on earnings management via real activities rather than accruals.

The remainder of this paper is organized as follows. Section II includes a review of the literature and Section III discusses the motivation for the expected association of the governance characteristics and REM. Section IV details the research design and Section V presents the results. The final section discusses the study's implications and limitations as well as suggestions for further research.

LITERATURE REVIEW

The extant literature presents substantial evidence that various board and audit committee characteristics are associated with accrual earnings management in U.S. firms (e.g., Klein, 2002; Yang & Krishnan, 2005; Bédard, Chtourou & Courteau, 2004; Xie, Davidson & DaDalt, 2003; Chtourou, Bédard & Courteau, 2001; Carcello, Hollingsworth, Klein & Neal, 2006; Kouki, Elkhaldi, Atri & Souid, 2011; Ghosh, Marra & Moon, 2010). However, to date, few studies have examined the association between board and audit committee characteristics and the likelihood

of *real* earnings management in U. S. firms. Carcello et al. (2006) use 2003 data to examine the association between the presence of accounting and nonaccounting audit committee financial experts and two measures of REM activities, abnormal discretionary expenditures and abnormal production costs. Their results indicate either no association or a positive association between accounting audit committee financial expertise and REM and no association between nonaccounting audit committee financial expertise and REM. Krishnan and Visvanathan (2008), using pre-SOX data, look at the association between three measures of REM (abnormal cash flow from operations, abnormal discretionary expenses, and abnormal production costs) and audit committee expertise as measured by accounting financial expertise, nonaccounting financial expertise, and nonfinancial expertise. Their findings suggest that only accounting financial expertise constrains REM. Thus, whereas Krishnan and Visvanathan (2008) find a negative correlation between accounting financial expertise and REM, Carcello et al. (2006) find either no relationship or a positive relationship between accounting financial expertise and REM.

Visvanathan (2008) uses pre-SOX data to examine the association between three metrics of REM (abnormal cash flow from operations, abnormal discretionary expenses, and abnormal production costs) and the audit committee characteristics of size, independence, and number of meetings, as well as the board of director characteristics of size, independence, and CEO/Chairman of the Board duality. He finds that audit committee meeting frequency is an important factor in limiting the occurrence of REM in the abnormal discretionary expenses model, but not in the abnormal cash flows or abnormal production costs models. Additionally, he finds that board independence is a significant factor in constraining REM in the abnormal discretionary expenses and abnormal production costs models, but not in the abnormal cash flows model. He finds no association between audit committee size, board size, audit committee independence, or CEO/Chairman duality and the three types of REM examined.

This study differs from these previous studies in three important ways. First, it examines post-SOX data. Given SOX's focus on corporate governance reform, this study seeks to determine if boards and audit committees with certain characteristics prove to be effective mechanisms for constraining REM after the enactment of SOX, or if it appears that stronger reforms are needed. Second, unlike these prior studies which base their identification of firms engaged in REM solely on abnormal levels of operating activities, I use Leggett's (2008) approach which includes a reporting incentive criterion, thereby strengthening the assumption that the REM firms identified are opportunistically manipulating earnings, as opposed to simply reacting to changing economic opportunities (e.g., cutting back on R&D as a result of anticipated reductions in investment opportunities) (Graham et al., 2005; Leggett, 2008). Third, it examines a more comprehensive set of audit committee and board of director characteristics. Rather than narrowly focusing on one audit committee characteristic as Carcello et al. (2006) and Krishnan and Visvanathan (2008) or only a few board and audit committee characteristics as Visvanathan (2008), I examine six audit committee and seven board characteristics that have been examined in association with accrual earnings management in past research.

HYPOTHESES DEVELOPMENT

This section provides the motivation for the expected associations between the audit committee and board characteristics and REM. The audit committee characteristics I examine are number of meetings, tenure, outside directorships, number of directors, financial expertise, and stock ownership. The board of director characteristics I examine include number of meetings,

tenure, outside directorships, number of directors, CEO/Chair duality, board independence, and stock ownership (of independent and non-independent members).

Number Of Meetings

Prior literature (e.g., Menon & Williams, 1994; Yang & Krishnan, 2005; Xie et al., 2003) posits that audit committees that meet infrequently are not likely to be effective monitors of management. A similar argument can be made for boards. As noted by Xie et al. (2003), a board that meets more often should have more time to focus on issues such as earnings management. On the other hand, boards that meet infrequently are likely to skim over management plans without questioning the motives behind them. Hence, I predict a negative association between the number of meetings of both boards (BDMEET) and audit committees (ACMEET) and the occurrence of REM.

Tenure

Experience on the board allows audit committee members and independent board members to increase their knowledge about company practices, risks, and issues specific to that firm (Bédard et al., 2004; Yang & Krishnan, 2005). This company-specific expertise is likely to assist the audit committee and independent board members in better protecting shareholder interests and improving firm performance (Yang & Krishnan, 2005). Therefore, I predict a negative association between the average tenure of both independent board members (INDTEN) and audit committee members (ACTEN) and the occurrence of REM.

Outside Directorships

Academic opinion is divided concerning the effect of multiple outside directorships in which board members engage. Some authors, including Shivdasani and Yermack (1999), note that a criticism of directors who hold multiple directorships is that they lack the time to be effective monitors of each company they serve. Other authors, including Bédard et al. (2004), suggest that additional directorships are both a signal to the market of directors' competence and a means of acquiring governance expertise. Similar arguments can be made for the effect of multiple directorships on audit committee members. Given these two differing perspectives, I do not place an expected sign on the relationship between the average number of outside directorships of both independent board members (INDDIR) and audit committee members (ACDIR) and the occurrence of REM.

Number Of Directors

In 1999 the Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees (BRC) noted that "Because of the audit committee's responsibilities and the complex nature of accounting and financial matters reviewed, the committee merits significant director resources … in terms of the number of directors dedicated to the committee" (BRC, 1999, 26).[2] Bédard et al. (2004) note that best practices suggest that larger audit committees will bring diverse views and expertise to ensure effective monitoring. Additionally, Visvanathan

(2008) suggests that larger committees are more likely to have greater participation in the monitoring process. I therefore predict a negative association between the size of the audit committee (ACSIZE) and the occurrence of REM.

Regarding board size, the accounting literature is divided on whether large or small boards are more effective at monitoring. Xie et al. (2003) note that larger boards may be better at preventing earnings management, as they are more likely to have independent directors with corporate or financial experience and Zahra and Pearce (1989) note that prior research suggests that larger boards are less likely to be dominated by management and thus are better able to protect shareholders' interests. However, Jensen (1993) and Chaganti, Mahajan and Sharma (1985) argue that CEOs are better able to control larger boards and larger boards are not as likely to function as well as smaller boards. In light of these conflicting views regarding board size, I do not place an expected sign on the association between board size (BDSIZE) and the occurrence of REM.

Financial Expertise

Congress enacted the SOX financial expert requirement in the belief that "… the effectiveness of the audit committee depends in part on its members' knowledge of and experience in auditing and financial matters" (U.S. Senate, 2002, 32).[3] Krishnan and Visvanathan (2008) note that audit committees with financial expertise are better equipped to examine the reasonableness of management explanations. Accordingly, I expect a higher percentage of financial expertise on the audit committee will result in more challenges to management's explanations for engaging in abnormal operating activities. I predict a negative association between the percentage of financial expertise of audit committee members (FINEXP) and the occurrence of REM.

CEO/Chair Duality

The Cadbury Committee (1992, 4.9) recommends that the roles of CEO and Chairman of the Board should be separate, as one person in both roles would present "a considerable concentration of power."[4] As noted in Chtourou et al. (2001), this concentration of power comes from the role the board has in both appointing and monitoring management and from the responsibility the Chairman of the Board has in setting the board agenda and running the meetings. Therefore, as proposed by Visvanathan (2008), boards which have the same person in both roles are less likely to be effective monitors and thus are less likely to constrain earnings management. As a result, I expect to find a negative association between the separation of the CEO and Chairman positions (NODUAL) and the occurrence of REM.

Board Independence

Prior literature (e.g., Bédard et al., 2004; Abbott, Parker & Peters, 2004; Yang & Krishnan, 2005) argues that a fully independent audit committee would be better able to protect shareholders' interests and fulfill its monitoring role because of its ability to view issues objectively. This expectation is supported by the provision in SOX requiring publicly traded companies to have completely independent audit committees.[5] Xie et al. (2003) make a similar argument for boards, noting that boards with a higher percentage of independent directors are

expected to better protect shareholders' interests and to more effectively monitor earnings management than those with primarily inside directors. Thus, I expect a negative association between the percentage of board independence (BDIND) and the occurrence of REM.

Stock Ownership

Research is divided about the effects of stock ownership on independent directors. As argued by Jensen (1993), encouraging outside board members to own substantial stock interests would provide better incentives for monitoring management and would more closely align their interests with those of the company's shareholders. However, as posited by Wright (1996), a direct financial interest in the company may weaken their independence. Therefore, I do not place an expectation on the sign of the association between independent board members' (INDSTOCK) and audit committee members' (ACSTOCK) extent of stock ownership and the occurrence of REM. Based on the expectation of managerial entrenchment, I predict a positive association between the occurrence of REM and the extent of stock ownership of non-independent board members (NISTOCK).

RESEARCH DESIGN

Sample selection begins with the population of U.S. firms that appear in the COMPUSTAT North America Fundamentals File for 2005-2007.[6] I exclude financial institutions (SIC codes between 6000 and 6500) and firms in regulated industries (SIC codes between 4400 and 5000), as these firms utilize a distinctive set of accounting rules. I also exclude firms with less than ten years of historical data, as I require each observation to have at least ten years of historical data in order to estimate a firm's normal level of discretionary expenditures for the eleventh year. Additionally, only firms traded on the New York Stock Exchange, American Stock Exchange, and NASDAQ are included.[7]

REM Firm Selection

I use the Leggett (2008) method to identify REM firms. Under this method, REM firms are defined as those with an abnormal decrease in discretionary expenditures in a magnitude sufficient to avoid reporting a loss. This loss avoidance criterion is used in an attempt to distinguish between firms that have engaged in REM from firms that have simply reacted to changing economic conditions or opportunities (Graham et al., 2005; Leggett, 2008). Similar to Leggett (2008), my focus on firms which engage in REM via a reduction of discretionary expenditures to avoid net losses stems from the fact that Graham et al. (2005) found that 80 percent of the financial executives they surveyed reported they would reduce discretionary expenditures on advertising, maintenance, and R&D for the purpose of meeting an earnings target and over 65 percent identified loss avoidance as an important earnings benchmark.[8]

Following Leggett (2008), I define discretionary expenditures as the sum of advertising, R&D, and SG&A expenses, calculate abnormal discretionary expenditures using an extension of the Dechow, Kothari and Watts (1998) discretionary expenditures expectation model, and then use the actual expenditures of each firm over the previous ten years to estimate each firm's normal discretionary expenditures for the eleventh year: [9]

$$\mathbf{DisExp_t / A_{t-1} = \alpha_0 + \alpha_1 (Sales_{t-1}/A_{t-1}) + \varepsilon_t} \quad \mathbf{(1)}$$

where $DisExp_t$ is equal to discretionary expenditures in period t, A_{t-1} is total assets in period t-1, and S_{t-1} is sales in period t-1. Abnormal discretionary expenditures for period t ($AbDE_t$) are calculated as the difference between actual discretionary expenditures (scaled by total assets in period t-1) and estimated normal discretionary expenditures.[10] Adjusted earnings ($AdjROA_t$) are calculated by subtracting abnormal discretionary expenditures from reported earnings:

$$\mathbf{AdjROA_t = ROA_t - AbDE_t} \quad \mathbf{(2)}$$

where ROA_t is net income in period t divided by total assets in period t-1 and $AbDE_t$ is abnormal discretionary expenditures in period t. Consistent with Leggett (2008), if $AdjROA_t$ is negative, and reported ROA_t equals or exceeds the zero earnings threshold by no more than two percent, the firm is classified as engaging in REM. This results in a preliminary sample of 178 REM firms.

Of the 178 REM firms, 16 were eliminated due to a lack of required proxy or financial statement data. From the 162 useable observations, I match each REM firm with a non-REM firm based on year, industry (SIC code), negative ROA_t, and $AdjROA_t$ within ± 30 percent of the REM firm's $AdjROA_t$.[11,12] Matching iterations were performed sequentially using 4-, 3-, 2-, and 1-digit SIC codes holding all other matching variables constant. Similar to Srinivasan (2005), if more than one match was available, the comparison firm closest in size (as measured by total assets in period t-1) was chosen.[13] I could not find a suitable match for 14 firms, resulting in a final sample of 148 matched pairs (296 firm-year observations). Panels A and B of Table 1 summarize the sample selection process and describe the sample distribution by year.

Table 1
Sample Selection and Distribution

Panel A: REM sample development	
Initial number of identified REM firm-year observations	178
Less: observations lacking required proxy or financial statement data	(16)
Observations available for matching	162
Less: observations without a suitable match	(14)
Final sample	148
Panel B: Distribution by fiscal year	
2005	49 (33%)
2006	49 (33%)
2007	50 (34%)
Total	148

Empirical Models

Using audit committee and board of director data hand-collected from proxy statements, I examine the relation between REM and governance characteristics by employing logistic regressions on my matched sample.[14] My regression models are:[15]

Model 1: Audit Committee

$$REM = \beta_0 + \beta_1 ACMEET + \beta_2 ACTEN + \beta_3 ACDIR + \beta_4 ACSIZE + \beta_5 FINEXP^{16} + \beta_6 ACSTOCK + \beta_7 MTB + \beta_8 LOGSIZE + \beta_9 LEV + \beta_{10} CURRENT + \beta_{11} SALESROWTH + \beta_{12} ASSETGROWTH + \beta_{13} LOGFEE + \beta_{14} BIG4 + \beta_{15} BLOCK + \beta_{16} ABACC + \varepsilon$$

Model 2: Board of Directors

$$REM = \lambda_0 + \lambda_1 BDMEET + \lambda_2 INDTEN + \lambda_3 INDDIR + \lambda_4 BDSIZE + \lambda_5 DUAL + \lambda_6 BDIND + \lambda_7 INDSTOCK + \lambda_8 NISTOCK + \lambda_9 MTB + \lambda_{10} LOGSIZE + \lambda_{11} LEV + \lambda_{12} CURRENT + \lambda_{13} SALESGROWTH + \lambda_{14} ASSETGROWTH + \lambda_{15} LOGFEE + \lambda_{16} BIG4 + \lambda_{17} BLOCK + \lambda_{18} ABACC + \varepsilon$$

REM is a dichotomous indicator variable with a value of 1 if the firm is identified as engaging in real earnings management ($AdjROA_t < 0$ and $0 \leq ROA_t \leq .02$), and 0 otherwise. All other variables are defined in Table 2 below.

Table 2
Variable Definitions

Variable Name	Pred.	Description
REM	N/A	Indicator variable with a value of 1 if the firm is identified as engaging in real earnings management ($AdjROA_t < 0$ and $0 \leq ROA_t \leq .02$).
AUDIT COMMITTEE		
ACMEET	(-)	Number of audit committee meetings held during the fiscal year.
ACTEN	(-)	Average years of board service of audit committee members.
ACDIR	(?)	Average number of outside directorships held by audit committee members.
ACSIZE	(-)	Number of members on the audit committee.
FINEXP	(-)	Percentage of audit committee members designated by company's board as audit committee financial experts.
ACSTOCK	(?)	Average value in millions of common stock beneficially owned by audit committee members.
BOARD OF DIRECTORS		
BDMEET	(-)	Number of board meetings held during the fiscal year.
INDTEN	(-)	Average years of board service of independent directors.
INDDIR	(?)	Average number of outside directorships held by independent directors.
BDSIZE	(?)	Number of directors on the board.
NODUAL	(-)	Indicator variable with a value of 1 if the roles of Chair and CEO are separated.
BDIND	(-)	Percentage of independent directors on the board.
INDSTOCK	(?)	Average value in millions of common stock beneficially owned by independent directors.
NISTOCK	(+)	Average value in millions of common stock beneficially owned by non-independent directors.
CONTROL VARIABLES		
MTB	(+)	Market value of equity divided by book value of equity.
LOGSIZE	(-)	Natural log of total assets at beginning of year.
LEV	(+)	Total liabilities divided by total assets.
CURRENT	(-)	Current assets divided by current liabilities.
SALESGROWTH	(+)	Annual growth in firm's sales (change in sales divided by sales at beginning of year).

Table 2 Variable Definitions		
Variable Name	Pred.	Description
ASSETGROWTH	(+)	Annual growth in firm's total assets (change in total assets divided by total assets at beginning of year).
LOGFEE	(-)	Natural log of total audit fees for the fiscal year.
BIG4	(-)	Indicator variable with a value of 1 if the auditor is a BIG 4 auditor.
BLOCK	(-)	Aggregate percentage of outstanding common shares beneficially owned by shareholders holding at least 5% of the firm's shares who are not currently directors or affiliated with management.*
ABACC	(+)	Abnormal accruals estimated by the Jones (1991) model.
* Following Beasley (1996), blocks held by company stock ownership plans and retirement plans are not included since the voting rights associated with those shares are generally controlled by top management.		

The rationale for the audit committee and board characteristics was discussed in Section III. Next, I discuss the control variables.

Control Variables

In addition to the variables of interest, I control for other factors that may be associated with real earnings management and/or board and audit committee characteristics. As suggested in prior research, I control for the possibility that some firms may be in certain situations which give them incentives to manage earnings. These include firms with long-term growth prospects, with the market-to-book ratio as the measure of growth prospects (MTB), and firms with debt covenant motivations, with total liabilities divided by total assets as the measure for closeness to debt covenant violations (LEV) (Yang & Krishnan, 2005; Lin, Li & Yang, 2006; Klein, 2002; Chtourou et al., 2001; Matsumoto, 2002; Dechow, Sloan & Sweeney, 1996). Also included are politically sensitive firms, which, as noted by Yang and Krishnan (2005), may choose to manage earnings for the purpose of reducing regulatory or political scrutiny against them. Firm size, defined as the natural log of beginning year's total assets, serves as the proxy for political costs (LOGSIZE).[17] In addition, Summers and Sweeney (1998) assert that managers of firms exhibiting poor financial health may take actions to improve the appearance of the company's financial position and managers of firms experiencing rapid company growth may take actions to maintain the appearance of consistent growth when growth slows. Thus, I include the current ratio (CURRENT) to control for the degree of financial health and two measures to control for the extent of firm growth: annual growth in firm sales (SALESGROWTH) and annual growth in firm assets (ASSETGROWTH).[18]

Following Bédard et al. (2004) and Chtourou et al. (2001), I also include monitoring mechanism variables that may reduce the need for an effective board or audit committee: LOGFEE (the natural log of total audit fees) to capture audit effort, BIG4 (an indicator variable which takes a value of 1 if the auditor is a BIG 4 firm and 0 otherwise) to capture auditor type, and BLOCK (the percentage of outstanding common stock held by the firm's significant shareholders) to capture outside shareholders in a position to monitor management actions. Finally, I include a variable to control for evidence of accrual earnings management (ABACC), as Cohen et al. (2008) and Roychowdhury (2006) note that firms that manipulate earnings may use both REM and AEM. I expect MTB, LEV, SALESGROWTH, ASSETGROWTH, and

ABACC to be positively associated with REM and I expect LOGSIZE, CURRENT, LOGFEE, BIG4, and BLOCK to be negatively associated with REM.

EMPIRICAL RESULTS

Descriptive Statistics And Univariate Analysis

The results in Table 3 present descriptive statistics for the 296 firm-year observations (148 REM and 148 comparison firms) used to test the models.[19] Based on two-tailed paired-sample t-tests, the results indicate that the audit committee members of the REM firms hold more outside directorships on average (1.653) than do the audit committee members of the non-REM firms (1.344; difference is significant at p=0.013). Additionally, the independent board members of the REM firms hold more outside directorships on average (1.663) than do the independent board members of the non-REM firms (1.346; difference is significant at p=0.005) and the non-independent board members of the REM firms have beneficial ownership over larger values of stock ($23.893M) on average than the non-independent board members of the non-REM firms ($10.439M; difference is significant at p<0.001). The control variable results indicate that the REM firms are larger (p=0.019), pay higher audit fees (p=0.098), have higher levels of asset growth (p=0.008), are audited by Big 4 firms more frequently (p=0.004), and are less leveraged (p=0.080) than the non-REM firms. In addition, the two groups differ significantly in the size of their abnormal accruals (p=0.001). All of the other audit committee, board of director, and control variables are not significantly different between the two groups.

Table 3
Descriptive Statistics

	REM sample (n=148)			Comparison sample (n=148)			Paired sample t-test		
Variable Name	Mean	Med.	Std.	Mean	Med.	Std.	Diff. in Means	t-stat	Pred.
AUDIT COMMITTEE									
ACMEET	7.703	7.000	3.963	7.926	7.000	3.603	-0.233	-0.53	(-)
ACTEN	7.624	6.667	4.741	7.323	6.667	4.340	0.301	0.54	(-)
ACDIR	1.653	1.550	1.117	1.344	1.000	1.120	0.309	2.52**	(?)
ACSIZE	3.487	3.000	0.760	3.493	3.000	0.751	-0.007	-0.08	(-)
FINEXP	0.457	0.333	0.241	0.470	0.333	0.262	-0.013	-0.43	(-)
ACSTOCK	0.869	0.523	1.271	0.705	0.370	1.435	0.164	1.02	(?)
BOARD OF DIRECTORS									
BDMEET	8.074	7.000	3.542	8.642	7.000	4.984	-0.568	-1.11	(-)
INDTEN	7.601	6.667	3.938	7.329	6.667	3.539	0.271	0.63	(-)
INDDIR	1.663	1.586	0.972	1.346	1.200	1.000	0.317	2.87***	(?)
BDSIZE	7.993	8.000	1.957	7.716	8.000	2.004	0.277	1.28	(?)
NODUAL	0.487	0.000	0.502	0.520	1.000	0.501	-0.034	-0.60	(-)
BDIND	0.742	0.750	0.119	0.741	0.750	0.128	0.001	0.03	(-)
INDTOCK	1.163	0.642	2.267	1.316	0.444	2.932	-0.153	-0.49	(?)
NISTOCK	23.893	6.681	41.782	10.439	4.307	19.478	13.454	3.91***	(+)
CONTROL VARIABLES									
MTB	1.979	1.590	1.845	1.788	1.570	1.970	0.190	0.82	(+)
LOGSIZE†	5.902	5.972	1.661	5.525	5.633	1.694	0.378	2.36**	(-)
LEV	0.497	0.500	0.225	0.546	0.547	0.252	-0.049	-1.76*	(+)
CURRENT	2.723	2.069	1.965	2.457	1.925	2.042	0.266	1.11	(-)
SALESGROWTH	0.048	0.033	0.225	0.037	0.008	0.232	0.011	0.43	(+)
ASSETGROWT	0.049	0.021	0.190	-0.011	-0.036	0.182	0.060	2.68**	(+)

Table 3
Descriptive Statistics

	REM sample (n=148)			Comparison sample (n=148)			Paired sample t-test		
Variable Name	Mean	Med.	Std.	Mean	Med.	Std.	Diff. in Means	t-stat	Pred.
H								*	
LOGFEE‡	13.795	13.866	1.176	13.594	13.630	1.163	0.200	1.66*	(-)
BIG4	0.750	1.000	0.435	0.615	1.000	0.488	0.135	2.90***	(-)
BLOCK	0.287	0.285	0.193	0.308	0.319	0.179	-0.021	-1.03	(-)
ABACC	0.012	0.015	0.105	-0.031	-0.011	0.113	0.043	3.29***	(+)

*, **, *** represent two-tailed significance at the .10, .05, and .01 levels, respectively.
†The mean raw size (beginning of year total assets) for the REM sample is $1,229,000 and $925,000 for the comparison sample (difference is not significant two-tailed).
‡The mean raw audit fees are $1,893,099 for the REM sample and $1,541,009 for the comparison sample (difference is not significant two-tailed).

Pearson and Spearman correlations (not reported) were calculated among the independent variables from Models 1 and 2. The results indicate that firm size is highly correlated with audit fees, board size, and usage of a Big 4 auditor, audit fees are highly correlated with usage of a Big 4 auditor, and leverage is highly correlated with the current ratio. Correlations among all other variables are generally small. An analysis of the variance inflationary factors (VIFs) for both models reveals all are below the commonly recommended 10.00 threshold, indicating that multicollinearity is not a concern.

Multivariate Analysis

Audit Committee Characteristics

Table 4 presents the logistic regression results for Model 1.[20] The results signify that the model is statistically significant (χ^2=32.2; p=0.0094) and provide some support for the expectation that audit committee characteristics are associated with the probability of REM activity. Specifically, the number of outside directorships exhibits a positive association with the occurrence of REM (p=0.0946) and the number of meetings exhibits a negative association (p=0.0855). These findings indicate the monitoring benefits of audit committee members seem to erode with additional directorships and increase with meeting frequency. All other audit committee characteristics are not significantly related to the probability of REM activity. Among the control variables, asset growth, abnormal accruals, and firm size are positively significant (p=0.0022, 0.0007, and 0.0254, respectively) and leverage is negatively significant (p=0.0482).

Table 4
Audit Committee Logistic Regression Results

$REM = \beta_0 + \beta_1 ACMEET + \beta_2 ACTEN + \beta_3 ACDIR + \beta_4 ACSIZE + \beta_5 FINEXP + \beta_6 ACSTOCK + \beta_7 MTB + \beta_8 LOGSIZE + \beta_9 LEV + \beta_{10} CURRENT + \beta_{11} SALESROWTH + \beta_{12} ASSETGROWTH + \beta_{13} LOGFEE + \beta_{14} BIG4 + \beta_{15} BLOCK + \beta_{16} ABACC + \varepsilon$

Independent Variable	Expected Sign	Coefficient Estimate	Wald χ^2
Intercept	N/A	0.958	0.138
ACMEET	(-)	-0.054	1.875*
ACTEN	(-)	0.014	0.247
ACDIR	(?)	0.201	2.794*
ACSIZE	(-)	-0.131	0.485
FINEXP	(-)	-0.386	0.525
ACSTOCK	(?)	0.008	0.005
MTB	(+)	0.030	0.173
LOGSIZE	(-)	0.340	3.817**
LEV	(+)	-1.231	2.766**
CURRENT	(-)	0.019	0.055
SALESGROWTH	(+)	-0.038	0.003
ASSETGROWTH	(+)	2.359	8.099***
LOGFEE	(-)	-0.124	0.250
BIG4	(-)	0.304	0.754
BLOCK	(-)	-0.825	1.266
ABACC	(+)	4.378	10.214***

Model χ^2 = 32.2; p =0.0094. Adjusted R^2 = 17.90%. n=148 matched pairs.

*, **, and *** =p-value < .10, .05, 01, respectively, one-tailed when expected sign is positive or negative, and two-tailed otherwise.

See Table 2 for variable definitions.

Board Of Director Characteristics

Table 5 presents the logistic regression results for Model 2.[21] Similar to the first model, the results signify that this model is statistically significant (χ^2=39.085; p=0.0028) and provide some support for the expectation that board characteristics are associated with the probability of REM activity. Specifically, independent directors' stockholdings exhibit a negative association with the occurrence of REM (p=0.0966), non-independent directors' stockholdings exhibit a positive association with the occurrence of REM (p=0.0125), and the number of outside directorships held by the independent directors exhibits a positive association with the occurrence of REM (p=0.0110). These findings indicate that independent directors should be encouraged to own substantial amounts of stock in the company. Additionally, they indicate the monitoring benefits of independent board members, as with audit committee members, seem to erode with additional directorships and that substantial stock ownership by non-independent board members is undesirable. Other board characteristics are not significantly associated with REM activity. Among the control variables, asset growth and abnormal accruals are positively significant (p=0.0018 and 0.0010, respectively).

Table 5
Board of Director Logistic Regression Results

$REM = \lambda_0 + \lambda_1 BDMEET + \lambda_2 INDTEN + \lambda_3 INDDIR + \lambda_4 BDSIZE + \lambda_5 DUAL + \lambda_6 BDIND + \lambda_7 INDSTOCK + \lambda_8 NISTOCK + \lambda_9 MTB + \lambda_{10} LOGSIZE + \lambda_{11} LEV + \lambda_{12} CURRENT + \lambda_{13} SALESGROWTH + \lambda_{14} ASSETGROWTH + \lambda_{15} LOGFEE + \lambda_{16} BIG4 + \lambda_{17} BLOCK + \lambda_{18} ABACC + \varepsilon$

Independent Variable	Expected Sign	Coefficient Estimate	Wald χ^2
Intercept	N/A	1.650	0.410
BDMEET	(-)	-0.035	1.105
INDTEN	(-)	0.004	0.015
INDDIR	(?)	0.368	6.459**
BDSIZE	(?)	0.040	0.214
NODUAL	(-)	0.010	0.001
BDIND	(-)	-0.724	0.406
INDSTOCK	(?)	-0.091	2.761*
NISTOCK	(+)	0.015	5.026**
MTB	(+)	-0.017	0.055
LOGSIZE	(-)	0.134	0.505
LEV	(+)	-0.919	1.431
CURRENT	(-)	0.035	0.185
SALESGROWTH	(+)	0.055	0.007
ASSETGROWTH	(+)	2.456	8.548***
LOGFEE	(-)	-0.171	0.477
BIG4	(-)	0.437	1.524
BLOCK	(-)	-0.530	0.457
ABACC	(+)	4.228	9.529***

Model $\chi^2 = 39.085$; p = 0.0028. Adjusted $R^2 = 22.12\%$. n=148 matched pairs.

*, **, and *** =p-value < .10, .05, 01, respectively, one-tailed when expected sign is positive or negative, and two-tailed otherwise.

See Table 2 for variable definitions.

Comparison To Prior Studies

Comparing this study's results to prior REM and corporate governance characteristics association studies, similar to Visvanathan (2008), I find that audit committee meeting frequency is a significant factor in limiting REM and that board size, audit committee size, and CEO/Chair duality are not associated with the likelihood of REM. However, unlike Visvanathan (2008), I do not find board independence to be an important factor in constraining REM. Additionally, I do not find any significance between audit committee financial expertise and REM in contrast to Carcello et al. (2006), who find a positive relationship between accounting financial expertise and REM and to Krishnan and Visvanathan (2008), who find a negative relationship between accounting financial expertise and REM.[22]

SUMMARY AND CONCLUSIONS

This study provides evidence on the association between board and audit committee characteristics and real earnings management. Whereas much research to date has focused on examining the effects of corporate governance characteristics on earnings management via accruals, I choose to examine the effects of these same governance characteristics on the

management of earnings via real business activities. As recent research indicates that REM has real economic costs to the firm and has increased since the passage of the Sarbanes-Oxley Act of 2002, there is a need to understand the role boards and audit committees play in its promotion or constraint.

I examine the following six audit committee characteristics: number of meetings, tenure, stock ownership, outside directorships, financial expertise, and number of directors. I examine the same characteristics for the board of directors with the exception of financial expertise and with the addition of CEO/Chair duality and independence. The results indicate there is some support for a linkage between board and audit committee characteristics and the likelihood of REM. Specifically, the number of outside directorships held by independent directors, non-independent directors' stockholdings, and the number of outside directorships held by audit committee members are positively related to the likelihood of REM, whereas independent directors' stockholdings and the number of audit committee meetings are negatively related to the likelihood of REM.

This study's results should be of interest to accounting regulators, policymakers, researchers, and outside stakeholders in that its findings reveal that certain board and audit committee characteristics do in fact appear to be associated with the occurrence of REM. However, the lack of significant negative associations found between the majority of board and audit committee characteristics examined and REM suggests that, unlike accrual earnings management, real earnings management is not effectively controlled by corporate governance. Additionally, comparison of the results from this post-SOX study to those of past pre-SOX studies suggests that the restraining power of governance mechanisms over REM does not appear to have improved over time.[23] Thus, the results highlight the need for additional governance research and reform to address earnings management via real business activities.

This paper is subject to a number of limitations. First, this study relies on the use of proxy statements which are not completely standardized and which include self-reported data. This self-reported data's presentation in the proxy statements is often subject to the interpretation and discretion of both the firms compiling the statements and the researchers using this information.[24] Second, my measure of real earnings management, although based on models from extant literature, is not free from any inherent biases in those models (Kang & Kim, 2012). Finally, as noted in past research (Hermalin & Weisbach, 2003; Xie et al., 2003; Yang & Krishnan, 2005), due to endogeneity problems associated with board literature, my results cannot be interpreted as demonstrating causality between board and audit committee characteristics and real earnings management.

Opportunities for further research include extending this study to include other types of real activities manipulation, such as through inventory overproduction or sales manipulation, and to include alternative earnings benchmarks, such as meeting or beating analysts' forecasts or prior year's earnings. Additionally, research on board and audit committee attitudes toward and concerns and familiarity with real earnings management would be useful.

ENDNOTES

1. By examining the post-SOX period, results can be compared to those from past pre-SOX studies to determine if the restraining power of governance mechanisms over REM has improved or worsened over time.
2. The Blue Ribbon Committee was formed in September 1998 by the SEC, the NYSE, and the NASD and issued a set of ten recommendations for strengthening the effectiveness of audit committees in February 1999.
3. Effective March 3, 2003, the SEC requires disclosure of whether or not a company has at least one financial expert on its audit committee, and if so, the name of the expert and whether this expert is independent of management. If a company does not have a financial expert it must disclose this fact and explain why it does not. Additionally, a company is permitted to disclose if it has more than one financial expert (SEC, 2003).
4. This committee, appointed by the Conservative Government of the United Kingdom in 1991 and chaired by Adrian Cadbury, produced a corporate governance best practices guide published in 1992.
5. SOX does provide for some exemptions to this rule, subject to approval by the Securities & Exchange Commission; however, all of the firms used in this sample have 100 percent independent audit committees.
6. The years 2002-2004 are not included for two reasons: 1) audit committee and board characteristics must be hand-collected from proxy statements, a very labor-intensive process. Not including the years 2002-2004 serves to balance the need for a sample size large enough to produce somewhat generalizable results and small enough to be manageable with regard to time and effort (Xie et al., 2003); and 2) it is reasonable to assume that during the time period 2002-2004 boards and audit committees were predominantly focused on ensuring that their firms were correctly complying with SOX, especially Section 404, as well as monitoring management's use of accrual earnings management, rather than devoting a large portion of their agendas to other less newsworthy and understood issues, such as REM.
7. The sample is limited to these firms to ensure availability of proxy statements.
8. Graham et al. (2005) find that other earnings benchmarks, such as analysts' forecasts, are also important to managers, but as noted by Leggett (2008), Roychowdhury (2006) finds the strongest evidence of REM activity in loss avoidance firms.
9. Whereas previous REM studies (Carcello et al., 2006; Krishnan & Visvanathan, 2008; Visvanathan, 2008; Roychowdhury, 2006; Taylor & Xu, 2008; Cohen et al., 2008) evaluate this model by industry and year, Leggett (2008, 14) evaluates it by firm as "firms within an industry can have significantly different levels of normal discretionary expenditures after controlling for size. The model in this study is used to estimate the earnings effect of abnormal discretionary expenditures; therefore, … [evaluating] this model by firm using the preceding 10 years of data [enables me] to determine a more precise measure of normal discretionary expenditure activity at the firm-level." Evaluating the model by firm eliminates the need to use the scale intercept ($1/A_{t-1}$) normally used in this model (Leggett, 2008).
10. For earnings analysis purposes, $AbDE_t$ is multiplied by -1 as this variable will be negative when firms decrease their discretionary spending.
11. Because REM firms are defined as having negative net income prior to the income-increasing abnormal discretionary expenditures, matched non-REM firms are defined as those that do not use discretionary expenditures to avoid reporting a loss.
12. The ± 30 percent cut-off is consistent with prior matching studies (e.g., Beasley, 1996; Sharma, 2004; Stanley & DeZoort, 2007; Abbott et al., 2004). Most of the REM firms and related non-REM firms are within ±20 percent.
13. Although many studies match on size, I chose not to since doing so would result in the loss of approximately half of my sample firms due to the inability to find a suitable match. I do, however, control for size in my regression models.
14. This research design is similar to that used by Beasley (1996), Dechow et al. (1996), and Abbott et al. (2004).
15. Consistent with Visvanathan (2008) and Xie et al. (2003), I use separate regression models for audit committees and boards due to correlation between several of the overall board and audit committee variables.
16. Due to a lack of agreement among accounting researchers on what should constitute an audit committee financial expert, I rely on the firm's designation of its audit committee financial expert(s). Although

companies are only required to disclose if they have at least one financial expert, 40 percent of the observations in my sample disclose more than one financial expert or else disclose that they do not have a financial expert. I acknowledge that the remaining 60 percent of the observations which disclose only one financial expert may in fact have more than one but chose not to disclose all of them. Consequently, if I remove this variable from Model 1, the results are qualitatively similar.

17. Results are qualitatively similar in Models 1 and 2 if I use the natural log of market value of equity in place of the natural log of total assets at the beginning of the year.
18. Financial health measures involving net income, such as ZSCORE, could not be used as, by design, all of the non-REM firms have negative net income and the REM firms have positive net income.
19. All non-binary variables in the models were winsorized at the 1st and 99th percentile to mitigate the effect of outliers.
20. All results are qualitatively similar using non-winsorized variables. Additionally, all results are qualitatively similar using OLS regression with both winsorized and non-winsorized variables.
21. All results, except for INDSTOCK and LEV are qualitatively similar using non-winsorized variables. INDSTOCK loses its significance at the p=0.10 level and LEV gains significance at the p=0.05 level. Additionally, all results are qualitatively similar using OLS regression with both winsorized and non-winsorized variables.
22. It should be noted, however, that unlike Carcello et al. (2006) and Krishnan and Visvanathan (2008), I do not make a distinction among various types of expertise (accounting, nonaccounting, etc.) in my definition of audit committee financial expertise.
23. Visvanathan (2008) suggests that future research should address this issue.
24. Examples of data subject to interpretation and discretion include exclusion or inclusion of private and nonprofit directorships (the SEC requires disclosure of the directorships of public companies on which all directors serve but many, if not most, companies choose to disclose directorships of additional companies on whose boards their directors sit, including private and nonprofit), inclusion or exclusion of stock owned by certain relatives of the director or by companies at which the director holds a management position, determination of financial expertise, and determination of independence.

REFERENCES

Abbott, L., S. Parker, & G. Peters (2004). Audit committee characteristics and restatements. *Auditing: A Journal of Practice & Theory*, 23(1), 69-87.

Beasley, M. (1996). An empirical analysis of the relation between the board of director composition and financial statement fraud. *The Accounting Review*, 71(4), 443-465.

Bédard, J., S. Chtourou, & L. Courteau (2004). The effect of audit committee expertise, independence, and activity on aggressive earnings management. *Auditing: A Journal of Practice & Theory*, 23(2), 13-35.

Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees (BRC) (1999). *Report and recommendations of the Blue Ribbon Committee on improving the effectiveness of corporate audit committees*. New York, NY: New York Stock Exchange and National Association of Securities Dealers.

Bhojraj, S., P. Hribar, M. Picconi, & J. McInnis (2009). Making sense of cents: An examination of firms that marginally miss or beat analyst forecasts. *The Journal of Finance*, 64(5), 2361-2388.

Cadbury Committee (1992). *Report of the Committee on the financial aspects of corporate governance*. London, U.K.: Gee.

Carcello, J., C. Hollingsworth, A. Klein, & T. Neal (2006). Audit committee financial expertise, competing corporate governance mechanisms, and earnings management. Working paper, University of Tennessee, Clemson University, & New York University.

Chaganti, R., V. Mahajan, & S. Sharma (1985). Corporate board size, composition and corporate failures in retailing industry. *Journal of Management Studies*, 22(4), 400-417.

Chtourou, S., J. Bédard, & L. Courteau (2001). Corporate governance and earnings management. Working paper, University of Sfax, University of Laval, & Free University of Bozen-Bolzano.

Cohen, D., A. Dey, & T. Lys (2008). Real and accrual-based earnings management in the pre- and post-Sarbanes-Oxley periods. *The Accounting Review*, 83(3), 757-787.

Dechow, P., S. Kothari, & R. Watts (1998). The relation between earnings and cash flows. *Journal of Accounting and Economics*, 25(2), 133-168.

Dechow, P., R. Sloan, & A. Sweeney (1996). Causes and consequences of earnings manipulations: An analysis of firms subject to enforcement actions by the SEC. *Contemporary Accounting Research,* 1(1), 1-36.

Ghosh, A., A. Marra, & D. Moon (2010). Corporate boards, audit committees, and earnings management: Pre- and post-SOX evidence. *Journal of Business Finance & Accounting,* 37(9) & (10), 1145-1176.

Graham, J., C.R. Harvey, & S. Rajgopal (2005). The economic implications of corporate financial reporting. *Journal of Accounting and Economics,* 40(1-3), 3-73.

Hermalin, B. & M. Weisbach (2003). Boards of directors as an endogenously determined institution: A survey of the economic literature. *Economic Policy Review,* 9(1), 7-26.

Jensen, M. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of Finance,* 48(3), 831-880.

Jones, J. (1991). Earnings management during import relief investigations. *Journal of Accounting,* 29(2), 193-228.

Kang, S. & Y. Kim (2012). Effect of corporate governance on real activity-based earnings management: Evidence from Korea. *Journal of Business Economics and Management,* 13(1), 29-52.

Klein, A. (2002). Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics,* 33(3), 375-400.

Kouki, M., A. Elkhaldi, H. Atri, & S. Souid (2011). Does corporate governance constrain earnings management? Evidence from U.S. firms. *European Journal of Economics, Finance, and Administrative Sciences,* 35, 58-71.

Krishnan, G. & G. Visvanathan (2008). Does the SOX definition of an accounting expert matter? The association between audit committee directors' accounting expertise and accounting conservatism. *Contemporary Accounting Research,* 25(3), 827-857.

Leggett, D. (2008). Real earnings management magnitude and subsequent operating performance. Working paper, University of Alabama.

Lin, J., J. Li, & J. Yang (2006). The effect of audit committee performance on earnings quality. *Managerial Auditing Journal,* 21(9), 921-933.

Matsumoto, D. (2002). Management's incentives to avoid negative earnings surprises. *The Accounting Review,* 77(3), 483-514.

Menon, K. & J. Williams (1994). The use of audit committees for monitoring. *Journal of Accounting and Public Policy,* 13, 121-139.

Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting and Economics,* 42(3), 335-370.

Securities and Exchange Commission (SEC) (2003). Disclosure Required by Sections 406 and 407 of the Sarbanes-Oxley Act of 2002, Release Nos. 33-8177; 34-47235. Washington, D.C.: SEC.

Sharma, V. (2004). Board of director characteristics, institutional ownership, and fraud: Evidence from Australia. *Auditing: A Journal of Practice & Theory,* 23(2), 105-117.

Shivdasani, A. & D. Yermack (1999). CEO involvement in the selection of new board members: An empirical analysis. *The Journal of Finance,* 54(5), 1829-1853.

Srinivasan, S. (2005). Consequences of financial reporting failure for outside directors: Evidence from accounting restatements and audit committee members. *Journal of Accounting Research,* 43(2), 291-334.

Stanley, J. & F.T. DeZoort (2007). Audit firm tenure and financial restatements: An analysis of industry specialization and fee effects. *Journal of Accounting and Public Policy,* 26, 131-159.

Summers, S. & J. Sweeney (1998). Fraudulently misstated financial statements and insider trading: An empirical analysis. *The Accounting Review,* 73(1), 131-146.

Taylor, G. & R. Xu (2008). Consequences of real earnings management on subsequent operating performance. *Research in Accounting Regulation,* 22(2), 128-132.

U.S. Senate (2002). Public Company Accounting Reform and Investor Protection Act of 2002, Report 107-205, 107th Congress, 2d Session, June 26, 2002. Washington, D.C.: U.S. Government Printing Office.

Visvanathan, G. (2008). Corporate governance and real earnings management. *Academy of Accounting and Financial Studies Journal,* 12(1), 9-22.

Wright, D. (1996). Evidence on the relation between corporate governance characteristics and the quality of financial reporting. Working paper, University of Michigan.

Xie, B., W. Davidson III, & P. DaDalt (2003). Earnings management and corporate governance: The role of the board and the audit committee. *Journal of Corporate Finance,* 9(3), 295-316.

Xu, R., G. Taylor, & M. Dugan (2007). Review of real earnings management literature. *Journal of Accounting Literature,* 26, 195-228.

Yang, J. S. & J. Krishnan (2005). Audit committees and quarterly earnings management. *International Journal of Auditing*, 9, 201-219.

Zahra, S. & J. Pearce II (1989). Boards of directors and corporate financial performance: A review and integrative model. *Journal of Management*, 15(2), 291-334.

PROSPECT THEORY AND RISKY CHOICE IN THE ECOMMERCE SETTING: EVIDENCE OF A FRAMING EFFECT

Tammy Bahmanziari, Middle Tennessee State University
Marcus D. Odom, Southern Illinois University Carbondale

ABSTRACT

Concerns of potential online consumers over privacy and security of their financial and other personal information is an impediment to the growth of ecommerce. These concerns are often addressed through the use of assurance structures placed on a website. Prior research has found that the effect of assurance structures is most pronounced when the vendor is unknown to the consumer and they have no prior interactions from which to judge the trustworthiness of the vendor. Another important factor to decision making under uncertainty in any context is the perceived problem domain of the decision maker. Behavioral Decision Theory helps to explain the behavior of individuals in decisions under uncertainty in terms of the perceived problem domain. Prospect Theory (Kahneman and Tversky, 1979) was used in this study to attempt to explain variance in the behavior of individuals under conditions of uncertainty in the ecommerce context.

A major proposition in this study was that since consumers are risk-averse in the gain domain; the risk relieving properties of assurance structures may moderate their decisions and induce more trust and purchase intentions and behavior. However, in the perceived loss domain, where risk- seeking behavior is common, little to no effect was expected since the reduction of risk is not a driving factor of the purchase decision. This study was a 2 x 2 fully crossed factorial design. Two factors, problem domain and the presence of assurance structures were manipulated with a dependent variable of purchase behavior. Subjects for this study were solicited from undergraduate students enrolled in accounting and management classes at a large Midwestern university. A total of 400 subjects participated in the study with 337 usable responses. The data provided the first evidence of framing effects in the ecommerce environment. The study also demonstrates that assurance structures moderate choice shifts attributed to the framing effect in the ecommerce environment.

INTRODUCTION

According to Forrester Research, Inc., online retail sales will grow to $370 billion by 2017. (Forte, 2017) The major impediments to the growth of ecommerce are the concerns of the consumer that impede the development of trust. Odom et al. (2002) identified seven specific concerns of the consumer: security of the transaction, privacy of information, legitimacy of seller, quality of the product/service, documentation adequacy, price fairness and customer service availability. (Odom et al., 2002) The online retailers must address these concerns in order to increase their market share in this time of explosive growth of the business-to-consumer (B2C)

ecommerce. Established ”brick and mortar” retailers that extend to the online environment can rely partly on their prior experience and reputation to help expand to online retail sales.

Studies have shown that trust in an online retailer is enhanced by brand equity. (Ambler, 1997; Grewal, Munger, Iyer and Levy, 2003) The new or unknown vendor must find other ways to address the concerns of the consumers on their websites and foster trust with the potential online consumer. McKnight et al. (1998) defined trust between unknown parties as initial trust. Perceptions of the structural characteristics of the Internet, such as attempts to communicate and ensure safety and security, can influence trusting beliefs and trusting intentions. (McKnight et al., 2002) In this study, assurance structures will refer to statements, promises, guarantees, logos, symbols and any other structural components of a website intended by the vendor to reduce perceptions of risk in transacting on their website. The model of initial trust formation outlined in McKnight et al. (2002) drew from the institutional-based trust theory of Shapiro. (Shapiro, 1987)

In institutional-based trust theory, structural assurance provided a means by which unfamiliar actors were able to participate in cooperative exchanges without the benefit of prior experience. The study of assurance structures is particularly important in the framework of unfamiliar vendors in that consumers do not have experience with the vendor in which to formulate prospects of outcomes from the transaction.

Prospect Theory (PT) (Kahneman and Tversky, 1979) addresses how the decision maker formulates the perceived problem domain. This theory has been tested in a variety of contexts and the findings have been robust in support of framing effects. (Chang, 2002; Kessler, Ford and Bailey, 1996; Kuhberger, 1995; Kuhberger, Schulte-Mechklenbeck and Perner, 1999; Lim, 1995; Olsen, 1997; Quiggin, 1993; Rose et al., Spring 2004; Tversky and Kahneman, 1986; Van Schie and Van Der Pligt, 1995)

Given the perceived risky nature of ecommerce transactions, the testing of this theory of risky choice, or choice under uncertainty, would increase understanding of purchasing behavior in ecommerce. No evidence exists pertaining to the interactive effects on purchase behavior, if any, of framing effects and the presence of assurance structures in an ecommerce purchase decision. According to Behavioral Decision Theory (BDT), when the problem domain is perceived to be a gain domain, the consumer should be more risk-averse and less likely to make a purchase. (Kahneman and Tversky, 1979) The presence of assurance structures on the website could reduce perceived risk and the risk adverse tendencies of consumers may be moderated such that the choice shifts attributed to framing are reduced or eliminated. However, when the problem is framed as a loss, BDT would predict that consumers would be risk seeking so assurance should be less effective.

Retailers on the web can influence frames by the use of certain words and marketing techniques. When a website markets a product with a limited availability or implies that not buying this product will produce some type of harm, injury or loss to the potential consumer, they are employing a negative message. These are negative aspects of the problem and this negative prospect is intended to influence the consumer such that the consumer will perceive that they will incur a loss relative to some reference point if they don’t buy this product. Sales messages on websites that stress the positive aspects of the product such as an attractive price and other positive aspects of the transaction are intended to influence the consumer such that the consumer will

perceive that failing to make a purchase would mean forgoing a potential gain. (Puto, 1987) Puto (1987) found that when a sales message simply contained the key words of “gain” or ”loss”, it produced shifts in the reference points of decision makers such that choice shifts attributed to the framing effect were demonstrated.

The perceived problem domain of gain will cause a risk-aversion by shifting the reference point for the decision to a gain position from the status quo. This will be important to ecommerce retailers to understand the importance of heuristics on websites and the potential effects of small changes in wording on perceived risk, purchase intentions and, ultimately, purchase behavior.

The purpose of the study is to determine whether assurance structures on websites moderate choice shifts attributed to the framing effect in an ecommerce environment. This research will test the effects of a risk-reliever (assurance structures) on framing effects in the ecommerce context. The addition of risk to the subject and measurement of behavior with transaction related consequences to the subject are extensions and contributions to the research in e-assurance. This research will increase our understanding of the role of both framing and assurance structures in the ecommerce context.

LITERATURE REVIEW OF ECOMMERCE RESEARCH IN PURCHASE INTENTIONS AND ASSURANCE STRUCTURES

Risk Relievers in E-commerce

A major complaint of both potential online consumers and their respective online retailers is that there is too much uncertainty associated with purchasing goods and services online. There is a fear of the loss of privacy or even worse, that information will be stolen via electronic means that will incur a financial loss. This fear may prevent many sales from taking place as consumers fear putting their private information into the online forms needed to make a purchase. The major way that retailers have addressed these concerns is through the use of risk relievers on their websites. The use of these risk relievers is intended to increase trust, and increase purchase intentions and purchase behaviors. According to institutional-based trust theory, these structures on the website provide assurance that the retailer will perform as agreed and increase trust in the website. (McKnight et al., 2002)

Assurance Structures

Prior research on the impact of assurance structures on ecommerce have investigated both the effect of third-party certifications (Noteberg et al., 2003; Odom et al., 2002; Lala, Arnold, Sutton and Guan, 2001; Kovar et al., 2000; Portz et al, 2000; Pennington et al., 2003-4) and retailer disclosures (Mauldin and Arunachalam, 2002; Houston and Taylor, 1999; Kaplan and Nieschwietz, 2003b) on the online consumer’s purchase intentions, trust and trusting intentions. Both third-party certifications and retailer disclosures are assurance structures intended to relieve risk to the online consumer and increase purchase intentions and trust. Assurance structures are defined as statements, promises, guarantees, logos, symbols and any other structural components of a website intended by the vendor to reduce perceptions of risk in transacting on their website.

Some examples of third-party certifications would be the BBB online and the WebTrust seals. Security, privacy and cookies usage policies, among others, are examples of retailer disclosures. Assurance structures are proposed to decrease the risk associated with an unknown vendor and increase both trust and trusting behaviors such as making a purchase on a website. Prior research has concluded that assurance structures do increase trust and purchase intentions.

Institutional-based Trust Theory

McKnight et al. (2002) proposed and tested a model of initial trust in ecommerce. McKnight et al. defined initial trust as trust between unknown parties. Unknown parties would not have prior experience upon which to base expectations for possible outcomes. McKnight et al. (2002) proposed that trust plays a central role in helping consumers overcome perceptions of risk and insecurity in the ecommerce environment. The propositions of McKnight et al.'s work were supported by institutional- based trust theory.

Institution-based trust reflects the security that one feels in a situation because of guarantees, safety nets, and other trust structures. (Shapiro, 1987; McKnight et al., 1998) Institution-based trust can be used to explain the paradox of 'swift trust' between unknown parties. (McKnight et al., 1998) Institution-based trust consists of two components of trusting beliefs: situation normality beliefs and structural assurance beliefs. Situation normality beliefs arise when trust is formed by the impression that the situation is normal or that 'things are properly ordered'. (Lewis and Weigert, 1985) Shapiro refers to structural safeguards in terms of regulations, guarantees and legal recourse. (Shapiro, 1987) Structural assurance beliefs signal the potential trustor that structures exist in the situation that relieves some of the risk with undesirable outcomes. In the context of ecommerce, both third-party certifications and retailer disclosures would provide structural assurance and thus, in this study, they are referred to as assurance structures.

McKnight et al. (2002) proposed that structural assurance beliefs would lead to increased trusting beliefs and trusting intentions. The results of the initial sample evaluation did not support this proposition. Additional analysis with the holdout sample did show that structural assurance beliefs did increase trusting intentions significantly. McKnight et al. offered a plausible explanation to the lack of results in the original sample. According to McKnight et al., the result was that dispositional- based trust factors were more influential in forming the subjects' trusting beliefs and intentions than institution-based trust beliefs. However, given the evidence that assurance structures have been found to influence trust and/or purchase intentions in several studies (Kovar et al., 2000; Mauldin and Arunachalam, 2002; Odom et al., 2002; Pennington et al., 2003-4), this seems quite unlikely.

Theory of Reasoned Action As It Relates To Purchase Intentions

Although this study is not an attempt to test the Theory of Reasoned Action (TRA) or its sister theory, the Theory of Planned Behavior (TPB), it is prudent to include some reference to these theories as they have been used in prior research to demonstrate the link between purchase intentions and purchase behavior. In Figure 1, the dependent variable in the research model is 'risk preference'. This risk preference is operationalized in this study as a purchase decision. Many of

the studies that serve as the theoretical foundation to this study use purchase intentions as the dependent variable. In many studies in various disciplines, purchase intentions are used as a proxy for a purchase decision or choice. Both the TRA and the TPB test intentions but they propose to predict decisions.

Ajzen and Fishbein (1980) formulated the (TRA) to help predict human behavior. The TRA suggests that a person's behavior is determined by their intention to perform the behavior. This intention is a function of their attitude toward the behavior and the subjective norm. With respect to framing effects, it could be surmised that the framing effects on purchase intentions are similar to the link between the constructs of attitude and intention in the TRA. It is not hard to make the leap that the risk-averse tendencies or the risk-seeking tendencies are attitudes that were influenced by framing effects.

The purchase intentions of individuals are often used as a proxy for behavior. Due to the desire to actually measure behavior in this study, the link between purchase intentions (intention in the TRA) and purchase behavior (Behavior in the TRA), links prior research in intentions with respect to trust and website purchasing to the actual behaviors that will be measured in this study.

Relationship between Purchase Intentions and Assurance

Bhattacherjee (2002) used willingness to transact as a dependent variable in an empirical investigation of the effect of familiarity and trust as assurance mechanisms. Willingness to transact is a similar construct to purchase intentions. In the Bhattacherjee (2002) study, familiarity was found to positively affect willingness to transact and trust. Jarvenpaa and Tractinsky (2003) studied several factors and their influences on trust and risk in an Internet store. This study supported a positive relationship between risk and trust towards an Internet store. However, since the authors are specifically trying to measure and test the effects of independent variables on initial trust, the use of the store reputation indicates that a familiar vendor was used. Thus, initial trust was not the type of trust tested. Any prior interaction or knowledge of the individuals with the vendor means that any measurement of trust could not conceptually be 'initial'.

Mauldin and Arunachalam (2002) studied the affects of product and vendor familiarity, web assurance, and information risk on intent to purchase online. They found that web assurance only affected intent to purchase when familiarity was low. This is an interesting finding for the present study because it demonstrates that web assurance is not significant in increasing purchase intentions where the consumer is familiar with the vendor.

LITERATURE REVIEW OF BEHAVIORAL DECISION THEORY

Introduction to Framing Effects in Risky Choice

Kahneman and Tversky (1979) introduced the concept of framing and its effects in the risky choice context. Tversky and Kahneman (1981) define framing very broadly as referring "to the decision maker's conception of acts, outcomes, and contingencies associated with a particular choice. The frame that a decision-maker adopts is controlled partly by the formulation of the problem and partly by the norms, habits, and personal characteristics of the decision maker" (p.

453). Kahneman and Tversky's (1979) prospect theory is widely accepted as a behavioral model of risky decision- making. Framing effects occur when individuals are risk-adverse when the perceived problem domain is gain and risk seeking when the perceived problem domain is loss. (Kuhberger, 1998) The interesting aspect of these phenomena is that the wording of the choices given to the subject can influence the perceived problem domain of the subjects. Although the actual problem domain may be loss or gain, the manipulation of the actual problem domain and the framing of the problem may influence the perceived problem domain of the subject jointly. Consider the following "Asian disease problem" used by Tversky and Kahneman (1981, p. 453).

Problem 1:

Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

If Program A is adopted, 200 people will be saved.
If Program B is adopted, there is 1/3 probability that 600 people will be saved and 2/3 probability that no people will be saved.

Problem 2:

Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

If Program C is adopted, 400 people will die.
If Program D is adopted, there is a 1/3 probability that nobody will die and a 2/3 probability that 600 people will die.

Both choices are logically and probabilistically identical except for the wording of the choices using saved in problem 1 and die in problem 2. However, for the "Asian disease problem", Tversky and Kahneman, (1981) reported that 72 percent of subjects using this scenario with the "Asian disease problem" chose Program A for Problem 1, and preferred the certain option that 200 will be saved. The use of the wording "will be saved" manipulates the perceived problem domain to a gain domain although this is clearly an actual problem domain of loss since the outcome most probably will be that of some deaths occurring. In the second problem, the use of the wording "will die" created a perceived problem domain of loss and should foster risk-seeking behavior. For problem 2 in the "Asian disease problem", the subjects were more risk seeking and chose option D (78 percent). (Tversky and Kahneman, 1981)

This example is demonstration of the "framing effect" because the actual problem domain is not manipulated; just the wording of the problem choices, positively for problem 1 (saved) and negatively for problem 2 (will die). Framing effects have been tested repeatedly in a number of contexts. Kuhberger (1998) reported the results of a meta-analysis of 136 empirical studies of framing with a pool of nearly 30,000 participants. The studies included in this study were located in 66 different journals from experimental, social, and applied psychology, medicine,

management, business and accounting and other applied areas. He concluded that framing is a reliable phenomenon and that type of sample (students vs. target populations) and unit of analysis (individual vs. group) were not important. Interestingly, by and large, these experimental evaluations carried no actual risk to the participants. A particularly salient point considering the experiments sought to test risky choice.

Manipulation of the perceived problem domain can be effected via two routes in the ecommerce environment: changes in the actual problem domain (gain vs. loss) and changes in the wording of the choices or problem frame (positive vs. negative) in a risky choice scenario. In this study, manipulation of the actual domain is used to test the effects on purchase behavior.

RESEARCH MODEL AND HYPOTHESIS DEVELOPMENT

Research Model

The research model used to operationalize the theoretical constructs in this study are outlined in Figure 1. Both initial trust and perceived risk are theorized to be affected by the manipulation of assurance structures and appropriate manipulation checks will be used to determine their veracity.

Definition of Research Constructs

The actual problem domain refers to whether the domain of the problem is a gain or a loss domain. A gain domain is manipulated by whether or not the subject will gain something from the interaction. For a lottery winner that has the choice to turn in a prize they have just won in order for a chance to win an even bigger prize package, the actual problem domain is a gain domain. In the classic “Asian Disease problem”, since the problem was dealing with the loss of life, the actual problem domain was loss. In this experiment, the operationalization of the actual problem domain will be determined by whether the subject has the ability to win additional lottery tickets or will be subject to varying levels of loss of lottery tickets. The problem frame, a control in this study, refers to the use of heuristics that cast the problem into a positive light (i.e. use of the wording ”tickets saved” or ”tickets not lost”) or into a negative light (i.e. use of the wording ”tickets not saved” or ”tickets lost”). The use of the negation is the indication of the turn from the positive framing to the negative framing in either domain. In this study, we test the effect of the actual domain on the perceived problem frame and subsequent behavior.

The moderating variable in the research model is assurance structures. Assurance structures as defined earlier in this paper are statements, promises, guarantees, logos, symbols and any other structural components of a website intended by the vendor to reduce perceptions of risk in transacting on their website. In this experiment, the assurance structures consist of the following elements on the websites viewed by the subjects: security policies, privacy and cookies usage policies, shipping information, money-back guarantees, and toll-free customer service numbers, among others. Any statement or guarantee of the retailer meant to reduce the perception of risk of the potential online consumer and, subsequently, increase initial trust and purchase intentions, would be considered an assurance structure.

Assurance structures are considered moderating variables because they are only expected to effect behavior under the perceived gain domain. Therefore, it is expected to moderate the relationship between the manipulation of the perceived problem domain and purchase behavior in the gain domain. In the loss domain, little to no effect is anticipated.

The dependent variable in this study is the risk preference of the potential online consumer. In contrast to several prior studies of online behavior, this study will require subjects to make an actual decision about making an online purchase where personal gain or loss is at stake. Although there's a strong link between intentions and behavior as demonstrated in the testing of the TRA, it is a natural extension of ecommerce assurance research to test the effect of the experimental manipulations on an actual behavior (or a choice). This will also enrich the study's external validity and avoid potential problems with tautological constructs.

Prospect Theory

In Prospect Theory, the actual problem domain determines the perceived problem frame of the decision. In applying this theory to ecommerce, one would expect that in this environment perceived as risky, and then problem domain should have a significant effect on choices made by consumers. If potential online consumers behave as Chang et al. (2002) predicted, then the problem frame will not affect the choices of buyers. The following hypotheses are based on the reflection effects of Prospect Theory:

> *H1a: According to prospect theory, when the website is presented in a gain domain/positive frame, online consumers will choose the certain option (not to buy) over the risky option (to buy). When the website is presented in a loss domain/negative frame, online consumers will choose the risky option over the certain option.*

> *H1b: According to prospect theory, when the website is presented in a gain domain/negative frame, online consumers will choose the certain option (not to buy) over the risky option (to buy). When the website is presented in a loss domain/positive frame, decision makers will choose the risky option over the certain option.*

These hypotheses outline the importance of perceived problem domain. In Prospect Theory, the actual problem domain as represented by H1a and H1b drives the perceived problem domain. In testing Prospect Theory, it is assumed that the gain domain will lead the decision maker to perceived a gain problem domain and be risk-averse in evaluating choice options. Conversely, the loss domain would cause the decision maker to be risk seeking.

Therefore, the ability of these manipulations, as was discussed previously, to predict choices among option sets will shed light on the process by which unknown vendors are evaluated by consumers in the ecommerce environment.

Moderating Effect of Assurance Structures

The role of assurance structures has been tested in the ecommerce context. (Kovar et al., 2000; Mauldin and Arunachalam, 2002; Odom et al., 2002; Pennington et al., 2003-4; McKnight et al., 2002) The findings of this research have generally shown that assurance structures help to

increase trust and/or purchase intentions of potential online consumers. This was, however, tested without consideration of the risk associated with the transaction.

Since assurance structures are supposed to address concerns about risk associated with the transaction online, consideration of the factors, namely the problem frame and perceived problem domain, which affect the consideration of risk, is of paramount importance. In this study, the interaction of the assurance structure and the factors used to determine the perceived problem domain is not hypothesized to change the perception of the online consumer as to whether the problem domain is gain or loss, rather, it is hypothesized that the actions of the subjects in the perceived problem domain of gain when assurance structures are present will reverse.

According to Kahneman and Tversky (1979, 282), the simplification of prospects in the editing phase can lead the individual to discard events of extremely low probability and to treat events of extremely high probability as if they were certain. So, with the introduction of the assurance structures, the prospects can be simplified such that the probability weights of the second part of Program B (”2/3 probability that no people will be saved) are judged as extremely unlikely and are discarded. The probability of the other part (1/3 probability that 600 will be saved) becomes more likely, so much so, that the decision maker treats this highly likely event as certain. Thus, leaving the decision maker only one rational choice. Regardless of the perceived problem domain, the risky option is the most chosen option.

This would mean that assurance structures would cause a choice reversal in the gain domain but not in the loss domain as the risky option simply becomes more desirable under the loss scenario. The following hypotheses attempt to test these propositions of the moderating effect of assurance structures drawn from the literature.

H2a: When the perceived problem domain of the decision maker is a gain, the presence of assurance structures will cause a choice reversal such that the perceived risk of the risky option (to buy) is eliminated and the decision maker will choose the risky option (to buy) over the certain option (not to buy).

H2b: When the perceived problem domain of the decision maker is a loss, the presence of assurance structures will not significantly affect the decision maker’s choice between option sets.

EXPERIMENTAL DESIGN

Subjects

Subjects were 400 undergraduate students recruited from accounting and management classes at a major university in the Midwest. After removing unusable responses, 337 useable responses were analyzed. Any completed questionnaires with incorrect answers to the lottery ticket manipulation questions were considered unusable and removed from the analysis.

Fifty-five percent of the subjects indicated that they spent 10 hours or more on various activities on the Internet. Ninety-three percent had made at least one purchase on the Internet and sixty-eight percent responded that they made at least one purchase on the Internet per semester. The subjects were composed of 202 males and 135 females. The average age of the subjects was 22.2 years old. The average yearly reported income (including parents’ income if they lived at home) was $16,310. (See Table 1) Based on these findings, it was determined that the subjects had

the opportunity, experience, knowledge and income to serve as excellent sample of potential Internet consumers.

The students were solicited for voluntary participation in the study. The incentives for participation were twofold: First, the students received nominal extra credit in most instances for participation by their respective instructors and secondly, five prizes of $200.00 each were to be awarded among the participants. The extra incentive of the lottery prize was included in the study to increase the probability that the solicited potential participants would desire to participate and to help operationalize a personal interest in the outcome of the decision task as is described below.

Selection of Sample Size and Power

Sample size and power were determined a priori using a sample size calculator provided online by DSS Research: http://www.dssresearch.com/toolkit/sscalc/ size_p2.asp. This company is a full service healthcare marketing research and consulting firm. This calculator requires the input of the expected percentages for each sample, the alpha level and the desired power. By entering ninety percent for sample one, 70 percent for sample two (a twenty percent difference which is practically significant), an alpha of .05 and a beta of .20, the calculator indicated the need for a sample of 25 per cell. The final sample size and percentage spread among groups in the study lead to realized power of 70 percent due to the reduced sample size for those entries that had to be eliminated. However, this level of power was considered sufficient to continue the chi-square analysis.

Task

Subjects assumed the role of an Internet consumer. Their task was to evaluate an online purchase decision made by the experimenter and determine whether it was a bad decision or a good decision. The story line was that the experimenter had purchased a box set of "The Beatles" from an online retailer. The purchase was recently made and therefore the results of that purchase had not been determined. The subjects were to determine if the purchase was a good decision or a bad decision as outlined in the instructions. To accomplish this task, they viewed the website and then determined whether they believed that the purchase would meet defined criteria included in the experimental materials. The number of lottery tickets earned by the subjects was tied to their accurate evaluation of the outcome of the online purchase decision made by the experimenter.

Procedures

The pool of possible participants was chosen from students enrolled in two management classes and five accounting classes. Some of the classes were lower division and some were upper division. The instructors of the classes gave permission for the experimenter to visit the class to read an invitation to participate in the experiment. A series of possible participation times were given to the participants, which varied from class visit to class visit. This was done to ensure that the students visiting the experimental laboratory were spread across the available times.

The experimental materials were collated by the experimental conditions with one set placed in front of each computer in the laboratory. As each participant completed the data

collection materials, a new set was placed at that computer from the top of the stack. That ensures that regardless of the session in which a participant attended, the subjects were assigned to conditions randomly. Measures were taken to ensure that the computers assigned to participants that were in the participant's line of vision were assigned the same website. In that way, the participant that looks around during their evaluation, at the computers next to them or those in the opposite row but in their line of vision, the same website would be viewed as they are viewing on their own computer. This was necessary to ensure that the participants were not aware that two websites were being used as this would destroy the ruse that this was a "real" website.

The subjects were asked to sign in as they arrived at the laboratory and choose any computer that was available. Allowing the subject to choose the workstation also increased the randomness of the condition assignment. At each workstation, there was an Internet enabled computer and a set of experimental documents. The experimental documents consisted of instructions for the task and a data collection envelope. (See Appendices C and E)

The subjects were instructed to read the instructions carefully as the experimental task was explained therein. At the conclusion of the instructions, the subjects were asked to log on to the computer using their regular login ID. The laboratory used for the experiment was the same computer laboratory that the students often use to complete assignments, check their email and surf the web. Therefore, most students were well aware of how to log into the computers. Those students who needed help were asked to raise their hands and wait for an experimenter to come by. The instructions included a website for the students to evaluate. Two websites were used and were completely crossed with the framing conditions.

Both websites were fictional and created for the purpose of the study. The participants were instructed in the instructions that the websites were real and that the purchase that they were evaluating was made from the website that they were viewing. The websites were identical except for the presence of assurance structures and the web address. The subjects were able to spend any amount of time they deemed necessary to make a decision about the online retailer and its ability to meet the established criteria.

After they were finished viewing the website, they were instructed to open the Data Collection envelope and completely fill out the questionnaire. The data collection consisted of obtaining the decision of the participant, manipulation checks, demographic information, risk propensity and personal contact information. The actual decision of the participant was whether or not the purchase from the viewed website was a good decision or a bad decision. A good decision means that the purchase would meet the criteria spelled out in the instructions. A bad decision means that the purchase would not meet the criteria. Their decision would measure the subject's intention to make a purchase from the website.

Each subject had the opportunity to either gain or lose tickets in the lottery depending on the outcome of the experiment. Two conditions, gain and loss, were created using lottery tickets. The subjects in the gain condition were given 100 tickets in the lottery just for participation in the experiment. If they choose that the decision was a good one, and thus decided to take a risk on the retailer, they were subject to one of two possible results:

1. *If the retailer performed as agreed and the purchase met the criteria set out in the instructions, then the subject would gain 1000 tickets, or*

2. *If the retailer failed to perform and the purchase did not meet the criteria set out in the instructions, then the subject would not gain any additional tickets.*

This manipulation modeled the possible consequences in an actual purchase on the Internet. When an individual makes a purchase on the web, the outcome of the decision to make the purchase will result in good or bad consequences to the consumer.

Alternatively, if the subject chose, they could decide that it was a bad decision, thereby predicting that the criteria set forth would not be met, and in this case, they would automatically gain 500 tickets in the lottery.

Note that the expected gain to the participant is 500 tickets regardless of the option chosen. If the risky option is chosen, the expected gain is 1000*.50 + 0*.50 or 500 tickets whereas in the second option the 500 gain is assured. This manipulation has important implications to testing Prospect Theory. It is critical in Prospect Theory that the two options differ in risk not expected gain. The loss condition was set up in a similar manner. In the loss condition, the participants were given 1000 tickets for participation and, if they choose the risky option, they could lose 0 tickets if the purchase met the criteria or 500 if the purchase did not meet the criteria. For the certain option, they would choose this option and automatically lose 500 tickets. These two scenarios, loss and gain, were crossed with each website, for a total of 8 separate conditions. The manipulation checks in this study consisted of a series of three questions that were designed to ensure that the subjects understood what they had to either gain or lose by their choice.

Of the 400 collected responses, 337 answered the questions concerning the number of lottery tickets at risk correctly. Only the responses that answered the questions correctly were included in the data analysis. The next section collected demographic information about the subjects.

The subjects also completed a series of six questions designed to gage their risk propensity in general. These questions were assigned to conditions randomly from a possible twelve questions in the Kogan and Wallach Choice Dilemmas Questionnaire (CDQ) (Kogan and Wallach, 1964) Finally, the subjects were asked to provide their names, email addresses and their telephone numbers so that they could be contacted in case they were winners in the lottery.

The 400 participants' personal information was entered into a Microsoft Access database with an index number being automatically entered for each record. After the information was entered, a random number generator at www.random.org selected 5 numbers ranging from 1 to 400. These numbers were matched to the index numbers assigned to the participants and the names of the winners were selected. The winners were notified and collected $200 dollars each. The names of the winners were not released due to privacy concerns.

Experimental Design

Two factors were varied in the experiment: presence of assurance structures (present/not present) and the problem domain (gain/loss). The dependent variable was the choice of the participant. If the participant chose that the purchase was a good decision (the risky option), they exhibited a preference for risk. This preference for risk arises from the fact that the expected value of both options would be the same; therefore, choosing the risky option manifests their risk

preference. If the participant chose the certain option, then they exhibited no preference for risk. The dependent variable would be measured as the proportion of the total participants that chose each of the options: risky vs. certain.

RESULTS

Testing of the Hypotheses

H1a was tested by testing the choices of the subjects in the two cell manipulations that matched the gain domain with the positive frame and the loss domain with the negative frame as outlined in H1a. In Table 2, these cells are identified as cell 1 (gain domain/positive frame) and cell 4 (loss domain/negative frame). For H1a to be supported, both of these cells must have significant results in the direction that is hypothesized in H1a. Each of the cell frequencies for all of the tests for both H1 and H2 were accomplished using SPSS 13.0 for windows using a Chi-square test of Goodness of fit. The cell frequencies in each cell were compared to the expected cell frequencies.

The expected cell frequencies were 50/50 (in percentage terms) for each cell. The 50/50 frequencies are expected based on expected utility theory. If this theory rather than Prospect Theory explains how the subjects make choices, then the choice between risky or certain options would be ruled by chance, giving a 50/50 outcome where expected utility is equal under each choice alternative, as it is in this experiment. Cell 1 was significant (Chi-square was 6.000, $p = .014$), and in the right direction, with subjects choosing B over A, or the certain rather than risky option. However Cell 4 was not significant. (Chi-square = 1.316, $p = .251$) Therefore, support for H1a is only partial.

H1b would be supported if both cells 2 and 3 were significant and in the right direction. Cell 2 was significant (Chi-square = 4.167, $p = .041$), and in the right direction with subjects choosing the certain over the risky option as predicted by Prospect Theory. However cell 3 (Chi-square = 2.333, $p = .127$) was not significant. Once again, support for H1b is partial.

Additional Analysis

The results support the conjecture that the subjects choose the certain option over the risky option seemingly independent of the framing or domain manipulations. However, this is not to say that domain did not affect their choices, but to say that the subjects made choices that indicate that they perceived the problem as a gain domain in all conditions. Had the subjects not had this perception and the resultant choice of the certain option, then the subjects' choices would have been closer to 50/50 in frequency given the equality of the expected utility.

A plausible explanation for why the subjects choose the certain option over the risky option can be considered at this point. First, for the subject to be in a gain or loss condition, they have to compare their alternatives or choices to their reference point. The reference point provided in the study was 100 tickets for the gain domain and 100 tickets for the loss domain. This manipulation was expected to provide a jumping off point for the increase or decrease in tickets based on the choice of the subject. However, if this manipulation failed to shift the reference point of the subject

from 0 tickets to 100 or 1000, depending on the condition, then the subjects would have been comparing their potential outcomes from their choices based on a starting point of zero tickets and a chance to get any tickets walking out the door would be a gain condition. This would and could explain the choice of the certain option for the subjects as they would be in a perceived gain domain and therefore, risk- adverse.

For this to be a plausible explanation, evidence must show that the risk attitude, as measured by the Dilemmas of Choice Questionnaire, was not significantly related to their choice. If it were, then the predisposed risk attitude of the subject would be a plausible explanation for their risk adverse choices overall. In order to argue that framing took place, no relationship between risk attitude and the choices chosen can be present. To test for a possible relationship between risk attitude and the choice made, a logistic regression model was run using SPSS 13.0 for Windows. The dependent variable was the choice of the participant and the subjects total score on the risk attitude questionnaire as the independent variable. Risk attitude was not significant. (Wald = 2.445, p=.118) Therefore, based on this analysis, it can be concluded that framing does explain some of the variation in choices by potential online consumers. The evidence also suggests that domain drives choices in the ecommerce environment.

Testing of the Interactive Effects of Assurance Conditions

H2a and H2b outline the proposed interactive effects of assurance structures and the framing effects in the ecommerce context. H2a predicted a choice reversal in the perceived gain domain. In the gain domain, the subjects would be expected to choose b over a, but with assurance, the choices would reverse such that subjects would prefer a over b with the assurances on the website.

To test H2a, a two step approach was used. First, the cell frequencies were tabulated to determine if a choice shift or choice reversal occurred. Secondly, a Chi- square test of independence was run to determine if the change was significantly related to the assurance condition. In the assurance condition, 53 subjects in the gain domain choose the risky option and 38 choose the certain option. In the no assurance condition, 24 subjects choose the risky option and 65 choose the certain option. Table 3 summarizes the counts in each experimental condition. This is direct evidence of a choice shift as predicted by H2a. In the second step, the chi-square test of independence demonstrated that assurance was a significant factor in the choice of the subject. (Pearson Chi-Square=17.98, p<.001) H2a is supported. (See Table 3) In the no assurance condition, H2b was partially supported.

At this point, the authors hesitate to analyze the results for the loss domain, after making an argument above that all persons acted as if they were in the gain condition. In the assurance condition, those subjects in the cell intended to act in a loss domain chose A over B at 37/44. In the no assurance condition, the subjects chose A over B at 22/54. (See Table 3) This shows a slight choice shift, yet not a reversal as in the groups intended for the gain domain. One possible explanation is that some of these subjects did perceive a loss domain as intended by the study, yet not a majority. This optimistic explanation should prove fertile ground for further testing in this field of inquiry.

The chi-square test of independence found that assurance was significant in the choice of the subjects. (Pearson Chi-Square = 4.679, p = .031) (See Table 3) This finding did not support H2b, which predicted that assurance would have no effect on the subject in the risk seeking condition of a perceived loss domain. H2b was not supported. Although H2b is not supported, the choice shift found in the loss domains, rather than reversal found in the gain domains, does indicate that it is possible that assurance structures do have differential effects based on the perceived domains of the decision maker in the ecommerce context.

IMPLICATIONS, LIMITATIONS, AND FUTURE RESEARCH

One of the main questions being addressed in this study was the effect of framing on choices of consumers in the ecommerce environment and whether assurance structures moderate those effects. The evidence strongly suggests that framing effects are present in the ecommerce environment and that assurance does interact with those effects to alter choices by individuals. The implications of this research are far reaching.

First, this research helps researchers understand more about the nature of decision making in the ecommerce environment. This study provides the first evidence of framing effects in the ecommerce environment. For at least the gain domain, framing effects were found that significantly altered the choices of the decision maker under uncertainty. This study also extends prior research by tying the outcome of the decision to a personal consequence of the decision maker.

For the accounting profession, important evidence of the overwhelming power of assurance for decision-making under uncertainty is presented in this study. Perhaps, based on the findings of this study, assurance serves a more useful purpose in potential “gain” domain ecommerce contexts than in the ”loss” domain contexts. This information could be used to market and target types of assurance services in the assurance market.

The apparent failure to manipulate the reference point of the subjects to implement the loss domain was a significant limitation of this research. However, given the evidence that the choices of the subjects were not significantly affected by the risk attitude of the subjects, the study did manage to provide direct evidence of framing effects in the gain domain. The reversal of the subjects’ choices in the assurance condition was attributed to the fact that the risks perceived by the subjects were mitigated by the assurances offered on the website.

Another limitation of this study was the use of student subjects. The student subjects were good proxies for online consumers but the use of online consumers would have given increased external validity to the study. The student subjects did have an interest in the outcome of the purchase decision and their personal outcome in the transaction was dependent on them making a good decision. Yet, the use on online consumers in real dollars transactions would have had greater utility. Future research should focus on creating and testing a loss domain. The main issue to address here is how to create a loss to the subjects within the confines of the ethical guidelines of the academic environment. In this study, the plan was to give the subjects 1000 tickets and then they would lose from that point. However, the subjects did not perceive this as much of a loss as they did a gain. Further research should endeavor to find new and creative ways to address this issue successfully.

Table 1 KEY DEMOGRAPHIC DATA Hours per week on Internet		
Choice	Frequency	Percentage
Less than 10 hours	151	44.8
1-20 hours per week	143	42.4
More than 20 hours per week	42	12.8
Total	337	100.0
Internet purchase frequency		
Never	25	7.4
Only once	26	7.7
Once per year	56	16.6
Once per semester	121	35.9
Once per month	92	27.3
Once per week	15	4.5
Several times per week	2	.6
Total	337	100.0

Table 2 CELL COMPARISONS		
No assurance condition	Gain	Loss
Positive Frame	Cell 1 (10/35) $p < .5$	Cell 3 (14/27) $p < .05$
Negative Frame	Cell 2 (11/35) $p < .05$	Cell 4 (13/31) $p < .05$
H1a: Both 1 and 4 tested H1b: Both 2 and 3 tested In parentheses: (# who chose Risky option/# who chose certain option) for each cell.		

Table 3
CHI-SQUARE TEST OF INDEPENDENCE

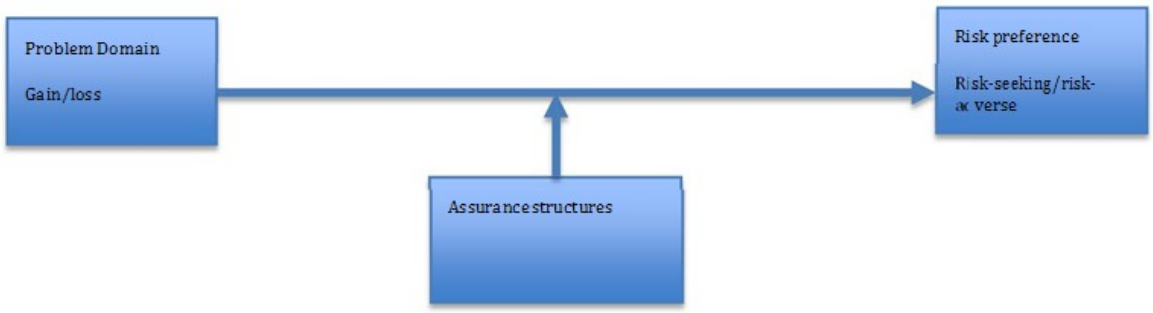
Gain condition			Assurance	No assurance	Total
Choice	Risky option A	Count	53	24	77
		Expected Count	38.9	38.1	77
	Certain Option B	Count	38	65	103
		Expected Count	52.1	50.9	103
Total		Count	91	89	180
		Expected Count	91	89	180

	Value	Asymp. Sig (2-sided)	Df
Pearson Chi-square	17.980	.000	1
Continuity Correction	16.725	.000	1
Likelihood Ratio	18.335	.000	1

Loss condition			Assurance	No assurance	Total
Choice	Risky option A	Count	37	22	59
		Expected Count	30.4	28.6	59
	Certain Option B	Count	44	54	98
		Expected Count	50.6	47.4	98
Total		Count	81	76	157
		Expected Count	81	76	157

	Value	Asymp. Sig (2-sided)	Df
Pearson Chi-square	4.679	.031	1
Continuity Correction	3.993	.046	1
Likelihood Ratio	4.719	.030	1

Figure 1



Construct Definitions

Actual Problem Domain is the actual domain of the problem is determined by whether the problem centers on a potential gain in utility for the decision maker or a potential loss in utility for the decision maker. The domain is determined by the shift from the reference point, 0, to some other point with a utility either positive or negative (Kahneman and Tversky, 1979).

Problem frame is determined by use of negation in the choice alternative and the use of heuristics. For example, 20 out of 100 lives saved means the same as 80 out of 100 lives not lost. In both cases, the actual problem domain is a loss but they are framed positively by the use of "saved" and "not lost". The use of the words "lost" or "not saved" would frame negatively (Kuhberger, 1995).

Assurance Structures are statements, promises, guarantees, logos, symbols and any other structural components of a website intended by the vendor to reduce perceptions of exposure to loss in transactions on their website (Bahmanziari and Odom, 2009) .

Risk preference refers to the choice of the decision maker. The risk preference of risk-seeking or risk-adverse is determined by the choice of the decision maker. A certain choice would identify the risk preference of the decision makers as risk adverse. The risky choice option, if preferred by the decision maker, would identify the risk preference of the decision maker as risk-seeking. This factor is the result of the manipulation of the actual problem domain and the problem frame (Chang et al., 2002).

REFERENCES

Ambler, T. (1997). How much of brand equity is explained by trust? *Management Decision*, 35, 283-292.

Arkes, H. R. (1991). Costs and benefits of judgment errors: Implications for debiasing. Psychological Bulletin, 110, 486- 498.

Bahmanziari, T. E., Odom, M. D. and Ugrin, J. C. (2009). An experimental evaluation of the effects of internal and external e-assurance on initial trust formation in B2C e-commerce. *International Journal of Accounting Information Systems, 10*(3), 152-170.

Battalio, R. C., Kagel, J. H. & Jiranyakul, K. (1990). Testing between alternative models of choice under uncertainty: Some initial results. *Journal of Risk and Uncertainty*, 3, 25-50.

Beattie, J. & Loomes, G. (1997). The impact of incentives upon risky choice experiments. *Journal of Risk and Uncertainty*, 14, 155-168.

Bhattacherjee, A. (2000). Acceptance of e-commerce services: The case of electronic brokerages. *IEEE Transactions on Systems, Man & Cybernetics: Part A: Systems and Humans*, 30, 411-420.

Bhattacherjee, A. (2002). Individual Trust in Online Firms: Scale Development and Initial Test. *Journal of Management Information Systems*, 19, 211-241.

Bigley, G. A. & Pearce, J. L. (1998). Straining for shared meaning in organizational science: Problems of trust and distrust. *Academy of Management Review*, 23, 405-421.

Blois, K. J. (1999). Trust in business to business relationships: An evaluation of its status. *Journal of Management Studies*, 36, 197-215.

Bonoma, T. V. & W. J. Johnston, W. J. (1979). Locus of control, trust and decision making. *Decision Sciences*, 10, 39- 60.

Chan, M. (1997). Some theoretical propositions pertaining to the context of trust. *The International Journal of Organizational Analysis*, 5, 227-248.

Chang, C. J.,Yen, S. H. & Duh, R. (2002). An empirical examination of competing theories to explain the framing effect in accounting-related decisions. *Behavioral Research in Accounting*, 14, 35-64.

Chang, O. H., & Nichols, D. R. (1987). Taxpayer attitudes toward tax audit risk. *Journal of Economic Psychology*, 8, 299- 309.

Chellappa, R. K. & Pavlou, P. A. (2002). Perceived information security, financial liability and consumer trust in electroinic commerce transactions. *Logistics Information Management*, 15, 258-368.

Chiang, K. & Dholakia, R. R. (2003). Factors driving consumer intention to shop online: An empirical investigation. *Journal of Consumer Psychology*, 13, 177-183.

Conchar, M. P., Zinkhan, G. M. , Peters, C. & Olavarrieta, S. (2004). An integrated framework for the conceptualization of consumers' perceived-risk processing. *Journal of the Academy of Marketing Science*, 32, 418-436.

Dalton, D. R., Johnson, J. L., & Daily, C. M. (1999). On the use of intent to variables in organizational research: An empirical and cautionary assessment. *Human Relations*, 52, 1337-1350.

Das, T. K. & Teng, B. S. (2001). Strategic Risk Behavior and Its Temporalities: Between Risk Propensity and Decision Context. *Journal of Management Studies*, 38, 515-534.

Edwards, K. D. (1996). Prospect theory: A literature review. *International Review of Financial Analysis*, 5, 19-38. Elliott, R. K. (1997). Assurance service opportunities: Implications for academia. *Accounting Horizons*, 11, 61-74.

Elliott, R. K. (1998). Assurance services and the audit heritage: What's new and what's rooted in the past. *The CPA Journal*, 68, 40-47.

Elliott, R. K. & Pallais, D. M. (1997). Are you ready for new assurance services? *Journal of Accountancy*, 183, 47-51.

Emby, C. (1994). Framing and presentation mode effects in professional judgment: Auditors' internal control judgments and substantive testing decisions. *Auditing: A Journal of Practice & Theory*, 13, 102-115.

Fagley, N. S. (1993). A note concerning reflection effects versus framing effects. *Psychological Bulletin*, 113, 451-452. Fagley, N. S. & Miller, P. M. (1997). Framing effects and arenas of choice: Your money or your life? *Organizational Behavior and Human Decision Processes*, 71, 355-373.

Forte, D. (2013). Ecommerce in U.S. could grow to $370 by 2017. *Multichannel Merchant Exclusive Insight.* Retrieved on May 5, 2014 from http://www.worldcat.org/title/multichannel-merchant-exclusive-insight/oclc/785985423

Fox, C. R. & Weber, M. (2002). Ambiguity aversion, comparative ignorance, and decision context. *Organizational Behavior and Human Decision Processes, 88,* 476-498.

Gefen, D. (2000). E-commerce: The role of familiarity and trust. *Omega*, 28, 725-737.

Gefen, D., Karahanna, E. & Straub, D. (2003). Trust and TAM in online shopping: An integrated model. *MIS Quarterly*, 27, 51-90.

Gefen, D. & Straub, D. (2003). Managing user trust in B2C e-Services. *e-Service Journal*, 2, 7-24.

Gigerenzer, G., Hoffrage, U. & Kleinbolting, H. (1991). Probabilistic mental models: A Brunswikian theory of confidence. *Psychological Review*, 98, 506-528.

Grabner-Kraeuter, S. (2002). The role of consumers' trust in online-shopping. *Journal of Business Ethics*, 39, 43-50.

Grazioli, S. & Jarvenpaa, S. L. (2000). Perils of internet fraud: An empirical investigation of deception and trust with experienced internet consumers. IEEE *Transactions on Systems, Man & Cybernetics: Part A: Systems and Humans*, 30, 395-410.

Grewal, D., Munger, J. L., Iyer, G. R. & Levy, M. (2003). The influence of internet- retailing factors on price expectations. *Psychology & Marketing*, 20, 477-493.

Hertwig, R., Barron, G., Weber, E. U. & Erev, I. (2004). Decisions From Experience and the Effect of Rare Events in Risky Choice. *Psychological Science*, 15, 534-539.

Hogarth, R. M. (1993). Accounting for decisions and decisions for accounting. *Accounting, Organizations and Society*, 18(5): 407-424.

Houston, R. W. & Taylor, G. K. (1999). Consumer perceptions of CPA WebTrust assurances: Evidence of an expectation gap. *International Journal of Auditing*, 3, 89-105.

Huang, J.H., Potoker, E. & Yang, C. H. J. (2001). The roles of fairness, trust and commitment in consumer satisfaction in internet shopping. Working paper.

Jackson, D. (1976). Personality inventory manual. Goshen, NY: Research Psychologists Press.

Jarvenpaa, S. L. (1999). Consumer Trust in an Internet Store: A Cross-Cultural Validation. *Journal of Computer-Mediated Communication*, 5, 1-35.

Jou, J., Shanteau, J. & Harris, R. J. (1996). An information processing view of framing effects: The role of causal schemas in decision making. *Memory & Cognition*, 24, 1-15.

Kahneman, D. & Tversky, A. (1979). Prospect Theory: An analysis of decision under risk. *Econometrica* 47(2): 263-292.

Kaplan, S. E. & Nieschwietz, R. (2003a). An examination of the effects of WebTrust and company type on consumers' purchase intentions. *International Journal of Auditing*, 7, 155-168.

Kaplan, S. E. & Nieschwietz, R. (2003b). A web assurance services model of trust for B2C e-commerce. *International Journal of Accounting Information Systems*, 4, 95-114.

Kessler, E. H., Ford, C. M. & Bailey, J. R. (1996). Object valence as a Moderator of the Framing Effect on Risk Preference. *Journal of Ecomonic Behavior & Organization*, 30, 241-256.

Kivetz, R. (2003). The effects of effort and intrinsic motivation on risky choice. *Marketing Science*, 22, 477-502. Kogan, N. & Wallach, M. A. (1964). Risk taking. New York, NY: Holt, Rinehart and Winston.

Koriat, A., Lictenstein, S. & Fischhoff, B. (1980). Reasons for confidence. Journal of Experimental Psychology: Human Learning and Memory, 6, 107-118.

Kovar, S. D., Burke, K.G. & Kovar, B. R. (2000). Consumer responses to the CPA WEBTRUST assurance. *Journal of Information Systems*, 14, 17-35.

Kuhberger, A. (1995). The framing of decisions: A new look at old problems. *Organizational Behavior and Human Decision Processes*, 62, 230-240.

Kuhberger, A. (1998). The influence of framing on risky decisions: A Meta-Analysis. *Organizational Behavior and Human Decision Processes*, 75, 23-55.

Kuhberger, A., Schulte-Mechklenbeck, M. & Perner, J. (2002). Framing Decisions: Hypothetical and Real. *Organizational Behavior and Human Decision Processes*, 89, 1162-1175.

Kuhberger, A., Schulte-Mechklenbeck, M. & Perner, J. (1999). The Effects of Framing, Reflection, Probability, and Payoff on Risk Preference in Choice Tasks. *Organizational Behavior and Human Decision Processes*, 78, 204- 231.

Lala, V., Arnold, V., Sutton, S. and Guan, L. (2001). The impact of relative information quality of ecommerce assurance seals on internet purchasing behavior. Unpublished work.

Lee, M. K. O. & Turban, L. (2001). A trust model of consumer internet shopping. *International Journal of Electronic Commerce*, 6, 75-91.

Levin, I. P., Schneider, S. L., & Gaeth, G. J. (1998). All frames are not created equal: A typology and critical analysis of framing effects. *Organizational Behavior and Human Decision Processes*, 76, 149-188.

Lewis, J. D. & Weigert, A. (1985). Trust as a social reality. *Social Forces*, 63, 967-985.

Lim, R. G. (1995). A range-frequency explanation of shifting reference points in risky decision making. *Organizational Behavior and Human Decision Processes*, 63, 6-20.

Limayem, M., Khalifa, M. & Frini, A. (2000). What makes consumers buy from internet? A longitudinal study of online shopping. *IEEE Transactions on systems, Man and Cybernetics-Part A: Systems and Humans*, 30, 421-432.

Maheswaran, D. & Meyers-Levy, J. (1990). The influence of message framing and issue involvement. *Journal of Marketing Research*, 27, 361-367.

Main, D. & Lambert, J. C. (1998). Improving your decision making. *Business & Economic Review*, 22, 9-12.

Mandel, D. R. (2001). Gain-loss framing and choice: Separating outcome formulations from descriptor formulations. *Organizational Behavior and Human Decision Processes*, 85, 56-76.

Mauldin, E. & Arunachalam, V. (2002). An experimental examination of alternative forms of web assurance for business-to-consumer commerce. *Journal of Information Systems*, 16, 33-54.

Mayer, R. C., Davis, J.H., & Schoorman, F.O. (1995). An integrative model of organizational trust. *Academy of Management Review*, 20, 708-734.

McKnight, D. H. & Chervany, N. L. (2001-2002). What Trust Means in E-commerce Customer Relationships: An Interdisciplinary Conceptual Typology. *International Journal of Electronic Commerce*, 6, 35-59.

McKnight, D. H., Choudhury, V., & Kacmar, C. (2002). Developing and validating trust measures for e-commerce: An integrative typology. *Information Systems Research*, 13, 334-359.

McKnight, D. H., Cummings, L. L., & Chervany, N. L.(1998). Initial trust formation in new organizational relationships. *Academy of Management Review*, 23(3): 473- 490.

Moreno, K., Kida, T. & Smith, J. F. (2002). The impact of affective reactions on risky decision making in accounting context. *Journal of Accounting Research*, 40, 1331-1349.

Mowen, M. M. & Mowen, J. C. (1986). An empirical examination of the biasing effects of framing on business decisions. *Decision Sciences*, 17, 596-602.

Murphy, G. B. & Blessinger, A. A. (2003). Perceptions of no-name recognition business to consumer e-commerce trustworthiness: The effectiveness of potential influence tactics. *Journal of High Technology Management Research*, 14, 71-92.

Noteberg, A., Christiaanse, E. & Wallage, P. (2003). Consumer trust in electronic channels. E-Service Journal, 2, 46-67. O'Clock, P. & Devine, K. (1995). An investigation of framing and firm size on the auditor's going concern decision. *Accounting and Business Research*, 25, 197-207.

Odom, M. D., Kumar, A. & Saunders, L. (2002). Web assurance seals: How and why they influence consumers' decisions. *Journal of Information Systems*, 16, 231-250.

Olsen, R. A. (1997). Prospect theory as an explanation of risky choice by professional investors: Some evidence. *Review of Financial Economics*, 6, 225-233.

Pablo, A. L., Sitkin, S. B., & Jemison, D. B. (1996). Acquisition decision-making processes: The central role of risk. *Journal of Management*, 22.

Pavlou, P. A. (2002). Institution-based trust in interorganizational exchange relationships: the role of online B2B marketplaces on trust formation. *Journal of Strategic Information Systems*, 4, 215-243.

Pavlou, P. A. (2003). Consumer acceptance of electronic commerce: Integrating trust and risk with the Technology Acceptance Model. *International Journal of Electronic Commerce*, 7, 101-134.

Pennington, R., Wilcox, H. D. & Grover, V. (2003-4). The role of system trust in business-to-consumer transactions. *Journal of Management Information Systems*, 20, 197-226.

Portz, K., Strong, J. M., Brusta, B. & Schneider, K. (2000). Do consumers understand what WebTrust means? *CPA Journal*, 70, 46-52.

Quiggin, J. (1993). Testing between alternative models of choice under uncertainty: Comment. *Journal of Risk and Uncertainty*, 6, 161-164.

Ratnasingham, P. & Pavlou, P. A. (2003). Technology trust in internet based interorganizational electronic commerce. *Journal of Electronic Commerce in Organizations*, 1, 17-42.

Reyna, V. F. & Brainerd, C. J. (1991). Fuzzy-trace theory and framing effects in choice: Gist extraction, truncation, and conversion. *Journal of Behavioral Decision Making*, 4, 249-262.

Rose, J. M., Rose, A. M. & Strand, C. S. (Spring 2004). The evaluation of risky information technology investment decisions. *Journal of Information Systems*, 18, 53-66.

Rotter, J. B. (1967). A new scale for the measurement of interpersonal trust. *Journal of Personality*, 35, 651-665.

Rousseau, D. M., Sitkin, S. B., Burt, R. S. & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of Management Review*, 23, 393-404.

Schlosser, A. E. (2003). Computers as situational cues: Implications for consumer's product cognitions and attitudes. *Journal of Consumer Psychology*, 13, 103-112.

Schneider, S. L., Holstrum, G. L. & Marden, R. E. (1993). Framing effects and audit decision making: Control environment evaluation. Poster presented at the annual meeting of the Society for Judgment and Decision Making.

Shapiro, S. P. (1987). The social control of impersonal trust. *American Journal of Sociology*, 93, 623-658.

Sitkin, S. B. & Pablo, A. L. (1992). Reconceptualizing the determinants of risk behavior. *Academy of Management Review*, 17, 9-38.

Sitkin, S. B. & Weingart, L. R. (1995). Determinants of risky decision-making behavior: A test of the mediating role of risk perceptions and propensity. *Academy of Management Journal*, 38, 1573-1592.

Sonsino, D., Benzion, U. & Mador, G. (2002). The complexity effects on choice with uncertainty-Experimental evidence. *The Economic Journal*, 112, 936-965.

Stewart, K. J. (2003). Trust transfer on the World Wide Web. Organizational Science, 14, 5-17.

Stoddard, J. E. & Fern E. F. (1996). The effect of information format and decision frame on choice in an organizational buying context. *Advances in Consumer Research*, 23, 211-217.

Suh, B. & Han, I. (2002). Effect of trust on customer acceptance of internet banking. *Electronic Commerce Research and Applications*, 1, 247-263.

Suh, B. & Han, I. (2003). The impact of customer trust and perception of security control on the acceptance of electronic commerce. *International Journal of Electronic Commerce*, 7, 135-161.

Torkzadeh, G. & Dhillon, G. (2002). Measuring factors that influence the success of internet commerce. *Information Systems Research*, 13, 187-204.

Tversky, A. & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211, 453-458.
Tversky, A. & Kahneman, D. (1986). Rational choice and the framing of decisions. *Journal of Business*, 59, 251-278.

Van Schie, E. C. M. & Van Der Pligt, J. (1995). Influencing risk preference in decision making: The effects of framing and salience. *Organizational Behavior and Human Decision Processes*, 63, 264-275.

Warrington, T. B., Abgrab, N. J., & Caldwell, H. M. (2000). Building trust to develop competitive advantage in e-business relationships. *Competitiveness Review*, 10, 160-169.

Wilson, E. J., McMurrian, R. C. & Woodside, A. G. (2001). How buyers frame problems: Revisited. *Psychology & Marketing*, 18, 617-655.

Yoon, S. (2002). The antecedents and consequences of trust in online purchase decisions. *Journal of Interactive Marketing*, 16, 47-63.

DOES CORPORATE GOVERNANCE IMPROVE BANKRUPTCY PREDICTION?

Islam Elshahat, Towson University
Ahmed Elshahat, Bradley University
Arundhati Rao, Towson University

ABSTRACT

In this research article the Altman's bankruptcy prediction model is replicated using recent data to test for the validity of the Altman's results. Also, a corporate governance index measure is incorporated to enhance the prediction of the firms' bankruptcy. For a one-year prediction window, we found no significant differences between bankrupt and non-bankrupt firm group means, however, there was significant group mean difference for the corporate governance index. The inclusion of the corporate governance index slightly improved the predictability of the bankrupted firms. There was no improvement in the overall predictability of Altman's bankruptcy prediction model after incorporating the corporate governance measures. Both prediction models, with and without corporate governance index, reported an overall predictability of 69% as compared to Altman's reported prediction rate 95%.

INTRODUCTION

In 1968 Altman's Z-Score was a game changer; this quantitative model was widely accepted and became the norm for bankruptcy prediction for academicians and practitioners. But it also had several skeptics; it spawned numerous research articles with the Z-Score itself coming under intense scrutiny. Over the years it has proven to be sample sensitive, providing inconsistent results for different sample sets and time periods. The original model was developed for firms in the manufacturing industry. Due to the continuous changes and complications in the business environment, non-financial as well as structural factors are contributing to a firm's performance and survival. Over the years several factors have been used as a proxy for the non-financial factors such as corporate governance. Variables such as Board of Director's characteristics, Board Committees, internal control and auditing systems add to the understanding of the firms' corporate governance. Corporate governance can be used as a comprehensive measure for the agency problems that directly affect the firm structure and survival.

In this research article we aim to improve the predictability of the Altman model by employing a corporate governance index, a better proxy for the firms' riskiness and/or probability of a firm going bankrupt. Our basic research question is whether or not the addition of corporate governance index would affect, or more specifically, improve, the predictability of the Altman's bankruptcy prediction model using recent data. Bankruptcy prediction would be helpful to investors, creditors, auditors and the capital market in general. The accuracy of predicting the business failure, i.e., bankruptcy, serves as guide and/or warning sign to managers, investors and creditors. We believe that the market will be more confident of audit opinions if it in sync with the

bankruptcy prediction. Most studies in the literature used financial ratios, i.e., quantitative measures, as proxy measures for bankruptcy prediction purposes. Our main contribution will be to use a corporate governance index as a non-financial variable to improve the Altman's bankruptcy prediction model. Following the same methodology developed by Altman in his original paper, we use discriminant analysis, to classify subjects of the selected sample into groups (bankrupt firms or non-bankrupt firms) based on the combination of financial and non-financial measures employed. The rest of the paper is organized as follows: Section II is a literature review of two topics: bankruptcy prediction and corporate governance, Section III describes the data selection process and the methodology used, Section IV discusses and analyzes the results, and finally, Section V presents the conclusion and limitations of this study.

LITERATURE REVIEW

Bankruptcy Prediction Literature

Altman (1968) was one of the earliest researchers who aimed at predicting corporate bankruptcy. Altman developed a quantitative bankruptcy prediction model based on five financial ratios. The sample was composed of 66 firms (33 firms filed for bankruptcy and a matched sample of 33 firms). The model accurately predicted bankruptcy 94% in the total sample and 95% accuracy within each group. Altman's results suggested that financial ratios can significantly predict corporate bankruptcy. He concluded by suggesting that this model could be used for business credit evaluations, internal control and serve as an investment guideline.

Libby (1975) concluded that traditional confidence in ratio analysis for credit rating seems justified. However, inconsistent results were reported by Casey's (1980) replication of Libby's. The researchers reported that, first, subjects' predictive achievement was significantly lower due to poor performance on bankrupt firms; second, individual differences in information-processing style and confidence level may explain a statistically significant portion of variance in subjects' predictive achievement; third, a composite judge prediction model did not outperform the average subject. Consequently, the study raised doubts of the high confidence in the financial ratios as predicting factor to financial performance of companies and also their use in the credit rating.

Dambolena and Khoury (1980) studied the stability of financial ratio over time while financially distressed firms are getting closer to bankruptcy and conduct a comparison to a control sample of non-distressed companies. The essential attribute of the model is that it uses the stability of all financial ratios over time, as well as the level of these ratios, as an explanatory variable in the derivation of a discriminate function. When comparing ratios' coefficient of firms that filed for bankruptcy and firms that did not, the results indicated a substantial degree of instability. The instability was measured by the standard deviation of the financial ratios over the few years before the bankruptcy dates, the standard error of estimate, and the coefficient of variation, in the ratios of firms that went bankrupt. The instability significantly increased over time as the corporation approached the bankruptcy date. The model classified firms into failed and non-failed groups with 78% accuracy five years prior to failure.

Gombola et al. (1987) conducted a study to determine whether cash flow from operations (CFFO) contributes to the prediction of corporate failure. The study showed conservative results

regarding the inclusion of the cash flow from operations as a variable in the prediction of failure. CFFO may be a possible predictor of failure, but only in the very short term. Gilbert et.al. (1990) demonstrate that financial ratio-based models were unable to distinguish bankrupted firms from other financially distressed firms. Furthermore, the variables that show any ability to discriminate between bankrupt and distressed firms are different from those that discriminate between bankrupt and randomly selected non-bankrupt firms. They conclude that while there are overlapping financial characteristics of the bankrupt and distressed firms, distressed firms are determined by non-financial factors. Grice and Ingram (2001) replicated the Altman bankruptcy model using different and more recent samples. The first sample was composed of firms that filed for bankruptcy between 1985 and 1987; this was the estimation sample. The second sample was composed of firms that filed for bankruptcy between 1988 and 1991; this was employed as a predictive sample. Grice and Ingram examined three research questions: (1) Is Altman's original model as useful for predicting bankruptcy in recent periods as it was for the periods in which it was developed and tested by Altman? (2) Is the model as useful for predicting bankruptcy of non-manufacturing firms as it is for predicting bankruptcy of manufacturing firms? (3) Is the model as useful for predicting financial stress conditions other than bankruptcy as it is for predicting bankruptcy? The results were negative for the first two questions but positive for the last question.

Sun (2007) revaluated the auditor's going concern opinions versus statistical models in bankruptcy prediction. The study attempted to add new evidence conducting the comparison based upon an improved statistical bankruptcy prediction model. The improved bankruptcy prediction model incorporates other non-financial variables that were introduced by other bankruptcy prediction research (e.g., Shumway, 2001). Non-financial variables included are: financial distress, industry failure rate, abnormal stock returns, and market capitalization. A hazard model was also employed. The overall results indicated that the predictability of the hazard model with incorporation of non-financial-ratio variables is superior to that of auditors' going concern opinions. This suggests that a bankruptcy prediction model could serve as a decision aid for the auditors' going-concern judgments.

Corporate Governance Literature

Daily and Dalton (1994) examined the relationship between independent/interdependent board composition and the structure of CEO/board chairman position and the filing of bankruptcy. The study relied on a matched-pair design of 50 bankrupted firms and 50 non-bankrupted matched firms. The matching was based on industry classification and the firms' size. The results indicated that the governance structure contributes to the incidence of bankruptcy beyond financial and size considerations. Gales and Kesner (1994) investigated the impact of boards in problematic environments or during crisis situations. Using a matched pairs design they examined a sample of 127 bankrupt and non-bankrupt firms. In the period leading to filing for bankruptcy, declining firms experienced loss of outside directors and decline in overall board size. When compared to their non-bankrupt counterparts, bankrupt companies have significantly different board structures and made more changes in their boards in the periods after Chapter 11 filing.

Klein (2002) examined the association between audit committee board characteristics and earnings management; the results demonstrates the negative association among audit committee

independence / board independence and abnormal accruals. Brown and Caylor (2006) reported a significant and positive association between firm operating measures, Return on Assets, and individual governance measure. However they did not provide a theoretical framework for why only certain corporate governance factors are significant and positively related to firms' operating performance.

Leach and Newsom (2007) investigated the earnings management behavior of firms that file for bankruptcy and found the following: first, firms attempt to manage their earnings in order to make their financial statements appear more favorable over the years prior to filing for bankruptcy. Second, as the need to file for bankruptcy becomes imminent, firms reverse their earnings management. More interestingly, a comparison of the earnings management behavior of bankrupt firms convicted of fraud versus bankrupt firms not convicted of fraud revealed that non-fraudulent bankrupt firms reverse their earnings management prior to filing while fraudulent bankrupt firms do not. Third, the matched control sample firms did not engage in earnings management activities like bankrupt firms, even though, they too are experiencing similar stock price performance and are of similar size. Larcker, Richardson, and Tuna (2007) examined of the association between measures of corporate governance, using 39 structural measures of corporate governance, and various accounting and economic outcomes. The results produced were inconsistent. The inconsistencies are partially attributable to the difficulty in generating reliable and valid measures for corporate governance. In 2007, Khanchel investigated the determinants of good corporate governance in US firms. The sample composed of 624 US listed, non-financial firms for the period between 1994 and 2003. Four indices were constructed to summarize the governance quality: board of directors' index, board committees' index, audit committee index, and an overall or total index. The results indicated significant and positive associations between each corporate governance index, exception to board index, and firm size, investment opportunities, intangible assets and directors and officers' ownership. Furthermore, institutional ownership and external financing needs are positively related to each corporate governance index considered. However, growth opportunities and performance have no significant effect on governance quality.

From the literature discussed we conclude the following: the Altman's bankruptcy prediction model is sample sensitive and thus not generalizable to small and/or non-manufacturing firms; next the predictive power (informative value) of the model could be increased by adding non-financial variables; and finally, the corporate governance variables/indices can serve as a good non-financial factor as it is related to the firm's failure and/or earnings management practices that could lead to bankruptcy filing.

DATA AND METHODOLOGY

In this research study, we test the effect of including a corporate governance index on Altman's bankruptcy prediction model. The basic Altman's bankruptcy prediction model included five financial ratios: Working Capital/Total Assets; Retained Earnings/Total Assets; EBIT/Total Assets; Market Value Equity/Book Value of Total Debt; and Sales/Total Assets. The corporate governance construct is measured by the corporate governance index used by Brown and Caylor (2006), provided by Institutional Shareholder Services (ISS) leading provider of corporate

governance research and analysis. ISS provides 61 corporate governance individual measures and 3 combined measures. The Brown and Caylor index was composed of 52 individual corporate governance measures, derived from the ISS 61 corporate governance measures. However combination factors were omitted and one corporate governance measure was split into two (poison pill and blank check preferred stock). Also 10 of the 61 provisions, which only apply to a subset of firms, were omitted. Four are related to charter/bylaw measures (poison pill with Third-Year Independent Director Evaluation (TIDE) provision, poison pill with sunset provision, poison pill with a qualified offer clause, and poison pill with a trigger threshold), and six are related to the state of incorporation (not incorporated in a state with a control share acquisition statute or company opted out, not incorporated in a state with a control share cash-out statute or company opted out, not incorporated in a state with a freeze-out provision or company has opted out, not incorporated in a state with a fair price provision or company has opted out, not incorporated in a state with state stakeholder laws or company opted out, and not incorporated in a state that endorses poison pills). The governance score is calculated by adding either 0 or 1 for the selected governance provisions. If the ISS considers the firm's governance measure to be minimally acceptable then 1 will be granted; otherwise it will be 0.

Following the methodology of the Altman's paper, first, we conduct the analysis of variance (ANOVA) to test the difference between bankrupt and non-bankrupt groups. If significant results were obtained then multiple discriminate analysis (MDA) will be conducted, which is a statistical technique to classify observations into one of priori groupings dependent upon the observation's individual characteristics. It is important to note that the Altman's bankruptcy prediction model predicts bankruptcy within a one-year window. In other words, the financial ratios for one year would be used to predict bankruptcy for the following year. The analysis will proceed as follows: First, the Altman's model will be replicated to confirm the inconsistency of the results mentioned in Altman's model; second, the corporate governance index will be incorporated in the model and redo the analysis one more time as described in step 1.Altman's bankruptcy prediction model:

$$Z = 0.12X_1 + 0.14\ X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5 \text{ …….. (1)}$$

Z = Overall index
X_1= Working Capital / Total assets
X_2= Retained Earnings / Total assets
X_3= Earnings Before Interest and Tax / Total Assets
X_4= Market Value of Equity / Book Value of Total Debt
X_5= Sales / Total Assets.

Based on the Altman's model the Z score is associated negatively with the bankruptcy probability, meaning that the higher the Z score the less probability the firm will go bankrupt, and vice versa. Improved Altman's bankruptcy prediction model:

$$Z = 0.12X_1 + 0.14\ X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5 + X_6 \ldots\ldots\ldots (2)$$

X_6 = Corporate Governance Index.

Based on the literature discussed earlier, we would expect the Corporate Governance Index to have a positive coefficient; the better the quality of the corporate governance the higher the Z score will be and the less probable the firm will become bankrupt. The research question will be whether the inclusion of the corporate measure improves the predictability of the Altman's bankruptcy model or not. Thus, the hypotheses are as follows:

H_1 The Altman bankruptcy prediction model is sample sensitive.
H_2 The use of a corporate governance measure will improve the predictability of the Altman bankruptcy prediction model.

The sample selection process was identical the original Altman study applied to a more recent time period. Bankruptcy data was collected for years 2004-2007. The data from the first 3 years will be used in the analysis while the data from the last year will be used to test the validity for Altman's upgraded model. Also, the data was collected from these particular years in order to match it with the corporate governance data in hand. The accounting data was obtained from the COMPUSTAT database for years 2003-2005. The initial sample selected was composed of 285 observations for all 3 years combined. 94 private firms were deleted and105 observations with no or incomplete accounting information was also deleted. The remaining 83 observations were matched with a control sample of non-bankrupt firms, matching was based on firms' size (using total assets) and industry classification (DNUM - Industry Classification Code). Finally, the corporate governance measure was added to the sample of 166 observations; 108 observations with no governance score were deleted. The final data set was composed of 58 observations; 29 bankrupt firms and 29 non-bankrupt firms. Table 1 summarizes the data set collection process.

Table 1
Sample Selection

Data set	Observations	
Initial data selected (Years : 2004 – 2005 – 2006)		282
(-) Private firms	(94)	
(-) Firms with incomplete accounting data	(105)	
(=) Subtotal		83
(+) A matched sample of non-bankrupted firms	83	
(=) Subtotal		166
(-) Observations with no Governance score	(108)	
Final data set		58

RESULTS

Altman's Reported Results

At 1% significance level Altman reported significant results to the group mean differences of the ratios across both groups; ratio X_5, i.e., Sales / Total Assets, was insignificant but still included (Table 2).

Table 2
ANOVA Results – Altman's Original Dataset
Variable Means and Test of Significance

Variable	Bankrupt Group Mean (n = 33)	Non-Bankrupt Group Mean (n = 33)	F Ratio
X_1	-6.1%	41.4%	32.60*
X_2	-62.6%	35.5%	58.86*
X_3	-31.8%	15.3%	26.56*
X_4	40.1%	247.7%	33.26*
X_5	150.0%	190.0%	2.84

*Significant at the .001 level

Given the significant results Altman proceeded to the discriminate analysis testing for the predictability of the developed model (Table 3), and reported a prediction rate of 95% (94% prediction for bankrupt firms and 97% for non-bankrupt firms)

Table 3
Altman's One Year Prediction Results

	Number Correct	Percent Correct	Percent Error	n		Predicted	
Type I	31	94	6	33	Actual	Group 1	Group 2
Type II	32	97	3	33	Group 1	31	2
Total	63	95	5	66	Group 2	1	32

Results of Altman's Study using More Recent Sample Set

Table 4 presents the descriptive statistics of the sample set used to replicate Altman's bankruptcy prediction model. The Analysis of Variance (ANOVA) is conducted to investigate significance of mean differences of the ratios between bankrupt and non-bankrupt firm groups (0=non-bankrupt firms, 1=bankrupt). The results were not consistent with Altman's reported results as the mean differences across both groups are all insignificant.

Table 4
Descriptive Statistics

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
X_1 = WC/TA	0	29	0.067	0.550	0.102	-0.143	0.276	-2.124	0.725
	1	29	-0.865	2.549	0.473	-1.835	0.104	-13.406	0.477
	Total	58	-0.399	1.887	0.248	-0.896	0.097	-13.406	0.725
X_2 = RE/TA	0	29	-3.680	9.916	1.841	-7.452	0.092	-48.813	0.665
	1	29	-20.845	71.358	13.251	-47.988	6.298	-383.877	0.149
	Total	58	-12.263	51.230	6.727	-25.733	1.208	-383.877	0.665
X_3 = EBIT/TA	0	29	-0.488	1.881	0.349	-1.204	0.227	-9.456	0.237
	1	29	-0.934	2.151	0.399	-1.752	-0.116	-9.234	0.104
	Total	58	-0.711	2.015	0.265	-1.241	-0.181	-9.456	0.237
X_4 = MVE/BVTD	0	29	40.776	88.257	16.389	7.205	74.347	0.052	286.036
	1	29	21.865	73.561	13.660	-6.116	49.846	0.006	286.036
	Total	58	31.320	81.089	10.648	9.999	52.642	0.006	286.036
X_5 = Sales/TA	0	29	1.260	0.998	0.185	0.880	1.640	0.072	4.415
	1	29	1.299	1.005	0.187	0.917	1.681	0.000	3.401
	Total	58	1.279	0.993	0.130	1.018	1.541	0.000	4.415

Table 5 illustrates the ANOVA results. All models reported insignificant F statistics indicating insignificant differences between groups for variables X_1, X_2, X_3, and X_4, however X_1 indicate significant difference between groups with p-value of approximately 6%.

Table 5
ANOVA Results – Recent Dataset
Variable Means and Test of Significance

		Sum of Squares	df	Mean Square	F	Significance
X_1 = WC/TA	Between Groups	12.595	1	12.595	3.706	0.059
	Within Groups	190.333	56	3.399		
	Total	202.928	57			
X_2 = RE/TA	Between Groups	4272.341	1	4272.341	1.646	0.205
	Within Groups	145327.000	56	2595.125		
	Total	149599.400	57			
X_3 = EBIT/TA	Between Groups	2.881	1	2.881	0.706	0.404
	Within Groups	228.600	56	4.082		
	Total	231.482	57			

Table 5 ANOVA Results – Recent Dataset Variable Means and Test of Significance						
		Sum of Squares	df	Mean Square	F	Significance
X_4 = MVE/BVTD	Between Groups	5185.418	1	5185.418	0.786	0.379
	Within Groups	369613.800	56	6600.247		
	Total	374799.200	57			
X_5 = Sales/TA	Between Groups	0.022	1	0.022	0.022	0.882
	Within Groups	56.183	56	1.003		
	Total	56.205	57			

Table 6 illustrates the coefficients for the classification function for bankrupt sample group (coded 1) and non-bankrupt sample group (coded 0). The functions are used to assign or classify cases into groups. The reported coefficients are contradictory to Altman's coefficient not only in the value but also in the sign, e.g., X_3 which was positive according to Altman research study.

Table 6 Fisher's Linear Discriminant Functions		
	Bankruptcy	
	0	1
X_1 = WC/TA	0.926	-0.374
X_2 = RE/TA	-0.037	0.002
X_3 = EBIT/TA	-0.313	-0.388
X_4 = MVE/BVTD	0.004	0.003
X_5 = Sales/TA	1.557	1.647
Constant	-1.932	-2.125

As reported in table 3 Altman's original model successfully predicted 95% of the sample set. However our results indicate, as reported in Table 7, a predictability of only 69% that is 26% less than the original results reported by Altman's.

Table 7 Classification Results				
		Predicted Group Membership		
	Bankruptcy	0	1	Total
Original Count	0	25	4	29
	1	14	15	29
Percentage Count	0	86.2%	13.8%	100
	1	48.3%	51.7%	100

Table 8 represents the different prediction rates reported by both studies.

Table 8
Altman's Bankruptcy Prediction for One-Year Window

	Altman's Dataset	Our Dataset
Overall predictability	95%	69.00%
Bankruptcy prediction	94%	51.70%
Non-bankruptcy prediction	97%	86.20%

Results for Step 2: Replicating Altman's Study using recent sample set and incorporating corporate governance measure. Table 9 summarizes the descriptive statistics of the variables in the upgraded model.

Table 9
Descriptive Statistics

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
X1 = WC/TA	0	29	0.067	0.550	0.102	-0.143	0.276	-2.124	0.725
	1	29	-0.865	2.549	0.473	-1.835	0.104	-13.406	0.477
	Total	58	-0.399	1.887	0.248	-0.896	0.097	-13.406	0.725
X2 = RE/TA	0	29	-3.680	9.916	1.841	-7.452	0.092	-48.813	0.665
	1	29	-20.845	71.358	13.251	-47.988	6.298	-383.877	0.149
	Total	58	-12.263	51.230	6.727	-25.733	1.208	-383.877	0.665
X3 = EBIT/TA	0	29	-0.488	1.881	0.349	-1.204	0.227	-9.456	0.237
	1	29	-0.934	2.151	0.399	-1.752	-0.116	-9.234	0.104
	Total	58	-0.711	2.015	0.265	-1.241	-0.181	-9.456	0.237
X4 = MVE/BVTD	0	29	40.776	88.257	16.389	7.205	74.347	0.052	286.036
	1	29	21.865	73.561	13.660	-6.116	49.846	0.006	286.036
	Total	58	31.320	81.089	10.648	9.999	52.642	0.006	286.036
X_5 = Sales/TA	0	29	1.260	0.998	0.185	0.880	1.640	0.072	4.415
	1	29	1.299	1.005	0.187	0.917	1.681	0.000	3.401
	Total	58	1.279	0.993	0.130	1.018	1.541	0.000	4.415
X_6 = Corporate Governance Index	0	29	25.966	4.136	0.768	24.392	27.539	19.000	38.000
	1	29	23.552	3.841	0.713	22.091	25.013	17.000	32.000
	Total	58	24.759	4.139	0.544	23.670	25.847	17.000	38.000

The ANOVA is conducted to investigate significance of the mean differences of the ratios and the corporate governance measure between bankrupt and non-bankrupt firm groups (0=non-bankrupt firms, 1=bankrupt). The results as presented in Table 10 were not consistent with Altman's reported results as the mean differences between bankrupt and non-bankrupt firm groups are all insignificant except of the X_1 (Working Capital/Total Assets). However the Corporate

Governance Index is significant at 5% confidence level, this is consistent with the literature supporting the association between corporate governance and firm operating performance.

Table 10
ANOVA Results

		Sum of Squares	df	Mean Square	F	Sig.
X_1 = WC/TA	Between Groups	12.595	1	12.595	3.706	0.059
	Within Groups	190.333	56	3.399		
	Total	202.928	57			
X_2 = RE/TA	Between Groups	4,272.341	1	4,272.341	1.646	0.205
	Within Groups	145,327	56	2,595.125		
	Total	149,599.4	57			
X_3 = EBIT/TA	Between Groups	2.881	1	2.881	0.706	0.404
	Within Groups	228.6	56	4.082		
	Total	231.482	57			
X_4 = MVE/BVTD	Between Groups	5,185.418	1	5,185.418	0.786	0.379
	Within Groups	369,613.8	56	6,600.247		
	Total	374799.2	57			
X_5 = Sales/TA	Between Groups	0.022	1	0.022	0.022	0.882
	Within Groups	56.183	56	1.003		
	Total	56.205	57			
X_6 = Corporate Governance Index	Between Groups	84.483	1	84.483	5.303	0.025
	Within Groups	892.138	56	15.931		
	Total	976.621	57			

Table 11 illustrates the coefficients for the classification function for bankrupt sample group (coded 1) and non-bankrupt sample group (coded 0). The functions are used to classify cases into groups. The reported coefficients are contradictory to Altman's coefficient not only in the value but also in the sign, for example X_3 was positive in Altman's study.

Table 11
Fisher's Linear Discriminant Functions

	Bankruptcy	
	0	1
X_1 = WC/TA	-0.387	-1.584
X_2 = RE/TA	0.013	0.048
X_3 = EBIT/TA	-0.623	-0.673
X_4 = MVE/BVTD	0.003	0.002
X_5 = Sales/TA	2.618	2.625
X_6 = Corporate Governance Index	1.738	1.602
Constant	-25.074	-21.792

Table 12 summarizes the classification results of the new upgraded model. The overall predictability remains the same 69% however the new model shows improvement in predicting the bankrupted firm at 58.6% as compared to 51.7%.

Table 12 Classification Results				
		Predicted Group		
	Bankruptcy	0	1	Total
Original Count	0	23	6	29
	1	12	17	29
Percentage Count	0	79.3%	20.7%	100.0
	1	41.4%	58.6%	100.0

The overall classification results of original Altman's study and the replication without the governance index and the replication with the governance index are summarized in Table 13

Table 13 Predictability for One-Year Window			
	Altman's Results	Replication (without CG Index)	Replication (with CG Index)
Overall predictability	95%	69.0%	69.0%
Bankruptcy prediction	94%	51.7%	58.6%
Non bankruptcy	97%	86.2%	79.3%

CONCLUSION

Altman's bankruptcy prediction model is one of the most commonly used bankruptcy prediction model in the accounting and finance literatures. Recent research studies highlighted the fact that the results reported by Altman's bankruptcy prediction model were sample sensitive. The corporate governance literature provided evidence to the association between corporate governance measure and firms operating performance. The replication of the Altman's bankruptcy prediction model revealed inconsistent results, where Altman's selected ratios were not significantly different among bankrupt and non-bankrupt firm groups. The prediction power of the replicated model was significantly below the prediction power reported in the Altman's study. In this study, we investigate possible improvement of the predictability of the Altman's bankruptcy prediction model by incorporating a corporate governance index measure. The results reveal minimal improvement in the predictability of the Altman's bankruptcy prediction model for the bankrupt firms group while lower predictability for the non- bankrupt firms group. The overall model predictability remain unchanged. Thus, we conclude that the Altman's bankruptcy prediction model is not generalizable to non-manufacturing firms and does not stand the test of time. Also, the Corporate Governance Index measure did not contribute significantly to the predictability of the bankruptcy model even though it was significantly different between bankrupt and non-bankrupt firm groups.

REFERENCES

Altman, E. (1968) "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy," *The Journal of Finance*, September, vol. 23, no. 4, pp. 589–609.

Brown, L., and M. Caylor (2006) "Corporate Governance and Firm Valuation," *Journal of Accounting and Public Policy*, vol. 25, no. 4, pp. 409-434.

Casey, C., Jr. (1980) "The Usefulness of Accounting Ratios for Subjects' Predictions of Corporate Failure: Replications and Extensions," *The Accounting Review* vol. 18, pp. 603–613.

Dambolena, I. and S. Khoury (1980) ''Ratio Stability and Corporate Failure,'' *Journal of Finance*, vol. 35, no. 4, pp. 1017–1026.

Daily, C. and D. Dalton (1994) "Bankruptcy and Corporate Governance: The Impact of Board Composition and Structure," *Academy of Management Journal*, vol. 37, pp. 1603-1617.

Gales, L., and I. Kesner (1994) "An Analysis of Board of Director Size and Composition in Bankrupt Organizations," *Journal of Business Research*, vol. 30, no. 3, pp. 271-282.

Gilbert, L., K. Menon, and K. Schwartz (1990) "Predicting Bankruptcy for Firms in Financial Distress," *Journal of Business, Finance and Accounting*, vol. 17, no. 1, pp. 161-171.

Gombola, M., M. Haskins, J. Ketz, and D. Williams (1987) "Cash Flow in Bankruptcy Prediction," *Financial Management*, Winter, pp. 49-59.

Grice, J., and R. Ingram (2001) "Tests of the Generalizability of Altman's Bankruptcy Prediction Model," *Journal of Business Research*, vol. 54, pp. 53-61.

Khanchel, I., (2007) "Corporate Governance: Measurement and Determinant Analysis," *Managerial Auditing Journal*, vol. 22, no. 8, pp.740-760.

Klein, A. (2002) "Audit Committee, Board of Director Characteristics, and Earnings Management."*Journal of Accounting and Economics*, vol. 33, pp. 375–400.

Larcker, D., S. Richardson, and I. Tuna (2007) "Corporate Governance, Accounting Outcomes, and Organizational Performance," *The Accounting Review*, vol. 82, no. 4, pp. 963-1008.

Leach,R., and A. Newsom (2007)"Do Firms Manage their Earnings Prior to Filing for Bankruptcy?"*Academy of Accounting and Financial Studies Journal*, vol. 11, no. 3, pp. 125-141.

Libby, R. (1975a) "Accounting Ratios and the Prediction of Failure: Some Behavioral Evidence," *Journal of Accounting Research*, 13 (1), pp. 150-161.

Libby, R. (1975b) "The Use of Simulated Decision Makers in Information Evaluation," *The Accounting Review*, July, pp. 475-489.

Sun, L. 2007 "A Re-evaluation of Auditors' Opinions versus Statistical Models in Bankruptcy Prediction," *Review of Quantitative Finance & Accounting*, 28 (1), pp. 55-78.

Shumway, T. (2001) "Forecasting Bankruptcy More Accurately: A Simple Hazard Model," *Journal of Business*, vol. 74, pp. 101–124.

EQUIFINALITY IN OPEN SYSTEMS: EXPLAINING THE PHENOMENON OF HARD MONEY MORTGAGES

Richard S. Brown, Penn State University Harrisburg

ABSTRACT

This paper is an exploratory study on a recent phenomenon in the U.S. lending industry—Hard Money Mortgages. Taking a Systems Theory approach, I argue that there are different paths that lead to the same outcome which is defined as a funded commercial project. In other words, this phenomenon is an example of equifinality in an open system. However, one important finding is that this path to a funded project runs counter to what profit-maximizing economics teaches in that it is a very costly path to that outcome. As such, I argue that the entrepreneurs who utilize this mechanism are making a strategic choice in lieu of an economic choice. The exploratory study is necessary because there is no detailed work on the hard money mortgage industry to date. Data was compiled through interviews and surveys of both borrowers and lenders. Additionally, textual sources and lender websites were used in order to gather information as well as triangulate data from the surveys. From an entrepreneurship perspective, this paper adds to the literature because this sub-industry entails small sellers (lenders) and small buyers (borrowers) who interact and circumvent large institutions (i.e. depository banks) to reach collective goals.

Keywords: Equifinality, Alternative Finance, Systems Theory, Hard Money Mortgages.

BACKGROUND

Recent literature that focuses on innovation in the context of entrepreneurship has been skewed toward high-tech firms (Desyllas and Hughes 2010; Hanaki, Nakajima, and Ogura 2010; Chiesa and Frattini 2011; Tellis, Yin and Niraj 2011). Although innovation is certainly important for technology and technology-related firms, industries that are low-tech also have a need for an innovative environment. The concept of innovation is not just concerned with products but also with processes. Process innovation can be argued to be as, if not more, important than product innovation because change affects products more rapidly.

From an open systems view, innovation entails the adaptation of new paths to a final state. If the system that is being studied is an industry, then this may mean that innovation brings about a secondary or tertiary path leading to a goal. Taking the open systems view, these paths lend credence to the notion of equifinality. In a business research setting, the question that must be asked is why do industries change and evolve from past patterns? The confusion that surrounds this question is amplified if the industry in question is low-tech in nature. In a high-tech environment, for example--biotechnology--new discoveries which are found in time t must be accounted for in the innovations in times t+1 and thereafter. The residual effect of past

discoveries is quite obvious in those settings (Patel and Ward 2011). This path dependency, however, is not so apparent in more mundane and fragmented settings.

The theoretical research question that catalyzed this study is: What inefficiencies or suboptimal situations arise in low-tech industries that create the need for alternate modes, i.e. equifinality? Having that question as a basis, this paper will analyze the sub-industry of alternative financial institutions with the notion that they are the result of equifinality in an open system.

In order to attempt to answer this question, this analysis will look at one phenomenon in the financial lending industry which appeared a few decades ago and has rapidly grown into a sub-segment of asset based lending in the United States. This study is exploratory in nature and the purpose is to both define this phenomenon for the academic literature while explaining one theoretical basis that may explain its arrival.

THEORY

Ludwig von Bertalanffy has been credited with developing the most comprehensive general systems approach beginning with his seminal work Perspectives on General System Theory (von Bertalanffy 1975). Bertalanffy was interested in developing his theory around systems which are non-linear yet mathematical. As such, General Systems Theory can attempt to explain much about the behavior of entrepreneurs and their subsequent innovations since competitive space as applied to organizations is both complex and non-linear. A crucial notion in the theory is that of equifinality. This term has been defined with slight variations but can be stated to be reaching an end state through different means (Morgan 1997). Additionally, these end states can be arrived at through different initial conditions and different intervening conditions.

Business scholars have, in the past two decades, used General Systems Theory as applied to organizational and strategic choice to explain variations in conditions which have led to the same end state. Two frequent citations on this topic are Miles and Snow (1978) and Gresov and Drazin (1997). The former used a typology method to label three types of firms that have superior performance—Defenders, Analyzers and Prospectors. The latter, and more recent, paper posited three types of equifinality at the firm level—Suboptimal, Tradeoff, and Configurational. In addition to these major works, a number of scholars have used equifinality in order to explain different business phenomenon. A list of these works include:

- *Equifinality in the context of developing economies (Azhar 2008);*
- *Equifinality and strategic groups (Marlin, Ketchen, Lamont 2007);*
- *Fit and suboptimal equifinality in the medical industry (Payne 2006, Doty, Glick and Huber 1993);*
- *Equifinality in information systems sourcing (Marcolin and Ross 2005);*
- *Equifinality and work teams (Mathieu et al. 2005);*
- *Equifinality in service industries (Jennings, Rajaratnam, Lawrence 2003);*
- *Equifinality and diversity of the workforce (Richard 1999);*

- *Equifinality and strategic choice (Vazquez-Bustelo 2009)*

Furthermore, Fiss (2007) brought forth a methodological argument in that he argued that previous empirical research on Configurational Theory had focused on linear methods. Instead, Fiss uses Boolean algebra to test combinatory effects leading to outcomes which are equifinal under the assumption of non-linearity. Finally, there has been little in the Entrepreneurship literature in terms of this topic. Harms, Kraus and Schwarz (2009) study the environmental factors of new ventures in terms of Configurational Theory and conclude that equifinality, among other factors, apply to new venture creation.

Systems Theory, in general, is concerned with environmental factors which are both external to, but melded with, the subject unit of analysis. As such, the notion of open systems in the context of competitive space is important in understanding the stability of entrepreneurial ventures. Thinking of a segment of industry as an open system, new ventures are constantly being effected by other factors in the environment; for example, competitor's strategy, interest rate fluctuations, economic growth as well as other external issues that must be accounted for. Although internal factors of ventures such as management experience, role formalization and the aggregate tacit knowledge base of all employees certainly garner advantages between and among firms, small companies tend to be pulled more by these external factors than do large, mature organizations.

INDUSTRY AND SUB-INDUSTRY

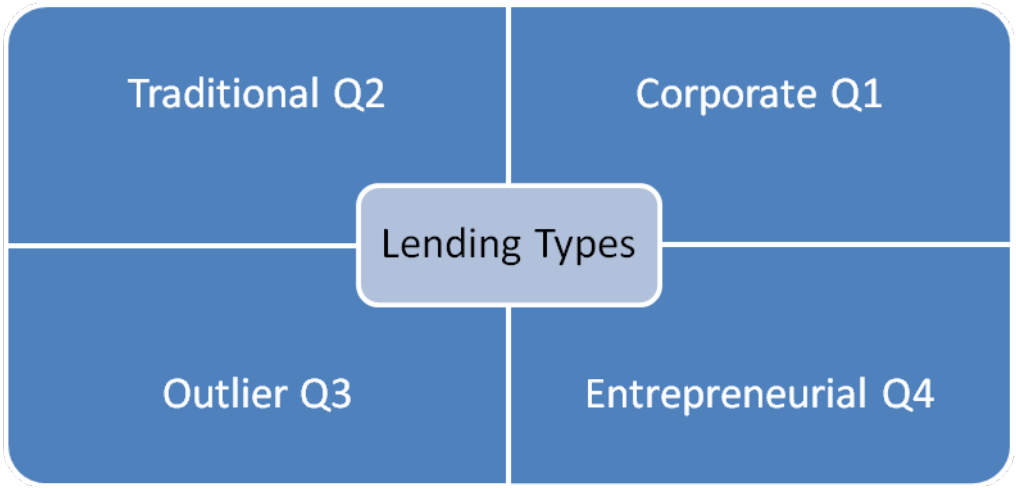
The financial industry is a broad grouping of firms that offer products including depository banking, investment banking, credit cards and the like. The U.S. government classifies most of these institutions in the two digit 60 SIC Code (Examples include 6011 Federal Reserve Banks, 6029 Commercial Banks). Under the umbrella of the financial industry, many institutions derive a large share of their revenues from commercial lending. Delving even deeper, commercial lending decomposes into secured and unsecured lending. In the former, institutions base their loans on an underlying asset most notably real property; whereas in the latter, loans have no underlying asset that is secured as collateral and is based more on the credit worthiness of borrowers.

Both secured and unsecured loans tend to be initiated by depository banks and other traditional lenders. Through consolidation and brand name recognition, the past 20 years have been categorized by large lending institutions increasing their hold on the worldwide banking/lending industry. However, there has also been an antithetical movement to this trend during the same time period. This movement deals with entrepreneurial activities in the space that was once reserved only for these larger firms. More specifically, four types of financing activities have become prevalent. They are all similar yet different from traditional lending institutions--Crowd Funding, Peer to Peer Lending, Microfinance and Hard Money Mortgages.

The uniqueness of these four paths to funding is that they are purely entrepreneurial in that both sellers and buyers are small entrepreneurs. Being a central point to this paper, this

statement needs some elaboration. If the end goal in commercial lending is a funded project, there are a few different combinatory dyads that can accomplish this task. As the Lending Matrix (Figure 1) below summarizes, these dyads include 1) Large Seller-Large Buyer, 2) Large Seller-Small Buyer, 3) Small Seller-Large Buyer and 4) Small Seller-Small Buyer:

Figure 1—Lending Matrix



As is apparent, Quadrant 1 is labeled Corporate funding because it entails both large lenders (Seller) and large borrowers (Buyer). Quadrant 2 is labeled Traditional funding and is the interaction of large lenders (Seller) and small borrowers (Buyer). An example of Quadrant 2 is a depository bank lending to a family owned business through a government sponsored loan. Quadrant 3 is labeled as an Outlier because it is extremely rare to see a small lender (Seller) and a large borrower (Buyer). The final section, Quadrant 4, is the most applicable to this study. This quadrant sees an interaction between small lenders (Seller) and small borrowers (Buyer) hence the label of Entrepreneurial.

The importance of the small lender-borrower dyad for the field of Entrepreneurship lies in understanding the motives behind both the supply side and demand side. As mentioned above, at least four types of lending can be explained by the Entrepreneurial Quadrant. This analysis focuses on hard money lending but many of the conclusions reached will apply to the other three types as well.

THE STUDY

This study is meant to be an exploratory analysis into a phenomenon that is both new and growing in the world of secured finance. As discussed previously, hard money mortgages are part of a wave of new products which compete with traditional lending. This phenomenon is important to the study of entrepreneurship and strategic competition because there are questions

as to the motivations of participants in this market space. With these thoughts as a backdrop, I conducted an informal study of insiders who participate in hard money mortgages. Participants represented both the supply side (Lenders) and the demand side (Borrowers).

There are three parts to the methodology. First, textual sourcing of information on hard money mortgages was undertaken. Both the Lexis-Nexis and Pro Source databases were searched resulting in 21 news articles concerning the phenomenon. Additionally, a search of hard money mortgage lenders was undertaken in order to find information on their lending tendencies. From this search, I compiled a database on 43 hard money lenders. Information such as origination fees, interest rates, company location, geographical lending areas and other information was compiled. Secondly, in depth interviews were performed with three executives representing lenders as well as with two borrowers. The goal of these interviews was to capture information in a qualitative manner as well as become familiar with overarching goals and motives of both parties. These interviews were completed in a semi-structured manner. Thirdly, for those participants that could not sit down for an interview because of either time or geographic constraints, electronic surveys were distributed. The survey design for the lenders were rather extensive and open ended. The survey design for borrowers was, with the exception of demographic information, based on a Likert-type scale with five intervals.

All told, in regard to lenders, three interviews and four surveys were compiled and, in regard to borrowers, two interviews and 11 surveys were completed. The interviews, surveys and textual data are not meant to be representative of any populations and, therefore, the results can be argued to be limited. However, I attempted to triangulate or corroborate the information of one source through one or both of the others. For example, in terms of hard data such as interest rates, I found convergence in the range that most of the lenders charged through all three sources. A summary of the data collection methods is as follows:

- *Five in-depth interviews*
- *15 survey responses*
- *21 textual sources (Newspaper and wire service articles)*
- *43 lender websites*

DEFINING THE PARAMETERS OF THE SUB-INDUSTRY SPACE

As a result of the analysis, the following can be said to be the parameters of the hard money mortgage industry in the United States.

Sub-Industry Features

- The industry is highly fragmented in terms of industry structure. As industries approach perfect competition, one finds many small, dislocated sellers in the marketplace (Brown 2009; Brown 2011). Although a Herfindahl-Hirschman Index (HHI) is not possible at this time because the total output of hard money mortgages is not quantifiable, there does

not seem to be any one lender that owns more than one percent of the market share. The HHI is unique in that it accounts for market share in two ways. First, it accounts for those market actors which own, in the aggregate, a large section of the space. Secondly, and because the market share value is squared, the HHI also accounts for anomalies in industries by giving additional weight to disproportionately large firms. Since firms with market shares that are less than one percent make up the hard money mortgage market and squaring such a small value produces a smaller value, the best estimate of the HHI is a value that is less than 100 on a scale from 0 (Perfect Competition) to 10,000 (Monopoly).

- There is no evidence that any firms categorized as hard money mortgage are publicly traded. Since this is the case, it was difficult to obtain financial information pertaining to gross sales, profit and the like. Additionally, no one firm stands out as the industry leader nor is there a group of firms that are predominant. Opposite this, evidence from the U.S. homebuilding industry (i.e. operative builders), which is another highly fragmented industry, shows that there is also no true dominant leader in the industry; however, there are a group of 11 firms that have significant (>1 percent) market share which can be labeled industry leaders. In the hard money mortgage industry, such a group does not exist.
- From the interviews and survey responses from lenders, the sub-industry seems to have begun in the 1980s in earnest. Although there is anecdotal evidence that other types of private loans were evident much earlier than this, these were not systematic as is the case presently.
- Knowledge of local markets is key in the minds of lenders. As opposed to traditional lending where loans are based off of a third-party appraisal, the lenders who participated in the study as well as information on many of the firms' websites noted that the lender's knowledge of what "…makes sense…" is more important than an appraisal which were viewed as being subjective. This point ties into both the Resource Based View and Knowledge Based View of the firm (Wernerfelt 1984; Barney 1991; Grant 1996) in which knowledge is a strategic asset especially knowledge that is tacit.
- Hard money mortgage firms are small as described previously. The size, as measured by employee count, in this study's sample ranged from one (proprietor only) to 27. I was unable to obtain employee count information on all of the firms in the set.
- Hard money mortgages are asset based meaning that the loans that are produced are secured by real property, almost always real estate. However, hard money mortgages are for business purposes only and are not secured by owner occupied residential properties.
- Hard money mortgages are considered commercial loans although they may secure residential property. The fact that they are commercial loans is based on the intent of the project. If the intent of the project is for commercial purposes (i.e. profit motivation), then the loan is commercial.

- Hard money mortgages, according to the sources, are used for many property types which include, single family residences (SFR), multi-family residences (MFR), industrial property, commercial property, and raw land.
- Hard money lenders have a tendency to lend in more populated areas. This could be due to the fact that it is difficult to value properties in more disperse settings because comparable sales may either not exist or not be all that comparable. Approximately 28% of the websites stated that the lender would lend in certain counties or cities in a state all of which were heavily populated areas. 20.9% of lender websites specifically forbade lending in "Rural areas" but most failed to define rural.

Competitive Factors

- The barriers to entry into the hard money mortgage business are low which is normal for highly fragmented industries (Porter 1980). In order to become such a lender, the only barriers are the obvious financial resources which are required to begin lending.
- 100 percent of lender respondents and interviewees viewed other hard money lenders as their primary competition. This was somewhat surprising in that borrower respondents stated that they also submit project funding requests to traditional banks at least sometimes 54.5% of the time.
- Competition has become stronger over the past decade as more lenders entered the market space. The barriers to entry are relatively small as discussed previously and, therefore, during the U.S. housing boom of the current decade, many more industry players were created. Additionally, since 2008, the lenders surveyed felt that competition has become greater. One lender stated that "…you would think that in a credit crunch that my phone would ring off the hook, but everyone is scared…" In other words, although credit has dissipated, he felt as though it was a demand side issue and not a supply side issue that was creating additional competitive forces.

Geographic Features

- Considering that hard money lending is an extremely fragmented industry with many small sellers, it is not surprising that firms are localized. In industries such as U.S. homebuilding, even those firms that exert the most market power are regional. Firms in the hard money mortgage industry were regional in some cases and even more localized in other. 52% of the firms in the sample lent only in the state in which they were located and 16% of lenders lent in five or less states. Only 8% (Four firms) were nationwide lenders where the company represented that they were willing to lend nationwide. Although this may be technically true, there was evidence that these firms do not actually lend in all states.

- California was the state that was most represented in the sample (28%) followed by Texas and Georgia (8% each). All told, only 19 states were represented showing that this type of lending is both fragmented and local.

Input Factor Market

- The input market for lenders is much simpler as compared to manufacturing or technology firms. Hard money mortgage lenders have either equity investment inputs, debt inputs or both. Equity inputs include private and institutional investors that generate returns in three different ways. First, investors can be paid similar to that of a publicly traded stock holder where they own a portion of the company as a whole. Secondly, investors can be paid a proportion of total profits but in a transaction-specific manner (i.e. Investor 1 invests in Transaction A only). Finally, investors can be paid a coupon return which is a set rate of return on their investment. This is similar to a bond but is considered equity to many lenders for reasons to be explained below.

It is important to understand that these private investor funds are used as equity for the hard money mortgage lender in order to lever their debt inputs. Debt inputs are normally bank lines of credit given from larger lenders to the hard money lenders. According to interviewees, typically this leverage is four to one although this can vary. Simply put, this means that for every dollar of private funds received, banks will lend the hard money lenders four additional dollars. In order to determine the lender's cost of capital, the hybrid structure of equity and debt can be calculated by $\mathbf{COC = W_1(E) + W_2(D)}$ where the Cost of Capital is equal to the weighted percentage of equity plus the weighted percentage of debt costs. The typical cost of equity funds seen in advertisements, and corroborated by interviewees, is 15% and typical lending rates, which move with the prime rate in the U.S., have averaged 7% according to interviewees. In a scenario such as this and with a four to one leverage, the cost of capital for the hard money lender equates to 8.6% (**COC= .2(15%) + .8(7%)**).

Financial Features

- The typical interest rate range charged by these lenders is between 12 and 17%.
- The typical amount of points charged by these lenders is four points. A point is defined as one percent of the total amount borrowed. This fee, however, is fixed and is non-refundable. Additionally, points are not proportional to the amount of time that borrowers. Therefore, if a borrower pays points and the loan is repaid in less time than the loan term, this is a fixed amount of cost unlike interest with varies with time.
- The typical loan to value ratio in the sample is 65%. This is the percentage of the total project cost that the lender will lend. The remaining portion must be contributed by the borrower in cash equity.
- There was a wide lending range in the sample. Whereas minimum lending criteria can be a constraint in transacting with deposit banks, maximum lending criteria was more

prevalent in hard money. Some lenders had a minimum lending amount as small as $15,000 USD while the median value was $80,000 USD. These figures are much lower than deposit banks. Four depository banks were contacted and the mean value of their minimum lending amount was $237,500 USD. In terms of maximum, many lenders advertised lending limits into the tens of millions. However, I found issues with these amounts. First, in the interviews and surveys undertaken with lenders, the highest response to maximum loan values was $2,500,000 USD. In fact, if that one respondent was eliminated, the highest amount was $500,000 USD. Secondly, although some lenders advertised limits up to $20,000,000, there was no evidence on websites that any borrower actualized this amount. On many of the larger lender websites, there were pages dedicated to "Recent Transactions" where brief information was posted. Although some of the transactions stated values as high as $9,000,000 USD, none approached the upper limits of the posted range. The lowest values for maximum lending limits for the lenders in the sample was $250,000 even though the median was $3,000,000 USD.

Borrower Features

- Borrowers tended to be male (90.9%) and between the ages of 25 and 49 (100%) although this may be due to sample selection bias. Attempts to validate this information through interviews, however, were generally confirmatory.
- The majority of borrowers (72.7%) had less than six transactions per year. Transactions were defined as total units and not total projects. For example, if a borrower were to finance a project of three properties at one site, this would count as three transactions. This is an important finding in that it shows that buyers are small entrepreneurs as posited by the Lending Matrix labeling of "Entrepreneurial Lending" in this analysis.
- The majority of borrowers (81.8%) have transaction sizes of between $75,000 and $200,000 again supporting the fact that these are small ventures.
- The most interesting finding concerns borrower motivations for using hard money lenders. This motivation runs counter to many profit-maximizing assumptions in the Economics literature. While hard money mortgages tend, on average, to have a cost that is more than double that of traditional commercial lenders, 54.5% of respondents were motivated by the speed and flexibility that hard money lenders offered over more bureaucratic banks. This can be viewed as being a strategic choice by these investors in dealing with the environment which overrides the direct financial impact that the extra cost brings with it. As one borrower stated (paraphrased), real estate investors need to be able to close on a property quickly in order to get the best price for a property. Therefore, being able to go through the acquisition stage in a timely manner to appease property sellers is a tradeoff to maximizing the profitability through lowering the cost structure of the project.

Impact of the Global Recession

- The global recession which started in the U.S. housing market has since spread like cancer throughout the financial system. There are two manners in which the hard money lending industry has been affected. First, the availability of both equity and debt funding has been reduced as banks withhold capacity in order to avoid excess opportunism (Williamson 1979). Secondly, demand for all loans has dissipated. In speaking with one lender, he stated that he thought that his product would be more in demand during this period because hard money lenders are still being somewhat aggressive relative to deposit banks. However, he followed that statement with some statistics which suggested that his annualized loan volume went from 165 loans per year in 2007 to 30 in 2009. The fact is that demand has dissipated at a greater velocity than has lending capacity. This leaves hard money lenders with a financial problem in that there are certain fixed costs which must be met before they become profitable. In addition to salaries and advertising, many lenders must pay fixed fees, or points, to their lenders to secure their lines of credit. Therefore, even if there is a reduced rate of lending, these fees must be paid. The fixed points are, in essence, capacity insurance as it guarantees that funds are available to lend if demand is suffice.
- Another factor that has not affected the hard money lenders proportionately to depository banks is that of default rates. In the surveys and interviews, lenders admit to a foreclosure rate that is less than 10%. It is difficult to get metrics for a large sample of hard money lenders to validate these numbers but, if this is the case, then this is relatively lower than deposit banks if compared to either the interest charged or the net margin on loans.

Risk Management

- Given that a range of origination points and rates can be surmised by this study as well as default rates, the following is an analysis of risk management concerning the hard money lenders relative to depository banks.

  The following figures in Table 1 are assumptions that attempt to approximate current conditions:

Table 1—Assumptions

	Depository Banks	Hard Money Lenders
Points Charged	1	5
Interest Charged	7.00%	15.00%
Cost of Capital	2.50%	8.60%
Default Rate	4.00%	8.00%
Net Loss on all Defaults	30%	30%

Given these assumptions, the equation that represents transaction risk is:

Return = [(R_p + R_i) – C_h] – L_n(D) where

R_p is the revenue generated due to points

R_i is the revenue generated due to interest

C_h is the hybrid cost of capital

L_n is the net loss defined as the amount of value not recaptured in a foreclosure by the lender

D is the default rate of a lender's total loan pool

- Calculating the equation based on the assumptions of each of the different lenders, the net returns are 4.3% for depository banks and 9.0% for hard money lenders. Since this accounts for default rates, the risk coverage can be stated to be

Risk Coverage = (1-Return)

Using this measure, risk coverage for depository banks is 95.7% and for hard money lenders it is 91.0%. This can be interpreted as, after adjusting for the rates charged, the net risk associated with hard money lenders is less than the risk associated with traditional depository banks.

Regulatory Environment

- An important distinction between hard money mortgage lenders and traditional lenders is that of the regulatory environment. Hard money mortgages are not regulated by any governmental body whereas depository banks are regulated by the states that they are chartered in as well as by the Federal Deposit Insurance Corporation (FDIC). Other traditional lenders who are not technically banks are also regulated by state banking associations. Therefore, in terms of transaction costs and legal constraints, hard money mortgages hold an advantage.

DISCUSSION AND CONCLUSION

The current gap in the literature is a serious discussion of this phenomenon. With the exception of Lapin (2006), there are no articles in the academic realm on hard money mortgages. Additionally, many of the journal articles which incorporate equifinality have concentrated on outcomes within the firm.

I have attempted to accomplish a few tasks in this analysis. First, this paper analyzes a theoretical basis for a phenomenon that has not been represented in the literature as of yet. Systems Theory, under which equifinality falls, can help to understand why environmental factors in an open system can lead to different paths to similar outcomes. In this paper, the outcome is a funded real estate project and, as I have shown, this can be done through different

methods. Secondly, this paper adds to the literature in Strategy, Entrepreneurship and Finance in that it explains and defines a sub-industry in the financial realm but has done so in a way that incorporates the competitive environment. This competitive environment is made more complex because hard money mortgages tend to be defined by lenders and borrowers that are both small entrepreneurial firms. Thirdly, this paper sets forth a template for future research in the area of alternative financial structures within the domain of the larger industry.

In terms of findings, I point to three major contributions in this study. The first of these is the fact that buyer behavior is counter to profit-maximizing behavior that economists as buyers make a strategic choice in many instances in using hard money lenders. The second contribution, which is consistent with theories in Management, is that knowledge is a key trait for hard money lenders. The knowledge of local markets may be one reason that the net risk associated with hard money seems to be lower than that of traditional lenders. The third contribution is the cluster effect of lenders in the United States. As seen in the sample, lenders are present in some areas and absent in others. The fact that many lenders only lend in their home state adds evidence to the knowledge-based advantage just discussed.

REFERENCES

Azhar, S. 2008. Strategic Orientation and Performance: The Case of Equifinality from a Developing Market Perspective. *The Business Review, Cambridge*, Summer, Vol. 10 Issue 4, pp. 120-129.

Barney, J. 1991. Firm Resources and Sustained Competitive Advantage. *Journal of Management* Volume 17 Issue 1, pp. 99-120.

Brown, R. 2009. Franchising as a Strategic Marketing Plan for Small Entrepreneurs: A Test Case of the Real Estate Brokerage Industry. *Academy of Entrepreneurship*, 15(2): 81.

Brown, R. 2011. Does Institutional Theory Explain Foreign Location Choices in Fragmented Industries? *Journal of International Business Research*, 10(1): 59.

Chiesa, V. and Frattini, F. 2011. Commercializing Technological Innovation: Learning from Failures in High Tech Markets. *The Journal of Product Innovation Management*, 28(4): 437.

Desyllas, P. and Hughes, A. 2010. Do High Technology Acquirers Become More Innovative? *Research Policy*, 39(8): 1105.

Doty, D., Glick, W. and Huber, G. 1993. Fit, Equifinality, and Organizational Effectiveness: A Test. *Academy of Management Journal*, Volume 36 Issue 6, pp. 1196-1251.

Grant, R. 1996. Toward a Knowledge-Based Theory of the Firm. *Strategic Management Journal* Volume 17, pp. 109-122.

Gresov, C. and Drazin, R. 1997. Equifinality: Functional Equivalence in Organizational Design. *Academy of Management*, Volume 22 Issue 2, pp. 403-429.

Hanaki, N., Nakajima, R. and Ogura, Y. (2010). The Dynamics of R&D Network in the IT Industry. *Research Policy*, 39(3): 386.

Harms, R., Kraus, S. and Schwarz, E. (2009). "The Suitability of the Configuration Approach in Entrepreneurship Research", Entrepreneurship and Regional Development, Volume 21 Issue 1, pg. 25.

Jennings, D., Rajaratnam, D. and Lawrence, F. (2003). "Strategy-Performance Relationships in Service Firms: A Test for Equifinality", *Journal of Managerial Issues*, Volume 15 Issue 2, pg. 208.

Lapin, G. (2006). "Hard-Money Loans: The New Generation of Real Estate Investment", *The Real Estate Finance Journal*, Spring, pp. 7-9.

Marcolin, B. and Ross, A. (2005). "Complexities in IS Sourcing: Equifinality and Relationship Management", *Database for Advances in Information Systems*, Volume 36 Issue 4, pp. 29-47.

Marlin, D, Ketchen, K. and Lamont, B. (2007) "Equifinality and the Strategic Groups-Performance Relationship", *Journal of Managerial Issues*, Summer, Vol. 19 Issue 2, pp. 208-234.

Mathieu, J. et al. (2005). "Scaling the Quality of Teammates' Mental Models: Equifinality and Normative Comparisons", *Organizational Behavior*, Volume 26 Issue 1, pp. 37-57.

Miles, R. and Snow, C. (1978). *Organizational Strategy, Structure and Process*, McGraw-Hill, New York.

Morgan, G. (1997) *Images of Organizations*, Sage Publishing, Thousand Oaks, CA.

Patel, D. and Ward, M. (2011). Using Patent Citation Patterns to Infer Innovation Market Competition. *Research Policy*, 40(6): 886.

Payne, T. (2006). "Examining Configurations and Firm Performance in a Suboptimal Equifinality Context", *Organization Science*, Volume 17 Issue 6, pp. 756-772.

Porter, M. (1980) *Competitive Strategy*, The Free Press, New York.

Richard, O. (1999). "Human Resource Diversity in Ideal Organizational Types and Firm Performance Employing the Concept of Equifinality", *The Mid-Atlantic Journal of Business*, Volume 35 Issue 1, pp. 11-25.

Tellis, G., Yin, E. and Niraj, R. (2011). How Quality Drives the Rise and Fall of High-Tech Products. *MIT Sloan Management Review*, 52(4): 14.

Vazquez,-Bustelo, D. (2009). "Approaches to Mass Customization: An Empirical Replication", International Journal of Manufacturing Technology and Management, Volume 16 Issue 3, pg. 197.

Von Bertalanffy, L. (1975) *Perspectives on General System Theory*, George Braziller, New York.

Williamson, O. (1979). "Transaction Cost Economics: The Governance of Contractual Relations", J*ournal of Law and Economics*, Volume 22, pp. 233-261.

FIRM LOCATION AND FINANCIAL REPORTING QUALITY

Michael Imhof, Wichita State University

ABSTRACT

I find that rural firms have higher quality financial reporting than urban firms. In additional tests, I document two pieces of evidence that may explain these differences. First, I find that differences in financial reporting quality between rural and city firms are greatest when rural firm analyst coverage is low. Second, rural firm stock price is less sensitive to missing the year-end consensus analyst earnings forecast. These findings suggest one reason for rural firms' higher financial reporting quality is that they have less incentive for managing earnings.

INTRODUCTION

Prior research suggestions information is more slowly disseminated to the market for rural firms than for firms in more populated areas (e.g., Loughran and Schultz, 2006; Loughran, 2008). Consequently, rural firms can be more difficult to monitor for investors (Ayers, Ramalingegowda and Yeung, 2011; John, Knyazeva and Knyazeva, 2011).1 For example, Loughran and Schultz (2005, 2006) find that rural firms have higher costs of capital and lower liquidity than urban firms. Similarly, Brockman, Francis and Pinnuck (2011) document that cost of external capital is lowest for firms headquartered in the 12 largest U.S. metropolitan areas relative to all other U.S. firms. Francis, Hasan and Waisman (2007) find that rural firms face higher costs of debt. John, Knyazeva and Knyazeva (2011) document that investors demand greater dividends for rural firms, especially for rural firms with low investment opportunities. Ayers, Ramalingegowda and Yeung (2011) find that managers are more likely to use opportunistic financial reporting when institutional investors are located far away.

Prior research also documents that rural firms have lower analyst coverage (Loughran and Schultz, 2005, 2006; John *et al.,* 2011), lower institutional investment (Loughran and Schultz, 2005, 2006; Brockman *et al.,* 2011), and provide less voluntary disclosure than urban firms (Francis *et al.*, 2007). However, existing literature offers mixed signals about the relation between firm location and financial reporting. On one hand, Urcan (2007) documents greater accrual quality and a lower likelihood of reporting small positive earnings for rural firms than for urban firms. On the other hand, Kedia and Rajgopal (2008) find that managers' incentives for financial misreporting are positively associated with the distance between the firm and the nearest SEC office which, for rural firms, is likely to be considerable. Ayers et al. (2011) report similar results with regards to firm proximity to large monitoring institutions; Managers of firms closer to institutional investors are less likely to misreport. Given these disparate findings, I investigate whether differences in financial reporting quality exist between rural and urban firms. I then examine whether factors known to impact financial reporting quality, namely analyst coverage,

institutional investment, voluntary disclosure and stock price sensitivity to earnings surprises, explain these differences.

Analyzing a comprehensive sample of rural and urban firms, from 1996 to 2009, I find that rural firms have higher financial reporting quality than urban firms. Inquiry into potential causes reveals the following: higher earnings quality of rural firms is *decreasing* in analyst coverage, indicating that lower analyst coverage partially explains why rural firms have higher earnings quality than urban firms. Alternately, higher earnings quality of rural firms is *increasing* in institutional investment, indicating that variation in earnings quality between rural and urban firms is likely not caused by differences in institutional investment. Furthermore, the variation in earnings quality between rural and urban firms does not depend on managerial earnings guidance. Finally, rural firm stock price is less sensitive to earnings surprises than urban firm stock price. Together with the results for analyst coverage, this last finding suggests a lower pressure to meet analyst earnings forecasts may be the primary reason why rural firms have higher earnings quality than urban firms. Results are robust to controls for industry and year effects, to independent measures of earnings quality, and to alternative specifications of the definitions of 'rural' and 'urban'.

My findings contribute to several streams of literature. They contribute to literature on the determinants of financial reporting quality by showing that the location of a firm's headquarters may explain cross-sectional variation in earnings quality. They also contribute to literature on the determinants of managers' incentives to manage earnings (e.g., Dechow and Skinner, 2000; Matsumoto 1999, 2000). Abarbanell and Lehavy (2003) argue that a stronger stock price reaction to earnings news may create an incentive for managers to avoid negative earnings surprises. Analyst activity may increase incentives to manage earnings as well, since analyst earnings forecasts may increase pressure to meet or beat analyst targets (e.g., Abarnell and Lehavey, 2003; Levitt, 1998; Rajgopal, Shivakumar and Simpson, 2007). Similarly, Chen *et al.*, (2011) argue that issuance of earnings guidance can lead to managerial myopia such that managers make short-term decisions in an effort to meet earnings targets at the expense of long- term performance. Finally, Matsumoto (2002) finds that transient institutional ownership may be positively associated with a propensity to just meet-or-beat earnings targets. My study provides additional evidence that differences in analyst coverage may lead to variation in earnings quality between rural and urban firms.

I also contribute to the broader literature on the geography of economics and finance. Glaeser (2009) argues that cities offer firms a number of advantages, one of which being that densely populated areas are natural conductors of information. I contribute to this literature by finding that rural firms report higher quality earnings than urban firms, and that having less incentive to manage earnings may at least partially explain this finding.

In the next section I discuss related literature and develop testable hypotheses regarding the relation between firm location and financial reporting quality and the impact of high quality financial on rural firm cost of capital and liquidity. In sections 3 and 4, I discuss my research design, test sample and present results of empirical analyses and sensitivity tests. In section 5, I conclude.

RELEVANT LITERATURE

Information and Geography

Arguing that even in the modern world information is largely immobile, prior studies suggest investors have more information about companies they are physically close to (e.g., Loughran and Schultz, 2005; Massa and Simonov, 2006; Van Nieuwerburgh and Veldkamp, 2009). Coval and Moskowitz (2001) find that mutual funds perform better on local stocks than on distant ones. This is especially true for geographically remote companies, indicating fund managers close to a firm may have greater access to value-relevant information than fund managers farther away. As Coval and Moskowitz (2001) explain:

> "*Investors located near a firm can visit the firm's operations, talk to suppliers and employees, and assess the local market conditions in which the firm operates. In addition to the lower travel, time, and research costs associated with obtaining such information, local investors may also gain access to private information*"
>
> -(Coval and Moskowitz, 2001, p. 839)

Supporting this conjecture, Ivkovic and Weisbenner (2005) analyze the brokerage accounts of 78,000 U.S. households between 1991 and 1996, and find that investors heavily favor firms located within 250 miles of their household, hold an average of 30% of their total portfolio values in domestic assets, and generate annual returns 3.2% beyond returns to non-local assets. Malloy (2005) finds that equity analysts geographically closer to the headquarters of the firms they analyze have lower forecast errors than analysts farther away. He also finds that forecasts and forecast revisions from local analysts have a larger impact on stock price than revisions by non-local analysts and that local analysts perform better on stocks in more remote areas. In an international context, Bae, Stulz & Tan (2008) find that domestic analysts make more precise estimates for domestic firms than do foreign analysts. Chan, Covrig & Ng (2005) examine the holdings of over 20,000 mutual funds across 26 countries, and find that fund managers typically perform better on domestic assets than foreign holdings.

In addition to affecting the costs of information acquisition, firm location may also impact investor recognition (Massa and Simonov, 2006; Brockman, Francis & Pinnuck, 2010). Barber and Odean (2003) find that investors prefer stocks that have recently been in the news. Similarly, Huberman (2001) finds that, in the 1990s, the customers of the Regional Bell Operating Company (RBOC) were more likely to invest in RBOC than other telecommunications companies, and attributes this finding to greater familiarity. In a similar vein, previous research suggests firms with larger advertising expenditures are more visible (Grullon, Kanatas & Weston, 2004). Additionally, cities provide natural conduits of exposure because of greater media presence, closer proximity to banks and more analyst activity (Glaeser, 2009; Coval and Moskowitz, 2001). Thus, they are likely to facilitate the flow of firm information, making firms headquartered in urban areas more visible to investors than firms headquartered in rural areas.

In sum, prior studies on firm location suggest information is more easily attainable and thus investors' monitoring costs are significantly lower for firms headquartered in or near highly populated areas (e.g., Van Nieuwerburgh & Veldkamp, 2009; Coval & Moskowitz, 2001).

Financial Reporting and Firm Transparency

Transparency depends both on the transmission of information through indirect channels and on information provided in a firm's financial reports (Bushman, Piotroski & Smith, 2004). Transparency in general may be associated with better governance (Wang, 2007). For instance, Dyck and Zingales (2004) find that firms with richer information environments have lower private benefits of control. Similarly, transparency may lead to lower information asymmetries between informed and uninformed investors, decreasing adverse selection risk (Easley and O'Hara, 2004). In line with this argument, Jin and Myers (2006) and Hutton, Marcus and Tehranian (2009) find that the likelihood of a stock price crash is lower in transparent firms. Holthausen and Watts (2001) argue and provide evidence that litigation risk is negatively related to firm transparency, while Charitou, Lambertides and Trigeorgis (2007) document a negative relation between firm transparency and the probability of bankruptcy. There may also be real benefits to transparency. Biddle and Hilary (2006) and Biddle *et al.*, (2009) find that managers in firms with greater financial reporting quality make more efficient investments.

Competing arguments exist regarding the relation between firm location and financial reporting quality. One possibility is that higher costs of investor information acquisition and lower overall visibility (Van Neiwerburg & Veldkamp, 2009; Huberman, 2001) increase the rewards to rural firm managers of managing earnings. This may especially be the case if it allows firm resources to be diverted more easily (Dyck & Zingales, 2004). Alternatively, rural firm managers may not wish to expend the necessary resources to ensure financial statement quality if they think it will matter little in reducing external capital costs (Brown *et al.*, 2008). For example, prior research finds that rural firms have higher levels of debt than urban firms (e.g. Francis, Hasan & Waisman, 2007). A greater dependency on debt may reduce the benefits of firm transparency, especially if the debt is procured through bank loans. This is possible because banks are efficient procurers of firm information and may achieve private information advantages because of the close relationships they develop with borrowers (Diamond, 1984; Myers & Majluf, 1984; Houston & James, 1996). Firms highly capitalized through debt may have less need to be transparent.

There may also be a resource reason for rural firms to have lower quality financial reporting. Urban firms may have access to a larger, more highly-skilled workforce (Glaeser, 2009; Florida, Gulden & Mellander, 2008). Research in auditing finds that larger audit offices provide better quality auditing services (Francis & Yu, 2009). Since the largest auditing offices are likely located in or near major economic areas, rural firms may also be at a disadvantage in hiring the best auditors.

It is equally plausible that rural firms have higher financial reporting quality than urban firms. Lower analyst coverage and less institutional investment may be associated with higher earnings quality, since analyst coverage and institutional investment can create pressures for managers to meet earnings benchmarks (Matsumoto, 1999; 2002). If rural firms have fewer outlets for information flow, financial reporting may be the paramount way in which managers communicate with investors. There may also be cultural/reputational reasons for rural managers to provide higher quality financial reports (Francis, Nanda & Olsson, 2008; Hope, 2003). Research suggests regional social norms, organizational attributes, and economic ideology can affect how

managers perform their jobs (e.g., Ralston *et al.*, 2008). Interactions with the local community and local investors may influence rural firm managers to the effect of increasing financial reporting quality.

Prior research fails to consider how the location of a firm's headquarters might impact its financial reporting quality. To shed light on the location-financial reporting quality relation, I investigate, in the context of the rural/urban dichotomy (see Coval & Moskowitz, 1999; Loughran & Schultz, 2005, 2006), whether firm location is associated with cross-sectional variation in financial reporting quality. I then investigate possible avenues through which such differences may arise.

RESEARCH DESIGN AND SAMPLE SELECTION

Defining Rural Firms

Following prior literature (e.g., Coval & Moskowitz, 1999; Ivkovic & Weisbenner, 2003; Loughran & Schultz, 2005, 2006), rural firms are defined as those firms headquartered 100 or more miles from any of the major U.S. Core Based Statistical Areas (CBSAs) with a 2010 U.S. Census population of 1,000,000 or more persons.2 Figure 2 in the Appendix lists the 52 U.S. CBSAs with 2010 populations in excess of 1,000,000 persons.

To capture rural location I measure the linear distance between a firm's headquarters and the center of each of the 52 major CBSAs with a population of 1,000,000 or more persons. To do this, I first obtain from Compustat the historical *Company* file which includes both the historical addresses and either firm zip-codes or the Federal Information Processing Standard (FIPS) codes for firms' headquarters.3 Using the historical *Company* file is necessary because the most recent Compustat *Company* file only provides the current location of a firm's headquarters, and then backdates this information to all previous years. For example, in 2008 AT&T moved its headquarters from San Antonio, Texas to Dallas, Texas (MSNBC, 2008). In Compustat, data taken from the 2008 *Company* file would only report AT&T's most recent location (Dallas, Texas) and this location would be backdated to all previous years as the firm's city of quarter, even though the company had been headquartered in San Antonio prior to 2008. Though not tabulated, I document that roughly 7% of firms listed in my final sample change the location of their headquarters every year. This is similar to numbers reported by Holloway and Wheeler (1991) who document that from 1980 to 1987, an average of 5.6% of U.S. public companies changed the location of their headquarters every year. Strauss-Kahn and Vives (2006) report a similar percentage for U.S. companies from 1996 to 2001. By using the historical *Company* file, I am able to calculate the distance between a firm and the nearest major city with minimal error.

For each of the 52 CBSAs listed in Figure 2, I attempt to capture the central-most zip- code by locating, via a Google® search, the headquarters of city hall of the primary city constituting each CBSA.4 After recording historical zip-codes for both firm and CBSA, I then obtain the longitude and latitude for each U.S. zip-code from Zipinfo.com, a provider of zip code information, and calculate the linear distance between each firm and city hall of the primary city constituting the CBSA. Figure 2 in the Appendix provides the formula for calculating linear distance. I construct a dummy variable *RURAL* equal to 1 if a firm is more than 100 miles from city hall, 0

otherwise. This approach is similar to Loughran and Schultz (2006) who consider firms 100 or more miles from the center of any U.S. city with a population over 1 million to be 'rural.' All firms located within 30 miles of the largest 15 metropolitan areas listed in Figure 2, I classify as 'urban.' As in prior studies (e.g., Loughran & Schultz, 2005, 2006; Clark, Francis and Hasan, 2009) I delete all firms headquartered between 31 and 99 miles from the center of the 52 largest CBSAs from my sample. This is done to reduce noise in the definitions of 'rural' and 'urban.'

Main Empirical Model

To test the relation between firm location and financial reporting quality, I use proxies for earnings quality (*EQ*) to capture a firm's overall financial reporting quality and model *EQ* as a function of rural location (*RURAL*) and controls, as suggested by prior research (equation 1 below). Expectations of the direction of each independent variable with earnings quality are provided under each variable in equation (1). As stated above, I expect the coefficient on *RURAL* to be statistically insignificant (null hypothesis).

$$EQ_{it} = \alpha_{it} + \underset{(+/-)}{\beta_1 RURAL_{it}} + \underset{(+)}{\beta_2 ACCRUALS_{it}} + \underset{(+)}{\beta_3 SIZE_{it}} + \underset{(-)}{\beta_4 LEVERAGE_{it}} + \underset{(+/-)}{\beta_5 MTB_{it}}$$
$$+ \underset{(+/-)}{\beta_6 SALES_{it}} + \underset{(+)}{\beta_7 DIVIDEND_{it}} + \underset{(-)}{\beta_8 VAR\_CFO_{it}} + \underset{(+)}{\beta_9 ROA_{it}} + \underset{(-)}{\beta_{10} LOSS_{it}} +$$
$$+ \underset{(-)}{\beta_{11} OPCYCLE_{it}} + \underset{(+/-)}{\beta_{12} ANALYSTS_{it}} + \underset{(+)}{\beta_{13} HOLDINGS_{it}} + \underset{(+)}{\beta_{14} BIG4_{it}} +$$
$$+ \underset{(+/-)}{\beta_{15} NASDAQ_{it}} + \underset{(+/-)}{\beta_{16} AMEX_{it}} + YEAR_t + INDUSTRY_{it} + \varepsilon_{it} \quad (1)$$

*For variable definitions refer to Table 1.

Measuring Earnings Quality

To capture earnings quality I estimate accrual quality, earnings persistence and earnings smoothness and use the principal component of these three measures as a proxy for earnings quality. Following Hutton, Marcus and Tehranian (2009) and Francis *et al.*, (2004), accrual quality (*ACCQ*) is estimated using Dechow and Dichev's (2002) method for measuring the standard deviation of abnormal accruals. Specifically, I estimate the following firm-specific model (equation 2) over 8-year rolling windows, where total accruals are a function of past, present, and future cash flows from operations. Francis *et al.* (2004) use 10-year rolling regressions to estimate firm-specific measures of my earnings quality metrics. Because this is a data-intensive restriction, I reduce this requirement to 8 years to gain more observations in my final sample. In unreported tests, I also use 5-year rolling windows; while some relations are weaker in statistical significance, results remain qualitatively unchanged.

$$ACCRUALSit = \alpha it + \beta 1CFOit\text{-}1 + \beta 2CFOit + \beta 3CFOit\text{+}1 + \varepsilon it \quad (2)$$

Where:

ACCRUALSit = Total accruals for firm *i* in year *t*, calculated as the change in working capital from *t-1* to *t* (see Dechow and Dichev, 2002)

CFOit+n = Cash flows from operations, scaled by beginning period total assets, for firm *i* in year *t+n*.

Accruals match the timing of accounting recognition of revenue with the economic benefits of revenue. However, as Dechow and Dichev (2002) argue, accruals are based on "assumptions and estimates that, if wrong, must be corrected in future accruals and earnings." As a result, estimation errors in accruals may lead to a lower correlation between accruals and cash flows. Equation (2) measures how well accruals map into cash flows. As such, the standard deviation of the residual from equation (2) has been widely used in the extant literature as a proxy for earnings quality, with higher (lower) levels indicating lower (higher) quality (Dechow, Ge and Schrand, 2010).

My second proxy for earnings quality is earnings persistence (*PERSISTENCE*). Persistent earnings are considered desirable because of the assumption that greater persistence makes for better inputs into equity valuation models and improves overall decision usefulness (Schipper & Vincent, 2003; Dechow, Ge and Schrand, 2010). Prior research documents stronger stock price response to news for firms with high earnings persistence (e.g. Komendi & Lipe, 1987; Collins and Kothari, 1989). Bradshaw, Richardson and Sloan (2001) and Bhojraj and Swaminathan (2007) also provide evidence of increased analyst performance and lower bond mispricing for firms with high earnings persistence. Li (2008) equates higher earnings persistence to financial statement clarity. Verrecchia (2001), Waymire (1985) and Tucker (2010) suggest firms with greater earnings persistence are more likely to provide earnings guidance.

Lev (1983) and Ali and Zarowin (1992) propose that the extent to which past earnings explain current earnings is a good approximation of earnings persistence. Regressing current period earnings on one-year lagged earnings, they measure persistence as the coefficient on lagged earnings, where higher persistence indicates higher earnings quality. Therefore, I estimate equation (3) over 8-year rolling windows, saving $\beta 1$ as a firm-specific measure of earnings persistence.

$$EARNINGSit = \alpha it + \beta 1EARNINGSit\text{-}1 + \varepsilon it \quad (3)$$

Where:

EARNINGSit,t-1 = Income before extraordinary items, scaled by beginning period total assets, for firm *i* in year *t, t-1*.

My third measure of earnings quality is the extent to which firms smooth reported earnings via accruals. Earnings smoothing mitigates problems associated with the mismatch of cash receipts

with payments (Tucker & Zarowin, 2006; Dechow, Ge and Schrand, 2010). However, smoothing that is in excess of the natural accruals process may constitute earnings management and thus lead to lower financial reporting quality (Dechow & Skinner, 2000). Following Francis *et al.,* (2004) and Francis *et al.*, (2008), I define earnings smoothing as the ratio of the standard deviation of income before extraordinary items scaled by beginning period total assets to the standard deviation of cash flows from operations scaled by beginning period total assets. I calculate standard deviations of both income before extraordinary items and cash flows from operations over the prior 5 years, including the current fiscal year. Because larger values denote greater smoothing, and hence lower earnings quality, I multiply this measure by negative one, such that *SMOOTHNESSit* = [σ(*NIBEit*)/σ(*CFOit*)] * (-1), and higher (lower) levels represent higher (lower) earnings quality.

As mentioned above I reduce the dimensionality of accrual quality, earnings persistence and earnings smoothness into a single principal component using common factor analysis. This approach allows me to utilize the common variance between these different measures of earnings quality (see Joliffe, 2002). The first factor extracted explains 88% of the variation in the group of proxies, and is the only factor with an eigen-value greater than 1. I retain this factor for use in my empirical models.

Control Variables

Control variables for equation (1) include total accruals (*ACCRUALS*) to account for the overall affect of accrual accounting on earnings quality. I also control for firm size. While evidence is mixed as to whether larger firms, on average, are more or less likely to engage in earnings management (Dechow *et al.*, 2010), I predict a positive relation with *EQ*, since larger firms are more visible and likely have more to lose for poor quality financial reporting. To control for firm size I include the natural log of total assets, (*SIZE*). Several studies provide evidence that managers, in an effort to avoid debt covenant violations, will be more likely to adopt income increasing accounting methods (e.g., Bowen, Noren, & Lacy, 1981; Zmijewski & Hagerman, 1981; Johnson & Ramanan 1988; Balsam, Haw, & Lilien, 1995; Kinney & McDaniel, 1989; Dichev & Skinner, 2002). Therefore, firm debt may be negatively associated with earnings quality. As such, I capture the potential effects of debt financing on earnings quality by including a control for firm leverage, (*LEVERAGE*). I also include a control for dividend expenditures (*DIVIDEND*), as prior literature suggests dividend payout may be associated with better governance (Brav *et al.,* 2005; John & Knyazeva, 2006).

Firm growth may also affect earnings quality. The argument here is that high growth firms likely have unsustainable earnings (Nissim & Penman, 2000). Furthermore, growth may be associated with greater management error and hence more earnings management (Richardson *et al.,* 2005). To control for firm growth I include controls for both the ratio of a firm's market value of equity to book value of equity (*MTB*), to capture a firm's future investment prospects, and 2-year average (*SALES*) to total assets to capture the extent to which the firm has responded to investment opportunities in the past. I expect both to be negatively related to earnings quality. Keating and Zimmerman (1999) and DeFond and Park (1997) suggest firm performance can also lead to variation in earnings quality. Therefore, I control for firm performance by including net income to total assets (*ROA*) and a dummy variable *LOSS*, equal to 1 if the firm reports a loss in

the prior year, 0 otherwise. I also control for the variance in operating cash flows (*VAR_CFO*) over the prior 5 years and the length of operating cycle (*OPCYCLE*), to capture additional operating risk (Biddle, Hilary & Verdi, 2009).

Prior studies suggest lower analyst coverage is one of the primary reasons rural firms have less information flow (e.g., Loughran & Schultz, 2005). Therefore I control for the number of analysts issuing at least one quarterly earnings forecast per year, (*ANALYSTS*). Governance may also impact financial reporting quality (e.g., Krishnan & Visvanathan, 2005; Garcia-Lara *et al.*, 2009). Therefore I include the ratio of the total number of shares owned by institutional investors to total shares outstanding, (*HOLDINGS*) to capture governance. I predict a positive relation between *HOLDINGS* and *EQ*. Finally, Francis and Yu (2009) find that clients of Big 'N' auditors are significantly less likely to manage earnings. To control for auditor quality I include a dummy variable *BIG4*, equal to 1 if a firm is audited by a Big 'N' audit firm, 0 otherwise and predict a positive relation between *BIG4* and *EQ*.

In addition to the above control variables I also include a dummy variable *NASDAQ* equal to 1 if a firm is listed on the Nasdaq stock exchange, 0 otherwise, and a dummy variable *AMEX* equal to 1 if a firm is listed on the American Stock Exchange, 0 otherwise. I include these controls because the average firm listed on the Nasdaq and/or AMEX is likely to have different attributes than the average firm listed on the New York Stock Exchange (NYSE) (Loughran & Schultz, 2005; Loughran, 2007). Table 1 provides the basic definitions, calculations, and data sources for all variables used in my empirical models.

Table 1
Variable descriptions

Variable	Definition	Caculation (if applicable)	Data Source
ACCQ	Standard deviation of abnormal accruals	Dechow and Dichev (2002); see text	Compustat
PERSISTENCE	Measure of earnings persistence	see text	Compustat
SMOOTHNESS	Measure of earnings smoothing	see text	Compustat
EQ	Principal component of σAcc, Persistence and Smoothness	see text	--
ANALYSTS	Number of analysts issuing earnings forecasts by year	see text	I/B/E/S
HOLDINGS	Percentage of outstanding shares held by institutional investors	see text	Thomson
LN_GUIDANCE	Measure of managerial earnings guidance	see text	FirstCall
RURAL	Dummy variable, 1 if firm has "rural" headquarters	see text	ZipInfo.com; Compustat
ACCRUALS	Total change in working capital	-(RECCH+INVCH+APALCH+TXACH+AOLOCH)	Compustat
BETA	Fama-French three-factor model coefficient on the market premium	see text	Compustat; CRSP
SIZE	Natural log of total assets	log (AT)	Compustat
ZSCORE	Measure of bankruptcy potential	(3.3*PI)+SALE+(.25*RE)+(.5*((ACT-LCT)/AT))	Compustat
LEVERAGE	Ratio of debt to total equity	(DLTT+DLC)/((PRCC*F*CSHO)+DLTT+DLC)	Compustat
DIVIDEND	Payout: dividend expenses to total assets	(DVC+DVP)/AT	Compustat
OPCYCLE	Natural log of daily operating cycle	log(((RECT/SALE)+(INVT/COGS))*360)	Compustat

Table 1
Variable descriptions

Variable	Definition	Caculation (if applicable)	Data Source
SALES	Average sales to total assets in year *t* and *t-1*	(SALE/AT + SALEt-1/ATt-1)/2	Compustat
CFO	Operating cash flows	OANCF/AT	Compustat
VAR_CFO	Volatility of operating cash flows	see text	Compustat
MTB	Ratio of market value of equity to book value of equity	(PRCC_F*CSHO)/CEQ	Compustat
ROA	Return on assets	OIADP/AT	Compustat
LOSS	Dummy variable , 1 if firm reported loss in prior year	see text	Compustat
BIG4	Dummy variable, 1 if audited by Big 'N' auditor	see text	Compustat
NASDAQ	Dummy variable, 1 if firm is listed on the Nasdaq Stock Exchange	see text	CRSP
AMEX	Dummy variable, 1 if firm is listed on the American Stock Exchange	see text	CRSP

Measuring Managerial Earnings Guidance

Similar to Dhaliwal, Khurana and Pereira (2010), to capture managerial earnings guidance I consider both the frequency and precision of quarterly management earnings forecasts over a firm's prior 3 years. Using the Thomson First Call 'Company Issued Guidelines' (CIG) file, I create 1) a measure of forecast frequency (*FREQUENCY*) which is the number of quarterly management earnings issued in the previous 12 quarters, and 2) a measure of precision (*PRECISION*), which involves scoring management earnings forecasts based on their format. I assign forecasts that are qualitative a score of 1, forecasts that are a range of values a score of 2, and forecasts that are point estimates a score of 3. My final earnings guidance measure is calculated as the product of both components: *GUIDANCE = FREQUENCY*PRECISION*. *GUIDANCE* is right skewed, mean 9.82 (median 2.00). Therefore I use the natural log of 1 + *GUIDANCE* (*LN_GUIDANCE*) in my empirical models. Descriptive statistics of both *GUIDANCE* and *LN_GUIDANCE* are provided in Table 1.

Sample

Table 2 details my sample breakdown. I begin with all firms available in the intersection of the Compustat Xpressfeed, CRSP, I/B/E/S, and Thomson First Call databases for the years 1996 to 2009 and then delete firms in the utilities (SIC 4900-4999) and financial services industries (SIC 6000-6999), firms not headquartered in the U.S., and firms with stock prices below $5. Loughran and Schultz (2005, 2006) delete firms with stock prices below $5 as these firms are less likely to be covered by analysts and institutional investors, making them less liquid, and likely to have higher costs of capital (Lee, Mucklow & Ready, 1993). I delete utility and financial firms because these firms are subject to regulations which may cause them to have characteristics that are significantly different than firms in other industries. As in prior research (e.g., Loughran & Schultz, 2005), to facilitate the comparison of rural firms and urban firms, I remove all firms headquartered

between 31 and 99 miles from any of the 52 CSBAs listed in Figure 1 in the Appendix. These deductions provide an initial sample of 46,410 firm-year observations covering 13,505 firms.

Table 2
Sample breakdown, 1996-2009

	Obs.	Firms
Rural and urban firms with Compustat/CRSP/Thomson merged data, less utilities, financial firms, non-U.S. firms and firms with stock price less than $5	46,410	13,505
Less lost data due to calculation of earnings quality measures (8-yr. rolling regressions)	(27,367)	(8,403)
Full sample for earnings quality tests	18,865	6,102
Less firms without I/B/E/S and FirstCall coverage (for analyst coverage and earnings guidance calculations)	(7,407)	(2,298)
Sub-sample for tests with earnings guidance	11,458	3,804

Because I require that firms have at least 8 consecutive years of observations to compute my earnings quality metrics, the sample is further reduced to 18,865 firm-year observations covering 6,102 firms. While this restriction is likely to introduce survivorship bias into my sample, it allows me to estimate firm-specific earnings quality measures, resulting in a better proxy for financial reporting quality (Francis *et al.*, 2004). First Call data on managerial earnings guidance is sporadic prior to 1996. Therefore, when earnings guidance is used as a partitioning variable, the sample is reduced to 11,458 firm-year observations covering 3,804 firms.

RESULTS

Univariate Results

Table 3 provides descriptive statistics for all variables used in my analyses. In examining the earnings quality metrics in panel A, I refer to Francis *et al.*, (2004). They report mean accrual quality as .026, mean persistence as .482, and mean smoothness as .640. My sample statistics are similar, as mean *ACCQ* is -.031, mean *PERSISTENCE* is .385, and mean *SMOOTHNESS* is -.660.5 Referring to Table 3, panel B, for the largest sample, nearly 60% of firms sampled are covered by at least one equity analyst by year, with an average coverage of 3 analysts. For the implied cost of equity sample, this number increases to 8.4. Furthermore, institutional investors hold nearly 66% of the outstanding shares for firms in the full sample. Loughran and Schultz (2005) document institutional ownership closer to 50% for their sample of firms. However, in an earlier study, O'Brien and Bhushan (1990) report average institutional investment of 70% for a larger sample of firms covered by Compustat. These numbers are comparable to prior studies (e.g. Doyle, Lundholm & Soliman, 2006; Francis, Nanda & Olsson, 2008).

Table 3
Full sample descriptive statistics, 1996-2009

	N	Mean	Median	S.D.	Q1	Q3
Panel A: Earnings Quality						
ACCQ	18,865	-0.0309	-0.0244	0.0233	-0.0405	-0.0148
PERSISTENCE	18,865	0.3847	0.3675	0.5195	-0.1183	0.5635
SMOOTHNESS	18,865	-0.6600	-0.7136	0.9482	-0.4413	1.1383
EQ	18,865	0.0201	0.0929	0.9401	-0.4173	0.5965
Panel B: Firm Characteristics						
ANALYSTS %	18,865	0.5852	1.0000	1.5657	0.0000	1.0000
ANALYSTS # (includes firms with no coverage)	18,865	3.0100	1.0000	4.6087	0.0000	4.0000
ANALYSTS # (firms with coverage only)	11,458	8.3869	6.0000	7.0302	3.0000	12.0000
HOLDINGS	18,865	0.6585	0.6795	0.3358	0.3954	0.9087
GUIDANCE (earnings guidance)	11,458	12.4352	2.0000	26.9187	0.0000	15.0000
LN_GUIDANCE (log 1+ GUIDANCE)	11,458	1.4233	1.0986	1.6452	0.0000	2.7726
Panel C: Control Variables						
RURAL	18,865	0.1201	0.0000	0.3251	0.0000	0.0000
ACCRUALS	18,865	0.0383	0.0141	0.2765	-0.0119	0.0602
BETA	18,865	0.9949	0.9359	1.3884	0.2110	1.7214
SIZE (log Assets)	18,865	6.0483	6.0456	1.4321	5.0114	7.0741
ASSET ($mil)	18,865	1090.28	422.25	1860.49	150.11	1180.94
ZSCORE	18,865	3.0438	3.3995	4.3759	2.1277	4.7124
LEVERAGE	18,865	0.1831	0.1249	0.1954	0.0116	0.2860
MTB	18,865	3.3474	2.0535	12.1436	1.3361	3.2752
SALES	18,865	1.3360	1.0891	3.2427	0.5192	1.7015
DIVIDEND	18,865	0.0115	0.0000	0.0346	0.0000	0.0137
OPCYCLE	18,865	4.7202	4.7908	0.6980	4.3605	5.1548
CFO	18,865	0.1059	0.1059	0.1285	0.0527	0.1640
VAR_CFO	18,865	0.0644	0.0494	0.0555	0.0297	0.0799
ROA	18,865	0.0361	0.0501	0.1198	0.0155	0.0857
LOSS	18,865	0.1729	0.0000	0.3782	0.0000	0.0000
BIG4	18,865	0.8962	1.0000	0.3050	1.0000	1.0000
NASDAQ	18,865	0.4534	0.0000	0.4978	0.0000	1.0000
AMEX	18,865	0.0817	0.0000	0.2740	0.0000	0.0000

See Table 1 for variable descriptions. ***, **, * denote statistical significance at the .01, .05, .10 levels respectively

Referring to Table 3, panel C, 12% of the firms in my largest sample can be considered 'rural'. Roughly 45% of firms are listed on the Nasdaq, while 8% of firms are listed on the American stock exchange. These results are close to percentages reported by Francis, Hasan and Waisman (2007) and Loughran (2007). Furthermore, the average firm in the liquidity sample has total assets of $1.09 billion, a market-to-book ratio of 3.4, and 18% debt to total assets (leverage). As a percentage of total assets, firms also pay roughly 1.1% in dividends. Cash flows from operations average about 11% of total assets and the standard deviation of cash flows is .064. Average operating cycle is 4.72 days, average ROA is 3.6% of total assets firms in my largest sample report a loss 17% of the time. Again, these numbers, where comparable, are similar to prior research (e.g., Francis *et al.*, 2004; Francis *et al.*, 2007; Clark, Francis & Hasan, 2009).

Table 4
Key subsample descriptive statistics, rural versus urban firms, 1996-2009

	Rural				Urban				Difference in Mean ANOVA Analysis
	N	Mean	Median	S.D.	N	Mean	Median	S.D.	
Panel A: Earnings quality									
ACCQ	2,492	-0.0279	-0.0235	0.0210	13,426	-0.0314	-0.0246	0.0239	0.0035**
PERSISTENCE	2,492	0.4305	0.3876	0.5348	13,426	0.2749	0.2630	0.5148	0.0555***
SMOOTHNESS	2,492	-0.6067	-0.6536	0.6709	13,426	-0.7698	-0.7775	1.0083	0.1632***
EQ	2,492	0.1316	0.2750	0.7954	13,426	-0.0617	0.1715	0.9720	0.1933***
Panel B: Transparency characteristics									
ANALYSTS %	2,492	0.5518	1.0000	0.4989	16,373	0.6158	1.0000	0.4911	-0.0640***
ANALYSTS # (includes firms with no coverage)	2,492	2.2625	1.0000	3.7519	16,373	3.1348	1.0000	4.7252	-0.8723***
ANALYSTS # (firms with coverage only)	1,375	6.6502	5.0000	5.6170	10,083	9.0991	7.0000	7.6979	-2.4489***
HOLDINGS	2,492	0.5833	0.5703	0.3173	16,373	0.6791	0.7059	0.3378	-0.0958***
GUIDANCE (earnings guidance)	1,375	10.3312	1.0000	21.7327	10,083	13.0725	2.0000	28.0403	-2.7413***
LN_GUIDANCE (log 1+GUIDANCE)	1,375	1.3494	0.6931	1.6012	10,083	1.4435	1.0986	1.6565	-0.0942***

See Table 1 for variable descriptions. ***, **, * denote statistical significance at the .01, .05, .10 levels respectively

Table 4 reports descriptive statistics for selected variables, split into subsamples of rural versus city firms. Rural firms appear to have significantly greater earnings quality than city firms. For instance, rural firms have average standard deviation of discretionary accruals (*ACCQ*) of (-.0279), significantly smaller than the average standard deviation of discretionary accruals for city firms (-.0314). Similarly, rural firms have greater earnings persistence (*PERSISTENCE*) (.431 versus .275) and less earnings smoothing (*SMOOTHNESS*) (-.607 versus -.769).6 The principal component for these metrics (*EQ)* is also significantly higher for rural firms (.1316 versus -.0617).

With regards to information characteristics (panel B), roughly 55% of rural firms are covered by at least one analyst, while over 61% of urban firms are covered by at least one analyst per year. Likewise, rural firms are covered by an average of 2.26 analysts per year, while city firms are covered by an average of 3.13 analysts per year. In the analyst coverage subsample, the difference in analyst coverage is 6.65 for rural versus 9.09 for urban firms. Furthermore, institutional investors hold almost 10% more of the average city firm than the average rural firm (68% versus 58%). Rural firms also provide significantly less disclosure through managerial earnings guidance than city firms, (10.33 versus 13.07). These differences, where comparable, are similar to prior research (e.g., Loughran & Schultz, 2005, 2006; Francis, Hasan & Waisman, 2007; John *et al.*, 2011).

Table 5
Pearson correlations of selected variables, 1996-2009

	1.	2.	3.	4.	5.	6.	7.	8.
1. RURAL	1							
2. ACCQ	0.0439	1						
	<.0001							
3. PERSISTENCE	0.0360	-0.0125	1					
	<.0001	0.1654						
4. SMOOTHNESS	0.0707	0.0489	0.0267	1				
	<.0001	<.0001	0.0032					
5. EQ	0.0845	0.7278	0.2653	0.6705	1			
	<.0001	<.0001	<.0001	<.0001				
6. ANALYSTS	-0.1034	-0.0719	- 0.0021	0.0111	-0.0568	1		
	<.0001	<.0001	0.8156	0.2204	<.0001			
7. HOLDINGS	-0.1173	-0.0340	0.0251	-0.0019	0.0162	0.4447	1	
	<.0001	0.0002	0.0055	0.8355	0.0736	<.0001		
8. LN_GUIDANCE	-0.0235	-0.0658	0.0363	0.0010	-0.0361	0.2790	0.3887	1
	0.0092	<.0001	<.0001	0.914	<.0001	<.0001	<.0001	

See Table 1 for variable descriptions. p-values for tests of significance are listed under correlations

Pearson correlations for key variables are provided in Table 5. *RURAL* is positively and significantly correlated with *ACCQ*, *PERSISTENCE*, *SMOOTHNESS* and *EQ*. In untabulated tests, I perform collinearity diagnostics and find that no independent variable has a variance inflation factor greater than 2.5, indicating equation (1) is likely not prone to multi-collinearity problems. In sum, descriptives statistics and correlations suggest rural firms have higher financial reporting quality than urban firms, measured in terms of three proxies for earnings quality, accrual quality, earnings persistence and earnings smoothness. They also confirm the findings of prior research that rural firms are covered by fewer analysts, have lower institutional holdings and provide less voluntary disclosure (Loughran & Schultz, 2006; Francis, Hasan & Waisman, 2007).

Multivariate results

Table 6 reports the results of estimating equation (1). Columns I, II and III represent equation (1) specified with different industry controls. For example, column I contains no industry controls, column II includes specific industry indicator variables for *manufacturing* (SIC 20-39), *mining* (SIC 10-14), *retail* (SIC 52-59), *services* (SIC 70-89) and *transportation* (SIC 40-49) and column III includes industry fixed-effects. Turning to the results, as the descriptive statistics and correlations suggest, rural firms appear to have significantly greater earnings quality. In all columns the coefficient on *RURAL* is positive and statistically significant (.1945, t- stat 10.81; .2012, t-stat 11.04; .2108, t-stat 11.09). These coefficients indicate roughly 20% higher average *EQ* for rural firms than for urban firms.

Table 6
Earnings quality and rural location, 1996-2009

Dependent Variable = EQ	+/-	I		II		III	
INTERCEPT	+/-	0.2980	***	0.2907	***	0.2299	
		2.76		2.70		1.08	
RURAL	+/-	0.1945	***	0.2012	***	0.2108	***
		10.81		11.04		11.09	
ACCRUALS	+	0.2346		0.2885	*	0.2586	
		1.37		1.65		1.51	
SIZE	+	0.1069	***	0.1071	***	0.1073	***
		13.88		13.52		13.58	
LEVERAGE	-	0.4580	***	0.4551	***	0.2398	***
		8.85		8.79		4.70	
MTB	+/-	-0.0004		-0.0005		-0.0007	*
		-0.96		-1.26		-1.77	
SALES	+/-	-0.0732	***	-0.0820	***	-0.0979	***
		-6.78		-6.77		-6.31	
DIVIDEND	+	1.0204	***	0.9729	***	0.5396	*
		3.20		3.05		1.88	
VAR_CFO	-	0.7505	***	0.8247	***	0.8512	***
		4.24		4.65		4.78	
ROA	+	0.4839	***	0.5244	***	0.5628	***
		3.93		4.23		4.68	
LOSS	-	-0.3864	***	-0.3877	***	-0.3421	***
		-11.24		-11.25		-10.01	
OPCYCLE	-	-0.1662	***	-0.1429	***	-0.1038	***
		-10.08		-8.33		-4.38	
ANALYSTS	+/-	-0.2587	***	-0.2744	***	-0.2299	***
		-8.89		-9.36		-7.65	
HOLDINGS	+	-0.0020		-0.0031		-0.0060	**
		-0.89		-1.32		-2.40	
BIG4	+	0.0708	***	0.0765	***	0.0427	
		2.62		2.82		1.58	
NASDAQ	+/-	-0.1140	***	-0.1324	***	-0.1048	***
		-5.38		-6.16		-5.06	
AMEX	+/-	-0.1217	***	-0.1315	***	-0.0897	**
		-3.44		-3.66		-2.42	
Firm Cluster		Y		Y		Y	
Year FE		Y		Y		Y	
Specific Industry Indicators		N		Y		N	
Industry FE		N		N		Y	
N		18,865		18,865		18,865	
Adj.-R2		0.381		0.387		0.443	

***, **, * denote statistical significance at the .01, .05, .10 levels respectively. t-statistics are listed under coefficients and are based on standard errors clustered at the firm-level.

Model I includes year fixed-effects and no industry controls. Model II includes year fixed-effects and specific industry indicator variables for mining (SIC 10-14), manufacturing (SIC 20-39), retail (SIC 52-59), services (70-89) and transportation (SIC 40-49). Model III includes both year and industry fixed-effects.

EQ is a measure of earnings quality based on the principle component of three common measures of earnings quality. These include a measure of accrual quality as calculated by Dechow and Dichev (2002), a measure of earnings persistence and a measure of earnings smoothness. RURAL is a dummy equal to 1 if a firm is headquartered 100 or more miles from the center of any of the 52 CBSAs in the U.S. with 2010 Census populations of 1,000,000 persons or more. ACCRUALS is total working capital accruals. SIZE is the natural log of total assets. Leverage is the ratio of debt to debt plus market value of equity. MTB is the ratio of the market value of equity to the book value of equity. SALES is total sales to total assets. DIVIDEND is dividend expense to total assets. VAR_CFO is the 5-year variance of operating cash flows to total assets. ROA is net income to total assets. LOSS is a dummy variable equal to 1 if a firm reported a loss in the prior year, 0 otherwise. OPCYCLE is length of operating cycle. HOLDINGS is the percent of common shares outstanding held by institutional investors. ANALYSTS is the number of equity analysts issuing earnings forecasts for the year. BIG4 is a dummy variable equal to 1 if the firm is audited by a Big "N" auditor for the year, 0 otherwise. NASDAQ is a dummy variable equal to 1 if a firm is listed on the Nasdaq stock exchange, 0 otherwise. AMEX is a dummy variable equal to 1 if a firm is listed on the American stock exchange, 0 otherwise.

Coefficients on control variables are generally as hypothesized. Total accruals (*ACCRUAL)* exhibit a positive and significant association with earnings quality, but only when specific industry controls are included in the model (.2885, t-stat 1.65) (column II). In all specifications, *SIZE*, *DIVIDEND* and *ROA* are positively and significantly related to earnings quality. Somewhat surprisingly, this is also the case for variance of operating cash flows (*VAR_CFO*). My *a priori* expectation was that uncertainty in cash flows would lead managers to smooth earnings more, leading to lower earnings quality. Average sales (*SALES*), reporting a loss (*LOSS*) in the prior year and the length of a firm's operating cycle (*OPCYCLE*) are all negatively and significantly related to earnings quality. Greater analyst coverage appears to be associated with less earnings quality in all models (-.2587, t-stat -8.89; -.2744, t-stat -9.36; -.2299, t-stat - 7.65). When industry fixed effects are included in the model, institutional holdings also appear to be associated with lower earnings quality (column III, -.0060, t-stat -2.40). Finally, being audited by a Big 'N' auditor appears to be associated with greater earnings quality, except when industry fixed-effects are included in the model; evident by the positive and statistically significant coefficients on *BIG4* in columns I and II (.0708, t-stat 2.62; .0765, t-stat 2.82; .0427). I interpret results in Table 6 as indication that financial reporting quality increases with the distance between a firm and its investors.

Next I investigate whether analyst coverage, institutional holdings and managerial earnings guidance explain earnings quality differences between rural and urban firms. In Table 7, I re-estimate equation (1), specified with both year- and industry-fixed effects, across subsamples of low and high analyst coverage, institutional holdings and managerial earnings guidance. To measure low and high I rank firms below and above their peer group industry-year average of analyst coverage, institutional holdings and earnings guidance, where peer group indicates that rural firms are compared only to rural firms and city firms are compared only to city firms. For example, if a rural (city) firm has analyst coverage below (above) the industry-year average for all other rural (city) firms, it is included in the low (high) analyst coverage subsample. The same definitions apply to partitions based on institutional holdings and managerial earnings guidance.

Table 7
Subsample analysis of earnings quality and rural location, 1996-2009

Partitioning variable =			Analyst coverage			Institutional holdings				Earnings guidance					
Dependent variable = EQ			I			II			III			IV			V			VI		
+/		-	Low			High			Low			High			Low			High		
INTERCEPT	+/	-	0.1463			1.2547	***		0.3488	**		0.9844	***		0.2660			1.1653	***	
			0.74			6.06			2.07			3.83			1.58			5.27		
RURAL	+/	-	0.1782	***		0.1313	***		0.0962	***		0.2283	***		0.1366	***		0.1270	***	
			6.64			6.37			3.77			9.33			5.85			4.99		
ACCRUAL		+	0.3637	*		0.2940			0.1967			0.0320			0.3051	*		-0.1366		
			1.93			1.44			1.22			0.13			1.75			-0.65		
SIZE		+	0.0830	***		0.0831	***		0.1035	***		0.0747	***		0.0997	***		0.0540	***	
			6.58			8.77			7.72			5.75			10.79			4.86		
LEVERAGE		-	0.0327			0.0257			0.0009			0.0860			-0.0497			0.3043	***	
			0.51			0.35			0.01			1.15			-0.80			4.23		
MTB	+/	-	0.0211	***		0.0006			0.0065	***		0.0003			0.0007			0.0026	***	
			5.60			1.16			3.05			0.67			0.71			5.39		
SALES	+/	-	-0.0792	***		-0.1696	***		-0.0853	***		-0.1385	***		-0.0744	***		-0.1607	***	
			-4.52			-9.23			-4.63			-7.69			-4.55			-7.64		

Table 7
Subsample analysis of earnings quality and rural location, 1996-2009

Partitioning variable =			Analyst coverage			Institutional holdings			Earnings guidance		
Dependent variable = EQ			I	II		III	IV		V	VI	
+/		-	Low	High		Low	High		Low	High	
DIVIDEND		+	0.8132 ***	2.9777 ***		0.9822 ***	3.5042 ***		0.9897 ***	4.1315 ***	
			2.70	5.07		3.68	5.23		3.46	6.14	
VAR_CFO		-	6.4608 ***	7.1655 ***		6.3319 ***	7.4890 ***		6.2254 ***	7.5177 ***	
			16.87	15.73		14.74	17.56		17.01	17.57	
ROA		+	-0.0056	-0.2749		-0.2458 *	-0.1111		-0.2008 *	0.3169	
			-0.04	-1.55		-1.91	-0.47		-1.76	1.24	
LOSS		-	-0.0953 **	-0.2022 ***		-0.1287 ***	-0.1691 ***		-0.1137 ***	-0.0863 *	
			-2.47	-4.51		-3.34	-3.41		-3.29	-1.88	
OPCYCLE		-	-0.0973 ***	-0.2239 ***		-0.1104 ***	-0.2048 ***		-0.1147 ***	-0.1989 ***	
			-3.10	-8.79		-4.68	-5.91		-4.18	-7.38	
ANALYSTS	+/	-	-0.1903 ***	-0.1121 ***		-0.2487 ***	-0.1815 ***		-0.2680 ***	-0.0872 **	
			-4.73	-2.75		-4.36	-3.71		-7.15	-2.03	
HOLDINGS		+	-0.0124 *	-0.0051 **		-0.0069 *	-0.0058 **		0.0018	-0.0052 *	
			-1.67	-2.10		-1.76	-2.22		0.90	-1.69	
BIG4		+	-0.0214	0.0688 *		-0.0240	0.0942 **		0.0283	-0.0043	
			-0.70	1.66		-0.80	2.26		1.00	-0.09	
NASDAQ	+/	-	-0.06392 **	-0.05091 **		-0.1241 ***	-0.0341		-0.079 ***	-0.03904	
			-2.23	-2.02		-4.49	-1.29		-3.25	-1.35	
AMEX	+/	-	-0.10649 ***	-0.08308		-0.11616 ***	-0.21723 **		-0.07012 *	-0.21452 ***	
			-2.66	-1.06		-3.11	-2.43		-1.83	-2.92	
Test of equal coefficients for RURAL*EQd across Low and High subsamples			t-stat	(2.45)		t-stat	(6.08)		t-stat	(0.92)	
Firm Cluster			Y	Y		Y	Y		Y	Y	
Year FE			Y	Y		Y	Y		Y	Y	
Industry FE			Y	Y		Y	Y		Y	Y	
N			10826	8039		8963	9902		10749	8116	
Adj.-R2			0.3266	0.3853		0.3592	0.355		0.3024	0.4456	

***, **, * denote statistical significance at the .01, .05, .10 levels respectively. t-statistics are listed under coefficients and are based on standard errors clustered at the firm-level.

Table 7, models earnings quality as a function of rural location and controls, split into subsamples of below (Low) and above (High) the peer group industry-year mean of analyst coverage, institutional holdings and issuance of managerial earnings guidance. All models include industry fixed-effects.

EQ is a measure of earnings quality based on the principle component of three common measures of earnings quality. These include a measure of accrual quality as calculated by Dechow and Dichev (2002), a measure of earnings persistence and a measure of earnings smoothness. RURAL is a dummy equal to 1 if a firm is headquartered 100 or more miles from the center of any of the 52 CBSAs in the U.S. with 2010 Census populations of 1,000,000 persons or more. ACCRUAL is the difference between earnings before extraordinary items and operating cash flows. SIZE is the natural log of total assets. LEVERAGE is the ratio of debt to debt plus market value of equity. MTB is the ratio of the market value of equity to the book value of equity. SALES is 2-year average sales to total assets. DIVIDEND is dividend expense to total assets. VAR_CFO is 5-year variance of operating cash flows to total assets. ROA is net income to total assets. LOSS is a dummy variable equal to 1 if a firm reported a loss in the prior year, 0 otherwise. OPCYCLE is length of operating cycle. ANALYSTS is the number of equity analysts issuing earnings forecasts for the year. HOLDINGS is the percent of common shares outstanding held by institutional investors. BIG4 is a dummy variable equal to 1 if the firm is audited by a Big "N" auditor for the year, 0 otherwise. NASDAQ is a dummy variable equal to 1 if a firm is listed on the Nasdaq stock exchange, 0 otherwise. AMEX is a dummy variable equal to 1 if a firm is listed on the American stock exchange, 0 otherwise.

Columns I and II of Table 7 report OLS estimates for equation (1) across analyst coverage subsamples. In both low and high subsamples, *RURAL* exhibits a positive and significant relation with earnings quality, though the magnitude of the relation decreases slightly as a firm moves from the low coverage subsample to the high coverage subsample (.1782, t-stat 6.64 versus .1413, t-stat 6.37). This equates to a roughly 3.5% greater level of earnings quality in rural firms with low

analyst coverage than rural firms with high analyst coverage. Columns III and IV report results of estimating equation (1) across subsamples of low and high institutional holdings. Again, the coefficients on *RURAL* suggest earnings quality is higher for rural firms, and relatively more so when institutional holdings is above the industry-year mean for all rural firms, as the coefficient on *RURAL* in the low subsample (column III) is .0962 (t-stat 3.77) while the coefficient in the high subsample (column IV) is .2293 (t-stat 9.33), a difference in earnings quality of over 13%.

Columns V and VI of Table 7 report OLS estimates for equation (1) across subsamples of low and high managerial earnings guidance. In both subsamples, the coefficient on *RURAL* is positive and statistically significant. For example, the coefficient on *RURAL* in the low earnings guidance subsample is .1366 (t-stat 5.85) while the coefficient in the high subsample is .1270 (t-stat 4.99). While this difference is arguably economically insignificant (only a 1% difference in the value of the EQ metric), it may indicate that the average rural firm benefits from high quality financial reporting more when voluntary disclosure is low. Finally, in all columns, the models explain between 30% and 45% of the variation in my earnings quality measure and coefficients on the control variables are generally as predicted and similar to those reported in Table 6.

As discussed earlier, Abarbanell and Lehavy (2003) argue that stock price sensitivity to earnings surprises may indicate a firm's incentive to manage earnings. Therefore, I also test whether the stock price response to earnings surprises is significantly different for rural firms than for city firms. If it is, it may indicate rural firm managers are punished less by the market than urban firm managers for missing analyst forecasts.

Calculating earnings surprise (*SURPRISE*) as the difference between fiscal-year end earnings and the last consensus analyst earnings forecast before the fiscal-year end, I estimate the 3-day (-1 to +1) cumulative abnormal return (*CAR*) surrounding the fourth quarter earnings announcement date and then model *CAR* as a function of *SURPRISE,* rural location (*RURAL),* an interaction *SURPRISE*RURAL, SIZE,* and year and industry controls (equation 7).

$$CAR(-1, +1)it = \alpha it + \beta 1 RURALit + \beta 2 SURPRISEit + \beta 3 RURAL*SURPRISEit +$$

$$\beta \mathbf{4} SIZEit + YEARt + INDUSTRYit + \varepsilon it \qquad (7)$$

Table 8 presents the results of estimating equation (7). As above, column I contains no industry controls, column II includes specific industry indicator variables, and column III includes full industry fixed-effects. My interest is on the coefficient of the interaction term *RURAL*SURPRISE*. If rural firms have higher earnings quality, which descriptive statistics and multivariate tests thus far suggest, their stock price will likely be less sensitive to meeting or beating analyst earnings forecasts than the stock price of city firms. In this case, the coefficient on the interaction term should be negative and statistically significant. Indeed, in all columns the coefficient on *RURAL*SURPRISE* suggests rural firm stock price is less sensitive to earnings surprises. In column I the coefficient is -.3290 (t-stat -2.33), in column *II* it is -.3318 (t-stat - 3.33) and in column III the coefficient on the interaction term is -.3001 (t-stat -2.90). These results suggest that rural firm managers may have less incentive to manage earnings than managers in city firms.

Table 8
Stock price reaction to earnings surprises, 1996-2009

Panel A: Descriptive statistics

Variable	N	Mean	Median	S.D.	Q1	Q3
CAR (-1, +1)	11,458	0.0132	0.0046	0.1158	-0.0548	0.0410
SURPRISE	11,458	0.0191	0.0087	0.1770	-0.0300	0.0300
RURAL	11,458	0.1203	0.0000	0.3242	0.0000	0.0000
SIZE	11,458	6.0488	6.0456	1.4321	5.0114	7.0741

Panel B: OLS results

Dependent variable = CAR (-1, 1)	I		II		III	
INTERCEPT	-0.8989	***	-0.8830	***	-0.7717	***
	-14.76		-20.52		-4.33	
SURPRISE	0.2219	***	0.2187	***	0.2331	***
	4.05		5.62		5.28	
RURAL	0.3167	**	0.3215	***	0.2992	***
	2.33		3.36		3.03	
RURAL*SURPRISE	-0.3290	**	-0.3318	***	-0.3001	***
	-2.33		-3.33		-2.90	
SIZE	0.0489	***	0.0488	***	0.0522	***
	10.66		14.96		15.16	
Firm Cluster	Y		Y		Y	
Year FE	Y		Y		Y	
Specific Industry Indicators	N		Y		N	
Industry FE	N		N		Y	
N	11,458		11,458		11,458	
Adj.-R2	0.146		0.154		0.169	

***, **, * denote statistical significance at the .01, .05, .10 levels respectively. t-statistics are listed under coefficients and are based on standard errors clustered at the firm-level.

Model I includes year fixed-effects only. Model II includes year fixed-effect and specific industry indicator variables for mining (SIC 10-14), manufacturing (SIC 20-39), retail (SIC 52-59), services (70-89) and transportation (SIC 40- 49). Model III includes both year and industry fixed-effects.

CAR (-1, +1) is the three day abnormal return surrounding the fourth quarter earnings announcement date. RURAL is a dummy equal to 1 if a firm is headquartered 100 or more miles from the center of any of the 52 CBSAs in the U.S. with 2010 Census populations of 1,000,000 persons or more. SURPRISE is the difference between actual reported earnings and the consensus analyst earnings estimate for the fiscal-year end. SIZE is the natural log of total assets.

Together, results presented in Tables 6-8 suggest rural firms have higher earnings quality than urban firms, and that this difference may be driven, in part, by rural firm managers having less incentive to manage earnings. This is evident in the combination of lower analyst coverage and lower sensitivity of rural firm stock price to missing analyst earnings forecasts.

Robustness Tests

Sarbanes-Oxley Act

As a robustness test, I also examine whether my results are sensitive to passage of the Sarbanes-Oxley Act (SOX) (2002), since provisions of SOX may limit managers' ability to

manage earnings. Research documents a number of potential benefits to SOX. For example, Iliev (2010) documents evidence that SOX 404 has led to more conservative reporting. Kalelkar and Nwaeze find that for firms with low levels of institutional holdings, SOX resulted in an increased value of earnings and earnings components, suggesting investors may be more confident in reported earnings post-SOX. Jain and Razaee (2006) find that bid–ask spreads, which were widening prior to 2002, began to decrease in the nine months after passage of SOX. Anecdotal evidence at the time also suggested rising investor confidence subsequent to SOX (e.g., Coates, 2007). Chang et al., (2009) report significant improvements in earnings quality in the 2-year period following SOX. Li et al., (2006), Chhaochharia and Grinstein (2005), and Jain and Razaee (2006) document positive effects for U.S. firms. Other studies find that the market responded favorably to new control procedures mandated by SOX (e.g, Beneish et al., 2006; Chan et al., 2006; Leuz, Triantis, and Wang, 2005). Wintoki (2006) documents positive abnormal returns for the largest firms, but negative abnormal returns for the smallest firms.

To gauge the potential impact of SOX on the relation between firm location and financial reporting quality, I partition my sample into pre- and post-2002 and 2003 time periods. I use both breakpoints because though some firms may have begun implementing SOX requirements in 2002, SOXs provisions were not legally required by public companies until 2003 and after (Coates, 2007). Regardless of which year is used to partition my sample, the results do not change significantly from pre- to post-SOX.

Alternative Definitions of 'Rural' and 'City'

Additionally, I estimate equation (1) using a *RURAL* dummy variable defined across both larger and smaller linear distances between firm headquarters and the center of the 52 CBSAs listed in Figure 1 of the Appendix. When 'rural' firms are defined as those 130 or more miles from city-hall of any of the 52 CBSAs, results are statistically stronger but qualitatively the same. When 'rural' firms are defined as those 75 miles or more, results are statistically weaker but qualitatively the same. When I define 'rural' firms as being 50 or more miles from the center any of the 52 CBSAs listed in Figure 1, results for equation (1) are inconclusive. Defining 'city' firms as any firm with its headquarters 15 or fewer miles from the center of the 52 CBSAs listed in Figure 1 does not change the interpretation of equation (1) estimates.

Individual Measures of Earnings Quality

I also examine the sensitivity of my results to alternative measures of earnings quality. First, when I use the individual earnings quality metrics, i.e., accrual quality, earnings persistence and earning smoothness, in place of the principle component EQ, results are similar. I alternatively calculate these three measures using 5-year firm-specific rolling regressions rather than 8-year. While this approach increases the number of firm-year observations in my final samples, results are statistically weaker, though the overall interpretation does not change.

Partitions by Big 'N' Auditors and Advertising Expenditures

Additionally, I examine whether being audited by a Big 'N' auditor makes a difference for the relation between firm location and financial reporting quality. It does not appear to matter. Finally, Grullon *et al.*, (2004) document evidence that advertising can improve firm visibility. Therefore, I partition firms by low and high advertising expenditures. As with Big 'N', this characteristic does not significantly impact my results.

CONCLUSION

Prior research on firm location argues that information for rural firms is more costly to acquire than information for firms headquartered in or near major population centers. This is because the larger physical distance between investors and rural firm headquarters may impede dissemination of firm information (Coval & Moskowitz, 1999; John *et al.*, 2011). Bushman *et al.*, (2004) argue that financial reporting constitutes the primary direct channel through which firm information is disseminated to investors. I examine whether firm location leads to variation in financial reporting quality between rural and city firms, whether rural firms can benefit from commitment to financial reporting quality through a reduction in the cost of external capital and an increase in liquidity and whether their ability to do so depends on differences in analyst coverage, institutional holdings and managerial earnings guidance.

Analyzing a comprehensive sample of rural and city firms, from 1996 and 2009, I find that rural firms have higher quality financial reporting, on average, than firms headquartered in or near the 15 largest metropolitan areas of the U.S. In additional tests, I document two pieces of evidence that may explain these differences. First, I find that differences in financial reporting quality between rural and city firms are greatest when rural firm analyst coverage is low. Second, rural firm stock price is less sensitive to missing the year-end consensus analyst earnings forecast. These two pieces of evidence suggest one reason why rural firms may have higher financial reporting quality is that they face fewer incentives for managing earnings towards analyst benchmarks.

ENDNOTES

1 As in Loughran and Schultz (2005, 2006), I refer to 'rural' firms as those firms headquartered 100 or more miles from any of the 52 U.S. metropolitan areas with a population of 1,000,000 or more persons, as of the 2010 U.S. Census. Firms that are headquartered within 30 miles of the largest 15 metropolitan areas in the U.S. (listed in Figure 1 in the Appendix) I denote 'urban' firms. Using a similar definition, Brockman et al. (2011) refer to urban firms as 'supercity' firms.

2 The Core Based Statistical Area is the standard classification for any region with a population in excess of 5,000 persons, as defined by the U.S. Census Bureau. Refer to http://www.census.gov/population/www/metroareas/metroarea.html.

3 Federal Information Processing Standard codes are 5-digit geographical codes issued by the National Institute of Standards and Technology (NIST), where the first 2 digits identify the state and the last 3-digits identify the county. For example. Kansas' state code is '20' and Crawford County, Kansas has a county code of '037.' Crawford County, Kansas therefore has a FIPS code of '20037.' Multiple zip-codes can be associated with a single FIPS code. In some years firm zip-codes are available in the Compustat *Company* file, in other years

only FIPS codes are provided by Compustat. In those years for which only FIPS codes are available, I hand-match FIPS codes to firm zip-codes by locating firm addresses using a Google® search.

4 While Clark *et al.,* (2007) and Loughran and Schultz (2005) take a similar approach, they also consider an alternative way to measure the distance between firms and cities. Specifically, they calculate the arithmetic average of the different linear distances between all zip codes in a CBSA and all zip codes in a firm's FIPS. Their results are generally not sensitive to this alternative method.

5 Recall that *ACCQ* and *SMOOTHNESS* are multiplied by (-1) in this paper, so that higher levels equate to higher earnings quality.

6 Recall that I define *SMOOTHNESS* as [σ(NIBEit)/σ(CFOit)] * (-1), such that higher levels of this metric actually capture **lower** earnings smoothing.

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REFERENCES

Abarbanell, J., & R. Lehavy (2003). Can stock recommendations predict earnings management and analysts' earnings forecast errors? *Journal of Accounting Research, 41*(1), 1-31.

Ali, A. & P. Zarowin (1992). The role of earnings levels in annual earnings-returns studies. *Journal of Accounting Research, 30*(2), 286-296.

Ayers, B., S. Ramalingegowda & P. E. Yeung (2011). Hometown advantage: The effects of monitoring institution location on financial reporting discretion. *Journal of Accounting and Economics, 52*, 41-61.

Bae, K., R. Stulz & H. Tan (2008). Do local analysts know more? A cross-country study of the performance of local analysts and foreign analysts. *Journal of Financial Economics, 88*(3), 581-606.

Balsam, S., I. Haw, I. & S. Lilien (1995). Mandated accounting changes and managerial discretion. *Journal of Accounting and Economics, 20*, 3-29.

Barber, B. & T. Odean (2007). All that glitters: The effect of attention and news on the buying behavior of individual and institutional investors. *Review of Financial Studies, 21*(2), 785-818.

Beneish, M., M. Billings & L. Hodder. (2008). Internal control weaknesses and information uncertainty. *The Accounting Review, 83*, 665-703.

Bhojraj, S. & B. Swaminathan (2007). How does the corporate bond market value capital investments and accruals? *Review of Accounting Studies, 14*, 31-62.

Biddle, G., & G. Hilary (2006). Accounting quality and firm-level capital investment. *The Accounting Review, 81*(5), 963-982.

Biddle, G., G. Hilary & R. Verdi. (2009). How does financial reporting quality relate to investment efficiency? *Journal of Accounting and Economics, 48*, 112-131.

Bowen, R., J. Lacey, & E. Noreen (1981). Determinants of the corporate decision to capitalize interest. *Journal of Accounting and Economics, 3*, 151-179.

Bradshaw, M., S. Richardson & R. Sloan. (2001). Do analysts and auditors use information in accruals? *Journal of Accounting Research, 39*(1), 45-74.

Brav, A., Graham, J., Harvey, C., and Michaely, R. 2005. Payout policy in the 21st century. Journal of Financial Economics 77 (3), 483-527.

Brockman, P., J. Francis & M. Pinnuck (2011). Super-city proximity, institutional investor recognition, and the cost of capital. Unpublished working paper: Lehigh University, University of Missouri, University of Melbourne.

Brown, S., W. Goetzmann, B. Liang & C. Schwarz (2008). Mandatory Disclosure and Operational Risk: Lessons from Hedge Fund Registration. *Journal of Finance, 63*, 2785- 2816.

Bushman, R., J. Piotroski & A. Smith. (2004). What determines corporate transparency? *Journal of Accounting Research*, 42(2), 207-252.

Chhaochharia, V. & Y. Grinstein. (2009). CEO compensation and board structure. *Journal of Finance*, *64*(1), 231-261.

Chan, K., V. Covrig, and L. Ng. (2005). What determines the domestic bias and foreign bias? Evidence from mutual fund equity allocations worldwide. *The Journal of Finance*, *60*(3): 1495-1534.

Chan, K., B. Farrell & P. Lee (2006). Earnings management, and return-earnings association of firms reporting material internal control weaknesses under Section 404 of the Sarbanes–Oxley Act. Unpublished working paper: Pace University

Chang, H., G. Fernando & W. Liao (2009). Sarbanes-Oxley Act, perceived earnings quality and cost of capital. *Review of Accounting and Finance*, *8*(3), 216-231.

Charitou, A., N. Lambertides & L. Trigeorgis (2007). Earnings behavior of financially distressed firms: The role of institutional ownership. *Abacus*, *43*(3), 271-296.

Chen, S., Matsumoto, D., Rajgopal, S. 2011. Is silence golden? An empirical analysis of firms that stop giving quarterly earnings guidance. *Journal of Accounting and Economics* 51, 134-150.

Clark, B., B. Francis, B., & I. Hasan (2009). Geography and cash holdings. Working Paper: Rennselaer Polytechnic Institute.

Coates, J. (2007). The goals and promise of the Sarbanes-Oxley Act. *Journal of Economic Perspectives 21*, 91–116.

Collins, D. & S. Kothari (1989). An analysis of intertemporal and cross-sectional determinants of earnings response coefficients. *Journal of Accounting and Economics*, *11*(2-3), 143- 181.

Coval, J., & T. Moskowitz (2001). Home bias at home: Local equity preference in domestic portfolios. *Journal of Finance*, *54*(6), 2045-2073.

Dechow, P. & I. Dichev (2002). The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors. *The Accounting Review*, *77*, 35-59.

Dechow, P., W. Ge & K. Schrand (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, *50*(2), 344-401.

Dechow, P. & D. Skinner (2000). Earnings management: Reconciling the views of accounting academics, practitioners, and regulators. *Accounting Horizons*, *14*, 232-250.

Defond, M. & C. Park (1997). Smoothing income in anticipation of future earnings. *Journal of Accounting and Economics*, *23*(2), 115-139.

Dhaliwal, D., I. Khurana & R. Pereira (2011). Firm disclosure policy and the choice between private and public debt. *Contemporary Accounting Research*, *28*(4), 293–330.

Diamond, D. (1984). Financial intermediation and delegated monitoring. *Review of Economic Studies*, *51*, 393-414.

Doyle, J., R. Lundholm & M. Soliman (2006). The extreme future stock returns following I/B/E/S earnings surprises. *Journal of Accounting Research*, *44*(5), 849-887.

Dyck, A. & L. Zingales (2004). Private benefits of control: An international comparison. *Journal of Finance*, *59(*2), 537-600.

Easely, D. & M. O'Hara (2004). Information and the cost of capital. *Journal of Finance*, *59*(4), 1553-1583.

Findlay, S. & P. Mathew (2006). An examination of the differential impact of Regulation FD on analysts' forecast accuracy. *Financial Review*, *41*(1), 9–31.

Florida, R., T. Gulden & C. Mellander (2008). The rise of the mega-region. *Regions, Economy, and Society*, *1*, 459-476.

Francis, B., I. Hasan & M. Waisman (2007). Does geography matter to bondholders? Working paper, Federal Reserve Bank of Atlanta, no. 2007-2.

Francis, J., A. Huang, S. Rajgopal & A. Zang (2008). CEO reputation and earnings quality. *Contemporary Accounting Research*, *25*(1), 109-147.

Francis, J., LaFond, R., Olsson, R., Schipper, K. 2004. Costs of equity and earnings attributes. *The Accounting Review* 79, 967-1010.

Francis, J., D. Nanda & P. Olsson. (2008). Voluntary disclosure, earnings quality, and cost of capital. *Journal of Accounting Research*, *46*, 53-99.

Francis, J. &M. Yu. (2009). Big 4 office size and audit quality. *The Accounting Review*, *84*(5): 1521-1553.

Garcia-Lara, J, B. Garcia-Osma, F. Penalva (2009). Cost of equity and accounting conservatism. *Review of Accounting Studies*, *16*, 247–271.

Glaeser, E. 2009. "Cities, agglomeration and spatial equilibrium" Oxford University Press: United Kingdom.

Grullon G., Kanatas, G., Weston, J. 2004. Advertising, breadth of ownership, and liquidity. *Review of Financial Studies* 17 (2), 439-461.

Hagerman, R., M. Zmijewski & P. Shah (1981). The association between the magnitude of quarterly earnings forecast errors and risk-adjusted stock returns. *Journal of Accounting Research*, 22(2), 526-540.

Holloway, S. & J. Wheeler (1991). Corporate headquarters relocation and changes in metropolitan corporate dominance, 1980-1987. *Economic Geography*, *67*(1), 54-74.

Holthausen, R, Watts, R. 2001. The relevance of the value-relevance literature for financial accounting standard setting. *Journal of Accounting and Economics* 31, 3-75.

Hope, O. (2003). Firm-level disclosures and the relative roles of culture and legal origin. *Journal of International Financial Management & Accounting*, *14*(3), 218-248.

Houston, J. & C. James (1996). Bank information monopolies and the mix of private and public debt claims. *Journal of Finance*, *51*(5), 1863-1889.

Huberman, G. (2001). Familiarity breeds investment. *Review of Financial Studies*, *14*, 659−680.

Hutton, A., Marcus, A., Tehranian, H. (2009). Opaque financial reports, R2, and crash risk. *Journal of Financial Economics* 94, 67-86.

Iliev, P. (2010). The effect of the Sarbanes-Oxley Section 404 compliance on audit fees, earnings quality and stock prices. *Journal of Finance*, *65*(3), 1163–1196.

Ivkovic, Z. & S. Weisbenner (2005). Local does as local is: Information content of the geography of individual investors' common stock investments. *The Journal of Finance*, *9*(1): 267-306.

Jain, P. & Z. Rezaee (2006). The Sarbanes–Oxley of 2002 and security market behavior: Early evidence. *Contemporary Accounting Research*, *23*(3), 629–54.

Jin, L., Myers, S. 2006. R2 around the world: new theory and new tests. Journal of Financial Economics 79, 257–292.

John, K. & A. Knyazeva (2006). Payout policy, agency conflicts, and corporate governance. Working paper: New York University, University of Rochester.

John, K., A. Knyazeva, A. & D. Knyazeva (2011). Do shareholders care about geography? *Journal of Financial Economics*, *101*, 533–551.

Johnson, W. & R. Ramanan (1988). Discretionary accounting changes from "successful efforts" to "full cost" methods: 1970-76. *The Accounting Review*, *63*, 96-110.

Jolliffe, I. (2002). "Principal Component Analysis" in Encyclopedia of Statistics in Behavioral Science. John Wiley & Sons, Ltd.

Kalelkar, R. & E. Nwaeze (2011). Sarbanes–Oxley Act and the quality of earnings and accruals: Market-based evidence. *Journal of Accounting and Public Policy*, *30*(3), 275–294

Keating, A. & J. Zimmerman (1999). Depreciation-policy changes: Tax, earnings management, and investment opportunity incentives. *Journal of Accounting and Economics*, 28, 359- 389.

Kedia, S. & S. Rajgopal (2009). Neighborhood matters: The impact of location on broad based stock option plans. *Journal of Financial Economics*, *92*(1), 109-127.

Kinney, W. & L. McDaniel (1989). Characteristics of firms correcting previously reported quarterly earnings. *Journal of Accounting and Economics*, *11*, 71-93.

Komendi, R. & R. Lipe (1987). Earnings innovations, earnings persistence, and stock returns. *Journal of Business*, *60*, 323-345.

Krishnan, G. & G. Visvanathan (2005). Reporting internal control deficiencies in the post- Sarbanes-Oxley era: The role of auditors and corporate governance. *International Journal of Auditing*, *7*(2), 73-90.

Lang, M. & R. Lundholm (1996). Corporate disclosure policy and analyst behavior. *The Accounting Review*, *71*, 467-492.

Lee, C., B. Mucklow & M. Ready (1993). Spreads, depths, and the impact of earnings information: An intraday analysis. *Review of Financial Studies*, *6*(2), 345-374.

Leuz, C., A. Triantis, A. & T. Wang. (2008). Why do firms go dark? Causes and economic consequences of voluntary SEC deregistrations. *Journal of Accounting and Economics*, *45*, 181–208.

Lev, B. (1983). Some economic determinants of time-series properties of earnings. *Journal of Accounting and Economic*s, *5*, 31-48.

Levitt, T. (1998). The "Numbers Game." Remarks delivered at the NYU Center for Law and Business, by SEC Chairman Arthur D. Levitt. September 28, 1998.

Loughran, T. (2007). Geographic dissemination of information. *Journal of Corporate Finance,* 13, 675-694.

Loughran, T. (2008). The impact of firm location on equity issuance. *Financial Management, (Spring),* 2-21.

Loughran, T., Schultz, P. 2005. Liquidity: Urban versus rural firms. Journal of Financial Economics 78, 341-374.

Loughran, Tim, and Paul Schultz. 2006. Aysmmetric information, firm location, and equity issuance. Working Paper.

Malloy, C. (2005). The geography of equity analysis. *The Journal of Finance*, *60*(2), 719-755. Massa, M. & A. Simonov (2006). Hedging, familiarity, and portfolio choice. *Review of Financial Studies*, *19*(2): 633-685.

Matsumoto, D. 1999. Management's incentives to guide analysts' forecasts. Working paper: University of Washington.

Matsumoto, D. (2002). Management's incentives to avoid negative earnings surprises. *The Accounting Review*, *77*(3), 483-514.

Mohanram, P & S. Sunder (2006). How has regulation fair disclosure affected the operations of financial analysts? *Contemporary Accounting Research*, *23*(2): 491–525.

MSNBC (2008). "AT&T to move headquarters to Dallas: World's largest telecommunications company is leaving San Antonio." Retrieved September 16, 2010 from: http://www.msnbc.msn.com/id/25417174/.

Myers, S. & N. Majluf (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*, 178-221.

Nissim, D., & S. Penman (2001). Ratio analysis and equity valuation: From research to practice. *Review of Accounting Studies*, *6*(1), 109-154.

O'Brien, P. & R. Bhushan (1990). Analyst following and institutional ownership. *Journal of Accounting Research*, *28*, 55-76.

Peterson, M. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies*, *22*(1), 435-480.

Rajgopal, S., L. Shivakumar & A. Simpson (2007). A catering theory of earnings management. Working paper: London Business School.

Ralston, D., D. Holt, R. Terpstra & Y. Kai-Cheng (2008). The impact of national culture and economic ideology on managerial work values: a study of the United States, Russia, Japan, and China. *Journal of International Business Studies* 39, 8-26.

Richardson, S., I. Tuna & M. Wu (2003). Predicting earnings management: The case of earnings restatements. Working paper, University of Pennsylvania and Hong Kong University of Science and Technology.

Richardson, S. (2006). Over-investment of free cash flow. *Review of Accounting Studies*, *11*, 159-189.

Schipper, K. and L. Vincent. 2003. Earnings quality. *Accounting Horizons* (Supplement), 97- 110.

Strauss-Kahn, V., Vives, X. 2006. Why and where do headquarters move? Working paper: INSEAD.

Tucker, J. 2010. Is silence golden? Earnings warnings and subsequent changes in analyst following. Journal of Accounting, Auditing and Finance 25 (3), 431-456.

Tucker, J. & P. Zarowin (2006). Does income smoothing improve earnings informativeness? *The Accounting Review*, *81*, 251-270.

Urcan, O. (2007). Geographical location and corporate disclosures. Working Paper: London Business School.

Van Nieuwerburgh, S., Veldkamp, L. 2009. Information acquisition and under- diversification. *Review of Economic Studies* 77, 779-805.

Verrecchia, R (2001). Essays on disclosure. *Journal of Accounting and Economics*, *32*, 97- 180.

Wang, I. (2007). Private earnings guidance and its implications for disclosure regulation. *The Accounting Review*, 82, 1299-1332.

Waymire, G. (1985). Earnings volatility and voluntary management forecast disclosure. *Journal of Accounting Research*, *23*(1), 268-295.

Wintoki, M. (2006). Corporate boards, regulation and firm value: The impact of the Sarbanes- Oxley Act and the exchange listing requirements. *Journal of Corporate Finance, 13*, 229–250.

APPENDIX

Figure 1
Core-based Statistical Areas (CBSAs) of the United States, by 2010 populations

	Municipality	State	Population
1	New York-Northern New Jersey-Long Island	NY-NJ-PA	19,069,796
2	Los Angeles-Long Beach-Santa Ana	CA	12,874,797
3	Chicago-Joliet-Naperville	IL-IN-WI	9,580,567
4	Dallas-Fort Worth-Arlington	TX	6,447,615
5	Philadelphia-Camden-Wilmington	PA-NJ-DE-MD	5,968,252
6	Houston-Sugar Land-Baytown	TX	5,867,489
7	Miami-Fort Lauderdale-Pompano Beach	FL	5,547,051
8	Washington-Arlington-Alexandria	DC-VA-MD-WV	5,476,241
9	Atlanta-Sandy Springs-Marietta	GA	5,475,213
10	Boston-Cambridge-Quincy	MA-NH	4,588,680
11	Detroit-Warren-Livonia	MI	4,403,437
12	Phoenix-Mesa-Glendale	AZ	4,364,094
13	San Francisco-Oakland-Fremont	CA	4,317,853
14	Riverside-San Bernardino-Ontario	CA	4,143,113
15	Seattle-Tacoma-Bellevue	WA	3,407,848
16	Minneapolis-St. Paul-Bloomington	MN-WI	3,269,814
17	San Diego-Carlsbad-San Marcos	CA	3,053,793
18	St. Louis	MO-IL	2,828,990
19	Tampa-St. Petersburg-Clearwater	FL	2,747,272
20	Baltimore-Towson	MD	2,690,886
21	Denver-Aurora-Broomfield	CO	2,552,195
22	Pittsburgh	PA	2,354,957
23	Portland-Vancouver-Hillsboro	OR-WA	2,241,841
24	Cincinnati-Middletown	OH-KY-IN	2,171,896
25	Sacramento–Arden-Arcade–Roseville	CA	2,127,355
26	Cleveland-Elyria-Mentor	OH	2,091,286
27	Orlando-Kissimmee-Sanford	FL	2,082,421
28	San Antonio-New Braunfels	TX	2,072,128
29	Kansas City	MO-KS	2,067,585
30	Las Vegas-Paradise	NV	1,902,834
31	San Jose-Sunnyvale-Santa Clara	CA	1,839,700
32	Columbus	OH	1,801,848
33	Charlotte-Gastonia-Rock Hill	NC-SC	1,745,524
34	Indianapolis-Carmel	IN	1,743,658
35	Austin-Round Rock-San Marcos	TX	1,705,075
36	Virginia Beach-Norfolk-Newport News	VA-NC	1,674,498
37	Providence-New Bedford-Fall River	RI-MA	1,600,642
38	Nashville-Davidson–Murfreesboro–Franklin	TN	1,582,264
39	Milwaukee-Waukesha-West Allis	WI	1,559,667
40	Jacksonville	FL	1,328,144
41	Memphis	TN-MS-AR	1,304,926
42	Louisville/Jefferson County	KY-IN	1,258,577

Figure 1
Core-based Statistical Areas (CBSAs) of the United States, by 2010 populations

	Municipality	State	Population
43	Richmond	VA	1,238,187
44	Oklahoma City	OK	1,227,278
45	Hartford-West Hartford-East Hartford	CT	1,195,998
46	New Orleans-Metairie-Kenner	LA	1,189,981
47	Birmingham-Hoover	AL	1,131,070
48	Salt Lake City	UT	1,130,293
49	Raleigh-Cary	NC	1,125,827
50	Buffalo-Niagara Falls	NY	1,123,804
51	Rochester	NY	1,035,566
52	Tucson	AZ	1,020,200

Figure 1 lists the 52 largest Core-Based Statistical Areas (CBSAs) by 2010 U.S. Census populations. Rural firms are any firms headquartered 100 or more miles from the center of any of these 52 CBSAs. City firms are any firms headquartered 30 miles or fewer from the center of the 15 largest CBSAs, shaded in gray. All data are from the U.S. Census Bureau.

Figure 2
Calculation of linear distance

Exact distance in miles = 3958.75 * arctan[sqrt(1-x^2)/x]

Where x = [sin(zip-code1.lattitude/57.2958) * sin(zip-code2.lattitude/57.2958)] + cos(zip-code1.lattitude/57.2958) * cos(zip-code2.lattitude/57.2958) * cos(zip-code2.longitude/57.2958 – zip-code1.longitude/57.2958)]

Notes: This measure of linear distance is available from Zipinfo.com. I confirm the accuracy of this formula for a random sample of firm distances using google.maps.com®.

THE FREQUENCY, MAGNITUDE, AND MEASUREMENT SUBJECTIVITY ASSOCIATED WITH LIABILITIES REPORTED AT FAIR VALUE

Denise Leggett, Middle Tennessee State University
Anne Wilkins, University of Tennessee at Chattanooga
Stanley Clark, Middle Tennessee State University

ABSTRACT

Pre-2008 accounting standards apply fair value measurement to assets much more extensively than to liabilities. Two new fair value standards, fully implemented in 2008, introduce some important changes to fair value measurement. SFAS No. 157 requires disclosure concerning the subjectivity of fair value measurements as determined by a three-level hierarchy, and SFAS No. 159 extends fair value measurement, on an optional basis, to a large set of liabilities. We examine the prevalence and magnitude of liabilities stated at fair value, the level of subjectivity associated with these fair value measurements, and how these amounts have changed over the five-year period since the implementation of SFAS No. 157 and SFAS No. 159. Our findings suggest both the prevalence and magnitude of fair value liabilities significantly increased over the study period, and the largest increases occurred in the most subjective levels of the fair value hierarchy. We also find firm size to be positively correlated with prevalence, and we identify firms in the utilities, alcoholic beverages, and shipping container industries as exhibiting the highest levels of prevalence.

INTRODUCTION

The Financial Accounting Standards Board (FASB) has increasingly relied on the use of fair value as the unit of measurement in financial statement reporting. The first, and still most significant, standard requiring fair value measurement is Statement of Financial Accounting Standard (SFAS) No. 115, *Accounting for Certain Investments in Debt and Equity Securities*[d](which is now incorporated in Accounting Standards Codification (ASC) 320). This standard, issued in 1993, requires most investments in marketable debt and equity securities to be reported at fair value. Later standards expand fair value measurement to derivative financial instruments (SFAS No. 133), business combinations (SFAS No. 141), asset retirement obligations (SFAS No. 143), and fixed assets (SFAS No. 144). In fact, it is difficult to find a significant accounting standard issued in the last twenty-five years that does not include some mention of fair value.

Most pre-2008 accounting standards requiring fair value measurement impact asset valuations to a much greater extent than liability valuations. In 2008, SFAS No. 159, *The Fair Value Option for Assets and Liabilities* (now incorporated in ASC 825), expands the potential use of fair value liability measurement by allowing firms the option to value financial liabilities at fair value. FASB's stated purpose for expanding the fair value measurement of liabilities is to reduce

earnings volatility in companies with an earnings mismatch created by reporting assets at fair value and liabilities at historical cost.

This recent expansion of fair value measurement once again highlights the debate over relevance versus faithful representation (reliability) and the need for consistency and comparability. Recent research suggests that asset fair values, either disclosed or reported in the financial statements, exhibit patterns of management manipulation (Clark, Jordan, and Dugan 2013; Jordan, Clark, and Pate 2013). Extant research also suggests that even knowledgeable financial statement users misinterpret counterintuitive gains and losses that result from liability fair value fluctuations (Lachmann, Wohrmann, and Wompener 2011; Gaynor, McDaniel, and Yohn 2011). Likewise, Pounder (2012) suggests the option to present liabilities at fair value on an item-by-item basis negatively impacts comparability and consistency.

Certainly, fair value measurements are relevant as they represent current market values, but many question the degree to which reliability is compromised. FASB responds by issuing SFAS No. 157, *Fair Value Measurement* (now incorporated as ASC 820), which requires disclosure of the amounts and levels of subjectivity associated with assets and liabilities reported in the balance sheet at fair value to help financial statement users discern the reliability and comparability of the reported fair values. The purpose of our study is to examine the prevalence of fair value reporting for liabilities, the level of subjectivity associated with these liabilities, and how these amounts have changed over the first five-year period following the implementation of SFAS Nos. 157 and 159. We also examine which firms typically report liabilities at fair value.

Our results suggest both the prevalence and the magnitude of liabilities reported at fair value have increased since 2008 and that the largest increases have occurred in the most subjectively-measured hierarchy categories defined by SFAS No. 157. Our results also suggest that the prevalence of fair value liability reporting increases with firm size and that firms in the utility, alcoholic beverage, and shipping container industries are most likely to report some liabilities at fair value.

The remainder of the paper is organized as follows. We detail the background and literature review for fair value liability measurement, present our research results, and follow with our conclusion.

BACKGROUND AND LITERATURE REVIEW

SFAS No. 133, *Accounting for Derivative Financial Instruments and Hedging Activities*, issued in 1998, was the first standard to require fair value measurement for a liability, namely derivative financial instruments. If the firm holding or issuing derivative financial instruments is in an unrealized gain (loss) position, a corresponding asset (liability) is reported at fair value on the balance sheet. SFAS No. 143, *Accounting for Asset Retirement Obligations,* issued in 2001, requires firms to account for a legal fixed asset retirement obligation at fair value when the fixed asset is acquired. The obligation is recognized at fair value and results in a liability with an associated increase to the cost of the asset. However, the liability is only initially measured at fair value because the liability is accreted using effective interest amortization over the life of the asset so that subsequent carrying values rarely reflect fair value. So, while these two standards create

some fair value reporting for liabilities, the financial statement effects are very limited in scope and application.

Fair value liability reporting was expanded by SFAS No. 159 to allow entities to *optionally* make an irrevocable choice to report a financial liability at fair value when the instrument is either newly acquired or when an existing instrument has a qualifying event (e.g. a significant modification to a debt contract). The option to report at fair value is at the discretion of management, and the choice applies on an item-by-item basis. Thus, one entity may report some liabilities at fair value while other liabilities remain valued at historical cost. Furthermore, one entity may elect to report a liability at fair value while another entity may elect to report a very similar liability at historical cost. If the fair value option is chosen, the entity reassesses fair value at the end of each reporting period and records a corresponding gain or loss to reflect the fair value fluctuation from period to period. FASB states the objective of the fair value option 'is to provide entities with the opportunity to mitigate volatility in reported earnings caused by measuring related assets and liabilities differently without having to apply complex hedge transactions."

Pounder (2012) suggests the most recent ***option*** to present a much larger set of liabilities at fair value negatively impacts comparability between fair value firms and their historical cost counterparts. Furthermore, Pounder (2012) states adopting fair value liability measurement on an item-by-item basis compromises consistency in the financial reporting of a firm across time. In addition, Pounder (2012) also suggests that unrealized gains are far more likely to be realized than unrealized losses as entities will likely buy back their own debt in the open market when its fair value is less than the original obligated principal terms.

In addition, the fair value measurement of liabilities is subject to the credit risk of the reporting entity. If a firm experiences a *decline* in credit worthiness, the fair value of its debt instruments decreases creating a *gain* to be reported on the statement of operations (Pounder 2012). Alternatively, an *increase* in creditworthiness results in a *loss* on the statement of operations. These counterintuitive effects raise concerns that financial statement users may misinterpret a gain (loss), attributable to a change in the fair value of liabilities, as positive (negative) information. Gaynor et al. (2011) find over 70% of their CPA participants (arguably financial savvy individuals) misinterpreted fair value gains as positive information. Likewise, Lachmann et al. (2011) also find evidence to suggest that non-professional investors were even more likely to misinterpret the fair value gains and losses pertaining to liabilities.

However, some financial statement users appear to appropriately recognize the fair value information. Cedergree and Chen (2012) find compensation committees appear to base their executive compensation judgments on income before debt valuation adjustments. They also find executives are penalized for both debt valuation gains and losses. Additionally, Bischof, Daske, and Sextroh (2013), using content analysis of public financial analyst conference calls, determine analysts' questions are positively associated with accounting effects of fair value changes in liabilities occurring as a result of the company's credit risk. This implies that analysts are seeking more information about the resulting income effects in consideration of their financial analysis and ultimate buy, sell, or hold recommendations of the entity.

Another continuing concern associated with fair value reporting, in general, is whether the amounts are reliably measured. FASB Financial Accounting Concept Statement No. 8, Chapter 3,

"Qualitative Characteristics of Useful Financial Information", identifies relevance and faithful representation as fundamental qualities of accounting information useful for decision making. Relevant information is information capable of making a difference in decision making for users of the financial information. Faithful representation is defined as reporting the economic substance of the financial transaction. Fair value information is generally considered relevant to financial decision making (Barth 2006). However, fair value measurement is frequently more subjective that its predecessor, historical cost measurement, giving rise to the debate between historical cost (assumed to have high reliability but low relevance) and fair value (assumed to have low reliability but high relevance).

SFAS No. 157 requires additional disclosure to indicate the level of subjectivity inherent in determining any fair value reported in the financial statements, at least in part to address reliability concerns. In the three-level hierarchy established by SFAS No. 157, Level 1 denotes the least subjective valuation. The fair value hierarchy prioritizes the inputs into the measurement calculations of fair value by assigning the highest priority to those inputs with quoted prices in active markets. Level 1 includes measurements based on identical assets/liabilities traded in active markets. Level 2 uses market transaction data for similar transactions, but the data is adjusted for subjective differences attributable to the actual asset or liability being measured. Level 3 measurements are used when no external market data is available and are based on the entity's best assumptions about inputs they believe the market would use in valuing the asset or liability in question. Items in this category obviously have substantial levels of subjectivity built into the measurement.

Several extant studies highlight potential reliability issues with fair value measurement. Clark, et al. (2013) examines asset amounts disclosed for each level of the fair value measurement hierarchy and, using forensic analysis, finds that all levels exhibit patterns of upward manipulation. Likewise, Jordan, et al. (2013) examines short term investments with fair values typically derived from market-based information, the most objective fair value measure. These authors, using forensic analysis, also find evidence suggesting upward manipulation. Watts (2003a, 2003b) also finds fair value estimates are vulnerable to managerial manipulation. However, Guthrie, Irving, and Sokolowsky (2011) did not find opportunistic election of the fair value option for liabilities among early adopters of the standard. More academic research (Koonce, Nelson, and Shakespeare 2011; Kadous, Koonce, and Thayer 2012) suggests users evaluate the reliability of the fair value information to determine the relevance of the information to their decision-making. This result suggests users are concerned about the potential for opportunistic measurement of fair values, providing further support for the fair value accounting debate that highlights the trade-off between relevance and faithful representation.

SFAS No. 159 gives firms the option to expand their use of fair value liability measurement, and several aforementioned studies suggest that fair value measurement may have negative consequences. The basis of our study is derived from understanding the potential impact of fair value liability measurement on financial reporting hinges upon the degree to which firms implement fair value liability reporting. We examine both the frequency and the magnitude of fair value liability measurement over the five-year period since the implementation of SFAS No. 157 in 2008. The simultaneous implementation of SFAS No. 159 also allows us to examine changes in

the frequency and magnitude of fair value liability reporting partitioned by the three-level hierarchy to provide insight into the subjectivity associated with fair value liability measurement. We seek to extend fair value liability research by answering the following questions: How has the frequency and magnitude of fair value liability reporting changed since the implementation of SFAS No. 159? How subjective are the fair value liability measurements presented in the financial statements? What are some characteristics of firms reporting liabilities at fair value?

RESULTS

Our full sample includes 35,255 firm-year observations taken from all available U.S. companies in the COMPUSTAT database for the years 2008 through 2012 with data necessary for this study. Missing hierarchy level data is set to zero rather than deleted under the assumption that the observation had no liabilities in that hierarchy level to report. Total liabilities stated at fair value for each observation is the sum of the fair value liabilities in each of the three hierarchy levels. We begin our analysis with 2008 data because it is the initial implementation year for both SFAS No. 157 and SFAS No. 159 which allows us to examine the prevalence and magnitude of fair value liability reporting both in total and partitioned by fair value hierarchy level.

Table 1
Percent (p-values) of firm reporting liabilities at fair value
n = 35,255

	2008	2009	2010	2011	2012	Full Sample
Level 1	.0509 (<.0001)	.0683 (<.0001)	.0730 (<.0001)	.0777 (<.0001)	.0840 (<.0001)	.0704 (<.0001)
Level 2	.1976 (<.0001)	.2813 (<.0001)	.2927 (<.0001)	.3097 (<.0001)	.3242 (<.0001)	.2798 (<.0001)
Level 3	.0700 (<.0001)	.1138 (<.0001)	.1437 (<.0001)	.1601 (<.0001)	.1538 (<.0001)	.1272 (<.0001)
Total	.2433 (<.0001)	.3590 (<.0001)	.3917 (<.0001)	.4142 (<.0001)	.4159 (<.0001)	.3630 (<.0001)

Table 1 discloses the percentage of companies reporting liabilities at fair value partitioned by fair value hierarchy level and year. Evaluating the sample as a whole, approximately 7% report Level 1 liabilities, 28% report Level 2 liabilities, 13% report Level 3 liabilities and a substantial 36% of the sample reports at least some liabilities at fair value. The trend analysis evident in Table 1 provides additional insight. In 2008, the first year that optional fair value liability reporting could be adopted, approximately 24% of the sample population reported some liabilities at fair value. Approximately 5% reported Level 1 liabilities (presumed to have the most objective measure of fair value), 20% reported Level 2 liabilities, and 7% reported Level 3 liabilities (presumed to have the most subjective measure of fair value). The percent of firms reporting fair value liabilities by hierarchy level and in total steadily rises from 2008 to 2011, but largely remains steady between 2011 and 2012. In 2012, the percentage of firms reporting liabilities at fair value seems to stabilize with approximately 8% reporting Level 1 liabilities, 32% reporting Level 2 liabilities, 15% reporting Level 3 liabilities, with a substantial 41% reporting at least some liabilities at fair value. As noted in Table 1, all values are statistically significant relative to 0 at the .01 level.

Table 2
First differences (p-values) of the percent of firms reporting liabilities at fair value
n = 35,255

	2008 to 2009	2009 to 2010	2010 to 2011	2011 to 2012	2008 to 2012
Level 1	0.0175 (<0.0001)	0.0046 (0.2811)	0.0047 (0.2919)	0.0064 (0.1751)	0.0332 (<0.0001)
Level 2	0.0836 (<0.0001)	0.0114 (0.1316)	0.0170 (0.0290)	0.0146 (0.0688)	0.1266 (<0.0001)
Level 3	0.0438 (<0.0001)	0.0299 (<0.0001)	0.0164 (0.0007)	0.0063 (0.3141)	0.0838 (<0.0001)
Total	0.1157 (<0.0001)	0.0327 (<0.0001)	0.0225 (0.0069)	0.0017 (0.8440)	0.1726 (<0.0001)

Table 2 discloses the first differences of the data presented in Table 1 to test the statistical significance of the year-to-year increases previously noted. All first differences of the 2008-2009 are positive and statistically significant at the .01 level. The number of firms reporting Level 1 liabilities increased by 1.75 percentage points, while the number of firms reporting Level 2 and Level 3 liabilities increased by 8.36 percentage points and 4.38 percentage points, respectively. In total, the number of firms reporting at least some liabilities at fair value increased by 11.57 percentage points. The approximate 3 percentage point increase in firms reporting Level 3 liabilities and any fair value liabilities in total from 2009 to 2010 is also significant at the .01 level. The magnitude of the Level 3 and total fair value first differences for the 2010 – 2011 period decrease but remain significant at the .01 level. The 2.18 percentage point increase in the number of firms reporting Level 2 liabilities is also significant at the .03 level for this same time period. In the next set of first differences (for the 2011 – 2012 period), only the 1.46 percentage point increase in the number of firms reporting Level 2 liabilities is statistically significant at the .07 level. The final column displays first differences between the percentage of firms reporting at least liabilities at fair value in 2008 relative to 2012, the first and last years in this study, respectively. Each hierarchy level exhibits a statistically significant increase at the .01 level, with the greatest increase occurring in Level 2. The percentage of firms reporting at least some liabilities at fair value increased by 17.26 percentage points over the 5-year study period with statistical significance at the .01 level.

Tables 1 and 2, taken together, suggest the number of companies reporting liabilities at fair value steadily increased from year to year between 2008 and 2011, leveling off between 2011 and 2012. The steady increase from 2008 through 2011 coincides with the first few years that firms were given the option to report an expanded set of liabilities at fair value by SFAS No. 159. The lack of increase from 2011 to 2012 is consistent with the possible maturation of fair value as a basis for liability measurement. This maturation suggests that most firms that wanted to exercise the option to apply fair value liability measurement did so prior to 2012 and that the number of companies reporting liabilities that required fair value measurement remained fairly constant from 2011 to 2012.

While the *percent* of firms reporting fair value liabilities in the previous two tables is sizeable, the *magnitude* of liabilities reported at fair value is more indicative of the potential impact of fair value liability reporting on the financial statements. We continue this study by examining

the magnitude of liabilities reported at fair value, limiting our analysis to only those 12,796 firms that report at least some liabilities at fair value (36.3% of the full sample as reported in Table 1) to avoid the dilutive effect of including firms with no fair value liabilities.

Table 3
Fair Value Liability Means in Thousands (p-values)
n = 12,796

	2008	2009	2010	2011	2012	Full Sample
Level 1	338.46 (0.0010)	387.66 (0.0002)	400.44 (<0.0001)	369.44 (<0.0001)	417.09 (<0.0001)	386.09 (<0.0001)
Level 2	5868.72 (0.0076)	3285.16 (0.0024)	2822.93 (0.0040)	3842.68 (0.0028)	3754.86 (0.0009)	3771.95 (<0.0001)
Level 3	302.16 (<0.0001)	181.18 (<0.0001)	147.74 (<0.0001)	163.18 (<0.0001)	164.88 (<0.0001)	183.32 (<0.0001)
Total	6509.34 (0.0052)	3853.99 (0.0013)	3371.11 (0.0018)	4375.30 (0.0014)	4336.84 (0.0004)	4341.36 (<0.0001)

Table 3 discloses the mean level of fair value liabilities reported among firms engaging in at least some fair value liability reporting. Table 3 suggests a general decreasing trend in the mean level of fair value liabilities *per observation* from 2008 to 2012. This decreasing trend, coupled with the increasing trend noted in Tables 1 and 2, suggests that new adopters of fair value liability reporting during this time frame did so in smaller magnitudes. The 2012 magnitudes for each hierarchy level and in total are similar to the means for the full sample. On average, fair value liability firms reported $386,000 in Level 1 liabilities, $3,772,000 in Level 2 liabilities, and $183,000 in Level 3 liabilities during the five-year period covered in this study. Hence, more than 86% of all fair value liabilities are valued using Level 2 criteria, which rely upon a moderate level of measurement subjectivity. All mean values reported in Table 3 are statistically significant relative to zero at the .01 level.

Given that firm size or macroeconomic effects could be driving the decreasing trend in magnitude level noted in Table 3, we continue our examination of magnitude by analyzing the percent of fair value liabilities relative to total liabilities.

Table 4
Fair Value Liabilities as a Percent of Total Liabilities (p-values)
n = 12,796

	2008	2009	2010	2011	2012	Full Sample
Level 1	.0127 (<0.0001)	.0163 (<0.0001)	.0182 (<0.0001)	.0137 (<0.0001)	.0188 (<0.0001)	.0162 (<0.0001)
Level 2	.0424 (<0.0001)	.0431 (<0.0001)	.0442 (<0.0001)	.0452 (<0.0001)	.0675 (<0.0001)	.0491 (<0.0001)
Level 3	.0208 (<0.0001)	.0315 (<0.0001)	.0449 (<0.0001)	.0442 (<0.0001)	.0389 (<0.0001)	.0373 (<0.0001)
Total	.0758 (<0.0001)	.0909 (<0.0001)	.1073 (<0.0001)	.1031 (<0.0001)	.1252 (<0.0001)	.1026 (<0.0001)

Table 4 reports fair value liabilities as a percent of total liabilities for the subset of firms reporting at least some liabilities at fair value. In general, the data suggest an increasing trend in the percent of total liabilities valued at fair value over the study period. The Level 1 percentage increases minimally over the study period, while the Level 2 percentage remains fairly constant until an increase in 2012. Level 3 liabilities increase from 2008 – 2010 and then level off, while the percent of fair value liabilities as a percent of total liabilities steadily increases over the whole study period with the exception of 2011. In the full sample, Level 1 liabilities represent 1.62% of total liabilities, while Level 2 and Level 3 liabilities represent 4.91% and 3.73% of total liabilities, respectively. The sum of all liabilities presented as fair value represents 10.26% of all liabilities presented on the balance sheet. All the values reported in Table 4 are statistically significant relative to zero at the .01 level.

Table 5
First Differences (p-values) of Fair Value Liabilities
as a Percent of Total Liabilities
n = 12,796

	2008 to 2009	2009 to 2010	2010 to 2011	2011 to 2012	2008 - 2012
Level 1	0.0036 (20.5700)	0.0020 (0.5004)	0.0046 (0.0898)	0.0051 (0.0396)	0.0016 (0.0206)
Level 2	0.0007 (0.8806)	0.0011 (0.8210)	0.0010 (0.8247)	0.0223 (<.0001)	4.9100 (<0.0001)
Level 3	0.0107 (0.0025)	0.0134 (0.0023)	0.0007 (0.8979)	-0.0053 (0.2465)	4.4800 (<0.0001)
Total	0.0150 (0.0232)	0.0165 (0.0178)	0.0043 (.5532)	0.0221 (0.0012)	7.1200 (<0.0001)

Table 5 discloses the first differences of the data presented in Table 4 to support the statistical significance of the year-to-year increases noted in the previous paragraph. Additionally, we also examined the total percentage change across all years in the study to find that each category exhibited a statistically significant increase. While Level 1 increased only .0016%, the increase is statistically significant at the .02 level. However, Level 2, Level 3, and total fair value liabilities exhibited increases of much greater magnitudes. Level 2 liabilities and Level 3 liabilities, as percentages of total liabilities, increased by 4.91 and 4.48 percentage points, respectively, with significance at the .01 level. Fair value liabilities, as a percent of total liabilities, increased by 7.12 percentage points during the five-year study period. This increase has statistical significance at the .01 level.

Table 6
Industries Reporting More than 47% of Total Liabilities at Fair Value
n = 35,255

Industry	Percent
Alcoholic Beverages	55.34
Chemicals	49.63
Automobiles, Trucks, and Aircraft	48.30
Utilities	63.12
Boxes and Shipping Containers	55.56
Rubber and Plastic, Shipbuilding, Railroad Equipment, and Financial	47.05

Next, we used the Fama and French 30-industry specification (Fama and French 2000) to examine our sample by industry and size, independently, to identify patterns among the firms that reported liabilities at fair value. While Table 4 indicates that firms, on average, use fair value measurement for 10.26% of their total liabilities, we find six industries with firms that report more than 47% of total liabilities at fair value. Firms in the utility industry use fair value measurement to value 63.12% of their total liabilities, while the alcoholic beverage (boxes and shipping containers) industry applies fair value measurement to approximately 55% of their total liabilities. We anticipated the extensive use of fair value liability measurement in the utility and financial sector industries because these industries routinely engage in derivative transactions to hedge risk exposure, and derivatives are mandatorily subject to fair value measurement.

Table 7
Percent of Observations (p-values) Reporting Fair Value Liabilities by Size
n = 35,255

	1	2	3	4	5	6	7	8	9	10
Level 1	.0060 (<0.0001)	.0139 (<0.0001)	.0119 (<0.0001)	.0216 (<0.0001)	.0428 (<0.0001)	.0542 (<0.0001)	.0797 (<0.0001)	.0982 (<0.0001)	.1288 (<0.0001)	.2474 (<0.0001)
Level 2	.0284 (<0.0001)	.0460 (<0.0001)	.0774 (<0.0001)	.1362 (<0.0001)	.1982 (<0.0001)	.2772 (<0.0001)	.3625 (<0.0001)	.4567 (<0.0001)	.5848 (<0.0001)	.6306 (<0.0001)
Level 3	.0746 (<0.0001)	.1067 (<0.0001)	.1027 (<0.0001)	.0817 (<0.0001)	.0910 (<0.0001)	.0891 (<0.0001)	.1027 (<0.0001)	.1404 (<0.0001)	.1707 (<0.0001)	.3129 (<0.0001)
Total	.1041 (<0.0001)	.1580 (<0.0001)	.1829 (<0.0001)	.2210 (<0.0001)	.2856 (<0.0001)	.3589 (<0.0001)	.4365 (<0.0001)	.5404 (<0.0001)	.6566 (<0.0001)	.6857 (<0.0001)

As a final step, we partitioned our full sample into deciles based on total assets to proxy firm size and evaluated the percent of observations reporting fair value liabilities, reporting the results in Table 7. Decile 1 represents the smallest 10% of the firms, while decile 10 represents the largest 10% of the firms. The results in Table 7 suggest a very strong correlation between the propensity to report at least some liabilities at fair value and firm size for each and every hierarchy level, as well as fair value liabilities in total. The percentage of firms reporting Level 1 liabilities increased from .0060 to .2474 across all deciles, while the percentage of firms reporting Level 2 liabilities increased from .0284 to .6306 across the same range. The percent of firms reporting Level 3 liabilities increased from .0746 for the small firms to .3129 for the largest firms. Accordingly, the percent of firms reporting at least some fair value liabilities increased from .1041 in decile 1 to .6857 in decile 10. All values reported in Table 7 are statistically significant relative to zero at the .01 level.

CONCLUSION

Our results suggest the prevalence of fair value liability reporting has exhibited an increasing trend since SFAS 159 allowed firms to optionally expand their use of fair value liability measurement in 2008. In 2012, more than 40% of all firms report at least some liabilities at fair value. Among those firms, fair value liabilities account for more than 12% of all liabilities reported on the balance sheet. Liabilities valued consistent with Level 2 and Level 3 criteria, the most subjective criteria, have experienced the most rapid increases. Collectively, these results suggest that a large number of firms elected the option to report eligible liabilities at fair value and that the

more subjective Level 2 and Level 3 criteria were used to value these liabilities. We also find fair value liability reporting to be positively correlated with both industry and firm size.

The extensive use of fair value liability reporting based on the most subjective measurement criteria, as noted in this study, suggests that any effect associated with fair value liability measurement will be substantial. Extant studies suggest fair value measurement negatively impacts comparability and consistency (Pounder 2012), correct interpretation of counterintuitive gains and losses (Gaylor et al. 2011; Lachmann et al. 2011), and opportunities for managerial manipulation (Jordan et al. 2013; Clark et al. 2013).

We acknowledge that this study has limitations. Our analysis is limited to those firms reported in the COMPUSTAT database, so, to the extent that our sample firms differ from firms in the population, our results may not generalize to the entire population. Mandatory fair value liability reporting existed prior to our study period, so we readily acknowledge that our results may not be entirely attributed to the optional fair value reporting enacted with SFAS 159. We have not yet tested our results in a multivariate setting; therefore, we have not controlled for macroeconomic effects, or examined other potential correlated variables. We acknowledge that the significance of our results might change in multivariate analysis. We encourage further research examining the disclosures relating to the fair value option to determine if they address the concerns about the reliability of the fair value option measurements as well as the potential impairment to comparability of financial information.

REFERENCES

Barth, M. 2006. Including estimates of the future in today's financial statements. *Accounting Horizons* 20: 271-275.

Bischof, J., H. Daske, and C. Sextroh. 2013. Analysts' Demand for Fair Value-Related Information: Evidence from Conference Calls of International Banks. Rochester: doi:http://dx.doi.org/10.2139/ssrn.2180896.

Cedergren M., C.Chen, and K. Chen. 2012. Debt valuation adjustments and CEO compensation. Rochester: doi:http://dx.doi.org/10.2139/ssrn.2176977

Clark, S., C. Jordan, and M. Dugan. 2013. Using Forensic Analytics to Evaluate the Reliability of Fair Value Reporting. *Journal of Forensic & Investigate Accounting* 5 (1): 151- 181.

Fama, E. and K. French. 2000. Forecasting profitability and earnings. *Journal of Business.* 73: 161-175.

FASB. 1993. *Accounting for Certain Investments in Debt and Equity Securities.* SFAS No. 115. Norwalk, CT.

FASB. 1998. *Accounting for Derivative Instruments and Hedging Activities*. SFAS No. 133. Norwalk, CT.

FASB. 2001. *Business Combinations*. SFAS No. 141. Norwalk, CT.

FASB. 2001. *Accounting for Asset Retirement Obligations*. SFAS No. 143. Norwalk, CT.

FASB. 2001. *Accounting for the Impairment or Disposal of Long-Lived Assets*. SFAS No. 144. Norwalk, CT.

FASB. 2006. *Fair Value Measurements*. SFAS No. 157. Norwalk, CT.

FASB. 2007. *The Fair Value Option for Financial Assets and Financial Liabilities.* SFAS No. No. 159. Norwalk, CT.

FASB. 2010. *Conceptual Framework for Financial Reporting Chapter 3, ''Qualitative Characteristics of Useful Financial Information.''* Statement of Financial Accounting Concepts No. 8. Norwalk, CT.

Gaynor, L., L. McDaniel, T. Yohn. 2011. Fair value accounting for liabilities: The role of disclosures in unraveling the counterintuitive income statement effect from credit risk changes. *Accounting, Organizations and Society* 36: 125-134.

Guthrie, K., J. Irving, and J. Sokolowsky. 2011. Accounting Choice and the Fair Value Option. *Accounting Horizons* 25 (3): 487-510.

Jordan, C., S. Clark, and G. Pate. 2013. The Debate Over Fair Value Reporting. *The CPA Journal* 83 (2): 46-51.

Koonce, L., K. K. Nelson, and C. Shakespeare. 2011. How do investors assess the relevance of fair value for financial instruments? *The Accounting Review* 86 (6): 2075–2098.

Kadous, K., L. Koonce, and J. Thayer. 2012. Do Financial Statement Users Judge Relevance Based on Properties of Reliability? *The Accounting Review* 87 (4): 1335-1356.

Lachmann, M., A. Wohrmann, A. Wompener. 2011. Acquisition and integration of fair value information on liabilities into investors' judgments. *Review of Accounting and Finance* 10 (4): 385-410.

Pounder, B. 2012. Another Fair Value Controversy. *Strategic Finance* November: 18-19.

Watts, R. (2003a). Conservatism in accounting part I. Explanations and implications. *Accounting Horizons* 17 (9): 207-221.

Watts, R. (2003b). Conservatisim in accounting part II: Evidence and research opportunities. *Accounting Horizons* 17 (12): 287-301.

THE INCENTIVE OF EARINGS MANAGEMENT IN CHINA FROM PROFIT BENCHMARKS PERSPECTIVE

Junjian Gu, Nagoya University
Dan Hu, Nagoya University

ABSTRACT

Many studies on earnings management have verified that earnings management occurs in china. However, research on the incentives of earnings management practices in China has been lacking. The goal of this paper is to determine what incentives managers of Chinese public corporation have when practicing earnings management to achieve several different profit targets, including loss avoidance, profit increasing and forecast achievement. In this study, we investigated incentives in terms of: 1. contractual relationship and 2. Stock market objective. Then we made several hypotheses on the motivations the managers practicing earnings management. Finally we carried out logit test to verify the various hypotheses.

Based on the results we found that when Chinese managers achieved different profit targets, their incentives of earnings management were also different. Our analysis shows that when managers avoided loss by earnings management, the incentives are more likely related to the contractual relationship objectives (the compensation and the implicit claims), while when they achieved earnings increasing or achieved forecast by earnings management, the incentives more likely related to the stock market objectives (Growth potential and return on assets 10%).

INTRODUCTION

Since 1970, the topic of accounting research about managers' using earnings management methods to reach kinds of aims, some like the compensation or the tax covenants, has been raised. (Watts and Zimmerman, 1986; Suda, 2000). And Xu (2010) found that managers' accrual-related forecast bias in range forecasts is somewhat affected by managerial opportunism and fear of litigation. We can see that the incentives of earnings management are verified by the different purposes. Therefore it seems that analyzing the incentives of earnings management with different profit targets, including loss avoidance, profit increasing and forecast achievement, is important. These three targets will be named as profit benchmarks.

About each profit benchmark we can find several extant researches. Matsumoto (2002) did researches about the incentive of managers when meet the forecast and found that there are three main factors of the incentive: 1, the ratio of the stockholder; 2, Maintain the relationship between consumers, employees and business partners; 3, the stock value relevance of earnings. Besides, Cheng and Warfield (2005) reported that one determining incentive to achieve forecasts is that managers are able to keep the stock. Also, Ke (2004) focused on the study of companies that keep profit increasing every year, and found that these companies are intended to retain the price of the stock and more likely to use earnings management to keep profit increasing. What's more, Koerniadi and Tourani-Rad (2008) asserted that Stock dividend issuing firms increase accruals

substantially in the issue year followed by poor earnings and stock price performance in the subsequent year. Last but not least, Salma et al (2011) found that firms that are subsequently sued have a higher prevalence of income-increasing discretionary accruals when the lawsuit allegations involve accounting issues.

Earnings manager practices have been found in China and there is much research proving that avoiding loss is an incentive of earnings management (Chen and Dai, 2004; Zhang, 2008). On the other hand, little research could be found about the relationship between other two profit benchmarks (increasing profit and achieving forecast) and earnings management. Also, even in the Chinese researches about the avoiding loss and earnings management, what are the managers' incentives to avoid loss remains unanswered. And this paper will try to answer the question: what incentives managers of Chinese public corporation have when practicing earnings management to achieve several different profit benchmarks.

Several researchers have found that the characteristics of the corporations which achieved the three profit benchmarks by using earnings management exist in the companies (Burgstahler and David, 2003; Suda and Shuto, 2006). Furthermore, research on this topic has divided incentives into two aspects: contract relationships and stock market objectives (Watts and Zimmerman, 1986; Healy, 1999; Suda and Shuto, 2006). The incentives of contractual relationship refers to the incentive of earnings management to improve management compensation or decrease the risk of voiding loan contracts; and the incentives of stock market objectives refers to the incentive of earnings management to improve the value of stock or raising capital.

For this paper, we apply the above conclusions to a Chinese context and investigate incentives in terms of contractual relationship and stock market objective. Then, we made several hypotheses on the managers' incentives for practicing earnings management. Finally, we carried out logit test to verify the various hypotheses. Compared with the prior researches this paper has two characteristics: 1. the objects of the research are three distinct profit benchmarks; 2. the hypotheses of incentive are set along two aspects. The aim of compounding profit benchmark and the incentives of earnings management is to ascertain whether the incentives will change or not with different profit benchmark. Based on the results we found that when Chinese managers achieved different profit targets, their incentives of earnings management were also different. Our analysis shows that when managers avoided loss by earnings management, the incentives are more likely related to the contractual relationship objectives (the compensation and the implicit claims), while when they achieved earnings increasing or achieved forecast by earnings management, the incentives more likely related to the stock market objectives (Growth potential and return on assets 10%).

HYPOTHESES

Contractual Relationship Motivated Earnings Management

Executive Compensation

Linking compensation with profit will align managers' interests with those of stockholders, yet it turns out that it can also contribute to increase in managers' incentive of earnings

management (Healy, 1985; Holthausen et al. 1995; Matsunaga and Park, 2001). Also, managers tend to use earnings management to improve their financial numbers and subsequently reinforce their compensation (George, 2009).

The findings above suggest that raising compensation will motivate managers to reach the profit benchmarks. Furthermore, it predicts that the more correlated the relation between compensation and profit, the higher the managers' motivation on earnings management would be. Using the above rationale, the following hypothesis is as follows:

H1 Managers whose compensation is related to profit are more likely to use earnings management to reach the profit benchmarks.

We use COMPlevel and COMPchange as proxy variables to reflect the relationship between compensation and profit. These two variables represent how much compensation will be changed when the profit changes and can be estimated by the regression equations below (Bushman et al, 1998; Otomasa,2006):

$$COMP = \alpha + \beta_1 NI + \varepsilon \quad (1)$$

where: $COMP$: Sum of the compensation and bonuses; NI : Net income;
β_1 :Constant of COMPlevel in loss avoidance situation.

$$\Delta COMP = \alpha + \beta_2 \Delta NI + \varepsilon \quad (2)$$

where: $\Delta COMP$: Difference between previous year and current year's COMP;
ΔNI : Difference between previous year and current year's NI;
β_2 : Constant of COMPchange in loss avoidance situation.

We hypothesized that COPMlevel and COMPchange will be positive for firms with high correlation between compensation and profit.

Manager Dismissal

Firms with unfavorable performance are more likely to change their management as penalty. Therefore, in order to avoid dismissal, managers will be more motivated to enhance stockholders' value (Otomasa, 2004).

Under the circumstance that the relevance of the value change and the possibility of manager dismissal are high, earnings management will be more prevalent. So those firms that have high possibilities of dismissing managers when the performance is worsening, are more likely to have the motivation to achieve the profit benchmarks. Using the above rationale, the following hypothesis is as follows:

H2 Managers who have the risk of being dismissed for under-performance are more likely to reach the benchmark using earnings management.

The proxy variable of the correlation between manager changing and profit will be reflected by CTURN. CTURN can be estimated with the regression equation below (Shuto, 2007):

$$CEO = \alpha + \beta_1 \Delta NI + \varepsilon \quad (3)$$

where: CEO : Dummy variable (1 = managers changed between current year and the following year; 0 = otherwise); ΔNI : Difference between previous year and current year's net income; β_1: Constant of CTURN in loss avoidance situation.

Table 1
INCENTIVES OF EARNINGS MANAGEMENT

	Construct	Proxy	Variable Name	Expected Sign
Panel A: Contractual relationship variables				
H1	Executive compensation	Estimated from the regression model (Bushman et al, 1988; Otomasa, 2008) with the cross section data from fiscal year t-5 to t-1. Each varible of the modelwill be devided by assets at the end of fiscal year t-1. The varible will be replace to 0 when it is minus.	COMPlevel(change)	(+)
H2	Manager changing	Estimated from the regression model CEO=α+β1ΔNI+εwith the data from fical year 2003to 2011. The variable will be replace to 0 when it is plus or there is no manager changed in the fiscal year t.	CTURN	(-)
H3	Debt contract	Estimated by the number of unpaid debt normalized by the total assets (change in natural logarithm).	COVEN	(+)
H4	Implicit claims	①Dummy variable indicating membership in durable goods industry ②R&D/Assets ③Measure of labor intensity (1－(PPE/Gross Assets)) Factor scores from factor analysis	ICLAIM	(+)
H5	Penalty	Dummy variable takes 1 for the firms that get punished during the year t-1 and 0 otherwise.	PENAL	(-)
Panel B: Stock market variables				
H6	Stock holding of management	Estimated by the number of staff's shares multiplied by 1% of the year-end stock price.	EQUIT	(+)
H7	Stock value's relevance of earnings	Estimated from the regression model P=α+β1EPS+ε with the cross section data from fiscal year t-5 to t-1.The variable will be replace to 0 when it is minus.	EARNPRICE	(+)
H7	Stock value's relevance of earnings	Estimated from the regression model CAR=α+β2ΔEPS+ε with the cross section data from fiscal year t-5 to t-1.The variable will be replace to 0 when it is minus.	EARNRET	(+)
H8	Growth potential	Market value / Book value.	MB	(+)
H9	Public offering	Dummy variable takes 1 for public offering during the year t+1 and 0 for those that are not.	SEO	(+)
H10	Bond releasing	Dummy variable takes 1 for public offering during the year t+1 and 0 for those that are not.	BOND	(+)
H11	Return on assets 6%	Dummy variable takes 1 for the ROA is between 6%-7% during the fiscal year t and 0 otherwise.	ROASIX	(+)
H12	Return on assets 10%	Dummy variable takes 1 for the ROA is between 10%-11% during the fiscal year t and 0 otherwise.	ROATEN	(+)
Panel C: Control variables				
	Size	Natural logarithm of the market value of equity.	lnMV	(+)
	Cash flow	Operating cash flow/ assets at the end of fiscal year t-1.	CFO(CCFO)	(+)
	Year	Year dummy.	YEARDummy	
	Industry	Industry dummy.	INDUSTRYDummy	

Since managers are more likely to be dismissed when the profit is worsening, the expected sign of CTURN is negative.

Debt Contract

The incompatible interest between creditors and stockholders poses a problem for managers. Managers will use several ways to alleviate the conflicts between the two and one method to settle them is to set debt covenants (Suda, 2000). However, when debt covenants require a specific profit target with strict requirements and penalties, managers are more likely to engage in earnings management to achieve the target set in the debt covenants. Using the above rationale, the following hypothesis is as follows:

H3 Managers in firms that have a higher risk in case of debt covenants violation are more likely to reach the profit benchmark using earnings management.

The proxy variable of the debt covenants (COVEN), will be estimated by natural log of ratio of value of unpaid debt and total assets. If the managers break the debt covenants, they will have to return the debt which will result in disruption in cash flow and business operation. Consequently, firms with more unpaid debt are in higher risk of breaking debt covenants.

Stakeholders' Implicit Claims

Stakeholders' implicit claims can be defined as relational contracts between firms and their stakeholders that are left implicit to accommodate change and have no legal standing (Bowen et al, 1995). Consequently, stakeholders with implicit claims will make their decisions whether to continue to trade with the firm based on its reputation or performance. Bowen et al. (1995) implied that the managers with great reliance on implicit claims with stakeholders are more likely to choose the accounting methods that can improve their financial performance. Using the above rationale, the following hypothesis is as follows:

H4 Managers with greater reliance on implicit claims with stakeholders are more likely to reach the profit benchmarks using earnings management.

In this study, we employ Matsumoto (2002) method to define stakeholders' implicit claims variable (ICLAIM): membership in a durable goods industry, research and development expenditures scaled by total assets, and measure of labor intensity (1 minus the ratio of gross property, plant and equipment to total assets).

Penalty

The China Securities Regulatory Commission (CSRC), Shanghai Stock Exchange and Shenzhen Stock Exchange have the duty to supervise listed firms in mainland China aim to protect the benefit of the investors. The firms that break capital market regulations would be penalized. These firms are then required to improve their behavior. Earnings management is expected to decrease in investor protection because strong protection limits insiders' ability to acquire private control benefits, which reduces their incentives to mask firm performance. (Christian L, Dhananjay N and Peter D. W; 2003) Using the above rationale, the following hypothesis is as follows:

H5 Managers in firms that were penalized by regulators are less likely to reach the profit benchmarks using earning management.

The dummy variable PENALTY is used as proxy variable of the penalty effect, where it takes a value of 1 for firms that are penalized during the year before current year and 0 otherwise.

Stock Market Motivated Earnings Management

Stockholding of Management

Previous research on managers' motivation in earnings management focused on stock options and ownership of firms' shares by their managers.

Ke (2004) examined firms that continually rise profit, and he made the following two conclusions. First, in order to make the profit rise continuously, managers are more likely to use earnings management. Second, in order to sell stocks at high price, managers who is in the high equity incentive firms will sell the stocks between the 2nd and 6th quarter during the rising trend. Accordingly, the equity incentive will motivate managers to reach the profit benchmarks. Using the above rationale, the following hypothesis is as follows:

H6 Managers in higher equity incentive firms are more likely to reach the profit benchmarks using earnings management.

Core and Guay (1999) argued that equity incentive could be estimated as the change in the amount of stock value belonging to the managers as the price of the stock increased by 1%. Hence, in this paper we estimate the proxy variable EQUITY by the natural log of the number of stocks held by managers multiplied by 1% of the year-end stock price.

The Stock Value's Relevance of Earnings

The stock value's relevance of earnings also affects the motivation of reaching the profit benchmark. Matsumoto (2002) said that lower stock value's relevance of earnings will lead to lower incentive for reaching analyst's expectation would be. Ke (2004) also concluded that firms with lower sensitivity to earnings and stock have less incentive to continually raise profit. Using the above rationale, the following hypothesis is as follows:

H7 Managers in firms that have high stock value's relevance of earning are more likely to reach the profit benchmarks using earnings management.

We use EARNPRICE and EARNRET as proxy variables to reflect stock the value's relevance of earnings. These two variables can be estimated by the regression equations below:

$$P = \alpha + \beta_1 EPS + \varepsilon \quad (4)$$

where: P : Price of the year-end; EPS : Earnings per share of the year-end;
β_1: Constant of EARNPRICE in loss avoidance situation.

$$CAR = \alpha + \beta_2 \Delta EPS + \varepsilon \quad (5)$$

where: CAR : The annual adjusted cumulative market return;
ΔEPS : Difference in the previous year and current years' EPS;
β_2 : Constant of EARNRET in loss avoidance situation.

The Growth Potential

Growth potential as represented by the ratio of market value and book value (M/B ratio) could affect managers' incentive to achieve profit benchmarks. Skinner and Sloan (2002) showed that compared to value stocks, growth stocks are much more sensitive to the negative errors of analysts' estimation.

Based on this finding, further research on the relationship between growth and profit benchmark have shown that high growth potential firms have bigger incentive to achieve the profit benchmarks (Matsumoto, 2002; Ke, 2004; Cheng and Warfield, 2005). Using the above rationale, the following hypothesis is as follows:

H8 Managers in firms with high ratio of market book value are more likely to reach the profit benchmarks using earnings management.

Direct Financial Funding

There are two direct ways of financial funding: public offering financing through securities market and issuing bond. When managers intend to conduct public offering, they are more likely to use earnings management to make recent financial figures appears better (Teoh et al, 1998). Cohen and Zarowin (2010) showed that post-seasoned equity offerings operating underperformance is driven not just by accrual reversals, but also reflects the real consequences of operational decisions made to manage earnings. By the same logic, it could be said that the managers have more motivation to achieve the profit benchmarks. Using the above rationale, the following hypothesis is as follows:

H9 Managers planning to conduct public offering in the next period are more likely to reach the profit benchmark using earnings management.

We use dummy variable SEO as a proxy variable to reflect the public offering where it takes a value of 1 for firms conducting public offering during the year after current year and 0 otherwise.

In addition to financing through public offering, managers planning to rise funding through bond issuance are more likely to use earnings management to make recent financial figures appears better. Sengupta (1998) verified that the value of bond issuance is dependent on the recent ratio of sales income. Using the above rationale, the following hypothesis is as follows:

H10 Managers planning to issue bond in the following term are more likely to reach the profit benchmarks using earnings management.

We use dummy variable BOND as a proxy variable to reflect the bond issuance where it takes a value of 1 for firms issuing bond during the year after current year and 0 otherwise.

Return on Assets (ROA)

The SCRC issued a regulation about capital increase of listed firms. This rule includes supplementary requirements of capital increase that during the period of three years, the average ROA has to be over 10% and the previous year's ROA has to be over 10%. However, under the condition that the firms are undergoing great asset restructuring, they only have to meet a minimum ROA increase of 6%. Previous Chinese research on managers' motivation in earnings management focused on meeting ROA 6% or ROA10% (Chen, Xiao and Guo 2000; Gu, 2008). Using the above rationale, the following hypothesis is as follows:

H11 Managers in firms with ROA that are close to the 6% threshold are more likely to reach the profit benchmarks using earnings management.

H12 Managers in firms with ROA that are close to the 10% threshold are more likely to reach the profit benchmarks using earnings management.

We use dummy variable ROASIX as a proxy variable to represents firms with ROA threshold of 6% where it takes a value of 1 for firms with ROA between 6%-7% and 0 otherwise. In addition, dummy variable ROATEN is as a proxy variable to represents firms with ROA threshold of 10% where it takes a value of 1 for firms with ROA between 10%-11% and 0 otherwise.

RESEARCH DESIGN AND SAMPLE

Research Design

To verify the hypothesis on earnings management of reaching profit benchmarks, we use the following logic regression model:

$$BENCHMARK = \alpha+\beta_1 COMP_{level(change)}+\beta_2 CTURN+\beta_3 COVEN+\beta_4 ICLAIM+\beta_5 PENAL +\beta_6 EQUIT+\beta_7 EARNPRICE(EARNRET)+\beta_8 MB+\beta_9 SEO+\beta_{10} BOND +\beta_{11} ROASIX+\beta_{12} ROATEN+\beta_{13} lmMV+\beta_{14} CFO(CCFO)+YEARDummy +INDUSTRYDummy+\varepsilon \quad (6)$$

From the equation (6), BENCHMARK is a dummy variable indicating whether or not the profit benchmark is achieved. It takes a value of 1 when the profit benchmark is achieved by using discretionary accruals and 0 otherwise.

Loss avoidance, profit increasing and forecast achievement will be represented by LOSSEM, DECEM and FORECASTEM variables. Discretionary accruals will be calculated with CFO modified Jones model (Kasznik, 1999). Three models named MODEL (1), MODEL (2) and MODEL (3) are constructed for those three variables.

In order to control for factor influencing the incentive of earnings management for reaching profit benchmarks, we use: size (SIZE: natural logarithm of the market capitalization), cash flow (CFO) and it is change (CCFO), year dummy (YEARDummy), industry dummy (INDUSTRYDummy). Since the bigger the size and the larger the cash flow contribute to higher possibility for achieving the profit benchmarks, the expected sign of the SIZE, CFO, and CCFO will be positive (Matsumoto, 2002; Ke, 2004; Cheng and Warfield, 2005). CFO variable is used to analyze the loss avoidance situation. In addition, CCFO would be used to analyze profit increasing and forecast achievement situations (Ayers et al, 2006).

Sample and Data

The sample is collected from the China Stock Market and Accounting Research (CSMAR) database for the period 2003-2011 which satisfy the following requirements:

1. Listed on either Shanghai or Shenzhen Stock Exchange.
2. Does not belong to the securities, banking or insurance industry.
3. Fiscal year ended as of December 31.
4. No missing variables or data.

Table 2

DESCRIPTIVE STATISTICS FOR DEPENDENT VARIABLE

Panel A: Profit benchmark

	Achieved		None achieved		Total
Loss avoidance	2,860	92.20%	242	7.80%	3,102
Using discretionary accruals	1,312	95.70%	59	4.30%	1,371
	1,312/2,860=	45.87%			
Earnings increasing	1,981	63.86%	1,121	36.14%	3,102
Using discretionary accruals	886	64.62%	485	35.38%	1,371
	886/1,981=	44.72%			
Forecast achievement	1,229	39.62%	1,873	60.38%	3,102
Using discretionary accruals	567	41.36%	804	58.64%	1,371
	567/1,229=	46.14%			

Panel B: Variables about incentive of earnings management

Variable	Obs	Mean	Std. Dev.	Min	Max
complevel	3,102	0.256	0.535	0.000	9.644
compchange	3,102	0.168	0.465	0.000	9.332
cturn	3,102	−0.248	1.434	−25.050	0.000
coven	3,102	0.008	0.028	0.000	0.258
iclaim	3,102	0.485	0.327	0.001	1.000
penalty	3,102	0.056	0.231	0.000	1.000
equit	3,102	3.371	4.415	0.000	18.269
earnprice	3,102	16.827	19.507	0.000	99.469
earnret	3,102	0.699	2.205	0.000	75.472
mb	3,102	1.681	1.124	0.611	16.006
seo	3,102	0.084	0.277	0.000	1.000
bond	3,102	0.095	0.293	0.000	1.000
roasix	3,102	0.055	0.228	0.000	1.000
roaten	3,102	0.025	0.155	0.000	1.000
lnmv	3,102	15.294	1.047	12.804	21.217
cfo	3,102	−0.005	0.461	−14.589	2.175
ccfo	3,102	−0.028	0.464	−14.509	2.587

Table 2 shows descriptive statistics results of the sample that meet the requirements. Panel A describes the ratio of the profit benchmarks achieved and Panel B depicts the incentive of earnings management variables.

From Panel A, 2,860 firm-years out of 3,102 firm-years are in the group of loss avoidance. It denotes that about 92.2% corporations have avoided the loss. Among the corporation that avoided the loss, there are 1,312 of the observations, about 45.87% of the corporations, used the discretionary accrual to achieve the benchmark. What's more, about 63.86% of the corporations kept earnings rising, among which there are nearly 44.72% used discretionary accrual to achieve the benchmark. At last, about 39.62% of the corporations reach the forecast, among which there are nearly 46.14% used discretionary accrual to achieve the benchmark.

Table 3
CORRELATIONS AMONG THE VARIABLES

Panel A: Correlation of the variable for loss avoidance

	m1sda	compl~l	cturn	coven	iclaim	penalty	equit	earnpr~e	mb	seo	bond	roasix	roaten	lnmv	cfo
m1sda	1														
complevel	0.052	1													
cturn	0.019	−0.05	1												
coven	0.072	−0.03	0.012	1											
iclaim	0.077	0.053	−0.02	−0.04	1										
penalty	−0.02	−0.02	0.035	−0.05	−0.02	1									
equit	0.034	0.01	0.027	0.044	−0.03	0.054	1								
earnprice	0.039	0.082	−0.06	0.047	−0.04	−0.03	0.011	1							
mb	0.029	−0.03	0.03	−0.09	−0.05	0.067	0.089	0.082	1						
seo	0.057	0.021	0.036	−0.03	−0.01	−0.01	0.018	−0.03	−0.04	1					
bond	0.084	−0.01	0.005	0.407	−0.01	−0.03	0.086	0.077	−0.08	0.041	1				
roasix	0.005	0.02	0.006	9E−04	0.028	−0.01	0.06	−0.03	−0.02	0.014	0.018	1			
roaten	0.042	−0.01	−0.01	0.011	0.019	−0.02	−0.03	−0.01	0.047	−0.02	0.013	−0.04	1		
lnmv	0.165	0.016	0.013	0.196	−0.01	−0.05	0.149	0.06	0.18	0.174	0.32	0.038	0.085	1	
cfo	−0.08	0.023	−0.01	0.002	0.035	−0.05	0.016	0.029	0.018	−0.23	−0	0.007	0.035	1E−04	1

Panel B: Correlation of the variable for earnings increasing

	m2sda	compch~e	cturn	coven	iclaim	penalty	equit	earnret	mb	seo	bond	roasix	roaten	lnmv	ccfo
m2sda	1														
compchange	−0.01	1													
cturn	0.073	−0.05	1												
coven	0.004	−0.01	0.012	1											
iclaim	0.072	0.006	−0.02	−0.04	1										
penalty	−0.02	−0.03	0.035	−0.05	−0.02	1									
equit	0.047	−0.02	0.027	0.044	−0.03	0.054	1								
earnret	−0	0.009	−0.02	−0	1E−04	−0.01	0.036	1							
mb	0.097	−0.07	0.03	−0.09	−0.05	0.067	0.089	0.066	1						
seo	0.071	8E−04	0.036	−0.03	−0.01	−0.01	0.018	−0.01	−0.04	1					
bond	0.037	0.025	0.005	0.407	−0.01	−0.03	0.086	−0.02	−0.08	0.041	1				
roasix	0.041	−0.03	0.006	9E−04	0.028	−0.01	0.06	0.024	−0.02	0.014	0.018	1			
roaten	0.052	−0.01	−0.01	0.011	0.019	−0.02	−0.03	−0.01	0.047	−0.02	0.013	−0.04	1		
lnmv	0.184	0.046	0.013	0.196	−0.01	−0.05	0.149	−0.03	0.18	0.174	0.32	0.038	0.085	1	
ccfo	−0.08	0.023	−0.01	0.01	0.018	−0.04	0.011	0.009	0.022	−0.21	−0	0.003	0.013	−0.03	1

Panel C: Correlation of the variable for forecast achievement

	m3sda	compch~e	cturn	coven	iclaim	penalty	equit	earnret	mb	seo	bond	roasix	roaten	lnmv	ccfo
m3sda	1														
compchange	−0.01	1													
cturn	0.051	−0.05	1												
coven	0.001	−0.01	0.012	1											
iclaim	0.047	0.006	−0.02	−0.04	1										
penalty	−0.02	−0.03	0.035	−0.05	−0.02	1									
equit	0.042	−0.02	0.027	0.044	−0.03	0.054	1								
earnret	−0.03	0.009	−0.02	−0	1E−04	−0.01	0.036	1							
mb	0.069	−0.07	0.03	−0.09	−0.05	0.067	0.089	0.066	1						
seo	0.017	8E−04	0.036	−0.03	−0.01	−0.01	0.018	−0.01	−0.04	1					
bond	0.029	0.025	0.005	0.407	−0.01	−0.03	0.086	−0.02	−0.08	0.041	1				
roasix	0.036	−0.03	0.006	9E−04	0.028	−0.01	0.06	0.024	−0.02	0.014	0.018	1			
roaten	0.06	−0.01	−0.01	0.011	0.019	−0.02	−0.03	−0.01	0.047	−0.02	0.013	−0.04	1		
lnmv	0.177	0.046	0.013	0.196	−0.01	−0.05	0.149	−0.03	0.18	0.174	0.32	0.038	0.085	1	
ccfo	−0.04	0.023	−0.01	0.01	0.018	−0.04	0.011	0.009	0.022	−0.21	−0	0.003	0.013	−0.03	1

From the panel A in table 3, the correlation of 12 variables for loss avoidance, the signs of all variables but CTURN are in line with the expected value. From the panel B in Table 3, the correlation values of the 12 variables for profit increasing, the signs of all variables but COMPchange, CTURN and EARNRET match up the expectation. Panel C in Table 3 showed the correlation of the 12 variables for forecast achievement where the signs of all variables but COMPchange, CTURN and EARNRET are aligned with the expectation. There are low level of correlation among the all variables, which means no multicollinearity problem.

RESULTS OF EMPRICIAL ANALYSIS

Table 4

LOGIT ANALYSIS OF ACHIEVING PROFIT BENCHMARK AND INCENTIVES OF EARNINGS MANAGEMENT

$$Model(1)\ LOSSEM = \alpha+\beta_1 COMP_{level}+\beta_2 CTURN+\beta_3 COVEN+\beta_4 ICLAIM+\beta_5 PENAL+\beta_6 EQUIT+\beta_7 EARNPRICE+\beta_8 MB+\beta_9 SEO+\beta_{10} BOND+\beta_{11} ROASIX+\beta_{12} ROATEN+\beta_{13} lmMV+\beta_{14} CFO+YEARDummy+INDUSTRYDummy+\varepsilon$$

$$Model(2)\ DECEM = \alpha+\beta_1 COMP_{change}+\beta_2 CTURN+\beta_3 COVEN+\beta_4 ICLAIM+\beta_5 PENAL+\beta_6 EQUIT+\beta_7 EARNRET+\beta_8 MB+\beta_9 SEO+\beta_{10} BOND+\beta_{11} ROASIX+\beta_{12} ROATEN+\beta_{13} lmMV+\beta_{14} CCFO+YEARDummy+INDUSTRYDummy+\varepsilon$$

$$Model(3)\ FORECASTEM = \alpha+\beta_1 COMP_{change}+\beta_2 CTURN+\beta_3 COVEN+\beta_4 ICLAIM+\beta_5 PENAL+\beta_6 EQUIT+\beta_7 EARNRET+\beta_8 MB+\beta_9 SEO+\beta_{10} BOND+\beta_{11} ROASIX+\beta_{12} ROATEN+\beta_{13} lmMV+\beta_{14} CCFO+YEARDummy+INDUSTRYDummy+\varepsilon$$

Variable Name	Expected Relation with	Model (1) Coef.	Model (1) P>|z|	Model (2) Coef.	Model (2) P>|z|	Model (3) Coef.	Model (3) P>|z|
complevel	(+)	0.215	0.004 ***	−0.050	0.624	−0.075	0.539
cturn	(−)	0.025	0.355	0.217	0.001 ***	0.167	0.013 **
coven	(+)	2.337	0.117	−1.614	0.334	−2.588	0.188
iclaim	(+)	0.627	0.000 ***	0.633	0.000 ***	0.254	0.159
penalty	(−)	−0.199	0.239	−0.265	0.163	−0.189	0.402
equit	(+)	0.003	0.740	0.007	0.445	0.016	0.151
earnprice	(+)	0.002	0.228	0.001	0.976	−0.040	0.241
mb	(+)	0.012	0.761	0.123	0.002 ***	0.102	0.018
seo	(+)	0.042	0.770	0.211	0.154	−0.151	0.394
bond	(+)	0.068	0.644	−0.038	0.808	−0.048	0.790
roasix	(+)	0.004	0.981	0.317	0.066 *	0.277	0.152
roaten	(+)	0.440	0.070 *	0.525	0.033 **	0.584	0.025 **
lnmv	(+)	0.319	0.000 ***	0.364	0.000 ***	0.441	0.000 ***
cfo	(+)	−0.848	0.000 ***	−0.422	0.001 ***	−0.215	0.025 **
likelihood		−2017.283		−1746.398		−1390.178	
Pseudo R2		0.045		0.059		0.058	
N		3,102		3,102		3,102	

*,**,*** Indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

The results of empirical analysis listed in Table 4.

From the results of Model (1), COMPlevel and ICLAIM exhibit estimate signs in accordance to the expected estimate and are statistically significant. Those variables represent the 5 variables which belonging to the part of contractual relationship two variables. Thus, H1 and H4 are supported. Meanwhile, among 7 variables related to stock market motivated earnings management, there is only one variable (ROATEN) that is statistically significant and consistent with the expected sign. Thus H12 is supported.

Hence, about the incentive of earnings management for loss avoidance, executive compensation and implicit claims are the motivations as the part of contractual relationship. Furthermore ROA10% is the part of stock market motivation.

From the results of Model (2), there is only one variable, ICLAIM, which is consistent with expected sign of estimate and is statistically significant. Those variables represent the 5 variables which belong to the part of contractual relationship Thus H4 is supported. Meanwhile, among the 7 variables which belong to the part of stock market motivation there are 3 variables (MB, ROASIX and ROATEN) which are consistent with expected sign of estimate and statistically significant. Thus H8, H11 and H12 are all supported.

Hence, about the incentive of earnings management for earnings increasing, implicit claims is the motivation as the part of contractual relationship. Furthermore ROA10%, ROA6% and growth potential are the part of stock market motivation.

From the results of Model (3), none of 5 variables which belong to part of contractual relationship have the expected sign and are statistically significant. On the other hand, 2 variables (MB and ROATEN) which have the same estimation sign as expected and are statistically significant. Those variables represent the 7 variables which belong to the part of stock market there are. Thus the H8 and H12 are supported.

Hence, about the incentive of earnings management for forecast achieving, as the part of contractual relationship nothing could be found as a motivation. And Growth potential and ROA10% are the motivations as the part of stock market.

CONCLUSION

Table 5
THE RESULTS ABOUT THE PROFIT BENCHMARK AND THE INCENTIVES OF EARNINGS MANAGEMENT

			Loss avoidance	Earnings increasing	Forecast achievement
HYPOTHESES	Contractual Relationship Objects	Executive compensation	○	×	×
		Manager changing	×	×	×
		Debt contract	×	×	×
		Implicit claims	○	○	×
		Penalty	×	×	×
	Stock Market Objects	Stock holding of management	×	×	×
		Stock value's relevance of earnings	×	×	×
		Growth potential	×	○	○
		Public offering	×	×	×
		Bond releasing	×	×	×
		Return on assets 6%	×	○	×
		Return on assets 10%	○	○	○

The results analyzed above have been summarized in Table 5. From Table 5, the features of earnings management for each profit benchmark are listed.

1. From the contractual relationship objectives, the number of incentives of earnings management for reaching the profit benchmark for loss avoidance is higher than the other two benchmarks. On the other hand, from the stock market objectives, the number of incentives of earnings management for reaching the profit benchmark for loss avoidance is less than the other two benchmarks. That means when the managers avoided loss by earnings management, the incentives are likely to connect to contractual relationship objectives, such as compensation and implicit claims.

2. There is no incentive connected to contractual relationship when the managers achieved the forecast by using earnings management. In other word, manager achieved the forecast by using earnings management not for contractual relationship objectives but only for stock market objectives.

3. The incentives of managers using earnings management to reach profit benchmarks for profit increasing and forecast achievement are similar. They are both more related to stock market objectives rather than contractual relationship objectives.

4. Making ROA close to the 10% is the only one incentive of reaching all the three profit benchmark by using earnings management. That is to say, whatever the profit benchmark is, managers are enthusiastic to meet the conditions of the capital increase. It is possible that capital increase of public corporations issued by the CSRC has a great effect on the managers' behavior.

In summary, the analysis shows that when managers avoided loss by earnings management, the incentives are more likely related to the contractual relationship purpose (the compensation and the implicit claims), while when they achieved earnings increasing or achieved forecast by earnings management, the incentives more likely related to the stock market objectives (Growth potential and return on assets 10%).

One aspect this study does not cover is changes in incentive over time. The Chinese accounting law and the accounting principle had changed since 2007. Consequently, the incentive might have been changed as well. This study does not investigate any possible changes that many have occurred after 2007 in the incentive of reaching profit benchmark by using earning management. So for the future study, it would be useful to analyze the incentive of earning management by two different period aiming to find some changes.

REFERENCES

Ayers, B., Jiang, J. & P. Yeung (2006). Discretionary accruals and earnings management: An analysis of pseudo earnings targets. *The Accounting Review*, 81, 617-652.

Bowen, R.M., DuCharme, L. & D. Shores (1995). Stakeholders' implicit claims and accounting method choice. *Journal of Accounting and Economics*, 20, 99-126.

Burgstahler & C. David (2003). Earnings management to avoid losses and earnings decreases: Are analysts fooled? *Contemporary Accounting Research*, 30(1), 253-294.

Bushman, R.M., Engel, E., Milliron, J. & A.J. Smith (1998). An empirical investigation of trends in absolute and relative use of earnings in determining CEO cash compensation, Working Paper.

Chen, X. & C. Dai (2004). An empirical analysis on the earnings management of the A-Share loss firms. *China Accounting Review*, 2, 299-310.

Chen, X., X.XiGaouo (, X20. &00). Stock option and earnings management of listed company. *China Economic Research*, 1,30-36.

Cheng, Q. & T.D. Warfield (2005). Equity incentives and earnings management. *The Accounting Review*, 80(2), 441-476.

Christian, L., Dhananjay, N. & Peter, D. Wysocki (2003). Earnings management and investor protection: an international comparison. *Journal of Financial Economics*, 69, 505-527.

Cohen, D.A. & P. Zarowin (2010). Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics*, 50, 2-19.

Core, J. & W. Guay (1999). The use of equity grants to manage optimal equity incentive levels. *Journal of Accounting and Economics*, 28, 151-184.

George, I. & K. George (2009). Earnings management and firm financial motives: A financial investigation of UK public firms. I*nternational Review of Financial Analysis*, 18, 164-173.

Gu, Z. (2008). T*he motivations and manners research of earnings management about listed company*. Unpublished doctoral dissertation, University of Shanghai Jiao Tong.

Healy, P.M. (1985). The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics*, 7, 85-107.

Holthausen, R.W., Lacker, D.F. & R.G. Sloan (1995). Annual Bonus Schemes and the Manipulation of Earnings. *Journal of Accounting and Economics*, 19(1), 29-74.

Kasznik, R. (1999). Top executive rewards and firm performance: A comparison of Japan and the United States. *Journal of Political Economy*, 102, 510-546.

Ke, B. (2004). Do equity-based incentive induce CEOs to manage earnings to report strings of consecutive earnings increases?, Working Paper.

Koerniadi, H. & A. Tourani-Rad (2008). Earnings management and the market performance of stock dividend issuing corporations: NZ evidence. *Accounting Research Journal*, 21(1), 4-15.

Matsumoto, D.A. (2002). Management's incentives to avoid negative earnings surprises. *The Accounting Review*, 77(3), 483-514.

Matsunaga, S.R. & C.W. Park (2001). The effect of missing a quarterly earnings benchmark on the CEO's annual bonus. *The Accounting Review*, 76, 313-332.

Otomasa, S. (2004). *Earnings Management and Accounting Information*, Otomasa, Shota: Moriyama-Shoten.

Otomasa, S. (2006). The present of retirement benefit accounting in the income statement. In *Empirical Research on Accounting to Provide Implications for Future Accounting Institution*, 244-262.

Salma, I., Xu, l. & R. Genese (2011). Real and accrual-based earnings management and its legal consequences. *Accounting Research Journal*, 24(1), 50-78.

Sengupta, P. (1998). Corporate disclosure quality and the cost of debt. *The Accounting Review*, 73, 459-474.

Shuto, A. (2007). Executive compensation and earnings management: Empirical evidence from Japan. J*ournal of International Accounting, Auditing and Taxation*, 16, 1-26.

Skinner, D.J. & R.G. Sloan (2002). Earnings surprises, growth expectations, and stock returns or don't let an earnings torpedo sink your portfolio. *Review of Accounting Studies*, 7, 289-312.

Suda, K. & A. Shuto (2006). Earnings management to meet earnings benchmarks: Evidence from Japan. In *Focus on Finance and Accounting Research*, 67-85.

Suda, K. (2000). *Positive Theory of Financial Accounting*, Suda, Kazuyuk: Hakuto-Shobo.

Teoh, S.H., Welch, I. & T.J. Wong (1998). Earnings management and the underperformance of seasoned wquity offerings. *Journal of Financial Economics*, 50, 63-99.

Watts, R.L. & J.L. Zimmerman (1986). Positive Accounting Theory, Englewood Cliffs, N.J: Prentice-Hall.

Xu, W. (2010). Do management earnings forecasts incorporate information in accruals? *Journal of Accounting and Economics*, 49, 227-246.

Zhang, X. (2008). The earnings management in fourth-quarter of Chinese listed companies. *China Accounting Research*, 4, 25-32.

ACCRUALS-BASED AUDIT QUALITY IN THE JAPANESE AUDIT MARKET

Dan Hu, Nagoya University
Ryo Kato, Nagoya University

ABSTRACT

Even though Japan is a developed country with the second largest economy in the world as of 2011 and has a unique business culture and power dynamic among audit firms, there remains a dearth of literature investigating the Japanese audit market. This paper discusses the features of the Japanese audit market and attempts to verify the relationship between accruals-based audit quality and auditor size in Japan. The empirical results show no relationship between audit quality and auditor size in the Japanese audit market, after client characteristics' effects have been controlled. This finding is consistent with Lawrence et al. (2011)'s results in their study of the U.S. audit market.

INTRODUCTION

Starting with DeAngelo (1981) "Auditor Size and Audit Quality" in the Journal of Accounting and Economics, the relationship between audit quality and auditor size has become a controversial issue not only for regulators and audit firms but also for academic researchers in the United States. Consistent with DeAngelo (1981), much literature finds that large audit firms with international brand names have superior audit quality to other firms (e.g., Becker et al. 1998; Francis et al. 1999; Behn et al. 2008). The literature also notes that audit practice office size is positively related with audit quality (e.g., Francis and Yu 2009; Choi et al. 2010). On the other hand, Louis (2005)'s study suggests that smaller audit firms provide better acquisition advice to their clients, while Lawrence et al. (2011) find that there is no difference between Big with Non-Big audit firms after controlling for client characteristics. The relationship between audit quality and auditor size remains controversial in empirical research circles.

As mentioned above, there is much literature concerned with audit quality and auditor size in the U.S. market. Japan, despite having a highly developed economy, the second-largest gross domestic product in the world in 2011, and a unique culture and hierarchy among audit firms (see Section 2), possesses little academic literature investigating its audit market (Yoshida 2006; Yazawa 2010; Ajward 2010). This study extends and expands on past work analyzing the effects of auditor size on audit quality in Japan, using both larger sample populations and applying Rubin (1985)'s propensity score weighting methodology, which was not used in the prior literature.

To test the association between audit quality and auditor size, we examine the relationship between auditor size dummy (big audit firm=1; otherwise=0) and discretionary accruals. We chose discretionary accruals as the proxy variable of audit quality for the following three reasons: First, as Francis (2011) points out, there is direct evidence that discretionary accruals could be thought of as the proxy variable of audit quality. Caramanis and Lennox (2008) measured audit quality in terms of auditor work hours and found that when the work hours are

smaller (audit quality is low) the positive discretionary accruals are larger. Gunny and Zhang (2012) found a direct link between audit quality (based on the conjecture that if a company is the target of PCAOB inspections, the company's audit quality is low) and the value of discretionary accruals.

Second, discretionary accruals could be first considered as an earning quality proxy, but after controlling for non-audit factors, a positive relationship could be found between changes in discretionary accruals (earning quality) and audit characteristics (audit quality) (Francis 2011). In fact, there is much literature (Francis and Yu 2009; Choi et al. 2010; Lawrence 2011) providing indirect evidence that discretionary accruals could be thought of as the best proxy variable for audit quality.

Francis (2011) argues that audit quality can be captured from the audit report that is under the auditor's control, or from financial statements that are produced by client companies and their auditors. There are two indicators of audit quality that can be derived from the audit report: (1) a qualified report indicating low audit quality; (2) an unqualified report indicating high audit quality. Since about 90 percent of audit reports in the United States are unqualified (Francis 2011), capturing audit quality from audit reports is difficult. In order to capture audit quality, this paper uses discretionary accruals calculated from a modified Jones model, the Dechow and Dichev (2002) model, McNichols' (2002) model, the ROA modified Jones model, and the CFO modified Jones model to capture information from financial statements.

Our results reveal that, in Japan's market, large audit firms with international brand names have the same audit quality as small audit firms, after controlling for client characteristics. This is consistent with Lawrence et al. (2011), who argue that the relationship between auditor size and audit quality will disappear after controlling for client characteristics.

Our paper contributes to the existing literature in three ways. First, our study uses Rubin's (1985) methodology--propensity score weighting--instead of the propensity score matching model which developed by Rosenbaum and Rubin (1983) to decrease bias due to the process of cutting the sample. Because many auditing or accounting studies (for example, Lawrence et al. 2011) use propensity score matching models, this study seeks to add an improved method to the literature.

Second, our search for titles of English-language research papers in the Web of Knowledge database that contain the terms "audit" and "Japan" retrieved only four results. As previously stated, there is a dearth of literature investigating the Japanese audit market, even though this is the second largest economy in the world in 2011. Our study attempts to add to the literature of the Japanese audit market.

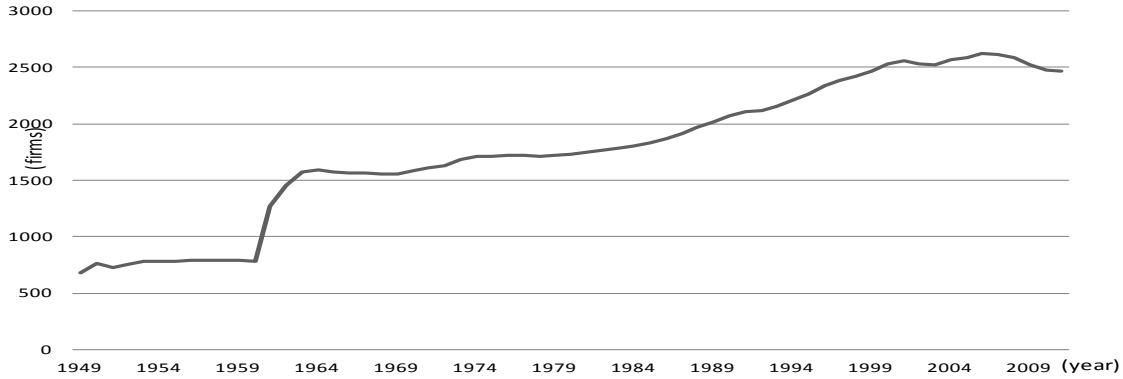
Third, in Japanese-language research literature, there are only three papers concerning the topic of the connection between audit quality and auditor size that employ the Dechow and Dichev (2002) model or the Jones model respectively to identify audit quality. Yoshida (2006), using the Dechow and Dichev (2002) model, finds that there is no significant relationship with audit quality, while Yazawa (2010) and Ajward (2010), using the Jones model only, found that there is in fact a relationship. This study extends the literature using a larger and more complete data set, in addition to a novel and improved methodology.

BACKGROUND, PREVIOUS LITERATURE AND HYPOTHESIS

Background: The Japanese Audit Market

When the GHQ occupied Japan from 1945 until 1952, the Japanese audit market began to develop. In 1948, the Certified Public Accountants Act was promulgated, and the Securities and Exchange Act was revised. The Tokyo Olympics in 1960 came to represent a symbolic turning point for the Japanese economy, which experienced high growth until the early 1990s, a period referred to as the "Japanese miracle." As the overall economy expanded, the audit market grew rapidly during that period (see Figure 1). However, because the audit market's expansion was based largely on the government requirement that listed companies provide audited financials, it developed with insufficient competitive elements. A similar situation has been observed in the audit market of many other developed economies, including the United States (for example, Gerakos and Syverson 2012).

Figure 1
The Number of Listed Companies/Auditor Clients in Japan



Note: The companies are listed on Japanese stock exchanges including: Tokyo, Osaka, Nagoya, Sapporo, Niigata, Kyoto, Hiroshima, and Fukuoka. Double listings are counted as one.
Source: Tokyo Stock Exchange Fact Book 2012.

Japanese audit firms face a much lower risk of litigation when compared with U.S. counterparts (Skinner and Srinivasan 2012), possibly because Japanese culture discourages such disputes (Ginsburg and Hoetker 2006). This seems to have muted the role of insurance among Japanese audit firms, compared with those in the United States.

Moreover, Japanese audit firms have their own power structure. As can be seen from Table 1, there are only three major audit firms in Japan: Shinnihon, Ernst & Young's member firm, with 26% of the market; Tohmatsu, Deloitte Touche Tohmatsu's member firm, with 25%; and Azsa, a KPMG member firm, with a 19% market share in 2011. PricewaterhouseCoopers' member firms, ChuoAoyama and Arata, only had a 2% market share in 2011. As other countries perceive it, Japan has Big 4 audit firms; however, in reality, there are only three major audit firms in the country, and the Big 3's power is substantial, representing a 70% market share.

Table 1
Market Share of Large Audit Firms in Japan

Year		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
BIGn (%)(based on client number)	Ernst & Young's member firm: Shinnihon	22.03	21.61	21.57	20.70	20.58	20.97	23.15	26.59	26.97	26.19	26.70
	Deloitte Touche Tohmatsu's member firm: Tohmatsu	19.46	20.37	21.10	21.61	22.01	21.71	21.86	24.95	24.66	24.72	24.82
	PricewaterhouseCoopers's member firm: ChuoAoyama	19.70	20.37	20.82	20.90	21.37	20.13	11.14				
	KPMG's member firm: Azsa	14.89	15.09	15.29	16.15	16.50	17.29	18.31	20.73	20.18	19.42	19.27
	PricewaterhouseCoopers's member firm: Arata						0.46	2.07	2.28	2.29	2.34	2.41
Non-BIGn (%)(based on client number)		23.91	22.57	21.22	20.63	19.55	19.90	25.54	27.72	28.19	29.66	29.21
Client Number		3659	3957	4015	4086	4189	4302	4397	4076	3930	3810	3731

Note: Chuoaoyama was dissolved due to the Kanebo scandal in 2007. Source: Nikkei NEEDS Data.

Even though Japan is a developed country with the second largest economy in the world as of 2011 and has a unique business culture and power dynamic among audit firms, there remains a dearth of literature investigating the Japanese audit market. The U.S. audit market on the other hand, has been the subject of a large body of research concerning the connection between audit quality and auditor size (for example, Becker et al. 1998; Francis et al. 1999; Behn et al. 2008). Our study assesses a basic but important, question in the audit academic world: What is the relationship between audit quality and auditor size in the Japanese audit market?

Previous Literature and Hypotheses

DeAngelo (1981) argues that audit quality is not independent of audit firm size. She attributes this to the idea that big audit firms would have "more to lose" should they fail effectively address a client's mistake on financial statements, this motivates major audit firms toward superior audit quality. Becker et al. (1998) first assumed that the audit quality of big audit firms is better than that of smaller firms, and found client companies of smaller audit firms to have more discretionary accruals than those of the big firms (on average, 1.5 to 2.1 percent of total assets). They demonstrate that audit quality, which is assumed to be higher in the big audit firms, has a positive correlation with earnings management, gauged by discretionary accruals. Francis et al. (1999) found that even the total accruals of the clients of Big 6 audit firms were higher than those outside of the Big 6. At the same time, the discretionary accruals of the clients of the Big 6 were smaller than those of the rest. Behn et al. (2008) demonstrated that the earnings forecast accuracy of analysts, which could be considered a proxy variable for audit quality (Lawrence et al., 2011), was higher and the dispersion smaller among the clients of Big 5 auditors vs. non-Big 5 auditors.

Moreover, previous studies show that audit practice office size is positively correlated with audit quality. Francis and Yu (2009) found that larger offices of Big 4 auditors provided higher quality audits by testing 6,568 U.S. companies between 2003 and 2005. Choi et al. (2010) found auditor office size has a significantly positive relationship with audit quality, measured as unsigned abnormal accruals, after testing a sample of U.S. companies between 2000 and 2005. They argue that audit quality difference between Big vs. non-Big audit firms is priced by the market in the audit fee.

As a counterpoint, Louis (2005) suggests that smaller audit firms provide superior acquisition advice to their clients. While Lawrence et al. (2011) verified that after client characteristics (for example, company size, company profitability) were controlled, the relationship between audit quality and auditor size that was identified in prior studies disappeared for U.S. firms. It seems that when considering the relationship between audit quality

and auditor size, one possibility is that a company's auditor size which is chose by the company, may decided by the company's size or company's profitability themselves.

This study first set the stage for our H1 hypothesis, following the basic pattern of previous research findings (Becker et al. 1998; Francis et al. 1999; Behn et al. 2008; Francis and Yu 2009; Choi et al. 2010). Our second hypothesis is based on insights offered by Lawrence et al. (2011).

H1 Audit quality has a positive relationship with auditor size.
H2 After controlling for the client size effect, the relationship between audit quality and auditor size will disappear.

METHODOLOGY AND SAMPLE

Methodology

To explain this paper's methodology, we must describe the approach of previous work, such as Yoshida's (2006) basic equation (methodology), summarized as follows:

$$ADA_{i,t} = \lambda_0 + \lambda_1 BIGnDummy_{i,t} + \lambda_2 Control_{i,t} + \varepsilon_{i,t} \quad \text{(1- previous)}$$

Where for firm i and fiscal year t: ADA = absolute value of discretionary accruals for year t; BIGnDummy = 1 if the client has a BIGn auditor, and 0 otherwise; Control = control variables and covariates.

However, to run the above equation (1-previous), we must note some hidden assumptions in the estimating treatment effect (the coefficient value of BIGn dummy). The hidden assumptions are: (1) dummy variable (BIGn dummy) and dependent variable (ADA) must have a linear relationship; (2) coefficients of control variables and covariates must be equal between the two groups (whichever dummy variable equals 1 or 0); (3) the distribution of error term must be equal between the two groups (whichever dummy variable equals 1 or 0). These assumptions are significant, and including many control variables and covariates in the equation (1-previous) to verify certain hypotheses would weaken its effectiveness.

To avoid the above-mentioned problem, our study demonstrates the relationship between audit quality and auditor size using the following model, using the weighed sample which is determined by the process after-mentioned.

$$ADA_{i,t} = \alpha_0 + \alpha_1 BIGnDummy_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where for firm i and fiscal year t: ADA = absolute value of discretionary accruals for year t (calculate by using the modified Jones (Dechow et al. (1995)) model); BIGnDummy = 1 if the client has a BIGn auditor, and 0 otherwise

To determine the weighed number for the sample which should use into equation (1), there are two steps to do. First, using logit regression (2) to estimate β, then using β to estimate $BIGn_{i,t}$ (e_i, "propensity score" as the estimated probability of receiving the select treatment, that is, the probability of selecting a BIGn as its auditor.). Second, using equation (3) to calculate ie_i, which is the weighting number we should use to weight the sample.

$$BIGn_{i,t} = \beta_0 + \beta_1 \ln ASSET_{i,t-1} + \beta_2 ATURN_{i,t-1} + \beta_3 CURR_{i,t-1} + \beta_4 LEV_{i,t-1} + \beta_5 ROA_{i,t-1} + \beta_6 \ln MKT_{i,t-1} + iD + yD + \varepsilon_{i,t} \quad (2)$$

lnASSET = natural logarithm of total assets for year t-1;
ATURN = (sales for year t) / (total assets for end of the year t-1);
CURR = (current assets for year t-1) / (current liabilities for year t-1);
LEV= (total liability for end of the year t-1) / (total assets for end of the year t-1);
ROA = (net income for year t) / (average assets of the year t-1);
lnMKT = natural logarithm of market value of equity for end of the year t-1;
iD = industry dummy classified by Tokyo Stock Exchange; and,
yD = year dummy from 2001 to 2011;
BIGn = 1 if the client has a BIGn auditor, and 0 otherwise.

$$ie_i = \frac{z_i}{e_i} \times \frac{N_1}{\sum_{i=1}^{N} \frac{z_i}{e_i}} + \frac{1-z_i}{1-e_i} \times \frac{N_2}{\sum_{i=1}^{N} \frac{1-z_i}{1-e_i}} \quad (3)$$

ie denotes the sampling weights, z denotes treatment group and control group (1 if it is BIGn group, and 0 otherwise), e denotes predicted propensity score, N_1 denotes the number of BIGn samples and N_2 denotes the number of Non-BIGn samples. $N=N_1+N_2$

Then, we again run equation (1) after employing the propensity score weighting (ie_i). Notice that Lawrence et al. (2011) run regression equation (1) of ADA including some control variables only after conducting propensity score matching; however, IPW (the inverse probability weighting methodology, developed by Rubin (1985).) enables us to estimate treatment effect without including control variables in equation (1).

SAMPLE

We used total listed companies in the Japanese stock market from 2001 to 2011. We deleted some indexes by industry for those with less than 20 samples of each index and each year because we need at least 20 samples to estimate discretionary accruals via the cross-sectional Jones model. This resulted in 14,443 firm-year observations (see Table 2 for details).

Table2
Firm-Years and the BIGn Percentage for Each Industry

Stock price index by industry (33 Sectors)	firm-year	Bign %
Construction	1,057	83.25%
Foods	668	76.95%
Textiles & Apparels	387	79.07%
Chemicals	1,461	77.02%
Pharmaceutical	287	85.37%
Glass & Ceramics Products	359	90.53%
Iron & Steel	443	68.85%
Nonferrous Metals	307	89.58%
Metal Products	476	67.65%
Machinery	1,410	72.27%
Electric Appliances	1,636	75.55%
Transportation Equipments	866	74.71%
Precision Instruments	305	81.97%
Other Products	439	71.53%
Land Transportation	555	89.37%
Warehousing & Harbor Transportation Services	224	79.46%
Information & Communication	667	82.16%
Wholesale Trade	1,471	76.14%
Retail Trade	553	79.20%
Real Estate	251	72.11%
Services	621	77.62%
Total	14,443	77.59%

RESULTS

Table 3 presents descriptive statistics for both BIGn clients and non-BIGn clients, and the results of the t-test (means test) and U-test (median test). There are 14,443 firm-year observations in the full sample, of which 11,207 (77.6%) and 3,236 (22.4%) have BIGn and non-BIGn audit firms respectively. The results of the t-test and U-test represent ADA, lnASSET, ATURN, LEV, ROA, and lnMKT and vary significantly between the two groups. That is, the sample companies with BIGn audit firms have fewer discretionary accruals, are bigger in size (total assets and market value of equity) and are more profitable and have more leverage than the companies with non-BIGn audit firms. This result offers evidence of the need to control the client companies' characteristics, when considering the relationship between audit quality and auditor size.

Table3
Client Characteristics and Big 3 vs. Non-Big 3

		BIGn	ADA	lnASSET	ATURN	CURR	LEV	ROA	lnMKT
Bign's client companies	firm-years	11,207	11,207	11,207	11,207	11,207	11,207	11,207	11,207
	Mean	1	0.030	11.318	1.107	2.062	2.603	0.019	10.358
	Std. Dev.	0	0.030	1.375	0.608	19.515	21.062	0.044	1.648
	10%	1	0.004	9.746	0.566	0.820	0.343	−0.019	8.372
	Median	1	0.021	11.113	0.968	1.440	1.270	0.020	10.172
	90%	1	0.065	13.225	1.790	3.323	4.647	0.062	12.681
Non-Bign's client companies	firm-years	3,236	3,236	3,236	3,236	3,236	3,236	3,236	3,236
	Mean	0	0.032	10.847	1.087	1.907	2.148	0.009	9.825
	Std. Dev.	0	0.035	1.316	0.606	13.678	5.997	0.095	1.502
	10%	0	0.004	9.278	0.547	0.847	0.354	−0.031	8.075
	Median	0	0.023	10.824	0.941	1.521	1.188	0.017	9.686
	90%	0	0.070	12.529	1.766	3.179	3.945	0.055	11.815
All sample (All client companies)	firm-years	14,443	14,443	14,443	14,443	14,443	14,443	14,443	14,443
	Mean	0.776	0.030	11.212	1.103	2.028	2.501	0.017	10.239
	Std. Dev.	0.417	0.032	1.376	0.607	18.369	18.769	0.059	1.631
	10%	0	0.004	9.633	0.562	0.827	0.345	−0.022	8.294
	Median	1	0.022	11.046	0.963	1.457	1.254	0.019	10.057
	90%	1	0.066	13.083	1.785	3.271	4.477	0.061	12.516
t-value			−3.47 ***	17.74 ***	1.64	0.51	2.02 **	6.05 ***	17.39 ***
z-value			−3.42 ***	14.20 ***	1.83 **	0.05	0.45	9.52 ***	15.87 ***

Table 4 describes Pearson correlation coefficients, in which some variables seem to have a strong correlation. However, since we have a large number of samples and our purpose is to estimate propensity score, multicollinearity will not affect our analysis.

Table4
Pearson Correlation Coefficient

	BIGn	ADA	lnASSET	ATURN	CURR	LEV	ROA	lnMKT
BIGn	1							
ADA	−0.0305	1						
lnASSET	0.1423	−0.1445	1					
ATURN	0.0134	0.1108	−0.1099	1				
CURR	0.0035	−0.0004	0.0023	−0.0203	1			
LEV	0.0101	0.0118	0.0288	0.016	−0.0062	1		
ROA	0.0724	−0.1275	0.116	0.0557	0.0213	−0.0519	1	
lnMKT	0.1361	−0.1113	0.8826	−0.1414	0.0194	−0.0141	0.2416	1

Table 5 presents the results of our test for the equality of regression coefficients between the BIGn group and the non-BIGn group. We estimated the multiple regression model below, dividing the cases into two parts where the samples are assigned to BIGn and non-BIGn to verify whether hidden assumption (2) is satisfied.

$$ADA_{i,t} = \mu_0 + \mu_1 \ln ASSET_{i,t-1} + \mu_2 ATURN_{i,t-1} + \mu_3 CURR_{i,t-1} + \mu_4 LEV_{i,t-1} + \mu_5 ROA_{i,t-1} + \mu_6 \ln MKT_{i,t-1} + iD + yD + \varepsilon_{i,t}$$

The left side of the table describes the result of multiple regression of the BIGn group and the right side describes that of the non-BIGn group. As we can see, the lnASSET, ROA, and lnMKT coefficients vary significantly between the two groups ($p < 0.01$), according to z-stat of the test for the equality of regression coefficients. This result indicates that hidden assumption (2) does not hold, hence we cannot estimate the treatment effect through a multiple regression model, as was attempted by prior researchers. If prior research methods were used in this situation, it would lead to biased results. Therefore, we should conduct a propensity score analysis, as this methodology needs not satisfy the three hidden assumptions mentioned in Methodology section.

Table5
Test for the Equality of Regression Coefficients

ADA2	Bign=1(Bign's client companies)					Bign=0(Non-Bign's client companies)					
	Coef.	Std. Err.	t-stat	p-stat		Coef.	Std. Err.	t-stat	p-stat		**z-stat**
Intercept	0.060	0.003	20.36	0.00	***	0.079	0.006	13.69	0.00	***	-2.83 ***
BIGn			-					-			
lnASSET	-0.005	0.001	-8.96	0.00	***	-0.013	0.001	-12.59	0.00	***	6.98 ***
ATURN	0.007	0.001	11.38	0.00	***	0.006	0.001	4.64	0.00	***	0.84
CURR	0.000	0.000	-0.12	0.91		0.000	0.000	0.19	0.85		-0.21
LEV	0.000	0.000	1.48	0.14		0.000	0.000	1.47	0.14		-1.26
ROA	-0.028	0.007	-3.78	0.00	***	-0.097	0.006	-15.30	0.00	***	7.15 ***
lnMKT	0.002	0.000	4.45	0.00	***	0.009	0.001	10.13	0.00	***	-6.89 ***
iD & yD	included					included					
Adj R-squared	0.086					0.172					
No. Obs	11,207					3,236					

After we confirmed that the hidden assumption need not be satisfied within our research data-set, we conducted the process discussed in our Methodology section. We estimated the equation (2) logistic regression model and weighted sample by ie in order to control for client characteristics. Table 6 shows the results of the logistic regression model (2), in which we find significant and positive lnASSET ATURN and ROA odds ratios of 1.286, 1.138, 8.839 respectively ($p<0.01$). These results tell us bigger firms in size (total assets), and more profitable (ATURN and ROA) ones have a propensity to select BIGn as their auditor.

Table6
The Result of Logistic Regression Model (2)

	odds ratio	Std. Dev.	z-vaule	p-value	
Intercept	0.172	0.037	-8.25	0.00	***
lnASSET	1.286	0.050	6.51	0.00	***
ATURN	1.138	0.050	2.98	0.00	***
CURR	1.001	0.002	0.36	0.72	
LEV	1.001	0.001	0.66	0.51	
ROA	8.839	3.564	5.40	0.00	***
lnMKT	1.001	0.033	0.04	0.97	
iD & yD	included				
Percent Correctly Predicted	77.9%				
No. Obs	14,443				

Second, we estimated equation (1) with weights calculated based on inverse of propensity scores, and the results are presented in Table 7. Model 1 and Model 2 of Table 7 describe the results of univariate analysis of equation (1) before and after employing IPW respectively. As we can see, BIGn variable coefficients of Model 1 are significantly negative, suggesting that bigger auditors have higher quality in terms of accruals-based audit quality. However, this result could be attributed to client characteristics to varying degrees. BIGn variable coefficients of Model 2 are insignificant after employing IPW, suggesting that BIGn auditors and non-BIGn auditors would provide comparable audit quality if clients' characteristics are controlled.

This result that BIGn auditors and non-BIGn auditors would provide comparable audit quality supports Lawrence et al. (2011), attributing BIGn versus Non-BIGn audit quality differences to client characteristics. While related studies in America and Japan concluded that bigger auditors are superior to smaller auditors in terms of audit quality, they did not employ propensity score analysis.

Table7
The Results of Regression (1)

	Model1					Model2				
	without weight					with weight				
ADA	coef.	Std.Dev	t-stat	p-stat		coef.	Std.Dev	t-stat	p-stat	
Intercept	0.032	0.001	57.88	0.00	***	0.030	0.001	52.60	0.00	***
Bign	−0.002	0.001	−3.78	0.00	***	0.000	0.001	−0.49	0.62	
No. Obs	14,443					14,443				

ROBUST ANALYSIS

ADA was used as the independent variable in equation (1) as a proxy variable for audit quality, calculated by using the modified Jones model. In addition to using the modified Jones model, we used the ROA modified Jones model, the CFO modified Jones model, the Dechow and Dichev (2002) model (DD), and the McNichols (2002) model, to calculate the variance which is the proxy variable for audit quality. The results are described in Table 8 and the results are similar to those of Table 7.

Moreover, we employed propensity score matching analysis following Lawrence et al. (2011), in which we conducted nearest neighbor matching without replacement. We matched the samples which have the closest propensity score (i.e. the closest predicted value of selecting BIGn auditor), and the results are similar to those of Table 7.

Table 8
The Results of Robustness Analysis

	Model1 without weight					Model2 with weight				
ADA(ROA)										
Intercept	0.031	0.001	58.36	0.00	***	0.030	0.001	53.39	0.00	***
Bign	−0.002	0.001	−2.76	0.01	***	0.000	0.001	−0.55	0.58	
No. Obs	14,443					14,443				
ADA(ΔCFO)										
Intercept	0.025	0.000	59.74	0.00	***	0.023	0.000	52.56	0.00	***
Bign	−0.002	0.000	−3.72	0.00	***	0.000	0.000	−0.24	0.81	
No. Obs	14,443					14,443				
DD										
Intercept	0.038	0.001	48.98	0.00	***	0.032	0.001	42.44	0.00	***
Bign	−0.003	0.001	−3.47	0.00	***	0.001	0.001	0.66	0.51	
No. Obs	13,000					13,000				
McNichols										
Intercept	0.036	0.001	49.94	0.00	***	0.031	0.001	43.57	0.00	***
Bign	−0.003	0.001	−3.12	0.00	***	0.001	0.001	1.18	0.24	
No. Obs	13,000					13,000				

CONCLUSION

The Japanese audit market began its development in the 1940s and experienced rapid growth, especially in the period following the Tokyo Olympics in 1960 until the beginning of the 21st century (see Figure 1). In recent years, due largely to the decrease of scale of PwC's member firm, only the Big 3 audit firms remain in the Japanese audit market. This is a key characteristic of the market (see Table 1). In spite of Japan's important role in the world economy, little research has been conducted on the Japanese audit market. Our study attempts to expand the body of research on the Japanese audit market, especially to address an important issue in this field: Does auditor size affect accruals-based audit quality in the Japanese audit market?

As the empirical results show, we can identify a positive relationship between audit quality and auditor size in the Japanese audit market if we do not include client characteristics in our model. However, after the effect of client characteristics has been controlled through propensity score analysis (inverse probability weighting and propensity score matching), the relationship become vanishes. These results are consistent with the recent study of Lawrence et al. (2011) regarding the U.S. audit market.

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REFERENCES

Ajward, A. R. (2010). The Earnings Quality Status of Contemporary Big-4 Affiliated Auditors amidst ChuoAoyama Crisis. *The Bulletin of the Graduate School of Commerce*, 71, 263-284.

Becker, C. L., DeFond, M. L., Jiambalvo, J. & K. R. Subramanyam (1998). The effect of audit quality on earnings management. *Contemporary Accounting Research*, 15(1), 1-24.

Behn, B., Choi, J. H., & T. Kang (2008). Audit quality and properties of analyst earnings forecasts. *The Accounting Review*, 83(2), 327-359.

Butler, M., Leone, A., & M. Willenborg (2004). An empirical analysis of auditor reporting and its association with abnormal accruals. *Journal of Accounting and Economics*, 37(2), 139-165.

Caramanis, C., & C. Lennox (2008). Audit effort and earnings management. *Journal of Accounting and Economics*, 45(1), 16-138.

Choi, J., C. Kim, J. Kim, and Y. Zang (2010). Audit office size, audit quality, and audit pricing. *Auditing: A Journal of Practice & Theory*, 29 (1), 73–97.

DeAngelo, L. E. (1981). Auditor size and audit quality. *Journal of Accounting and Economics*, 3(3), 183-199.

Dechow, P. M. & I. D. Dichev (2002). The quality of accruals and earnings: the role of accrual 40 estimation errors. *The Accounting Review*, 77 (Supplement), 35-59.

Dechow, P., Sloan, R. & A. Sweeney (1995). Detecting earnings management. *The Accounting Review*, 70(2), 193-225.

Francis, J. R., Maydew, E. L. & H. C. Sparks (1999). The role of big 6 auditors in the credible reporting of accruals. *Auditing: A Journal of Practice & Theory*, 18(2), 17-34.

Francis, J. R. (2011). A Framework for Understanding and Researching Audit Quality. Auditing: A Journal of Practice & Theory, 30 (2), 125–152.

Ginsburg, T., & G. Hoetker (2006). The unreluctant litigant? An empirical analysis of Japan's turn to litigation. *Journal of Legal Studies*, 35, 31-59

Gerakos, J. & C. Syverson (2012). Competition in the audit market. Working paper.

Gunny, K. A. & T. C. Zhang (2012). PCAOB inspection reports and audit quality. *Journal of Accounting and Public Policy*, 32(2), 136-160.

Heninger, W. G. (2001). The association between auditor litigation and abnormal accruals. *The Accounting Review*, 76(1), 111-126.

Hoshino, T. (2009). *Statistical science for investigated and observed data: Causal inference, selection bias and data fusion*. Tokyo: Iwanami-Shoten.

Kasai, N. (2011). The Relation Between Audit Partner Tenure and Audit Quality. Working Paper Series, Shiga University.

Kasznik, R. (1999). On the association between voluntary disclosure and earnings management. *Journal of Accounting Research*, 137(1), 57-81.

Khurana, I., & K. Raman (2004). Litigation risk and the financial reporting credibility of Big 4 versusnon-Big 4 audits: Evidence from Anglo-American countries. *The Accounting Review*, 79(2), 473-495.

Kitagawa, N. & M. Goto (2009). Validity verification of performance matched discretionary accrual measures: Additional verification of Kothari, Leone, & Wasley (2005). *Kokumin Keizai Zasshi*, 199(2), 53-88.

Kothari, S., Leone, A., & C. E. Wasley (2005). Performance matched discretionary accrual measures. *Journal of Accounting Economics*, 39(1), 163-197.

Lawrence, A., Minutti-Meza, M. & P. Zhang (2011). Can Big 4 versus non-Big 4 differences in audit quality proxies be attributed to client characteristics? *The Accounting Review*, 86(1), 259-286.

Louis, H. (2005). Acquirers' abnormal returns and the non-Big 4 auditor clientele effect. *Journal of Accounting and Economics*, 40 (1-3), 75-99.

Lunceford, J. K. & M. Davidian (2004). Stratification and weighting via the propensity score in estimation of causal treatment effects: a comparative study. *Statistics in Medicine*, 23, 2937-2960

McNichols, M. F. (2002). Discussion of the Quality of Accruals and Earnings: The Role of Accrual Estimation Errors. *The Accounting Review*, 77(Supplement), 61–69.

Peasnell, K. V., Pope, P. F. & S. Young (2000). Detecting earnings management using cross-sectional abnormal accruals models. *Accounting and Business Research*, 30(4), 313-326.

Rosenbaum, P.R. & D. B. Rubin (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70(1), 41-55.

Rubin, D. B. (1985). The use of propensity scores in applied bayesian inference. Bayesian Statistics, 2, 463-472.

Skinner, D.J & S. Srinivasan (2012). Audit quality and auditor reputation: Evidence from Japan. T*he Accounting Review*, 87(5), 1737-1765.

Suda, K., Yamamoto, T. & S. Otomasa (2007). *Accounting Manipulation*. Tokyo: Diamond-Sha.

Yazawa, K. (2010). Big4 and Audit Quality: Audit Cost Hypothesis and Conservative Accounting Hypothesis. *Aoyama Journal of Business*, 44(4), 167-181.

Yazawa, K. (2011). Big4 and Audit Quality: Moral Hazard Hypothesis. *Aoyama Journal of Business*, 46(1), 159-179.

Yoshida, K. (2008). Analysis of audit quality and reported earnings management in Japan. In Tomosugi, Y., Tanaka, H. & L. Sato (Eds.), *Research about reliability of financial information*, 224-235.

Tokyo Stock Exchange (2012). *Tokyo Stock Exchange FACT BOOK 2012*. Tokyo: Tokyo Stock Exchange.

THE EFFECT OF INVESTOR RELATIONS ON CORPORATE BOND CREDIT RATING

Tae-Jung Kim, Chonnam National University
Seong-Il Jeon, Chonnam National University*

ABSTRACT

In this study, an empirical analysis was carried out in order to observe whether the implementation of investor relations (IR), which is voluntary disclosure made by a company, improves confidence and transparency in the company and favorably influences external stakeholders, during borrowed capital financing in order to give a positive effect on the cost of borrowed capital. A proxy of the cost of borrowed capital was the corporate bond credit rating(CR); moreover, the relation between IR and CR of companies who met the criteria for sampling, out of those listed in KOSPI from 2007 to 2010, was analyzed.

The results are as follows: first, the companies who held investor relations had higher corporate bond credit rating and bigger firm size (SIZE), while those who did not hold IR had more burden of cost of interest (CI) and nearly negative (1) net earnings (NEG). However, leverage (LEV) was higher in companies with IR. This indicates that companies holding IR have a relatively greater reliance on borrowed capital; yet, they elicit a favorable response from external stakeholders by giving IR to raise CR, lightening the burden of the cost of borrowed capital.

Second, the implementation of IR is found to have a positive (+) influence on CR. This means that IR reduces information asymmetry in order to ultimately lower the cost of borrowed capital.

These results suggest that as the importance of IR increases, IR will improve the confidence in a company by bridging the asymmetry of information and lessen the burden of the cost of borrowed capital. However, this study has the following limitations: i) it extracted data only from a particular credit-rating agency as it used CR as a proxy for the cost of borrowed capital and ii) that the analysis was confined to the t-1 year-section of companies with IR.

INTRODUCTION

Through investor relations, companies can enhance the continuity of stock price and liquidity by quickly providing external stakeholders, with accurate information on their business activities and improving the market's function of determining price. Also, companies holding IR will gain trust within the capital markets by obtaining positive results from the business assessment. Such positive recognition by capital markets will raise CR, which will then diminish the cost of capital financing. As a result, companies may reduce capital costs by enhancing

* Corresponding author: Seong-Il Jeon, Chonnam National University, College of Business Administration, 77 Yongbong-ro, Buk-gu, Gwangju 500-757, Korea; Tel: +82-62-530-1460; Email: sijeon@jnu.ac.kr

confidence in them in order to ease information asymmetry and raise CR through IR. Accordingly, this study intended to investigate the effect of IR on capital markets focusing specifically on CR.

According to research done by Kim, Lee, and Choi (2008), Merton (1987), Sohn (1997), and others, IR showed that management's forecasts were accurate and that the forecasts bridged the asymmetry of information. Research by O'hara (2003) also reported that the expansion of the size of capital markets is recognized as the cause of increasing or decreasing the cost of capital financing. Meanwhile, research by Diamond and Verrecchia (1991) found that companies' voluntary disclosure contributed to reducing capital costs by easing information asymmetry, and thereby vitalized the trend of voluntary disclosure. In this context, voluntary disclosure is regarded as a means of companies'business strategy for lowering information asymmetry.

This study verified the relations between IR, which motivates external stakeholders'positive response towards the company by easing the asymmetry of information through voluntary disclosure, and the cost of borrowed capital, which is relatively easy to be objectively measured among the cost of capital financing. Recently, as more companies engage in IR with higher frequency, a dramatic change in the global capital markets, as a result of the global financial crisis, makes companies to become aware of the burden of the cost of borrowed capital. Therefore, since there is no empirical analysis as to whether companies'voluntary disclosure through IR improves confidence and transparency in them as well as reduces the cost of borrowed capital, this study intended to investigate the relations between the implementation of IR and CR of companies who were listed in KOSPI from the years 2007 to 2010. CR is measured as a way to assess a company's ability to repay the principal and interest accrued therefrom by considering the financial elements and non-financial elements, such that it may affect the cost of capital financing. For instance, research by Shin and Kim (2010) suggested that since credit appraisal by a credit-rating agency is directly or indirectly connected with the interest rates for corporate bonds and stock prices, which are closely related to the company's capital financing. This is done in order to make the corporate credit rating have an impact on the determination of the capital structure, a drop in the credit rating would provide a significant negative influence on the change of capital structure in the next year. Therefore, this study analyzed as to whether the company's voluntary disclosure through IR improved confidence and transparency in the company and whether it reduced the cost of borrowed capital.

Moreover, an empirical analysis was conducted by using CR by Korea Investors Service Inc. as a proxy for borrowed capital in order to reveal that IR had a statistically significant positive effect. It indicated that the implementation of IR reduced information asymmetry among external stakeholders, including executives, investors and creditors, to enhance confidence in the company and to have positive influence on credit rating in the long term.

Overall, a logical basis for this study was provided as follows: Section II summarized the reviews of the preceding researches, including the theoretical background of IR out of voluntary disclosure, and the cost of borrowed capital; it also described the difference of this study from the preceding ones; Section III explained the sampling and study methods of companies with IR; Section IV presented the results of the empirical analysis; the results are outline, implications and the limitations in Section V.

PRIOR LITERATURE AND HYPOTHESIS DEVELOPMENT

Investor Relations aims at helping to establish a business strategy for contributing to a company's capital financing and reducing the cost of capital financing by improving confidence in the company by external stakeholders, through future-oriented voluntary disclosure of business information. Hence, IR is found to have positive effects on improving the overall values of the company and reducing capital costs.

Merton (1987) analyzed that such active disclosure attracted the attention of investors to the company thereby increasing investments by individual investors.

Sohn (1997) argued that IR provided special information critical to investors' decision-making; moreover, he stated that executives' forecasts presented during IR were more accurate than those of the analysts and as a result, they revised their forecasts based on the information obtained from IR. Thus, he concluded that IR was a reliable activity of a company.

Kim and Song (1999) studied IR activities and investment patterns of companies who gave IR from 1993 to 1997 and analyzed the effects of IR in order to find that the stock price rose during the period prior to IR, indicating that IR had a positive impact on investors'pre-decision making.

Na and Jin (2002) carried out a logit analysis using investment-grade and speculation-grade companies, as a dependent variable, and financial, non-financial and market variables, as independent variables, in order to suggest a predictive model for credit rating. As a result, the firm size and the dividend rate out of the financial variables and the affiliated relation and industrial inclination out of the non-financial variables were important in predicting the credit rating.

Kim et al. (2008) verified the effect of IR on reducing information asymmetry among investors; they discovered that there was a significant negative relation between the implementation of IR and the level of information asymmetry in the next quarter. Further, they found that the eased asymmetry of information stemmed from the reduced activity of informed traders.

Lee, Chun, and Park (2008) investigated the effects of low disclosure quality of companies after being designated as a violator of disclosure regulations in KOSPI and KOSDAQ from 1999 to 2005 on capital markets by using the cost of borrowed capital. They found that the credit ratings of those violators were significantly lower than those of non-violators and that the interest rate for loans increased by about 1.4%. This suggests that low disclosure unfavorably influences the capital markets, which then increases the cost of borrowed capital.

Park and Ji (2010) analyzed whether there was difference in the value relevance of financial information of companies who held IR activities more than once and companies who never held IR activities from the years 2002 to 2009. They revealed that those with IR had higher stock price multiples for equity per share and earnings per share than those without IR. This implies that the accounting information disclosed by companies is relatively reflected in the enterprise value, as IR contributes to easing the imbalance of information among companies and external investors as well as improving confidence in a company.

Lee (2011) explored the relevance between the disclosure quality and the cost of borrowed capital of companies from 2003 to 2007, and realized that the disclosure quality

significantly influenced the cost of borrowed capital. It is interpreted as the reduction in the cost of borrowed capital by applying a relatively low risk premium to companies with good disclosure quality.

Park (2011) analyzed as to whether the cost of borrowed capital of unlisted companies with a good credit rating is lowered, and suggested that the better the company's credit rating is, the lower the cost of borrowed capital is even after controlling for financial information and for the companies'characteristics.

According to the theoretical and empirical results above, most preceding studies regarding IR and the cost of borrowed capital were conducted based on the relevance of the stock price of the enterprise value by taking into account the IR and information asymmetry. Moreover, researches on the cost of borrowed capital focused on disclosure quality and credit rating in order to suggest that good disclosure quality lessened the burden of the cost of borrowed capital and that companies with good credit rating reduced the cost of borrowed capital.

Therefore, this study learned that if a company holds IR activities, it will elicit a favorable response from investors and creditors in the capital market in order to obtain good CR. Such positive appraisal will raise CR to ultimately lighten the company's burden of financing the cost of capital. Consequently, companies holding IR will earn economic benefits, including reduced the cost of borrowed capital by raising the CR. Therefore the following hypothesis is stated:

Hypothesis *Investor Relations (IR) is positively (+) related to Corporate Bond Credit Rating (CR).*

SAMPLE AND RESEARCH DESIGN

Sample and Data Selection

This study selected samples out of 3,058 companies listed in KOSPI from the years 2007 to 2010 in order to analyze the relationship between Investor Relations and the cost of borrowed capital. The following companies were excluded: those whose accounting period did not end in December, those without financial data, those without CR and those in the financial business showing very different characteristics among the samples and financial institutions for better comparison. Data of IR implementation and corporate financial data were collected from the KIS-VALUE database of Korea Investors Service Inc.; 1,513 samples were selected, except for the 99 who belonged to the top/bottom 1% in order to overcome outlier errors in the results of this study. Among the samples with data of IR implementation or non-implementation, CI out of the cost of borrowed capital and CR. A final number of 1,513 samples were chosen for the empirical analysis, including 1,065 companies without IR and 448 companies with IR, which accounted for 42% of samples without IR.

Table 1
PRESENT COMPANY CONDITION OF THE SAMPLE

	2007	2008	2009	2010	Total
Number of listed company by year	746	765	770	777	3,058
(-) Not year-end settlement	(88)	(86)	(85)	(84)	(343)
(-) Financial industry	(14)	(14)	(15)	(16)	(59)
(-) Without Financial data	(37)	(37)	(38)	(34)	(146)
(-) Without Corporation bond credit rating	(226)	(220)	(228)	(244)	(898)
(-) Remove variables above normal condition	(20)	(32)	(27)	(20)	(99)
Final sample	381	376	377	379	1,513
Company that has implemented investor relations (IR)	118	117	107	106	448
Company that has not implemented investor relations (IR)	263	259	270	279	1,065

Research Design

To verify the hypothesis that the implementation of IR by companies listed in KOSPI is positively (+) related to CR, this study used a regression model based on CR as a proxy for the cost of borrowed capital.

Model

$$CR_{i,t} = \alpha + \beta_1 SIZE_{i,t} + \beta_2 CI_{i,t} + \beta_3 ROA_{i,t} + \beta_4 NEG_{i,t} + \beta_5 IR_{i,t-1} + \beta_6 YR_{i,t} + \beta_7 IND_k$$

CR: value scored at equal intervals depending on each company's CR (20~1 scores at equal intervals from AAA to D)
SIZE: Log (total assets)
CI: interest expenses on liabilities, total financial expenses (interest cost + bond interest + loss on bond redemption - earning on bond redemption + interest related to loan for construction) / average interest accrued for liabilities (short-term bond + short-term borrowings + current portion of long-term debts - other current portion of long-term bond + long-term bond + financial lease debts + long/short-term securitized debts + reorganization and composition obligations)
ROA: net income to total assets (net income/total asset)
NEG: negative: 1; non-negative: 0
IR_{t-1}: implementation status of IR (IR is implemented in t-1 year: 1; not-implemented: 0)
YR_t: year dummy; if the observed value belongs to t-year: 1; if not: 0 (k=2007, 2008, 2009, 2010)
IND_k: industry dummy; if the observed value belongs to k-industry: 1; if not: 0

In the model, the hypothesis that the implementation of IR has a statistically significant positive (+) relation with CR, which was a dependent variable used as a proxy for the cost of borrowed capital, is presumed to be supported by the results that companies with IR had higher CR and lower CI, while those without IR had a relatively lower CR and higher CI. Moreover, this study conducted an analysis based on the data of t-1 year of companies with IR and without IR in order to improve the validity of the results of this study. Research by Francis, Khurana, and Pereira (2005) suggested that firm size (SIZE), ROA and the cost of borrowed capital, which were used as control variables, had positive (+) correlations. The bigger the size of the

companies, the lower the risk and the cost of borrowed capital became, which revealed the estimated positive (+) relations. The higher the ROA increased, the higher the CR became, and the lower the burden of the cost of borrowed capital, which showed the estimated negative (-) relations.

EMPIRICAL RESULTS

Descriptive Statistics

The descriptive statistics for the samples are shown in Table 2. The CR of the overall companies was 12.649 and the CR of those with IR was higher than that of those without IR, 15.051 and 11.638, respectively. The CI of companies without IR was higher than that of those with IR, 5.626 and 5.292, respectively, indicating that the companies who held IR have a greater burden of the cost of borrowed capital. The ROA of companies with IR was higher than that of those without IR by over 50%, 0.094 and 0.042, respectively; it is also higher than the average ROA of 0.058. The LEV of companies with IR and without IR was less than 3% of the average of 0.463. The NEG of companies without IR was closer to negative (1) than that of those with IR. Taken together, companies with IR had higher CR and bigger SIZE, whereas those without IR had more burden of CI and reached nearly negative (1) of NEG. However, LEV was higher in those with IR within 5%. All these results represent that companies who hold IR activities rely more on borrowed capital; yet, since IR improves the confidence and transparency in the companies in order to elicit a favorable response from the external stakeholders, it also raises the CR and reduces the burden of the cost of borrowed capital.

The correlation analysis of the samples is presented in Table 3. Panel A revealed that overall, companies had significant positive (+) correlations of CR with IR, size and ROA, 0.348, 0.603 and 0.304, respectively, which means that bigger-sized companies with IR and higher ROA have higher CR. CI was negatively (-) correlated with CR and IR, which means that companies with higher CR, which was used as a proxy for the cost of borrowed capital, have reduced CI, and moreover, the implementation of IR diminishes CI.

Table 2
DIFFERENCE ANALYSIS OF THE MAIN VARIABLES ACCORDING TO THE IMPLEMENTATION OF INVESTOR RELATIONS

	Total Company (N=1,513)		Company that has performed IR (N=448)		Company that has not performed IR (N=1065)		t value	Z value
	Avg	Median	Avg	Median	Avg	Median		
CR	12.649	13.000	15.051	16.000	11.638	12.000	14.09***	14.90***
SIZE	27.083	26.857	28.347	28.402	26.551	26.428	23.56***	18.86***
CI	5.528	4.786	5.292	4.616	5.626	4.862	-1.13	-2.18**
ROA	0.058	0.066	0.094	0.101	0.042	0.053	7.30***	9.00***
LEV	0.463	0.481	0.498	0.524	0.448	0.464	4.88***	4.74***
NEG	0.164	0	0.107	0	0.188	0	-3.92***	-3.90***

CR: Interval scores assigned values depending on each company's corporate bond credit rating (AAA ~ D to 20 ~ 1)
SIZE: Log(total asset)
CI: interest cost to liabilities, total financial expense (interest + bond interest + loss from redemption of bond - gains from redemption of bonds + interest during construction) / average interest of liability (short-term bond + short-term borrowings + current maturities of long-term obligation - other current maturities of long-term obligation + long-term bond + liabilities in financial lease + current liabilities of long & short-term obligation + obligation of consolidation & liquidation)
ROA: net income to total assets (net income/total asset)
LEV: Liability ratio(Total liability./Total asset)
NEG: If net margin is negative, 1. If net margin is positive,0
IR: Whether investor relations has implemented or not (If yes, 1, if No, 0)

Panel B showed the results of analyzing the correlations among major variables after the implementation of IR. Both the SIZE and ROA of companies with IR and without IR had significant positive (+) correlations. However, the correlation coefficients of SIZE and ROA of the companies with IR were 0.704 and 0.340, respectively, which was higher than those of the companies without IR, 0.460 and 0.233. This implies that companies with IR have bigger SIZE and higher ROA. On the other hand, CI, LEV and NEG in both companies with IR and without IR had significant negative correlations. Specifically, the correlation coefficients of CI, LEV and NEG of companies with IR were -0.242, -0.263 and -0.266, respectively, which were lower than those of the companies without IR, -0.167, -0.204 and -0.216, respectively. It means that companies with IR have relatively lower CI and LEV, and that their NEG is close to positive (0).

Table 3
CORRELATION ANALYSIS
Panel A: Correlation about the total company

	CR	IR	SIZE	CI	ROA	LEV
IR	0.348***	-	-	-	-	-
SIZE	0.603***	0.518***	-	-	-	-
CI	-0.185***	-0.029**	-0.115***	-	-	-
ROA	0.304***	0.184***	0.232***	-0.140***	-	-
LEV	-0.162***	0.124***	0.158***	0.070***	-0.135***	-
NEG	-0.247***	-0.100***	-0.158***	0.129***	-0.718***	0.168***

Panel B: Correlation of the main variables according to Investor Relation implementation

Classification variable	Company that has performed IR(N=448)	Company that has not performed IR(N=1065)
	CR[b]	CR[b]
SIZE	0.704 ***	0.460 ***
CI	-0.242 ***	-0.167 ***
ROA	0.340 ***	0.233 ***
LEV	-0.263 ***	-0.204 ***
NEG	-0.266 ***	-0.216 ***

b * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level).
All variables in the model are defined in Table 2.

Regression Analysis

The results of the regression analysis of samples for this study are shown in Table 4. Panel A describes the results of the regression analysis of the effects of IR on CR. The implementation status of IR had a significant positive (+) influence on CR, which represented the cost of borrowed capital with 0.390(1.86). The result that can be translated is IR reduced information asymmetry among the external stakeholders.

As an additional analysis of Panel A, Panel B shows the results of the additional analysis carried out using the Ordered Logit Model in order to improve the convenience of regression coefficients, which may occur during OLS in the case of CR, which was a dependent variable measured by the ordinal scale. As a result, the coefficient calculated by the implementation status of IR was 0.281(Wald= 6.24), which was a statistically significant positive (+) value.

Testing the Hypothesis: Hypothesis: IR Is Positively (+) Related to CR.

Table 4
RESULTS OF THE REGRESSION ANALYSIS
Panel A: Corporate bond credit rating influenced by Investor Relation implementation

	SIZE	ROA	CI	NEG	IR	Intercept, year & industry dummies	Adjusted R^2
Regression coefficient[a] (t-statistic)[b]	1.514 (22.85***)	0.066 (2.61**)	-0.104 (-5.98***)	-2.291 (-9.71***)	*0.390 (1.86*)*	Included	0.428

[a]For convenience, the regression coefficient of each year and industry and intercept were omitted.
[b] * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level
All variables in the model are defined in Table 2.
YR_t= If year dummy and observed value are included in the applicable year, 1. If not, 0 (k=year of 2007, 2008 and 2009).
IND_k= If industry dummy and observed value are included in the applicable year, 1. If not, 0
There was no chance of multi-collinearity between the independent variables. Belsley-Kuh-Welsch's (1980)condition index calculated shows the Eigenvalue values of each independent variable was more than 0.56 and maximum value of condition index was less than 3.42.

Testing the Hypothesis: Hypothesis: IR Is Positively (+) Related to CR.

Panel B: Corporation bond credit rating influenced by Investor Relations according to the Ordered Logit Model

Variable	Regression coefficient	Wald[b]
SIZE	0.929	603.20***
ROA	0.058	5.76 **
CI	-0.051	33.85***
NEG	-1.031	76.85***
IR	*0.281*	*6.24* **
Intercept, year and industry dummy variable	Included	
Pseudo R^2	0.515	

[a]For convenience, the regression coefficient of each year and industry and intercept were omitted.
[b] * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level
All variables in the model are defined in Table 2.
YR_t= If year dummy and observed value are included in the applicable year, 1. If not, 0 (k=year of 2007, 2008 and 2009).
IND_k= If industry dummy and observed value are included in the applicable year, 1. If not, 0
Pseudo R^2 is calculated as below (Pindyck and Rubibfeld, p.281):

$$Pseudo R^2 = 1 - \frac{\Sigma(y_i - \hat{y}_i)^2}{\Sigma(y_i - \overline{y}_i)^2}$$

$y_i$is an actual value of dependent variable, $\overline{y}_i$is an average value of y_i, and $\hat{y}_i$is an estimated value of y_i(Pr)

This means that companies who held IR have a more positive influence on CR than those without IR, and this result is similar to that of the analysis of OLS. Pseudo R^2, which represents the goodness of fit, was 0.515; it was a positive value and was also high er than the explanatory

power of OLS(0.428). Such results support the hypothesis of this study since the implementation of IR reduced the asymmetry of information among external stakeholders to raise CR.

CONCLUSION

There is a growing trend for companies to improve the economic value for stakeholders through stable and efficient capital financing as well as to hold investor relations continuously and occasionally as part of the strategic activities for promoting sustainable growth and development. In this study, an empirical analysis was carried out in order to observe as to whether the implementation of investor relations (IR), which is voluntary disclosure made by a company, improves the confidence and transparency in the company and favorably influences external stakeholders, during borrowed capital financing in order to give a positive effect on the cost of borrowed capital. A proxy of the cost of borrowed capital was the corporate bond credit rating; the relation between IR and CR of companies who meet the criteria for sampling out of those listed in KOSPI from 2007 to 2010 was analyzed.

The results are as follows: first, companies who held investor relations had higher corporate bond credit rating and bigger firm size (SIZE), while those who did not hold IR had more burden of cost of interest (CI) and nearly negative (1) net earnings (NEG). However, leverage (LEV) was higher in companies with IR. This indicates that companies holding IR have a relatively greater reliance on borrowed capital, but elicit favorable response from external stakeholders by performing IR to raise CR, lightening the burden of the cost of borrowed capital.

Second, the implementation of IR is found to have a positive (+) influence on CR. This means that IR reduces information asymmetry in order to ultimately lower the cost of borrowed capital.

These results suggest that as the importance of IR is growing IR will improve the confidence in a company by bridging the asymmetry of information and will also lessen the burden of the cost of borrowed capital. However, this study has the following limitations: it extracted data only from a particular credit-rating agency as it used CR as a proxy for the cost of borrowed capital; also, the analysis was confined to the t-1 year-section of companies with IR.

REFERENCES

Belsley, Kuh and Welsch (1980). Regression diagnostics : identifying influential data and sources of collinearity

Diamond, D.W. & R.E. Verrecchia (1991). Disclosure, liquidity and the cost of capital. *The Journal of Finance, 46*, 1325-1360.

Francis, J.R, I.K. Khurana, & R. Pereira (2005). Disclosure incentives and effects on cost of capital around the world. *The Accounting Review, 80*, 1125-1162.

Kim, B.M., D. Lee, & B. Choi (2008). Investor relations and information asymmetry. *The Korean Journal of Finance, 21*(3), 1-39.

Kim, C. & M.K. Song (1999). The effect of investor relations activity on the investment behavior. *Korean Journal of Financial Studies, 24*, 55-81.

Lee, A.Y., S.B. Chun, & S.S. Park (2008). The effect of unfaithful disclosure on the cost of debt. *Korean Accounting Review, 33*(1), 127-158.

Lee, S.C. (2011). A study on the relationship between disclosure quality and cost of debt capital. *Korean Accounting Journal*, *20*(4), 1-34.

Merton, R.C. (1987). A simple model of capital market equilibrium with incomplete information. *Journal of Finance*, *42*, 483-510.

Na, Y. & D. Jin (2002). An empirical research on the usefulness of non-financial information in the credit rating model development. *Korean Accounting Journal*, *11*(4), 23-64.

O'Hara, M. (2003). Liquidity and price discovery. *Journal of Finance*, *58*, 1335-1364.

Park, H.J. & H.M. Ji (2010). The effect of investor relations (IR) on value relevance of accounting information. *Journal of Taxation and Accounting*, *11*(4), 419-436.

Park, J. (2011). The incremental information value of credit ratings on the cost of debt—focused on the non-listed firms. *Journal of Taxation and Accounting*, *12*(2), 523-553.

Shin, M. & S. Kim (2010). The effects of credit rating changes on capital structure decisions of firms. *The Korean Journal of Financial Management*, *27*(4), 27-59.

Sohn, S. (1997). The comparison of management's forecast with analysts' forecast—in case of investor relations. *Korean Accounting Review*, *22*(3), 107-129.

AUDIT QUALITY AND MEASUREMENT: TOWARDS A COMPREHENSIVE UNDERSTANDING

Dan HU, Nagoya University

ABSTRACT

The financial crisis of 2008 and recurrent audit failure scandals have highlighted the importance of audit quality, with regulators and academicians presenting their suggestions one after another. This paper discusses such suggestions and proposes a classification for the elements of audit quality under three elements—inputs, outputs, and context. The author selected 12 measures supported by strong and consistent empirical research for the study. Using the three-category classification of audit quality proposed in this paper, I classify the 12 measures into three groups, and discusses the advantages and shortcomings of these measures as proxy variables of audit quality.

INTRODUCTION

The importance of highly reliable financial reports and external audits was recognized again after the 2005 Kanebo scandal, the 2008 financial crisis, and the 2011 Olympus scandal. High-quality financial-reporting supply chains are essential for the creation of reliable financial reports. In particular, external audits play an important role in enhancing the quality of financial reports. It is well known that the quality of financial reports is determined and supported by the quality of the external audit, in which multiple parties are interested.

The importance of audit quality is well recognized, but until recently, researchers believed that "Audit quality is much debated but little understood." Knechel et al.'s (2013, 385) paper presented a consensus between academicians and regulators. This paper attempts to synthesize academic and regulator perspectives and to propose a framework of audit quality with comprehensive categories of classification under it. Next, using the proposed framework and previous insights from academic literature, this paper discusses the measures of audit quality.

The strongest authority on audit quality, as recognized by academics, is Linda E. DeAngelo. In 1981, she wrote the paper "Audit size and audit quality" in the Journal of Accounting and Economics, in which she proposed the notion of audit quality. During the last two decades, Jere R. Francis's empirical research on audit quality was widely cited in the academic world. In 2011, Francis published a paper titled "A framework for understanding and researching audit quality" in Auditing: A Journal of Practice & Theory, in which he proposed a framework to summarize academic literature and mentioned the notion of audit quality. Later, in 2013, the senior editor of Auditing: A Journal of Practice & Theory, W. Robert Knechel, and others wrote an article titled "Audit quality: Insights from the academic literature" in the same journal. Here, they attempted to add to the work of Francis (2011) with not only empirical data, but also experimental data. I expect to gain a new perspective on the notion of audit quality from the work of Knechel et al. (2013) also.

However, after analyzing the paper, I find that audit quality is a "complex and multi-faceted concept" (also see IAASB, 2011, 3). This paper attempts to collate the viewpoints of FRC (2008), Francis (2011), Knechel et al. (2013), and IAASB (2013), to propose a simple classification for audit quality, while listing measures of audit quality.

This paper contributes to the literature in two ways. First, it discusses popular frameworks of audit quality presented by academicians and regulators, and attempts to derive one common framework for a comprehensive understanding of audit quality. Second, it attempts to select measures of audit quality that are supported by consistent empirical results and creates a comprehensive understanding of these measures, using the framework proposed in this paper.

AUDIT QUALITY AS A SIMPLE CONCEPT

Various stakeholders, such as users, auditors (audit firms), regulators and the society, have different understandings of the concept of audit quality (IOSCO, 2009; IAASB, 2011; Knechel et al., 2013). As Knechel et al. (2013) have pointed out, for example, users of financial statements might believe that if these statements do not contain any significant inaccuracies, audit quality is high. On the other hand, auditors may believe that if the tasks they are requested by auditor team to complete are clear, high audit quality is achieved. Audit firms may suppose that if the audit can withstand litigation, it is of a high quality. Regulators may believe that if special standards are complied with, the audit is of a high quality. Finally, the society might deem an audit to be of high quality if it precludes litigation between the society and the company.

DeAngelo (1981, 186) argues that audit quality is "the market-assessed joint probability that a given auditor will both (a) discover a breach in the client's accounting system, and (b) report the breach." DeAngelo's (1981) definition has two parts to it. One part is the probability that the auditor will discover a breach, which depends on the technical expertise of the auditor, the auditor's efforts in the audit process, and the audit sampling methodology. The other part is the probability that the auditor will report the breach, which depends on the auditor's objectivity, professional skepticism, and independence.

Francis (2011) first points out that, generally speaking, audit quality is achieved when auditors issue an "appropriate" audit report after confirming whether the client company has complied with GAAP (generally accepted accounting principles). He argues that the concept of audit quality is complex and "cannot be reduced to a simple definition," and the level of audit quality is gradual not dichotomy.

Moreover, Knechel et al. (2013, 407) write that a good audit is "one where there is execution of a well-designed audit process by properly motivated and trained auditors who understand the inherent uncertainty of the audit and appropriately adjust to the unique conditions of the client." Knechel et al. attempt to define audit quality using five attributes, namely "incentive," "uncertainty," "uniqueness," "process," and "professional judgment" (Knechel et al., 2013, 386). According to them, "incentive" means that "an audit is an economically motivated response to risk"; "uncertainty" means that the consequence of the audit's output and audit report is uncertain and cannot be observed; "uniqueness" means that the client company, audit team, and audit contract are different from each other; "process" means that audit is a systematic activity; and "professional judgment" means that the conduct of the audit depends on the appropriate usage

of professional knowledge and skill. Knechel et al. further point out that audit quality cannot be observed directly, but can only be perceived.

Given the disagreement among academics and regulators on the definition of audit quality, a consensus on the definition of a simple concept such as audit quality has not been achieved. The Financial Reporting Council in the United of Kingdom (FRC) was the first regulator in the world to issue official documents on audit quality from 2006 onwards. In its discussion paper in 2006 called "Promoting Audit Quality," it said that "there is no single agreed definition of audit quality that can be used as a 'standard' against which actual performance can be assessed" (FRC, 2006, 16). The International Organization of Securities Commissions (IOSCO) said in its 2009 consultation report that it is difficult to define audit quality and that the perspective of one stakeholder differs from that of another.

Because of the difficulty in attaining a consensus on the concept of audit quality, regulators and academicians are attempting to define it using a comprehensive framework. In the next section, I will introduce the reader to some popular frameworks for defining audit quality and propose a classification for this concept.

AUDIT QUALITY AS A FRAMEWORK CONCEPT

In this section, I will introduce four frameworks of audit quality: FRC (2008), Francis (2011), Knechel et al. (2013), and the International Auditing and Assurance Standards Board (IAASB) (2013). I have chosen these frameworks because FRC was the first regulator to issue official documents on audit quality, while the works of Francis and Knechel et al. capture the academic world's viewpoint, and IAASB (2013) is the most recent official view from an international organization.

THE FRC (2008) FRAMEWORK

After the 2006 discussion paper called "promoting audit quality," FRC issued "The Audit Quality Framework" in February 2008. Figure 1 presents the contents of this framework. As seen in the figure, in FRC's (2008) opinion, there are five drivers of audit quality including (1) the culture within an audit firm, (2) the skills and personal qualities of audit partners and staff, (3) the effectiveness of the audit process, (4) the reliability and usefulness of audit reporting, and (5) factors outside the control of auditors, which affect audit quality.

To elaborate on the first driver, if the partner and staff have the time and resources to achieve a high quality audit, their payments are connected with audit quality, and there are inter-firm and international monitors of audit quality, audit quality will improve. As far as the partners' and staff's skills are concerned, if they possess professional skepticism, obey auditing and ethical standards, and are given ample training, audit quality is likely to improve. Regarding the audit process driver, if the audit team is not under financial pressure, implements an audit plan, maintains complete documentation, correctly applies judgment and documents it, and has high-quality technical support, audit quality will improve. Regarding the audit reporting driver, if auditors can communicate with the audit committee and report the audit opinion clearly, this will positively influence audit quality. Finally, some factors that influence audit quality are not controlled by

auditors. For example, stakeholders that support auditors, the quality of corporate governance, an audit committee, and a suitable regulatory environment can enhance audit quality.

Table 1
The FRC (2008) Framework for Audit Quality

Driver	Indicators
（1）The culture within an audit firm	The culture of an audit firm is likely to provide a positive contribution to audit quality where the leadership of an audit firm: • Creates an environment where achieving high quality is valued, invested in and rewarded. • Emphasizes the importance of 'doing the right thing' in the public interest and the effect of doing so on the reputation of both the firm and individual auditors. • Ensures partners and staff have sufficient time and resources to deal with difficult issues as they arise. • Ensures financial considerations do not drive actions and decisions having a negative effect on audit quality. • Promotes the merits of consultation on difficult issues and supporting partners in the exercise of their personal judgment. • Ensures robust systems for client acceptance and continuation. • Fosters appraisal and reward systems for partners and staff that promote the personal characteristics essential to quality auditing. • Ensures audit quality is monitored within firms and across international networks and appropriate consequential action is taken.
（2）The skills and personal qualities of audit partners and staff	The skills and personal qualities of audit partners and staff are likely to make a positive contribution to audit quality where: • Partners and staff understand their clients' business and adhere to the principles underlying auditing and ethical standards. • Partners and staff exhibit professional skepticism in their work and are robust in dealing with issues identified during the audit. • Staff performing detailed 'on-site' audit work have sufficient experience and are appropriately supervised by partners and managers. • Partners and managers provide junior staff with appropriate 'mentoring' and 'on the job' training. • Sufficient training is given to audit personnel in audit, accounting and industry specialist issues.
（3）The effectiveness of the audit process	An audit process is likely to provide a positive contribution to audit quality where: • The audit methodology and tools applied to the audit are well structured and: ◦ Encourage partners and managers to be actively involved in audit planning. ◦ Provide a framework and procedures to obtain sufficient appropriate audit evidence effectively and efficiently. ◦ Require appropriate audit documentation. ◦ Provide for compliance with auditing standards without inhibiting the exercise of judgment. ◦ Ensure there is effective review of audit work. ◦ Audit quality control procedures are effective, understood and applied. • High quality technical support is available when the audit team requires it or encounters a situation it is not familiar with. • The objectives of ethical standards are achieved, providing confidence in the integrity, objectivity and independence of the auditor. • The collection of sufficient audit evidence is not inappropriately constrained by financial pressures.
（4）The reliability and usefulness of audit reporting	Audit reporting is likely to provide a positive contribution to audit quality where: • Audit reports are written in a manner that conveys clearly and unambiguously the auditor's opinion on the financial statements and that addresses the needs of users of financial statements in the context of applicable law and regulations. • Auditors properly conclude as to the truth and fairness of the financial statements. • Communications with the audit committee include discussions about: ◦ The scope of the audit.

Table 1 The FRC (2008) Framework for Audit Quality	
Driver	**Indicators**
	◦ The threats to auditor objectivity. ◦ The key risks identified and judgments made in reaching the audit opinion. ◦ The qualitative aspects of the entity's accounting and reporting and potential ways of improving financial reporting.
（5）Factors outside the control of auditors	Factors outside the control of auditors which are likely to make a positive contribution to audit quality include: • An approach to corporate governance within the reporting entity that attaches importance to corporate and financial reporting and to the audit process. • Audit committees that are active, professional and robust in dealing with issues identified during the audit. • Shareholders that support auditors, where appropriate, thereby increasing the likelihood that directors and management will comply with their obligations in relation to the preparation of reliable financial statements. • Reporting deadlines that allow the opportunity to carry out an audit without undue reliance on work performed before the end of the reporting period. • Appropriate agreed arrangements for any limitation of liability. • An audit regulatory environment that focuses on the drivers of audit quality.
Source: FRC (2008, 3-7).	

THE FRAMEWORKS OF FRANCIS (2011) AND KNECHEL ET AL. (2013)

Francis (2011) and Knechel et al. (2013) have proposed two frameworks to review previous research and enhance the understanding of audit quality. I have presented these two frameworks together in Table 2. As seen in the table, Francis (2011) and Knechel et al. (2013) suggest that there are six and four factors, respectively, each of which affects audit quality. In Francis' (2011) framework, the six factors are (1) audit inputs, (2) audit processes, (3) accounting firms, (4) audit industry and audit markets, (5) institutions, and (6) economic consequences of audit outcomes. Meanwhile, in Knechel et al.'s (2013) framework, the four factors are (1) inputs, (2) processes, (3) outcomes, and (4) context.

Table 2 Francis (2011) and Knechel et al. (2013): Frameworks for Audit Quality	
Francis（2011, 126）	**Knechel et al. (2013, 404)**
（1）Audit Inputs • Audit tests • Engagement team personnel	**（1）Inputs** • Incentives and motivation • Professional skepticism • Knowledge and expertise • Within-firm pressures
（2）Audit Processes • Implementation of audit tests by engagement team personnel	**（2）Process** • Judgment in the audit process • Audit production • Assessing risk • Analytical procedures • Obtaining and evaluating evidence

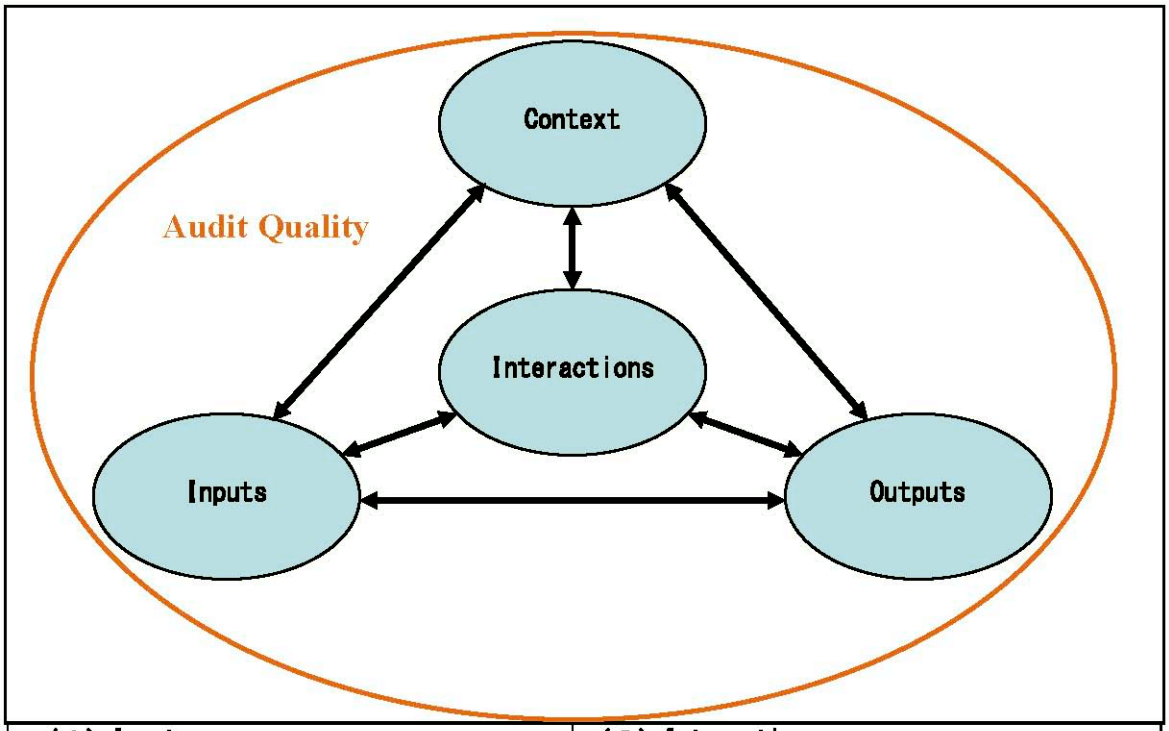
Table 2
Francis (2011) and Knechel et al. (2013): Frameworks for Audit Quality

Francis（2011, 126）	Knechel et al. (2013, 404)
	• Auditor-client negotiations • Review and quality control
（３） Accounting Firms • Engagement teams work in accounting firms • Accounting firms hire, train, and compensate auditors, and develop audit guidance (testing procedures) • Audit reports are issued in name of accounting firms	**（３）Context** • Audit partner compensation • Abnormal audit fees • Non-audit fees • Audit fee premium – Big N auditors and industry specialists • Auditor tenure • Market perceptions of audit quality
（４） Audit Industry and Audit Markets • Accounting firms constitute an industry • Industry structure affects markets and economic behavior	
（５） Institutions • Institutions affect auditing and incentives for quality, e.g., State Boards of Accountancy, the AICPA, FASB, SEC, and PCAOB, as well as the broader legal system	
（６） Economic Consequences of Audit Outcomes • Audit outcomes affect clients and users of audited accounting information	**（４）Outcomes** • Adverse outcomes ◦ Restatements ◦ Litigation • Engagement team personnel ◦ Discretionary accruals ◦ Accounting conservatism • Audit reports • Regulatory reviews of audit firms

The two frameworks have a few differences (see Table 2). For example, in the first factor in both frameworks, namely inputs, Francis (2011) emphasizes on the team's combined input in the audit, while Knechel et al. (2013) emphasize on the auditor's personal input and characteristics. However, according to Knechel et al. (2013, 390, Note 9), the factors "audit inputs," "audit process," and "economic consequences of audit outcomes" in Francis' framework are similar to the factors "input," "process," and "outcomes" in Knechel et al.'s framework. Further, the factors "accounting firms," "audit industry and audit markets," and "institutions" in Francis' framework can be summarized under the factor "context," in Knechel et al.'s framework.

THE IAASB (2013) FRAMEWORK

Figure 1
The IAASB's (2013) Audit Quality Framework



(1) Inputs Categorized at the engagement, firm, and national levels across three broad headings: · Values, Ethics and Attitudes; · Knowledge, Experience and Time; and · Audit Process and Quality Control Procedures.	**(2) Interactions** Described as effective interactions between: · Auditors and management, those charged with governance, users, regulators; · Management and those charged with governance, regulators, users; · Those charged with governance and regulators, users; and · Regulators and users.
(3) Outputs Categorized at the engagement, and firm and national, levels and including output from: · The auditor; · The audit firm; · The entity; and · Audit regulators.	**(4) Contextual Factors** · Business practices and commercial law · Laws and regulations relating to financial reporting · The applicable financial reporting framework · Corporate governance · Information systems · Financial reporting timetable · Broader cultural factors

Source: IAASB (2013, 18-23).

The International Auditing and Assurance Standards Board (IAASB) is a standards-making body of the International Federation of Accountants (IFAC), and issues the International Standards on Auditing (ISA). In 2011, IAASB published a document titled "Audit Quality: An IAASB Perspective." In 2013, it published a consultation paper titled "A Framework for Audit Quality,"

in which it created a framework from its perspective. While IAASB (2013) is a big volume with 72 pages, the audit quality framework relevant to this paper is summarized in Figure 1.

As seen in Figure 1, there are four elements in IAASB (2013) that are related to audit quality: (1) inputs, (2) outputs, (3) context, and (4) interactions. When measuring "inputs" and "outputs," there are three issues to consider: the audit engagement, the audit firm side, and the national side (see IAASB, 2013, 20-23 for details.). The "input" element consists of (1) "values, ethics and attitudes of auditors"; (2) "knowledge and experience of auditors," "time for audit," and "effectiveness of the audit process and quality control procedures" (IAASB, 19). The "output" element consists of the auditor, audit firm, entity (for example, audit committees), and audit regulators' outputs (see IAASB, 2013, 22-23). The key components of the "interactions" element seem to be interactions between/among the auditor, management, those charged with governance, users, and regulators (IAASB, 23). The "context" element consists of seven items (see Figure 1.). Moreover, the four elements influence each other and their interactions contribute to "audit quality."

PROPOSED FRAMEWORK OF THIS PAPER

In this section, I first described four above-mentioned popular frameworks for audit quality. While the FRC's (2008) and IAASB's (2013) frameworks represent regulator perspectives, Francis' (2011) and Knechel et al.'s (2013) frameworks represent the viewpoint of the academia. Here, I propose a three-element framework that synthesizes these frameworks. My framework for audit quality consists of the elements a) input, b) output, and c) context. Table 3 shows the contents of my proposed framework and their relationship with other frameworks. In the next section, I will use the proposed framework to classify the measures of audit quality which previous empirical research had used.

Table 3
Proposed Framework and the Relationship with Other Frameworks

Author's Proposed framework	FRC (2008)	Francis (2011)	Knechel et al. (2013)	IAASB (2013)
Inputs	(2) The skills and personal qualities of audit partners and staff	(1) Audit Inputs	(1) Inputs	(1) Inputs
	(3) The effectiveness of the audit process	(2) Audit Processes	(2) Process	
Outputs	(4) The reliability and usefulness of audit reporting	(6) Economic Consequences of Audit Outcomes	(4) Outcomes	(2) Outputs
Context	(1) The culture within an audit firm	(3) Accounting Firms	(3) Context	(3) Interactions
	(5) Factors outside the control of auditors	(4) Audit Industry and Audit Markets		(4) Context
		(5) Institutions		

MEASURES OF AUDIT QUALITY

From the frameworks of audit quality discussed above, it is evident that many factors influence audit quality. However, very few factors can be used as proxy variables for audit quality, given their low substitutability. In this section, I will list the measures of audit quality that have been verified or suggested in previous research, classify these measures using the framework proposed in the previous section and discuss the advantages and shortcomings of each measure for use in future research.

Table 4 discusses 12 measures selected by the author for use in empirical research. From the perspective of the framework proposed in the previous section by author, the twelve measures can be categorized into a) input, b) output, and c) context measures. Note that some measures can be classified into input, and/or output and/or context measures in the same time (see Table 4 for details.).

Table 4
A Summary of the Measures of Audit Quality That Are Suited to Empirical Research

Proposed framework	Measurements	Previous research	Advantages as audit-quality proxy variable	Shortcomings as audit quality proxy
Input, output, context	(1) Audit firm (office) size	DeAngelo (1981), Francis et al. (1999), Francis and Yu (2009)	The cost of evaluation is an important consideration while evaluating audit quality. Audit firm (office) size is considered to be a proxy variable of audit quality, which does not require high evaluation costs. The assumption here is that audit quality is uniform among audit firms or offices. Client companies can switch audit firms or offices according to their audit-quality needs.	This assumption is not always true; audit quality is not necessarily uniform among audit firms and offices.
Input	(2) Audit time	O'Keefe et al. (1994), Caramanis and Lennox (2008)	Since it reflects the efforts of the auditor, it is a direct measure of audit quality.	The auditor's efforts might not affect the outcome of the audit, and therefore, may not affect the quality of the outcome. Audit times may be different for partners and staff, and needs to be considered separately.
Input	(3) Auditor specialization	Krishnan (2003), Balsam et al. (2003), Reichelt and Wang (2010)	If auditors have sufficient knowledge of a specific industry, the quality of their audit is better than that of others.	Even if auditors have specific industrial knowledge, it is not necessary that they will make efforts to audit well. Further, efforts do not result in outcomes at times.
Output	(4) Restatement	Kinney et al. (2004), Francis (2011), Knechel et al. (2013)	If a restatement is required, the quality of the financial report is thought to be low. Because it is believed that audit quality is positively related with the quality of the financial report, restatement is considered a negative measure of audit quality.	Even if there is no any restatement, it is still possible that audit quality is low. Further, restatement is a direct measure of the quality of the financial report and not of audit quality.
Output	(5) Litigation or regulatory reviews of audit firms	Gunny and Zhang (2011), Francis (2011), Knechel et al. (2013)	If audit fault is indicated by litigation or regulatory review, it is clear that the audit quality is low.	Even if there is no indication of litigation or regulatory review, audit quality could still be low.

Table 4
A Summary of the Measures of Audit Quality That Are Suited to Empirical Research

Proposed framework	Measurements	Previous research	Advantages as audit-quality proxy variable	Shortcomings as audit quality proxy
Output	(6) Accruals	Yoshida (2006), Yazawa (2010), Lawrence et al. (2011)	High audit quality is a deterrent to earnings management by an organization.	This is a traditional measure of earnings quality, and several voices have expressed doubts about its efficacy as a measure of audit quality.
Output	(7) Earning benchmark	Burgstahler and Dichev (1997), Carey and Simnett (2006), Francis and Yu (2009)	If the quality of audit is high, there are fewer instances earnings management, such as attempts to avoid losses on record or attempts to record even small profits.	This is a traditional measure of earnings quality, and several voices have expressed doubts about its efficacy as a measure of audit quality.
Output	(8) Accounting conservatism	Knechel et al. (2013)	Literature suggests that accounting conservatism has a negative relationship with litigation and a positive relationship with auditor specialization. Therefore, accounting conservatism is thought to have a positive relationship with audit quality, and might be a measure of audit quality.	This is a traditional measure of earnings quality, and several voices have expressed doubts about its efficacy as a measure of audit quality.
Output	(9) Going-concern report	DeFond et al. (2002), Carey and Simnett (2006), Francis and Yu (2009)	Going-concern reports make it possible to measure audit quality directly from the audit's outcome. The independence of auditors is thought to be connected directly with audit quality. While a going-concern report is one measure of auditor independence, it is also considered a measure of audit quality.	The use of a going-concern report to measure audit quality can result in type I and type II errors.
Output, context	(10) Analyst forecast accuracy	Khurana and Raman (2004), Lawrence et al. (2011)	Analyst forecast accuracy is thought to be a measure of the credibility of a financial report. Since the credibility of the financial report has a positive relationship with audit quality, analyst forecast accuracy can be considered a measure of audit quality.	This is a traditional measure of the credibility of a financial report, and several voices have expressed doubts about its efficacy as a measure of audit quality.
Output, context	(11) Ex ante cost of equity capital	Behn et al. (2008), Lawrence et al. (2011)	The ex-ante cost of equity capital is thought to be a measure of the reliability of a financial report. Since the reliability of a financial report has a positive relationship with audit quality, ex ante cost of equity capital can be considered a measure of audit quality.	This is a measure of the reliability of a financial report, and several voices have expressed doubts about its efficacy as a measure of audit quality.
Context	(12) Abnormal audit fees	Knechel et al. (2013)	Audit fees that are higher than average may suggest a problem with the financial reports. On the other hand, audit fees that are below average suggest that the auditors may not be carrying out a thorough audit.	Average audit fee is, in some sense, artificially decided. One should be prudent when using this figure as a benchmark and treating higher or lower audit fees as bad news.

INPUT MEASURES

There are three input measures of audit quality: (1) audit firm (office) size, (2) audit time, and (3) auditor specialization. "Audit firm (office) size" is a classic proxy variable for audit quality (DeAngelo, 1981). The reason it can be used as a proxy variable for audit quality is that the audit quality of a firm or office is often uniform. However, the assumption of uniformity in audit quality

among firms or offices is not always correct. Using audit firm size as a measure of audit quality has several limitations (Choi et al., 2010). Further, audit firm (office) size is not only an input measure, but also an output and context measure. For example, in IAASB's (2013) framework (see Figure 1), audit firm size is classified under the "output" and "input" elements. Further, in Francis' (2011) framework (see Table 2.), audit firm size is classified under the "context" element.

"Audit time" is the most direct measure of auditor effort and therefore, directly measures audit quality. The use of "auditor specialization" as a proxy variable for audit quality is intuitive; if auditors have sufficient knowledge of the specific industry, the quality of their audit is higher, ceteris paribus. However, merely because they have knowledge of the industry does not mean they will put efforts into the audit, and greater efforts do not always result in improved outcomes. The two measures, namely, audit time and auditor specialization have shortcomings as proxy variables of audit quality. Moreover, these shortcomings adversely affect the "inputs" perspective for the variables of audit quality.

OUTPUT MEASURES

There are nine output measures of audit quality: (1) audit firm (office) size, (4) restatement, (5) litigation or regulatory review of audit firms, (6) accruals, (7) earnings benchmark, (8) accounting conservatism, (9) going-concern report, (10) analyst forecast accuracy and (11) ex-ante cost of equity capital.

The measures (4) and (5), namely, restatement and litigation or regulatory review of audit firms, point to shortcomings in audit quality. However, even when there is no restatement, litigation, or regulatory review of audit firms, audit quality could be low. This is a limitation of these measures. As Palmrose (1988) points out, litigation occurs in less than one percent of audit engagements. Therefore, if academicians try to use litigation as a measure of audit quality, they will be analyzing only one percent of the entire sample, and this may not be representative of the rest of the sample.

The measures (6), (7) and (8), namely accruals, earnings benchmark and accounting conservatism, can be used for analysis because they are all measures of earnings quality as well. Antle and Naleguff (1991) suggest that financial reports are the result of cooperation between the client company and auditor; therefore, earnings quality can be used as a measure of audit quality. However, academicians (for example, Francis, 2011, 130) have raised doubts about the substitutability of measures of earnings quality for audit quality.

A going-concern report is a measure of audit quality. The obvious advantage of this measure is that the going-concern report makes it possible to measure audit quality directly from the audit's outcome. However, as Knechel et al. (2013, 398) point out, type I or type II errors might occur during the application of this measure. For example, as Carson et al. (2013) have reported, 40-50 percent of all bankrupt companies did not receive going-concern reports in the year before they filed for bankruptcy. This is a type I error. Meanwhile, 80-90 percent of companies that received going-concern reports in the previous year did not become bankrupt. This is a type II error.

The measures (10), namely analyst forecast accuracy, and (11), namely ex-ante cost of equity capital, can be considered together because they have two common characteristics. First,

both measures are market recognitions for audit quality. Second, since these measures are both market recognitions, they can also be classified under the "context" element (see Table 2). On the other hand, because the two measures are representative of the credibility and reliability of financial reports (Khurana and Raman, 2004; Behn et al., 2008), it is doubtful whether these measures apply to audit quality or not.

CONTEXT MEASURES

There are four context measures of audit quality: (1) audit firm (office) size, (10) analyst forecast accuracy, (11) ex-ante cost of equity capital and (12) abnormal audit fees. As argued previously in this paper, "audit firm (office) size" can be classified under the "context" element of audit quality as well (see Francis' (2011) framework in Table 2). Further, "analyst forecast accuracy" and "ex-ante cost of equity capital," too, can be classified under the "context" element of audit quality, because they represent "market perceptions of audit quality" in Knechel et al.'s (2013) framework.

"Abnormal audit fees" can be a measure of audit quality for two reasons. First, higher-than-average audit fees may suggest problems in the company's financial reports. On the other hand, lower-than-average audit fees may suggest that the auditors are not carrying out a thorough audit. However, it is difficult to determine the average level of audit fees, and this process is artificial, in a sense. Therefore, one must be careful while treating this artificial average fee as a benchmark and viewing any figure that is higher or lower than the average as bad news.

SUMMARY AND CONCLUSION

Recently, there have been several controversies about audit quality and frameworks, and the regulators of various countries, as well as academicians, have made multiple suggestions, one after another. Starting with FRC's (2006) discussion paper, regulators published a string of reports and documents on audit quality (for example, FRC (2008); IOSCO (2009); IAASB (2011, 2013)). Meanwhile, in the academic world, the widely read DeAngelo (1981) and the recent work of Francis (2011) and Knechel et al. (2013), which were published in the same reputed journal one after another, indicate the growing interest among scholars in the notion of audit quality. The 2008 financial crisis and recurrent window-dressing scandals have further highlighted the importance of audits and audit quality.

Given the abovementioned background, this paper attempts to summarize the frameworks suggested by regulators and academicians, and proposes a common framework. It then suggests measures of audit quality and uses this common framework to classify them. The results of this paper can be summarized in the three following paragraphs:

First, DeAngelo (1981) was a pioneer in defining audit quality and described it as the detection of breach by auditors, followed by the reporting of the breach to the public. Meanwhile, Francis (2011) first defined audit quality as the compliance of an audit report to GAAP and pointed out that audit quality has gradually increased from a low level to a high level. Finally, Knechel et al. (2013) listed five attributes and attempted to define a "good audit" using these attributes. These

attempts to define audit quality showed that the definition of audit quality was complex, had several aspects to it, and could not be summarized in a single sentence.

Second, since it is difficult to create any single definition of audit quality, regulators and academicians continue to use frameworks for this purpose. FRC published its first trial report in 2006, and in 2008, it listed five drivers influencing audit quality under its framework. Francis (2011) listed six factors, while Knechel et al. (2013) listed four indicators, and IAASB (2013) listed four elements of audit quality under its framework. This paper synthesizes these frameworks and proposes three elements that influence audit quality, namely (1) inputs, (2) outputs, and (3) context.

Third, under the three elements of audit quality in the proposed framework, this paper presents 12 measures of audit quality, which are supported by strong and consistent evidence from previous empirical research. This paper also discusses reasons to use these 12 measures as proxy variables for audit quality and the shortcomings to such an approach. The 12 measures are (1) audit firm (office) size, (2) audit time, (3) auditor specialization, (4) restatement, (5) litigation or regulatory review of audit firms, (6) accruals, (7) earnings benchmark, (8) accounting conservatism, (9) going-concern report, (10) analyst forecast accuracy, (11) ex-ante cost of equity capital, and (12) abnormal audit fees. Among these measures, (1) (2) (3) are "input" elements, (1) (4) (5) (6) (7) (8) (9) (10) (11) are "output" elements, and (1) (10) (11) (12) are "context" elements. In future research, these 12 measures can be used to conduct empirical research on audit quality.

REFERENCES

Antle. R., & B. Nalebuff (1991). Conservatism and auditor-client negotiations. *Journal of Accounting Research*, 29 (Supplement), 31-54.

Balsam, S., J. Krishnan, & J. Yang (2003). Auditor industry specialization and earnings quality. *Auditing: A Journal of Practice & Theory*, 22 (2), 71-97.

Behn, B., J. H. Choi, & T. Kang (2008). Audit quality and properties of analyst earnings forecasts. *The Accounting Review*, 83 (2), 327-359.

Burgstahler, D., & I. Dichev (1997). Earnings management to avoid earnings decreases and losses. J*ournal of Accounting and Economics*, 24, 99–126.

Carey, P., & R. Simnett (2006). Audit partner tenure and audit quality. *The Accounting Review*, 81, 653-676.

Caramanis, C., & C. Lennox (2008). Audit effort and earnings management. *Journal of Accounting and Economics*, 45 (1), 16-138.

Carson, E., N. Fargher, M. Geiger, C. Lennox, K. Raghunandan, & M. Willekens (2013). Auditor reporting on going-concern uncertainty: A research synthesis. *Auditing: A Journal of Practice & Theory*, 32 (Supplement 1), 353-384.

Choi, J., C. Kim, J. Kim, & Y. Zang (2010). Audit office size, audit quality, and audit pricing. *Auditing: A Journal of Practice & Theory*, 29 (1), 73-97.

DeAngelo, L. E (1981). Auditor size and audit quality. *Journal of Accounting and Economics*, 3 (3), 183-199.

DeFond, M., K. Raghunandan, & K. R. Subramanyam (2002). Do non-audit service fees impair auditor independence? Evidence from going concern audit opinions. *Journal of Accounting Research*, 40, 1247-1274.

Financial Reporting Council (FRC) (2006). *Promoting audit quality*. Discussion paper. London, LDN : FRC.

Financial Reporting Council (FRC) (2008). *The audit quality framework*. London, LDN : FRC.

Francis, J., L. E. Maydew, & H. C. Sparks (1999). The role of Big 6 auditors in the credible reporting of accruals. *Auditing: A Journal of Practice & Theory*, 18 (2), 17-34.

Francis, J. R. & M. Yu (2009). Big Four office size and audit quality. *The Accounting Review*, 84 (5), 1521–1552.

Francis, J. R (2011). A framework for understanding and researching audit quality. *Auditing: A Journal of Practice & Theory*, 30 (2), 125-152.

Gunny, K., & T. Zhang (2011). PCAOB Inspection Reports and Audit Quality. *Journal of accounting and public policy*, 32, 136-160.

Hribar, P., T. D. Kravett, & R. J. Wilson (2010). A new measure of accounting quality. Working paper, The University of Iowa and The University of Texas at Dallas.

International Auditing and Assurance Standards Board (IAASB) (2011). *Audit quality: An IAASB Perspective*. New York, NY : IAASB.

International Auditing and Assurance Standards Board (IAASB) (2013). *A Framework for Audit Quality*. New York, NY : IAASB.

International Federation of Accountants (IFAC) (2008). *Financial Reporting Supply Chain: Current Perspectives and Directions*. New York, NY : IFAC.

International Organization of Securities Commissions (IOSCO) (2009). *Consultation report on transparency of firms that audit public companies*. Madrid, Spain, MAD : IOSCO.

Khurana, I., & K. Raman (2004). Litigation risk and the financial reporting credibility of Big 4 versus non-Big 4 audits: Evidence from Anglo-American countries. *The Accounting Review*, 79 (2), 473-495.

Kinney, W. R., Jr., Z.-V. Palmrose, & S. Scholtz (2004). Auditor independence, non-audit services, and restatements: Was the U.S. government right? *Journal of Accounting Research*, 42 (3), 561-588.

Knechel W. R., G. V. Krishnan, M. Pevzner, L. B. Shefchik, & U. K. Velury (2013). Audit Quality: Insights from the Academic Literature. *Auditing: A Journal of Practice & Theory*, 32 (Supplement 1), 385-421.

Krishnan, G (2003). Does Big 6 auditor industry expertise constrain earnings management? *Accounting Horizons*, 17 (Supplement), 1-16.

Lawrence, A., M. Minutti-Meza, & P. Zhang (2011). Can Big 4 versus non-Big 4 differences in audit quality proxies be attributed to client characteristics? *The Accounting Review*, 86 (1), 259-286.

O'Keefe, T. B., D. Simunic, & M. Stein (1994). The production of audit services: Evidence from a major public accounting firm. *Journal of Accounting Research*, 32 (2), 241-261.

Palmrose, Z-V (1988). An analysis of auditor litigation and audit service quality. *The Accounting Review*, 63(1), 55-73.

Public Company Accounting Oversight Board (PCAOB) (2013). *Standing Advisory Group Meeting: Discussion-Audit Quality Indicators*. Washington, DC: PCAOB.

Reichelt, K., & D. Wang (2010). National and office-specific measures of auditor industry expertise and effects on audit quality. *Journal of Accounting Research*, 48 (3), 647-686.

Yazawa, K. (2011). Big4 and Audit Quality: Moral Hazard Hypothesis. *Aoyama Journal of Business*, 46(1), 159-179.

Yoshida, K. (2008). Analysis of audit quality and reported earnings management in Japan. In Tomosugi, Y., Tanaka, H. & L. Sato (Eds.), *Research about reliability of financial information*, 224-235.

FIRST PAGE FOR THE HISTORY OF STOCK OPTIONS

Akihiro Noguchi, Nagoya University
Masako Futamura, Otaru University of Commerce

ABSTRACT

Purpose of this paper is to reveal the reason for treating stock option outstanding account as paid-in capital from the historical perspective. Why stock options were classified as equity will be clarified, based on the analysis of original form of stock option plans in the early 20th century. Adding explanation to the first page of the history of accounting for stock options is the objective of this paper.

Stock options could be described as a main tool for incentive compensation at the end of the 20th century. The proliferation began in the early 1950s in the United States (U.S.), when a preferential treatment was implemented in the Internal Revenue Code. Although the liability/equity classification of a stock option outstanding account is still under controversy, accounting standards in the U.S. consistently supported equity classification. In order to figure out the reason for equity classification, it is important to analyze the very beginning of the form of stock options. However, descriptions in the stock option literature about the early cases of stock option plan are quite limited.

This paper describes the very early case of stock option plan found by searching the database ProQuest Historical Annual Reports. The original form of the stock option plan was stock sold on installment, which could be the reason for equity classification of stock options.

INTRODUCTION

As history supports contemporary research in policy-making and practice and in standard setting (Previts, Parker, Coffman, 1990), it is important to do research in accounting history. The purpose of this paper is to reveal the reason for equity classification of the stock option outstanding account from the historical perspective. Prior studies did not explain stock option plans before 1920s, in addition to literature review, search for what was written in annual reports was conducted to reveal the stock option plans before 1910s. Because the stock sold on installments was the original form of stock option plan, equity classification was a natural result of recording the transaction following that form.

Classification between equity and liabilities is still an unsettled issue. *Preliminary Views* of the Financial Accounting Standards Board (FASB, 2007, 7) supported to classify stock options as liabilities. On the other hand, preliminary view of the International Accounting Standards Board (IASB) is that the existing definition of equity – the residual interest in the assets of the entity after deducting all its liabilities – should not be changed (IASB, 2013, 84). In accounting literature, Kaplan & Palepu (2003) supported to classify stock options as equity, but Ohlson & Penman (2005, 2007) supported to classify stock options as liabilities.

However, not only current U.S. Generally Accepted Accounting Principles (U.S. GAAP), and International Financial Reporting Standards and International Accounting Standards (IFRSs)

classify stock options as equity, U.S. GAAP consistently supported to classify stock options as equity from the first accounting standard for stock options. In order to clarify the reasons for equity classification of stock options, it is necessary to do research from the beginning of the history of stock option plans. Stock options are the major form of additional compensation besides cash payment. Preferential tax treatment was considered as main reason for their wide usage, but compensation that could be provided without recognizing expense could be another reason for proliferation. History of stock options after 1920s in the U.S. had been explained in prior studies. Stock options before 1910s will be analyzed in this paper, based on the survey of annual reports retrieved from the database *ProQuest Historical Annual Reports*.

One of the objectives for this paper was to point out that THE EMPLOYEES PROFIT-SHARING PLAN OF THE UNITED STATES RUBBER COMPANY IN 1904 could be considered as the very early case of stock option plan that could be found in the database of the annual reports with the text of the agreement. Because of the availability of annual reports or other documents in the database, maybe that was not the first stock option plan, but it could be said that was one of the original type of stock option plans.

The other objective was to clarify those very early cases of stock options took a form of stock sold on installment with holder's option to cancel. Stock sold on installment was consistent with the explanation of the account credited for stock options in *Accounting Research Bulletin No.37*, "Accounting for Compensation in the Form of Stock Options" (ARB 37).

Because the early design of stock option plan took the form of distribution of shares of stock sold on installment, it was natural that the value of option was recommended to credit to an account similar to capital stock subscribed.

LITERATURE REVIEW OF THE STOCK OPTION PLANS IN THE EARLY 20TH CENTURY

Recent publications about stock options do not mention about the history of stock option plans during the first half of the 20th century. Delves (2004, 27) describes that stock options became a common form of executive compensation starting in the 1950s, and gained fairly wide acceptance among public companies in the 1960s. Wallace & Smith (1991), and Casson (2000) focus on current stock options or share options. Sweeney (1960) can be considered as one of the early and major publication related to the research on stock options. The reason for wide usage of stock option was explained by the passage of Section 130A of the Internal Revenue Code, which imposed only the long-term capital gains tax on the gain realized on sale of stock acquired by exercise of the option qualified as restricted stock option (Sweeney, 1960, 31-36). Ikoma (1967) could be considered as the second major publication in that field, but as for the history of stock option plans in the 1920s was analyzed by citing Baker (1940).

The first accounting standard for stock options, ARB 37, was issued in 1948. The main issue in ARB 37 was when and how compensation should be recognized and measured, but it was also stated that the entry to be made on the books should be a charge against the income account for the value of the option and a credit to an account similar to the account to which subscriptions for capital stock should be credited (par.13). Thus, the account credited for stock option was considered as an account similar to capital stock subscribed. Dillavou (1945) could

be considered as the very early literature on accounting for stock options. The main focus of the paper was measurement issue, and although the entry method to credit "Stock Option Outstanding" was explained, the characteristics of that account was not explained. There was also an article entitled "Capital stock issued to employees and officers" in *The Journal of Accountancy* published in 1937 which explained accounting for stock options in question and answer format. However, the stock options were not recognized and the accounting treatment was only made at the date of issue of the stock.

As for the information about the stock option plan itself, it was written in Sweeney (1960, 14) that there was little information available about the stock option contracts granted to executives prior to 1940, and Baker (1940) was cited for explaining the early history of stock options. Baker (1940) described the stock options from 1928 through 1938, mainly based on companies listed on the New York Stock Exchange. According to *Barron's* (July 28, 1930), executives of United Cigar Stores Co. of America were granted options to purchase shares of common stock as part of compensation for their service. "Stock options" in 1930s (some in late 1920s) were explained in those articles.

Term "stock options" was not easy to find in the articles in 1920s. But there were stock ownership plans for employees to subscribe company's shares with choice of cancelling the subscription. It was reported in *National Association of Corporation Training Bulletin* (November 1, 1920) that General Electric Company made such kind of arrangements to encourage stock ownership by employees. There was an article about Employee Stock Ownership Plan of The Electric Storage Battery Company in *American Management Review* in 1923. That plan was designed to provide employees to purchase shares of the stock on installment and with choice of cancelling their stock application before fully paid.

By 1928, employee stock ownership plans became popular and could be categorized into three types. The first plan is to buy the stock in the open market and sell it to the employees on the installment plan. The second is to sell the treasury stock at a rate below the regular market price. The third is to offer the stock at market value but giving some special bonus in addition. In most plans, employee may voluntarily cancel his subscription (*Monthly Labor Review*, 1928).

Cowdrick (1929) mentioned that employee stock ownership had been initiated by a few companies about the beginning of the century. Following section describes the very early case of stock ownership plan that could be considered as the original type of stock option plan.

THE EMPLOYEES PROFIT-SHARING PLAN OF THE UNITED STATES RUBBER COMPANY IN 1904

Literature review could not reveal the situation or the original type of stock options before 1910s. In order to look for the early case of stock options, we used the database *ProQuest Historical Annual Reports*. That database delivers over 130 years of reports from more than 800 U.S. companies, which are digitized and indexed (http://www.proquest.com/products-services/pq_hist_annual_repts.html). By searching the database using "stock option" as keywords for the period before 1910, 187 annual reports were found. However most of them were irrelevant because they just included option for stockholders (e.g. *Pennsylvania Railroad*

Company Annual Report 1883), or other transactions (e.g. *Illinois Central Railroad Company Annual Report 1898*) than providing shares of stock to employees.

Some companies did disclose offering of shares of stock to the employees (e.g. E. I. du Pont de Nemours Powder Company 1909, United States Steel Corporation 1903), but there was no option factor included in that scheme. United States Rubber Company was the exception. At the beginning of 20th century, the company introduced employees profit-sharing plan. According to the *Twentieth Annual Report of the United States Rubber Co.* (May 21st, 1912), it was written that the Company adopted a profit sharing plan through a "Stock Option" in 1904. It should be noted here that the term "Stock Option" was used by that company at that time.

First Annual Report of the United States Rubber Company was dated March 31st, 1893, and only contained list of assets and liabilities as financial statement. In *Tenth Annual Report*, dated May 20th, 1902, ten year history of the company was described in the President's Annual Report. According to that Report, the company was organized by acquiring majority interest of nine leading companies manufacturing rubber boots and shoes, which consisted one-third of the production in the United States. By 1898, as a result of consolidation of other large rubber boots and shoes companies, the percentage of product increased to three-quarters of the total output of rubber boots and shoes in the United States.

Samuel P. Colt served as the president of United States Rubber Company from 1901 until 1918. The annual reports issued during his presidency contained much more information than those of either his immediate predecessor or his successor (Babcock, 1966, 55). As for the length of the annual reports of United States Rubber Company, before 1900 was 7 pages in average, and after 1918 until 1932 was 11 pages in average, but during 1901 to 1917, the average was 13 pages. Colt was attorney general of Rhode Island, and then he became appointed assignee of the bankrupt National Rubber Company which he reorganized and incorporated as the National India Rubber Company that later became one of the companies brought together to form the United States Rubber Company (Babcock, 1966, 53-54). Such background might explain the reason for detailed information provided in the annual reports during his presidency, and the reason for 22 pages annual report in 1904 with the full text of agreement of "Employees' stock option" attached as Exhibit "A".

According to Babcock (1966, 65-66), at the beginning of 20th century, the manner in which the various companies comprising United States Rubber Company had been brought about together, created a serious human problem. There were the employees of the several rubber footwear companies from which the United States Rubber Company was formed originally, together with employees of footwear companies acquired later. There were also tire and mechanical goods companies acquired. Employees of the companies so consolidated did not readily relinquish their loyalties. Such situation made United States Rubber to be one of the first of the larger corporation to make it possible for key employees to acquire a financial interest in the company on favorable terms.

Annual reports of the United States Rubber Co. are available in the database *ProQuest Historical Annual Reports* from the *First Annual Report* of the Company issued on March 31st, 1893. Explanation about the employees profit-sharing plan of the Company appear in the *Twelfth Annual Report* (May 17th, 1904).

Outline of the plan was as follows;

1. The Company has accumulated a block of the Preferred Stock and a block of the Common Stock.
2. Those stocks were transferred to the name of principal employees under a plan.
3. The certificates were endorsed and held by the Subsidiary Company.
4. If the employee remains in the employment of the United States Rubber Company or one of its Subsidiary Companies till January 1st, 1908, he may at his option acquire stock by paying specified price ($45 a share for Preferred and $10 a share for Common) and interest. Same conditions were applied till February 1, 1910.
5. Prepayment was allowed, and if the employee decided not to take such stock, he was entitled to receive his money back with interest.
6. The amount of interest charged on the purchase price should not exceed the amount of dividends declared.

The object of that plan was "to stimulate employees to greater interest and energy in its affairs" (*Twelfth Annual Report of the United States Rubber Co.,* 6) by sharing the gains to be derived from success of the Company. So it was incentive compensation. And also the expression "Employees' stock option" could be found in the title of the full text of agreement.

The employees could choose whether to purchase shares or not, after 4 year service period, and that option lasted for another 2 years. Purchase price of the shares was given at the grant date, although there was interest incurred, the amount of interest will be offset by the amount of dividends declared. Although the form of the contract was a little complicated, the substance of the contract was nothing but a stock option plan. However, the form of the transaction was a treasury stock sold on installment.

As for accounting treatment, it was not clear from United States Rubber Company and Subsidiary Companies, Consolidated General Balance Sheet on March 31st, 1904. But following the scheme described in the annual report, the company first acquired treasury stocks and transferred them to the name of employees. Although the certificates were then endorsed and held by the subsidiary company, those employees became stockholders when they signed the agreement. Accounting for the purchase and disposal of treasury stock would be completed at that time.

SOME OTHER EARLY CASES

Employees' Subscriptions to Capital Stock of General Electric Company in 1920

According to the *Twenty-Ninth Annual Report of the General Electric Company*, in November 1920, the privilege of subscribing shares of capital stock were offered to the employees, payments to be made on the installment plan by deduction from wages. A subscriber were allowed to withdraw from his subscription agreement at any time prior to the date of final payment, in which case the total amount paid by him plus interest would be refunded. Substance of the transaction was quite similar to the plan adopted by the United States Rubber Co. That

means although the form of the transaction might be stock sold on installment, the substance was stock option.

As the Condensed Balance Sheet of the General Electric Company dated on December 31, 1920, only presents the amount of "Capital stock issued", the amount of subscribed capital stock by employees was not presented on the balance sheet. The amount was added to "Capital Stock" when common stock was issued on completion of subscription payments by employees. "Employees' subscriptions to Company securities" was presented among Current liabilities in the Condensed Balance Sheet, the amount of payments made on the installment plan might be credited there.

There was variety in accounting for subscriptions of capital stock in the early 20th century. In Bennett (1916, 107-111), two methods for recording stock sold on installments were explained. One was to credit Capital Stock Subscribed account for the amount subscribed and transfer to Capital Stock account when each installment was paid. The other was to omit the entry of the subscriptions and credit Capital Stock account when paid.

Not only what was written in the literature at that time, there were variety in balance sheet presentation for Capital Stock Subscribed account. In the Consolidated Balance Sheet of Westinghouse Electric & Manufacturing Company of March 31, 1911, "Due from Subscribers to Capital Stock" was presented among Current Assets. But, Statement of Assets and Liabilities of December 31, 1906, of The Pittsburgh Plate Glass Company did not include the unpaid balance on stock subscriptions in Capital Stock. In the Balance Sheet of December 31, 1911, of the American Telephone and Telegraph Company, "Capital Stock Instalments" was presented right below "Capital Stock" and total of them were presented. Similar presentation of "Subscription to Capital Stock" could be found in the Balance Sheet of Commonwealth Edison Company of December 31, 1920. It was not difficult to find Capital Stock Subscribed presented in the balance sheet in 1920s.

Employees' Stock Plan of American Telephone and Telegraph Company in 1921

According to the *Annual Report of the Directors to the Stockholders for the Year Ending December 31 1921 American Telephone and Telegraph Company*, continuous opportunity was provided to Bell System employees to subscribe for and acquire stock of the company by the Employees' Stock Plan dated May 1, 1921. The principal provisions included: to be entitled to subscribe for stock, continuously in the employ of the Bell System for six months; subscription payments for the stock are made by deductions for the employee's wages; interest at the rate of 8 per cent is allowed on installment payments and credited to the employee's account; the employee may pay the unpaid balance after six month and receive the certificate of stock; provision upon equitable terms is made for cancellation. Before the introduction of Employees' Stock Plan dated May 1, 1921, Stock Plans under which employees might purchase stock of the company on an installment payment basis have several times been offered.

According to the *Annual Report of the Directors to the Stockholders for the Year Ending December 31 1919 American Telephone and Telegraph Company*, a second stock purchase plan effective in 1920, by which employees of one year's service or more in the Bell System are aided to become stockholders of the company, for which they are to pay out of their wages at the rate

of a few dollars a month, was announced. It was mentioned in the *Annual Report of the Directors of American Telephone and Telegraph Company to the Stockholders for the Year Ending December 31 1914*, the plan, although not effective until 1915, by which employees of two years' service or more in the Bell System were aided to become stock holders of the company in monthly installments. The plan has been extended as of March 1, 1916 (American Telephone and Telegraph Company, 1916, 21).

It was AT&T 1984 Stock Option Plan beginning on January 1, 1984, which made the company able to grant options and stock appreciation rights to selected key employees (American Telephone and Telegraph Company, 1985, 27).

ACCOUNTING FOR STOCK SUBSCRIPTIONS

The first accounting standard for stock options was ARB 37 issued by the Committee on Accounting Procedure of the American Institute of Accountants in 1948. In paragraph 13, it was stated that the entry to be made on the books should be a charge against the income account for the value of the option and a credit to an account similar to the account to which subscriptions for capital stock should be credited.

ARB 37 stated that compensation was to be measured as of the date when the employee first became entitled to exercise the option, it was revised in 1953, changed the date for measuring compensation to that date on which the stock option was granted. As a result, for most of stock options, compensation cost was measured as zero, and no entry was made to charge compensation expense for granting stock options. ARB 37 (Revised) still stated that upon exercise of an option the sum of the cash received and the amount of the charge to income should be accounted for as the consideration received on the stock issuance (par.14), but accounting treatment for lapsed options was not stated.

According to Paton & Paton (1955, 48-49), the annual entries for stock options were explained by crediting "Capital Represented by Stock Options" account. The credit to the temporary capital account was made period by period as the services were received. They considered that the acquisition of valuable services was not altered by failure of the option holder to complete the investment process, few if any accountants would recommend crediting income with the element of capital received from the defaulting investor. And that the case of invested services represented by rights which were allowed to lapse was on about the same footing as cash invested through an ordinary stock subscription and forfeited. In both situations the credit covering the amount invested was a capital item (Paton & Paton, 1955, 52-53).

If compensation cost was measured and recognized for stock options, the credit for that was to an account similar to the account for capital stock subscribed. When stock was sold on installments, stock subscription receivable account was debited and capital stock subscribed was credited. As mentioned earlier, Bennett (1916) described two methods for stock subscription receivable, one is to on balance and the other to omit. Now, SEC Regulations requires stock subscription receivables to be presented as deduction in equity instead of presented among assets. ASC 505-10-45-2 also states that the predominant practice is to report notes receivable arising from the issuance of equity interests as a reduction of shareholders' equity. So until stock subscription receivable is actually paid in, the increase in equity is not recognized. However,

capital stock subscribed account itself is classified as equity, which has not changed for more than a century.

SUMMARY

Purpose of this paper was to reveal the reason for treating stock option outstanding as paid-in capital from the historical perspective. Classification between equity and liabilities is still an unsettled issue. Although stock option outstanding account has been classified as paid-in capital from ARB 37, FASB *Preliminary View* in 2007 proposed to classify it among liabilities, but IASB *Discussion Paper* in 2013 classified it as equity. It is necessary to reveal the very beginning of stock option plans to make clear the reason for equity classification.

United States Rubber Company's plan was one of the early cases of stock option plan, and it took a form of stock sold on installments. Stock sold on installment was consistent with the accounting treatment described in ARB 37 and Paton & Paton (1955). When stock option was granted, the treatment was to credit an account similar to capital stock subscribed.

At the beginning of the 20th century, there was accounting practice to present treasury stock among assets (Hatfield, 1909, 151-152). So the accounting treatment of United States Rubber Company seems to be different from accounting for stock sold on installments. Although the form of the transaction to sell treasury stock on installments and unissued stock might be different, the substance of those transactions is identical. It could be argued that granting stock options were considered as a transaction similar to stock sold on installment, and stock option outstanding account was considered as an account similar to capital stock subscribed. If unissued stocks were used instead of treasury stocks, the form of the very early case of stock option plan was nothing but stock sold on installments.

Prior studies did not explain stock option plans before 1920s, it was necessary to review what was written in annual reports to reveal the stock option plans before 1910s. THE EMPLOYEES PROFIT-SHARING PLAN OF THE UNITED STATES RUBBER COMPANY IN 1904 could be considered as the very early case of stock options that could be found in the database of the annual reports with the text of the agreement. And, those very early cases of stock options took a form of stock sold on installments with holder's option to cancel. Such form of the transaction was consistent with the equity classification of stock options.

This paper depends on the annual reports available in the database *ProQuest Historical Annual Reports*, annual reports or other documents are not included that database are not included in the research.

Balance sheet presentation of "Option warrants" were not discussed in this paper, either. In the balance sheet of Cities Service Company on January 10, 1916, "Preferred Stock Warrants" and "Common Stock Warrants" were presented, right below "Preferred Stock Subscriptions" between "Bills Payable". In the balance sheet on December 31, 1916, they were presented among "Current Liabilities". But, as for the first accounting standard for stock purchase warrants, *APB Opinion No.10* in 1966 stated that they should be accounted for as paid-in capital (typically by a credit to capital surplus), which were consistent with the accounting treatment for stock options So, further research is required to clarify the accounting treatment for stock purchase warrants.

REFERENCES

Accounting Principles Board, American Institute of Certified Public Accountants (1966). *APB Opinion No. 10*, Omnibus Opinion－1966. Financial Accounting Standard Board (1983). *Accounting Standards: Original Pronouncements.* Stamford, CT: FASB.

Accounting Principles Board, American Institute of Certified Public Accountants (1967). *APB Opinion No. 12*, Omnibus Opinion－1967. Financial Accounting Standard Board (1983). *Accounting Standards: Original Pronouncements.* Stamford, CT: FASB.

Accounting Principles Board, American Institute of Certified Public Accountants (1969). *APB Opinion No. 14*, Accounting for Convertible Debt and Debt Issued with Stock Purchase Warrants. Financial Accounting Standard Board (1983). *Accounting Standards: Original Pronouncements.* Stamford, CT: FASB.

Accounting Principles Board, American Institute of Certified Public Accountants (1972). *APB Opinion No. 25*, Accounting for Stock Issued to Employees. Financial Accounting Standard Board (1983). *Accounting Standards: Original Pronouncements.* Stamford, CT: FASB.

American Telephone and Telegraph Company (1915). *Annual Report of the Directors of American Telephone and Telegraph Company to the Stockholders for the Year Ending December 31, 1914.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved September 12, 2013, from http://search.proquest.com/docview/88174696?accountid=12653

American Telephone and Telegraph Company (1916). *Annual Report of the Directors of American Telephone and Telegraph Company to the Stockholders for the Year Ending December 31, 1915.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved September 12, 2013, from http://search.proquest.com/docview/88175285?accountid=12653

American Telephone and Telegraph Company (1920). *Annual Report of the Directors of American Telephone and Telegraph Company to the Stockholders for the Year Ending December 31, 1919.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved September 12, 2013, from http://search.proquest.com/docview/88176367?accountid=12653

American Telephone and Telegraph Company (1922). *Annual Report of the Directors to the Stockholders for the Year Ending December 31, 1921, American Telephone and Telegraph Company.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved September 11, 2013, from http://search.proquest.com/docview/88176661?accountid=12653

American Telephone and Telegraph Company (1985). *AT&T 1984 Annual Report.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved September 12, 2013, from http://search.proquest.com/docview/88209416?accountid=12653

Anonymous (1920). General Electric Company encourages stock ownership by employes. *National Association of Corporation Training Bulletin*, 7(11); 502-503.

Anonymous (1923). Employee stock ownership-The Electric Storage Battery Company. *American Management Review*, 12(7); 11.

Anonymous (1924). Employees' profit-sharing: An instrumentality for increasing workers' interest in efficient and economical management of business. *Barron's*, 4(2); 7.

Anonymous (1928). Investment and speculation features of employee stock ownership. *Monthly Labor Review*, 27(3); 49-53.

Anonymous (1930). United Cigar Stores Co. of America: To give executives stock instead of salaries. *Barron's*, 10(30); 18.

Anonymous (1937). Capital stock issued to employees and officers. *The Journal of Accountancy*, 64(2): 142-144.

Bennett, R.J. (1916). *Corporation Accounting*. New York, NY: The Ronald Press Company.

Babcock, G.D. (1966). *History of the United States Rubber Company: A Case Study in Corporation Management.* Indiana Business Report No.39, Bureau of Business Research, Graduate School of Business, Indiana University.

Baker, J.C. (1940). Stock options for executives. *Harvard Business Review*, Autumn: 106-122.

Casson, P. (2000). *Company Share Options*. Chichester, UK: John Wiley & Sons.

Cities Service Company (1916). *Cities Service Company Report To Stockholders Sixth Annual Meeting April 4, 1916.* America's Corporate Foundation; *ProQuest Historical Annual Reports.* Retrieved July 30, 2014 fromhttp://search.proquest.com/docview/88175447?accountid=12653

Cities Service Company (1917). *Cities Service Company Report To Stockholders Seventh Annual Meeting April 3, 1917*. America's Corporate Foundation; *ProQuest Historical Annual Reports.* Retrieved July 30, 2014 from http://search.proquest.com/docview/88175440?accountid=12653

Committee on Accounting Procedure, American Institute of Accountants (1948). *Accounting Research Bulletin No. 37,* Accounting for Compensation in the Form of Stock Options. *The Journal of Accountancy*, 87(1); 38-41.

Committee on Accounting Procedure, American Institute of Accountants (1953). *Accounting Research Bulletin No.37 (Revised),* Accounting for Compensation Involved in Stock Option and Stock Purchase Plans. *The Journal of Accountancy*, 95(3); 310-313.

Committee on Accounting Procedure, American Institute of Accountants (1953). *Accounting Research Bulletin No.43,* Restatement and Revision of Accounting Research Bulletins. American Institute of Certified Public Accountants (1961) *Accounting Research and Terminology Bulletins (Final Edition)*. New York, NY: AICPA.

Commonwealth Edison Company (1921). *Report of the Commonwealth Edison Company for the Fiscal Year December 31, 1920*. America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved July 25, 2014 from http://search.proquest.com/docview/88176574?accountid=12653

Cowdrick, E.S. (1929). Selling stock to employes. *Nation's Business*, 17(5); 23-27.

Delves, D.P. (2004). *Stock Options and the New Rules of Corporate Accountability: Measuring, Managing, and Rewarding Executive Performance*. New York, NY: The McGraw-Hill Companies.

Dillavou, E.R. (1945). Employee stock options. *The Accounting Review*, 20(3); 320-326.

E. I. du Pont de Nemours Powder Company (1910). *E. I. du Pont de Nemours Powder Company Annual Report 1909*. America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved April 24, 2014, from http://search.proquest.com/docview/88173845?accountid=12653

Financial Accounting Standards Board (1985). *Statement of Financial Accounting Concepts No.6,* Elements of Financial Statements. Norwalk, CT; Financial Accounting Foundation. Retrieved August 24, 2013, from http://www.fasb.org/cs/BlobServer?blobkey=id&blobnocache=true&blobwhere=1175822102897&blobheader=application%2Fpdf&blobcol=urldata&blobtable=MungoBlobs

Financial Accounting Standards Board (1995). *Statement of Financial Accounting Standards No.123,* Accounting for Stock-Based Compensation. Norwalk, CT; Financial Accounting Foundation.

Financial Accounting Standards Board (2004). *Statement of Financial Accounting Standards No.123 (revised 2004),* Share-Based Payment. Norwalk, CT; Financial Accounting Foundation. Retrieved August 23, 2013, from https://asc.fasb.org/cs/BlobServer?blobkey=id&blobwhere=1175820918940&blobheader=application%2Fpdf&blobcol=urldata&blobtable=MungoBlobs

Financial Accounting Standards Board (2007). *Preliminary Views*, Financial Instruments with Characteristics of Equity. Norwalk, CT: Financial Accounting Foundation.

Flood, J.M. (2014). *Wiley GAAP 2014: Interpretation and Application of Generally Accepted Accounting Principles*. Hoboken, NJ: John Wiley & Sons, Inc.

General Electric Company (1920). *Twenty-Ninth Annual Report of the General Electric Company.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved September 11, 2013, from http://search.proquest.com/docview/88175418?accountid=12653

General Electric Company (1922). *Thirty-First Annual Report of the General Electric Company.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved July 13, 2014, from http://search.proquest.com/docview/88176451?accountid=12653

General Electric Company (1923). *Thirty-Second Annual Report General Electric Company.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved July 13, 2014, from http://search.proquest.com/docview/88178322?accountid=12653

General Electric Company (1924). *Thirty-Third Annual Report General Electric Company.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved July 13, 2014, from http://search.proquest.com/docview/88175198?accountid=12653

Hatfield, H.R. (1909). *Modern Accounting*. New York, NY: D. Appleton and Company.

Ikoma, M. (1967). *SUTOKKU OPUSHON NO KENKYU*. Tokyo, Japan: HYORONSHA. [in Japanese]

Illinois Central Railroad Company (1898). *Illinois Central Railroad Company Forty-Eight Annual Report of the Directors to the Stockholders.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved April 24, 2014, from http://search.proquest.com/docview/88173416?accountid=12653

International Accounting Standards Board (2004a). *International Financial Reporting Standard, IFRS 2,* Share-based Payment. London, UK: International Accounting Standards Committee Foundation (IASCF).

International Accounting Standards Board (2004b). *Basis for Conclusions on International Financial Reporting Standard, IFRS 2* Share-based Payment. London, UK: International Accounting Standards Committee Foundation (IASCF).

International Accounting Standards Board (2010). *Conceptual Framework for Financial Reporting*. London, UK: International Accounting Standards Committee Foundation (IASCF).

International Accounting Standards Board (2013). *Discussion Paper*, A Review of the Conceptual Framework for Financial Reporting. London, UK: IFRS Foundation. Retrieved August 8, 2013 from http://www.ifrs.org/Current-Projects/IASB-Projects/Conceptual-Framework/Discussion-Paper-July-2013/Documents/Discussion-Paper-Conceptual-Framework-July-2013.pdf

International Accounting Standards Board (2013). *eIFRS Green Book*. London, UK: IFRS Foundation. Retrieved August 23, 2013 from http://eifrs.ifrs.org/eifrs/Menu?view=eifrsEdu

Kaplan, R.S. & Palepu, K.G. (2003). Expensing stock options: A fair-value approach. *Harvard Business Review* 81(12); 105-108.

Mori, K. (2010). Looking back at the developments on accounting for employee stock options: A gradual change from allocation perspective to appreciation perspective. *The Bulletin of the Graduate School of Commerce*, 71; 285-302. [in Japanese] Retrieved August 24, 2013, from http://dspace.wul.waseda.ac.jp/dspace/bitstream/2065/33880/1/ShogakuKenkyukaKiyo_71_Mori.pdf

Ohlson, J.A. & Penmaan, S.H. (2005). *Debt vs. Equity: Accounting for Claims Contingent on Firms' Common Stock Performance with Particular Attention to Employee Compensation Options*. New York, NY: Columbia Business School, Center for Excellence in Accounting and Security Analysis. Retrieved August 23, 2013, from http://academiccommons.columbia.edu/download/fedora_content/download/ac:125377/CONTENT/CEASA-WP645445.pdf

Ohlson, J.A. and Penman, S.H. (2007). Accounting for employee stock options and other contingent equity claims: Taking a shareholder's view. *Journal of Applied Corporate Finance*, 19(2); 105-110.

Paton, W.A. & Paton, Jr., W.A. (1955), *Corporation Accounts and Statements*. New York, NY: The MacMillan Company.

Pennsylvania Railroad Company (1884). *Thirty-seventh Annual Report of the Board of Directors of the Pennsylvania Railroad Company to the Stockholders*. America's Corporate Foundation; *ProQuest Historical Annual Reports.* Retrieved April 24, 2014, from http://search.proquest.com/docview/88173042?accountid=12653

Previts, G. J., Parker L.D., Coffman, E.N. (1990). Accounting history: Definition and relevance. *Abacus*, 26(1): 1-16.

Sweeney, D.L. (1960). *Accounting for Stock Options*. Michigan Business Studies Volume XIV No.5, Ann Arbor, MI: Bureau of Business Research, School of Business Administration, The University of Michigan.

The Pittsburgh Plate Glass Company (1907). *Annual Report*. America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved July 25, 2014, from http://search.proquest.com/docview/88173592?accountid=12653

United States Rubber Company (1893). *First Annual Report of the United States Rubber Co.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved August 29, 2013, from http://search.proquest.com/docview/88172897?accountid=12653

United States Rubber Company (1894). *Second Annual Report of the United States Rubber Co.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved August 29, 2013, from http://search.proquest.com/docview/88173088?accountid=12653

United States Rubber Company (1902). *Tenth Annual Report of the United States Rubber Co.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved August 29, 2013, from http://search.proquest.com/docview/88178464?accountid=12653

United States Rubber Company (1904). *Twelfth Annual Report of the United States Rubber Co.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved August 29, 2013, from http://search.proquest.com/docview/88179045?accountid=12653

United States Rubber Company (1912). *Twentieth Annual Report of the United States Rubber Co.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved August 29, 2013, from http://search.proquest.com/docview/88174242?accountid=12653

United States Steel Corporation (1903). *First Annual Report of the United States Steel Corporation*. America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved April 24, 2014, from http://search.proquest.com/docview/88179369?accountid=12653

Wallace, W.A. & Smith, S.D. (1991). *Accounting for Options: No Longer an Option*. Research Monograph No.18, Vancouver, Canada: The Canadian Certified General Accountants' Research Foundation.

Westinghouse Electric & Manufacturing Company (1911). *Westinghouse Electric & Manufacturing Company Annual Report.* America's Corporate Foundation; *ProQuest Historical Annual Reports*. Retrieved July 25, 2014, from http://search.proquest.com/docview/88174497?accountid=12653

Zeff, S.A. (1972). *Forging Accounting Principles in Five Countries: A History and an Analysis of Trends*. Champaign, IL: Stipes Publishing Company.