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Empirical Forecasting of Returns during the Great Recession through Economic Value Added

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Abstract

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MBA, Colorado Technical University, 2010

BA, University of Cape Coast, 2001

Dissertation Submitted in Partial Fulfillment of the Requirement for the Degree of

Doctor of Philosophy

Applied Management and Decision Sciences

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Abstract

US economic recession from 2007- 2009, also known as the Great Recession, negatively impacted the financial sector as well as other aspects of society. Researchers have found value-based measures and accounting measures as effective performance measures, but they have found inconclusive results when comparing the strengths of economic value added (EVA) and accounting measures in predicting stock performance. This study used data from the Great Recession to further compare EVA and accounting measures. The purpose of this cross-sectional or correlational study was to determine the relative predictive strength of EVA during the Great Recession to determine whether a model with EVA added to accounting measures did a better job predicting stock returns. Secondary were data collected from a sample of 93 Fortune 500 Companies from 2007-2009 and then analyzed via multivariate regression analysis. The null hypothesis was not rejected. The result showed that EVA was not a useful addition to accounting variables in predicting stock returns during the Great Recession. Although the findings did not support EVA as a better predictor of stock returns during the Great Recession, the study revealed useful information about value-based measures and value-creation, especially how they are impacted by the period of a severe economic downturn. Researchers have indicated that creating value for shareholders enables the funding of positive-net-present-value projects that would result in positive social change. This study revealed that firms are unlikely to create shareholder value through returns on investment for a positive social change in unfavorable economic conditions.

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Dedication

This scholarly work is dedicated to my family for their staunch support and encouragement. I make a dedication to my three children Christopher, Frederick, and Christina with the hope that they would be inspired to reach the greatest height in life. I also dedicate this scholarly work to my wife, Emelia, my mother, Comfort, and my brothers and sister for their best wishes and strong belief that motivated me throughout this study. Finally, to all my friends and family members who knew about my research and supported me with their prayers and best wishes.

Acknowledgement

I would like to acknowledge the support and the selfless work of my committee members, Dr. Thomas Spencer, the chairman, and Dr. Aridaman Jain, the methodology member. I am very grateful to the chairman who was initially the methodology member and had to move up and take the position of the chair when my initial chair, Prof Reza Hamzaee, ended his successful career with the University. Prof Spencer deserves special thanks because he started with me from the beginning and pushed me forward with his experience and knowledge during difficult moments. I extend a heartfelt appreciation to Dr. Jain for supporting the study with his valuable feedbacks complementing the work of the chair. His constructive criticisms to the various portions of the study were crucial and useful in bringing out the quality in this work. I can't leave out the retired Prof. Reza Hamzaee who was my faculty mentor for my KAMs and chaired the initial stage of my dissertation; my thanks to him for the inspiration he provided. To the faculty members who played various roles, the hard-working program director, Dr. Sandy Kolberg, the URR, Dr. David Bouvin, and Dr. Freda Turner, I say your commitments to ensure that every student at Walden University is successful pivoted me to reach this milestone of my life. Thank you, and God bless you all.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

Economic value added (EVA) is an important financial performance measurement tool that is connected to shareholders value creation (Ivanov, Leong, and Zaima, 2014). Economic value added integrates financial management system and decentralizes the decision-making process, which in turn may enhance shareholder value (Chari, 2009). In this study I used data from the economic recession from 2007- 2009, referred to as the *Great Recession* to investigate whether adding EVA to accounting measures to predict stock returns was significant. The study was an effort to encourage research on EVA, test the robustness of EVA, and determine if there was justification for promoting it as a robust value-creation metric to indicate performance. Brewer, Gyan, and Hock (1999) citing Tully (1993) indicated that the adoption of EVA helps companies to increase shareholders' value through competitive advantage. A firm needs a sustained competitive advantage to expand and employ more resources (both human resource and capital resource) for socio-economic development resulting in a positive social change. According to Burja (2013), the main condition for improving the standard of living and quality of life in a national economy is for firms to increase value creation.

In the following sections, I summarized the literature to show a gap and to underscore the background of the study. The problem statement, the purpose of the study, and the research question and hypotheses followed in that order. I also provided the theoretical foundation of the main concept (EVA) along with other key variables in the study. The theoretical foundation was followed by definitions of the dependent variable (outcome variable) and the independent variables (predictors) in the study. The assumptions, scope, and delimitations of the study were underscored in subsequent sections as well as a brief summary of the methodology for data collection and data analysis.

Background of the Study

Researchers have found that value-based measures and traditional accounting measures are useful performance indicators and predictors of stock returns (Sheela & Karithikeyan, 2012). Some value-based measures include EVA, market-value added (MVA), refined economic value added (REVA) and EVA-momentum. Similarly, other traditional accounting measures that were variables under consideration in this study included return on Asset (ROA), return on equity (ROE), earnings per share (EPS), and price/equity (P/E). While some studies pointed to value-based measures as better predictors of stock return than accounting measures, others pointed to the opposite.

Hamilton, Rahman, and Lee (2009) concluded that value-based measures were better stock performance indicators than accounting measures. Balu and Morad (2009) cited Wallace (1996), Johns and Makhijia (1997), and Kleiman (1999) to underscore that EVA was better in explaining the return of a stock than accounting measures. They also cited Uyemura et al. (1996) to indicate that EVA explained more variations in MVA than EPS, ROE, ROA, and NI. Panahi, Preece, Zakaria, and Rogers (2014) showed that a meaningful correlation existed between EVA and MVA and stock price for companies listed on Tehran Stock Exchange. Mamum and Mansor (2012) found better relationships between EVA-based financial measures and stock returns than traditional measures and stock returns in Malaysia. The researchers also pointed out that EVA was a better indicator of returns compared to traditional measures and a better measure of determining a firm's value. Sharma and Kumar (2010) cited Maditinos et al. (2006) and Lehen and Makhija (1997) and indicated that EVA is a better predictor of stock returns than any other measure. Ivanov et al. (2014) also claimed that as an important value-creation tool, EVA is an excellent performance measure that is the most effective and successful model. EVA was

deemed useful because it is an important performance metric that is supported by financial theory and valuation principle (Balu & Morard, 2009). Chari (2009) cited Stewart (1994) to indicate that EVA is the best wealth-creation measure among the rest. He continued that EVA is 50% better than EPS and ROI.

Other researchers have indicated that accounting measures were better than value-based measures in predicting stock returns. Khan, Shah, and Rehman (2012) found EVA as a weaker contributor to the prediction of stock returns than Cash Flow from Operation (CFO) and Net Income (NI) in the Pakistani stock market. Nakkaei, Hamid, and Anuar (2013) did not find that EVA and EVA-related measures were better than ROE and ROA in predicting stock returns in Bursa, Malaysia. Parvaei and Soran (2013) studied the comparison between EVA and accounting measures (which included net income and free cash flow) in the Tehran Stock Exchange from 2005 - 2009 and found that EVA did not explain stock returns better than other measures. Also, Shubita (2010) showed EVA as a weaker performer in predicting stock returns in the Jordanian economy. Their findings supported those of Dodd and Chen (1996) that EVA was able to show 20% variability in stock returns as against 24.5% variability by ROA.

EVA, other value-based measures, accounting measures, and financial theories and models had contributed to the function and development of the financial sector. However, after the Great Recession, many scholars and researchers criticized the effectiveness of these underlying theories and models of the financial system. For instance, Haworth (2012) indicated that the Great Recession was an affront on the effectiveness or viability of financial models and theories underlying the capital market. Modern Portfolio Theory (MPT) states that with a given level of market risk, assets can be constructed to form a portfolio to give maximized returns - an efficient portfolio (Berk & DeMarzo, 2011). According to Haworth (2012), the theory assumes

constant volatility and correlations and ignores volatility and correlations. Haworth continued that a systemic crisis like the 2008 financial crisis makes uncorrelated assets' returns move together bringing correlations to one thereby eroding the protection brought by diversification. Swedroe (2012) alluded to similar criticisms of theories and models underlying the financial system.

However, according to some researchers, a recession had varied effects on the performance of firms and hence the effectiveness of metrics used to measure the performance of firms. Ramakrishman and Ragothaman (2014) alluded to a positive impact of a recession on the ability to increase profitability and create value. Their study indicated that 2007 to 2009 Great Recession allowed large firms to cut cost and improve overall efficiency for improved profitability and value creation. On the other hand, Bello (2009) showed poor performance for most of the US domestic equity mutual funds during the 1990 and 2001 recessions and twelve months following each recession. Srinivasan, Lilien, and Sridher (2011) affirmed that whether or not a firm's expenditure on research and development and advertisement, for example, would improve a firm's performance during the period of recession depends on its market share, financial leverage, and its product-market profile. Mandal and Bhattacharjee's (2012) study showed that the Indian market was highly affected by the volatility in the world market during the period of the Great Recession as the recession created negative returns in the Indian stock market, which had had positive daily returns.

As already noted, results from studies comparing the predictive strength of EVA with accounting measures to determine which of the sets was a better predictor of stock returns had been inconclusive. The seemingly inconclusive research findings were investigated further in this study, this time factoring the effect of the Great Recession. No recent study had assessed the

relative predictive strength of EVA and its relative performance as a predictor of stock returns in United States factoring the effect of the 2007 to 2009 Great Recession. This study was conducted to fill the gap with the aim of testing the robustness of EVA, and determine if there was justification for promoting it as a robust value-creation metric.

The Problem Statement

Not only does a period of a recession make creating value difficult (Dorsey, Fiore, & O'Reilly, 2012), but a period of a recession might impact the abilities of value-based measures and accounting measures to predict stock returns. Moreover, there have been inconclusive findings on whether value-based measures were better than accounting measures in predicting stock returns.

Specifically, EVA is Net Operation Income after Tax (NOPAT) above the cost of capital (Balu & Morard, 2009), which could be challenging during the period of the Great Recession for firms (Dorsey et al., 2012). Research had not established EVA as a better indicator of returns than accounting measures. No recent study had assessed the relative performance of EVA as a predictor of stock returns in the US taking into consideration the effect of the Great Recession. This study filled the gap.

The Purpose of the Study

The purpose of this quantitative study was to examine the relative strength of EVA in predicting stock returns of Fortune 500 companies during the Great Recession. A stock return, the dependent variable, according to Nakhaei et al. (2013), was estimated as the ending stock price less initial stock price plus dividend all divided by the ending stock price. The independent variables included Economic Value Added (EVA), a value-based metric, and accounting metrics

such as Earnings per share (EPS), Return on Asset (ROA), and Return on Equity (ROE), and Price/Equity Ratio (P/E). EVA is Net operational Income after tax (NOPAT) less cost of Capital. ROA and ROE are terms used for returns earned by the company on its assets and equity respectively. EPS is the amount of income earned by a share of stock during the period (Henry et al., 2012). P/E is the ratio of price per share to EPS. In this study I evaluated whether a model with EVA added to accounting variables better predicted Fortune -500 stock returns than a model with only accounting variables during the Great Recession.

The Research Question and Research Hypotheses

Stewart (1994) underscored that EVA can better explain stock returns than traditional accounting performance measures (Visaltanachoti, Luo, & Li, 2008). O'Byrne (1996) indicated that EVA performs better than earnings in explaining variations in stock return (Visaltanachoti et al., 2008). The correlation between changes in Market Value Added (MVA) and stock returns changes is high. It is high because MVA is investors' way of knowing the amount of money (Lefkowitz, 1999). Balu and Morard (2009) citing Uyemura et al. (1996) indicated that EVA explains variation in MVA better than Net income (NI), Earnings per Share (EPS), Return on Asset (ROA), and Return on Equity (ROE). Salehi, Enayati, and Javadi (2014) indicated that ROE, ROA, and P/E are considered measures for judging a firm's financial performance. Additionally, citing Carter et al. (2003), Salehi, Enayati, and Javadi (2014) indicated that ROA is an excellent factor in explaining the value of a company.

On the basis of the above studies, I posed:

Research question: Could a better job be done in predicting stock returns of Fortune-500 Companies by considering EVA in addition to accounting variables [earnings per share (EPS),

return on asset (ROA), return on equity (ROE), and price-to-equity ratio (P/E)] during the period of the Great Recession? The first research question called for a multiple regression analysis and two models. The first regression model had only accounting variables. The second regression model included EVA in addition to the accounting variables of the first model.

Model 1: $Y = \beta0 + \beta1\ (EPS) + \beta2\ (ROA) + \beta3\ (ROE) + \beta4\ (P/E) + e$

Model 2: $Y = \beta0 + \beta1\ (EPS) + \beta2\ (ROA) + \beta3\ (ROE) + \beta4\ (P/E) + \beta5\ (EVA) + e$

Y = dependent variable, the stock returns

$\beta0$ = regression constant; it is the value of Y when the sum of the parameters of the predictors is zero

βs = Regression coefficients of individual predictors

e = the error term

Based on the models and the above question, I put forward the ensued hypotheses:

Ho: The Regression Coefficient of EVA is equal to zero in the model that included EVA in addition to the accounting variables.

Ho: $\beta5\ (EVA) = 0$

Ha: The Regression Coefficient of EVA is not equal to zero in the model that included EVA in addition to the accounting variables

Ha: $\beta5\ (EVA) \neq 0$

The examination of the regression coefficients (beta-values and b-values) provided the answer as to which of the predictors was relatively a better indicator of stock returns during the 2007-2009 Great Recession. Specifically, SPSS's model parameter output gave the b-values and beta values of predictors. These values helped in ascertaining the degree to which a predictor affected the outcome to evaluate the predictive strength of each predictor (Field, 2013).

Theoretical Foundation (Operational Definition of Technical Terms)

Economic Value Added (EVA)

EVA is defined as "a financial measure based on operating income after tax, investment in asset to generate the income, and the cost of the investment in assets (weighted average cost of capital)" (Brewer et al., 1999, p.4). It measures economic value in a dollar term created because the company takes into account the cost of debt and cost of equity (Abdeen & Haight, 2002). Mamum et al. (2012), Dagogo and Ollor (2009), and Young (1997) have indicated that EVA measures the difference between return on capital and the cost of capital. Value is created when return on capital is greater than the capital invested; EVA is a metric that quantifies that value of the firm (Ivanov, Leong, & Zaima, 2014). Additionally, it is a performance measure and a compensational tool that allows for a better alignment of managers and shareholders' interests reducing agency cost and improving performance (Hamilton et al., 2009).

EVA as a theoretical model was developed by a U.S. firm, Stern Stewart and Co. It has been used or applied by companies such as General Electric and Coca-Cola. Mamun et al. (2012) indicated that the origin of EVA dates back to the time of Hamilton (1777) and Marshall (1890). They stated that these great thinkers advocated that firms' earnings must be greater than their cost of equity and cost of debt for wealth to be created. EVA is related to residual income, the

estimation of the economic profit of the company, and calculated using information from the company's financial statements (Balu & Morard, 2009).

In 1980, Stewart revised the computation of residual income making some adjustments to it. Accounting adjustments are needed to convert accounting profit (NI) and accounting capital to economic profit and economic capital (Balu & Morard, 2009). Then in 1989, Stern Stewart & Co, a consulting firm based in New York, coined the concept EVA (Mamun et al., 2012) who cited Geyser and Liebenberg (2003).

In calculating EVA, accounting conventions, as specified by GAAP in US or IFSB, are not followed. Adjustments are made to accounting profit in other to arrive at EVA. It is called making the necessary adjustments to improve the correctitude of calculating EVA as a measure of value creation (Balu & Morard, 2009). As already indicated, EVA was calculated using mostly data from the company's financial information as presented in their annual reports.

EVA's calculation is as follows:

EVA = Net operating profit after taxes – capital charges……. (1)

EVA = NOPAT – [Invested capital (Economic asset) x WACC]

EVA = NOPAT-WACC x invested capital

EVA = ROA – WACC x invested capital

WACC = Weighted average cost of capital of the company

ROA = return on asset; ROA = NOPAT/invested capital; NOPAT = EBIT-T

EBIT = Earnings before interest and taxes

NOPAT = NOI + Adjustments

NOI = Net operating income

T = Taxes

Invested capital includes both equity and debt, but not non-interest bearing current liabilities (Chari, 2009). According to Tamjidi, Hushmandi, and Habashi (2012), who cited Stewart (1991), capital is the book value of capital used in the company. However, Chari (2009) cited Geyser and Liebenberg (2002) to indicate that it is more appropriate to use market value to calculate the cost of capital. He indicated that the use of book value to calculate the cost of capital can overestimate or underestimate the real cost.

Thus: EVA = (NOPAT – WACC) x total –current liabilities……. (2)

EVA = (r-c) x capital invested

Also, EVA = NI – Cost of Equity (Balu and Morard, 2009)……..… (3)

Where:

r = rate of return on capital

c = rate of cost of capital

If EVA > 0, it means EVA is positive. A positive EVA means there is a value created, and a negative EVA means value is destroyed. A company must increase its operating profit without increasing capital to create value (Tamjidi, Hushmandi, & Habashi, 2012) citing Lovata and Costigan (2002). A positive EVA is also called economic profit (plus adjustments) that is excess NOPAT over capital charges (fee charged to the company for the use of capital) (Chari, 2009). Economic profit is residual income from accountants' perspective (Mamum, Entebang, & Mansor, 2012) citing Young (1997). The difference between EVA and residual income is accounting adjustments made (Mamun et al., 2012).

Calculating the Components of Economic Value Added (EVA)

Net operation profit after tax. It is the profit the company has generated from its ongoing operation; it is net sales – operating expenses (all operating expenses including tax). *NOPAT* = profit & loss before tax + interest expense – income taxes – tax shield on interest (tax rate x interest expense) (Mamun et al., 2012).

Capital charges. These charges are calculated by multiplying the company's capital invested by WACC. Going into detail, let's look at (Mamun et al., 2012), who cited Issham et al. (2008) and estimated the capital charges as follows:

Invested capital = short-term debt + long term debt + minority interest + shareholders' equity

WACC = cost of debt x [{total debt/ (total debt + CMVE)] x (1-tax)} + {cost of equity x [CMVE/ (Total debt + CMVE)}]……. (4)

CMVE = Company's share price x total share outstanding

Market value of company = CMVE + Total debt + Minority interest (Mamun et al., 2012).

Cost of equity is calculated using CAPM (The Capital Asset Pricing Model), which is breaking down into the following:

$E(Ri) = Rf + \beta i\,[(Rm) - Rf]$…… (5)

E (Ri) = expected return of the asset

Rf = risk-free return

E (Rm) = expected return of the market

E (Rm) – Rf = the expected risk premium

βi = the beta of the asset (Courtois et al., 2012).

The beta of an asset uses the standard deviation of an asset and the correlation between the market and the asset.

Beta = correlation between market and asset/standard deviation of the market (Singal, 2012). The risk-free rate is often the rate of the Treasury bill. The risk-free rate and the market risk premium enable us to estimate the expected return of the asset (Singal, 2012).

Net Income (NI)

Net income was an important variable in the study but not a variable of study. Net income was used for calculating EVA and most of the other independent variables. To avoid the problem of multicollinearity, NI was excluded. Net income or net profit is revenue minus all expenses (Henry, Robinson, & Greuning, 2012). Another name for net income is accounting profit, which is related to profit maximization, the final objective of the company. Unlike EVA, Net income does not take into consideration the cost of equity. In its simplest form, Net Income is:

NI - cost of equity = EVA (Balu & Morard, 2009)…….. (6)

NI = EBIT – Interest –Taxes…… (7)

NI = (Sales– variable expense – fixed expense – depreciation and amortization) – interest – taxes

NI = EBITDA – depreciation and amortization – interest - taxes

NI = EBIT –Interests –Taxes

NI considers only the cost of debt, and it follows strictly accounting rules as established by GAAP (Balu & Morard, 2009).

Return on Asset (ROA)

It is a term used for a return earned by the company on its assets. In its simplest calculation, it is net income over total asset for the period, and that was how I estimated ROA in this study. A higher ROA means the company is generating more income by a given level of assets (Henry et al., 2012). It is calculated by dividing Net income by average total assets. Since Net Income includes interest payment to creditors, interest expense is normally added back to Net income, so

ROA reflects return on all assets invested (Henry et al., 2012). So ROA can also be presented as the net income plus interest expense and (1-tax rate) [operating income or EBIT) divided by average total assets.

ROA = $\frac{NI}{Average\ total\ assets}$ or $\frac{NI+Interest\ Expense\ (1-Tax\ rate) OR\ operating\ income\ or\ EBIT}{Average\ total\ assets}$ ..... (8)

Return on Equity (ROE)

Return on Equity (ROE) is a return earned on a company's equity capital covering minority equity, preferred equity, and common equity.

ROE = $\frac{Net\ income}{average\ shareholders'equity}$ = $\frac{Net\ Income}{Average\ total\ Assets}$ x $\frac{average\ total\ assets}{average\ shareholders'equity}$ ..... (9)

ROE = ROA x Financial leverage. A company can improve its ROE by improving ROA and using leverage effectively. The company is said to be using its leverage effectively when it borrows at a rate lower than the marginal rate it can earn investing the amount borrowed into its business (Henry et al., 2012). A company with no leverage (no liability) has a leverage ratio of 1.0 (Henry et al., 2012).

ROE is better presented by DuPont equation given below:

Return on Equity (ROE) =$[\frac{Net\ income}{sales}]\ [\frac{sales}{asset}]\ [\frac{asset}{equity}]$; it is further extended as:

ROE= $[\frac{Net\ income}{EBT}][\frac{EBT}{EBIT}]\ [\frac{EBIT}{Revenue}][\frac{revenue}{average\ total\ asset}][\frac{average\ total\ assets}{equity}]$ ..... (10)

Earnings per Shares (EPS)

EPS is the amount of income earned by a share of stock during the period; it can be the basic EPS and diluted EPS. The basic EPS is defined as the ratio of net income minus preferred dividends to weighted average number of ordinary shares outstanding. The diluted EPS is defined as the ratio of adjusted income available for ordinary shares (reflecting conversion of

diluted securities) to the weighted average number of ordinary and potential ordinary shares outstanding (Henry et al., 2012). Diluted EPS is earned when dilutive financial instruments are converted to common stock (Henry, Greuning, & Robinson, 2012).

Tamjidi, Hushmandi, and Habashi (2012) found a significant relationship was found between EPS and EVA, but not between EPS and REVA. EVA was also found to perform better than current profit, return, and cash flows. Citing Machuga et al. (2001), the researchers revealed that EVA's performance was better than future accounting earnings and financial analysts' earnings per share forecast in predicting Earnings per Share. Worthington and West (2004) was cited by Tamjidi et al. (2012) to indicate that EVA's accuracy is higher than Return on Equity (ROE), Earnings per Share (EPS), and Return on Investment (ROI).

Price/Earnings Ratio (P/E)

In this study, estimated EPS was used to compute P/E. P/E is the ratio of price per share to earnings per share (EPS). It shows the amount of investment in common stock costs per dollar of earnings (Henry, Robinson, & Greuning, 2012).

$$\text{P/E} = \frac{Share\ price}{earnings\ per\ share} \quad \text{..... (11)}$$

P/E ratio is sensitive to nonrecurring earnings or one-time earnings events and the susceptibility to manipulation of net income (Henry, Robinson, & Greuning, 2012).

Other Theoretical Basis of Stock Return and EVA

Stock return is a periodic income; it is an annual income (cash dividend and capital gain/loss) earned by an investor for holding a stock of a company.

$$\text{Stock return} = \frac{(P1-P0)+D}{Po}$$

Where: P0 is initial stock price; p1 is the ending stock price (period 1), and D is dividends.

Nakhaei et al. (2013) estimated total return as the ending stock price (P1) less initial stock price (P0) plus dividend paid during the period (D) all over the ending stock price. Balu and Morard (2009) showed that EVA had the highest explanatory power of stock returns when compared to accounting variables. Owusu-Antwi, Mensah, Crabbe, and Antwi (2015) found that EVA better determines the performance of banks in Ghana than ROA. Further, Visaltanachoti et al. (2008), citing Stewart (1994), indicated that EVA explains stock returns better than other traditional performance measures. Tamjidi, Hushmandi, and Habashi (2012) pointed to the study by Hehn and Makhija (1996) who had investigated the relationship between EVA, Market value added (MVA), and stock returns. The researchers used 241 sampled companies in the US in the years of 1987, 1988, 1992, and 1993. A stronger correlation was found between EVA and stock return than EVA and market value added (MVA) and stock return. Mamum and Mansor (2012**)** used young (1997) model and Issam et al. (2008) model and concluded that there is a better relationship between EVA-based financial parameters and stock return in Malaysia.

However, Khan et al. (2012) found that EVA had a weaker contribution in predicting stock returns when compared with Net Income and Operating Cash flow in a study conducted at the Pakistani Stock Market. Also, Dodd and Chen (1996) examined 566 companies between 1986 and 1992 and showed that only 20% change in stock returns is explained by EVA (Kyriazis & Anastassis, 2007).

Nature of the Study

The study was a quantitative study using cross-sectional design. Data on the variables under study were collected on a population of the highest ranked 402 of the Fortune 500 companies during the period of 2007 - 2009 to test the stated hypotheses. Quantitative method tests objective theories examining the relationship among variables by measuring the variables

and using statistical procedures to analyze the estimates of variables (Field, 2013). Therefore, this study was a quantitative study using SPSS, a software used for statistical procedures. The study proceeded as follows: I collected data on the variables under consideration, measured the variables, and used multiple regression analysis techniques to analyze the relationship between the variables.

The design used was a cross-sectional or correlational design because it described the pattern of relation between variables using data analysis techniques (Frankfort-Nachmias & Nachmias, 2000). This study was conducted to determine the relationship between EVA and stock returns and compare the relationship with the relationship between stock return and traditional accounting measures. The goal was to assess the strength of EVA in predicting stock returns first, then check whether or not EVA or any of the accounting variables provides a better indication of stock returns during the period of a Great Recession.

Basic Definitions of Key Concepts

Annualized Return

It is a periodic income, and, in this case, an annual income (cash dividend and capital gain/loss) earned by an investor for holding a stock of a company. Annual return is estimated by the formula:

R-annual = $(1 + rperiod)^c - 1$ ..... (12)

Total return = $\frac{(P1-P0)+D}{Po}$ ..... (13)

Where:

P0 is the initial stock price; p1 is the ending stock price (period 1), and D is dividends.

Net Income (NI)

Net income was not one of the variables under study, but it was the base from which most of the variables in the study were estimated. EVA is NI – Cost of Equity; ROE is NI divided by Total Equity; ROA is NI divided by total assets; EPS is NI divided by weighted average share outstanding. The inclusion of NI in the model would have resulted in multicollinearity problems. NI is the revenue less the cost of doing business that includes depreciation, interest taxes, and other expenses.

Economic Value Added (EVA)

It is net income with accounting adjustments (NOPAT) less adjusted cost of capital (cost of equity and cost of debt).

Earnings per Share (EPS)

It is of two types: basic EPS and diluted EPS. Basic EPS is net income minus preferred dividends divided by weighted average number of ordinary shares outstanding. Diluted EPS is also adjusted income available for ordinary shares (reflecting conversion of diluted securities) divided by weighted average number of ordinary and potential ordinary shares outstanding.

Return on Equity (ROE)

It is the ratio of net income to total equity.

Return on Assets (ROA)

It is the ratio of net income to total assets.

Price/Equity Ratio

It is the ratio of price per share to earnings per share.

Assumptions

The study was conducted under several assumptions. Most of the assumptions related to EVA and the statistical analysis used for the study. Let me begin with the implicit assumptions.

First, it was assumed in estimating annual returns that returns could be repeated precisely every week; investing money every week will earn similar returns for a year (Singal, 2012). It was also implicitly assumed that the main responsibility of management is to create as much wealth for shareholders as possible. Thus, the basic objective of an enterprise is to maximize the shareholders' value. The firm's profitability is highly correlated with the strength of the economy. Thus, EVA is strong with a strong economy. Also, it was assumed that the effects of a recession on a firm's performance are not influenced by pre-recessionary years' activities but were limited to the period under study.

An important assumption of this study was to estimate EVA using the book value of capital as a proxy for the market value of capital invested in assets in place. Thus, I calculated EVA for all the 93 companies using the formula (NI – cost of Equity), which might be at variance with reality. This assumption was made because of the difficulty in estimating the market value of assets in place. The market value of assets in place includes capital invested in the assets as well as their expected future growth. Book value was used to account for the accounting choice made in the current period, accounting decisions made over time on how assets were depreciated, inventories are valued, and how acquisitions are dealt with (nyu.edu, 2014).

The estimation of the equity cost of capital was done assuming that the percentage return that company's shareholders require on their investments was calculated using the Capital Assets Pricing Model (CAPM) (Fraker, 2006). Thus, assumptions governing the CAPM were applicable in this study. CAPM is known for avoiding many complexities of the financial market and making simplified assumptions. The model assumes that investors are risk averse, want higher returns for their investments (Maximization of utility), and are rational (Singal, 2012). Also,

CAPM assumes a frictionless market where there is no transaction cost, taxes, or any cost or restriction on short selling (Singal, 2012). Related to this is the model's assumption that borrowing and lending are done at a risk-free rate. The CAPM also assumes a single-period model in which investors make decisions on the basis of that one period. Further, it assumes that all investors have the same expectations and beliefs, meaning investors have a similar way of analyzing securities using the same probability distribution and the same inputs for cash flows (Singal, 2012). Investments are assumed to be infinitely divisible, and investors are price-takers because there are many investors with securities prices unaffected by investors' trade (Singal, 2012). The CAPM's assumptions are made to indicate that we have marginal investors who choose a mean-variance-efficient portfolio in a predictable manner (Singal, 2012).

There were also statistical assumptions, which related to random-effect model assumptions (Green & Salkind, 2011).These assumptions presented biases that might be associated with this study. If any of these assumptions were violated, the test-statistics and p-value would have been inaccurate resulting in a wrong conclusion. The assumptions included addictive and linearity, normal distribution, homoscedasticity (homogeneity of variance), and independence (Field, 2013).

Variables were assumed to be 'multivariately' normally distributed in the population, which was an indication that the only statistical relationship that existed was a linear one (Green & Salkind, 2011). The assumption of additive and linearity was that the outcome variable (the dependent variable) is assumed to be linearly related to the predictors in a relationship summed up by a straight line. Thus, in this study, the combined effect of predictors was described by adding together their individual effects (Field, 2013). Thus, this should hold: b1X1 + b2X2 + ……bnXn.

The assumption of standard normal distribution was needed to compute confidence interval as well as in estimating the b-values in the regression equation. The test statistic is normally distributed in testing the null hypothesis; parameter estimates are normally distributed making the test statistic and p-value estimates accurate (Field, 2013). Since errors result due to our inability to predict the outcome perfectly, it was assumed that the residuals are normally distributed.

The independence assumption was that cases in a random sample of a population are independent of each other just as scores on variables are independent of other scores on other variables (Green & Salkind, 2011). It is called an assumption of homoscedasticity (homogeneity of variance), which means the variance of the outcome variable should be stable at all levels of the predictor variables (Field, 2013). This assumption enabled the researcher to get an optimal estimate using the method of least squares. Finally, it was assumed that errors in the model are not related, or the errors are independent of each other. Otherwise using the standard error to compute confidence interval and significance tests would result in invalid estimates.

Scope and Delimitations

The study was undertaken to determine how EVA would perform when used to predict stock returns comparing with EPS, ROA, ROE, and P/E during 2007 to 2009 Great Recession. The study limited the discussion to one value-based measure, EVA, and four accounting measures, EPS, ROA, ROE, and P/E because of the ease with which those measures were estimated. Fortune 500 companies, American companies, were used because of their operational and financial strength and their competitive edge. The study centered on these companies because they had all the ingredients needed to define fully the level of business activities defining the economy of the USA, the economic capital of the world. The study relied on data

from Fortune 500 US companies, their financial information as given by their income statements, balance sheets, and other relevant sources. It should be noted that companies selected were publicly traded organizations that file their reports with Security and Exchange Commission (SEC) on a regular basis. The study limited the study period to 2007 and 2009 (the period of the Great Recession in the United States of America). The data collected covered the period of the Great Recession, the variables under consideration, and reflected the prevailing economic conditions at the time. Nevertheless, the effects were envisaged to transcend times and international borders enabling decisions with future goals in mind.

Limitations

The study faced several limitations most of them relating to the use of CAPM in estimating equity cost of capital of EVA. In estimating CAPM, one uses many assets (in constructing true market portfolio) which are not investable such as human capital and assets in closed economies (Singal, 2012). Also, estimating CAPM involves the use of proxies to represent true market portfolios, but proxies vary among analyses and generate different returns for the same assets (Singal, 2012). CAPM doesn't reflect real life complexities of the financial market; it assumes investors are rational but ignores the possibility of personal biased and experience affecting decision-making leading to suboptimal investments (Singal, 2012). Moreover, in a real-life situation, the market has transaction cost and taxes associated with investment transactions (Singal, 2012). However, using CAPM to estimate the cost of equity is known and accepted in the financial world as a way of estimating the cost of equity. Thus, it didn't diminish the relevance of the study.

The study also used only companies in US basing analysis on their past performance. To use the past performance of companies suggested the study was not current because companies

that had ranked among the best 500 in 2007, 2008, and 2009 were not currently among the best Fortune 500 companies at the time of the study. With regards to the recession, the study was current because there had not been another Recession besides the Great Recession in 2007 to 2009. Also, the cost of implementing EVA had the potential to place a serious limitation on efforts to encourage a broad usage of this measurement in promoting shareholders value. This concern was also raised by Tamjidi, Hushmandi, and Habashi (2012) citing Lovata and Castigan (2002).

The Significance of the Study

EVA had been touted as a value-creation metric and a financial measure known for the creation of value for shareholders (Ivanov, Leong, & Zaima, 2014). The study was undertaken to contribute to the knowledge base on EVA explaining the effects of the Great Recession on the performance of EVA as compared with other measures. It was important to know how an adverse economic situation affected the effectiveness of EVA as a predictor of stock return, as a measure of managerial performance in creating value for shareholders and as a tool for stock analysis. The goal was to determine whether or not EVA is robust and credible enough to encourage its use as viable value-creating metric that is reliable. The study was an effort to encourage research on EVA, test the efficacy of EVA, and to determine if there was justification for promoting it as a robust value-creation metric that was a better indicator of a firm's performance.

The study was to effect positive social change stressing the creation of value for shareholders. The act of working to create and increase value for shareholders is a strong recipe for drawing investors or shareholders to the company. Investors or shareholders want companies that create value for their wealth. Companies that create value can raise funds from the stock

market through equity capital to fund positive-NPV projects that drive socio-economic development. The social change implication is reflected in the possibility of a general reduction in unemployment and poverty, and an improvement in the standard of living of people. Burga (2013) underscored that the main condition for improving the standard of living and quality of life is for a firm to increase value creation. Second, Brewer, Gyan and Hock (1999) citing Tully (1993) indicated that companies that aim to increase value reap the benefit of getting competitive advantage over competitors. Getting competitive advantage is a necessary concomitant for increasing access to financial capital for developmental projects that bring positive social change in the company's environment. A sustained competitive advantage gives a company the needed funds to expand and employ more resources for the socio-economic development of its geographical epoch for a positive social change.

Summary

In summary, EVA is an important tool for evaluating the performance of management teams and companies with regards to their efforts in creating value for shareholders. Previous research had compared EVA's performance with the performance of accounting measures so as to indicate which measure was able to make a better prediction of stock returns among other things. Proponents believe that EVA is the best measure as far as returning value to shareholders and predicting stock returns are concerned. However, EVA's critics see accounting measures as better measures. An adverse economic condition was projected to affect how these measures effectively predict stock returns. In this study, unlike previous studies, EVA, as an indicator of stock returns was examined comparing with stock return indicators like ROE, ROA, EPS, and P/E during the 2007 to 2009 Great Recession using data from sampled US Fortune-500 companies. The research question underpinning this study was how EVA in addition to

accounting measures would perform in predicting stock returns in a period of the Great Recession. In the next section, I have presented literature on EVA and its performance as compared with accounting measures have been presented.

Chapter 2: Literature Review

Introduction

Economic Value Added (EVA) is an enterprise's net operating profit after tax minus cost of capital invested. It gives an indication that an investor's capital is efficiently used resulting in the creation of shareholders' value. Although, it is an important performance measure, its reputation as a better performance measure had not been thoroughly established or substantiated. The problem was exacerbated when I factored in the effect of the Great Recession. As already noted there is the possibility of difficulty in making the desired profit and creating value during the period of the Great Recession, but studies on the effect of a recession on performance have not pointed to a clear direction.

Most empirical studies supporting EVA as a better performance measure dated back in the 1990s just as studies against EVA. The preceding statement underscored that there was a paucity of current research supporting EVA, its usefulness as a predictor of stock return, and as a better performance measure than traditional measures. Moreover, the results of previous studies comparing the effectiveness of EVA as a performance measure with traditional accounting measures had been inconclusive. For instance, Visaltanachoti et al. (2008), citing Stewart (1994), indicated that EVA explains stock returns better than other traditional performance measures. But Dodd and Chen (1996) examined 566 companies between 1986 and 1992 and showed that only 20% change in stock returns is explained by EVA (Kyriazis & Anastassis, 2007).

A Great Recession is an exogenous shock in the corporate sector (Nistor, Ulici, & Schiau, 2010). Various writers had alluded to the fact that some financial theories were not proven right before, during, or after the period of an economic crisis. That was not to say a recession had a negative effect on returns because research on it had not pointed to any direction. However,

Haworth (2012) pointed out that the 2008 financial crisis highlighted the problem of people following the assumption of constant volatility and correlation of the Modern Portfolio Theory. Smith and Walsh (2008) underscored that it was hard to make the abnormal return using publicly available information (as indicated by efficient market hypothesis) during the 2008 financial crisis. The absence of the ability to make an abnormal return is an indication that the financial market is efficient, at least according to the efficient market hypothesis (semi-strong form efficient). However, that was not what Smith and Walsh (2008)'s study seemed to suggest. The study seemed to point to the difficulty in making the required return on investment during the period of economic downturn or crisis such as in the period of recession. Whatever the conclusion of that study was, it is still true that no study had compared the effect of 2007 to 2009 Great Recession on the relative performance of EVA as a predictor of stock return.

For the remainder of this chapter, I highlighted the search strategy used and reviewed the literature on the origin of Economic Value Added (EVA). I also threw light on the theoretical propositions, advantages, and disadvantages of EVA as well as accounting adjustments needed to be done in arriving at EVA. The determinants of EVA were highlighted as well as EVA and how it relates to stock price/return. Further, I pointed out how EVA had been applied in various studies including studies that had compared EVA's performance with traditional measures. Finally, EVA was differentiated from EVA-related variables as well as research on the effect of a recession on a firm's performance.

Literature on Search Strategy

The literature for this study came from Walden Library, specifically from Business and management databases. The Business and Management Databases are sources of literature for Business and management studies starting with business source complete/premier subsection.

The Business and Management Databases at the Walden University Library has over ten databases that cover peer-reviewed journals, trade publications, and other sources of information on business and management. I highlighted on the main ones.

The first Database, as I have already pointed out is the *Business Source Complete Database*, a source for most of the journals I used for this study, especially for this literature review. It contains thousands of full-text academic journals, conference papers, and so on, which are all rich sources of information on Business, Finance, and Management (Waldenu.edu, 2014). It is followed by the *ABI/IN FORM Complete sub-database*, which also provides peer-reviewed journals, trade publications, all aspects of information on international business, etc. (Waldenu.edu, 2014). Just like the Business source complete database, this data base is also useful for accessing peer-reviewed journals needed for this study. Search terms put into databases' search engines include "EVA and return", "Economic value added and return", "EVA and EPS" etc. When the search button is checked, these databases return research on the terms put into the databases starting with most recent studies.

Emerald Management Journal Sub-Database covers published management research suited for Walden's model of the scholar-practitioner. The Walden's library website indicates that this sub-database is a leader in publishing management research for scholars and practitioners. There is also the *Stage Premier Sub-Database*, which the website explicitly says it contains 56 peer-reviewed management journal not found in other databases underscoring its uniqueness among the databases (Waldenu.edu, 2014).

Another important sub-database, and, in fact, a more useful sub-database for this study is the *Hoover's Company Records Sub-database.* According to Walden's library website, the Hoover's Company Records sub-database is a place where one can retrieve the profile of over

4000 companies, 600 industries, and 225,000 key executives as well as company-specific information. The company-specific information includes company overview, company history, operation and historical data. This sub-database is a source of information on the study's sampled 98 Fortune-500 Companies. Equally important for this study is the *Market Share Reporter Sub-Database*, which gives a comparative business statistics. The database gives a researcher an opportunity to use a four-digit SIC code to retrieve data for more than 2,000 entries (Waldenu.edu, 2014). There are other databases such as Accounting & Tax, Hospitality & Tourism Complete, and the World Bank Open Knowledge Repository. Others include the National Bureau of Economic Research, LexisNexis Academic, Gale Virtual Reference Library and Regional Business News (Waldenu.edu, 2014).

Literature on the Origin of Economic Value Added (EVA)

Mamun et al. (2012) cited Anderson et al. (2005) to state that the origin of EVA dates back to the days of Hamilton (1777) and Marshall (1890). Hamilton (1777) and Marshall (1890) advocated that firms' earnings must be greater than the cost of equity and cost of debt to create wealth. Although, the concept of wealth creation is linked to the two theorists, Marshall is known to have done more of the work. In 1890, Alfred Marshall hinted that economic profit is the real profit a firm achieves when it covers both the operating cost and cost of its invested capital (Burksaitiene, 2009). Alam and Nizamuddin (2012) underscored that the economic profit Alfred Marshall spoke about is total net gain less interest on invested capital at the current interest rate.

The sense of wealth creation gave way to the concept called residual income that was used by General Electric for measuring performance in the course of time. The concept of residual income has existed over 75 years, but it was ignored until the 1990s (Young, 1999). Young (1999) indicated EVA is residual income that has been "rediscovered" and "reshaped"

into a short-term performance measure called EVA. Thus, EVA is simply the incarnation of the residual income concept that is the true economic profit alluded to by Hamilton (1777) and Marshall (1890) (Vijayakumar, 2012). Citing Wallace (1997), Alam and Nizamuddin (2012) indicated that EVA is residual income with some adjustments in the calculation of the income and capital. EVA is, therefore, a variant of residual income, according to Goldberg (1999). Alam and Nizamuddin (2012) hinted that the idea of residual income appeared in accounting literate in the name of Church (1917) and Scovill (1924). They also indicated that in the 1960s the concept was in the discussion of Finnish accountants and financial press.

In 1980, Stewart started working on revising the computation of residual income adding adjustments to it based on some GAAP guidelines. In 1989, Stern Stewart and Co, a consulting firm located in New York, coined the concept EVA and trademarked it (Mamun et al., 2012) citing Geyser and Liebenberg (2003). In 1991, Stewart came up with a book called "the quest of value" introducing EVA as value-based financial measures indicating its benefits. Then in 1994 Stewart presented a document to support EVA asserting that EVA stands out as the best of the other financial measures in creating value for shareholders (Mamun et al., 2012). Stern Stewart and Co worked so well to develop EVA extending residual income by introducing adjustments to remove some accounting distortions introduced by GAAP guidelines (Burksaitiene, 2009). In the process, they (Stern Stewart and Co) popularized EVA in the 1990s drawing the attention of people in the financial and investment industry. Now it has become more popular with value-seeking investors and business owners to the point that Fortune Magazine called it today's hottest financial idea (Hatfield, 2002). To some extent, EVA can be looked at as being synonymous with economic profit, residual income, and economic value management (Junior et al., 2014). Before throwing more light on the premise that EVA is a better measure than

accounting measures, let's look at other propositions of EVA from its supporters before some of EVA's adjustments.

Theoretical Propositions of Economic Value Added (EVA)

EVA is defined as "a financial measure based on operating income after tax, investment in asset to generate the income, and the cost of the investment in assets (weighted average cost of capital)" (Brewer, Chandra, & Hock, 1999, p4). According to Burksaitiene (2009), EVA, which is the difference between after-tax operating profit and cost of capital, is adjudged the best measure of a company's real profit. It measures economic value in a dollar term created because the company takes into account the cost of debt and cost of equity (Abdeen and Haight, 2002).

Studies such as Dagogo and Ollor (2009) and Young (1997) have indicated that EVA measures the difference between return on capital and the cost of capital (Mamun et al., 2012). A value is created when the return on capital is greater than the cost of the capital invested; EVA is a metric that quantifies that value of the firm (Ivanov, Leong, & Zaima, 2014). Citing Jahankhani and Zariffard (1995), Tamjidi et al. (2012) underscored that a positive EVA is assumed to reflect the optimal allocation of resources leading to the creation of value for shareholders. A negative EVA, on the other hand, is interpreted as a loss of resources and, therefore, a loss of wealth for shareholders. EVA is a great tool for creating value and it's highly supported.

EVA is highly supported by value-loving and performance-driven managers and investors because it provides a single, united, and accurate way of measuring value and performance (Saji, 2014). EVA tells shareholders how much value managers have added to the company (Alam & Nizamuddin, 2012). As a value-based performance measure, adopting EVA allows management to put the central focus on value creation that aligns with value

maximization in today's wisdom as against the age-old profit maximization linked to accounting variables (Alam & Nizamuddin, 2012).

EVA enables value maximization and stock price maximization (Vijayakumar, 2012). Thus, EVA can also serve managers who have short-term goals with the focus on the stock price. Moving from value maximization to stock price maximization is an easy process. When the financial market is efficient, the stock price will be maximized when the firm's value is maximized (Vijayakumar, 2012), who cited Damodaran (1996). Maximizing the stock price is very important to managers with a short-term focus because it is the most observable of all the measures as it shows the real wealth of shareholders as shareholders can sell stock and receive the price for it (Vijayakumar, 2012). However, Vijayakumar (2012) indicated putting the focus on the stock price is not the best for managers as it moves the control of business efforts from managers because stock prices are controlled or determined by short-term investors and analysts.

EVA is a performance measure and a compensational tool that allows for a better alignment of managers and shareholders' interests reducing agency cost and improving performance (Hamilton, Rahman, & Lee, 2009). It is a good metric for evaluating a firm's performance and developing an incentive scheme as it helps a company to create value in excess of the required return of the firm's investors (Salehi, Enayati, & Javadi, 2014). Thus, it promotes shareholders interest by indicating or specifying to management what its primary financial objective is: to create value (Degel & Degner, 2000). Degel and Degner (2000) also indicated that EVA brings about a continuous improvement in the business process as efforts are made to create value for shareholders.

Hatfield (2002) cited Goldberg (1999) to underscore that the underlying reason for using EVA as a compensation and performance tool is to get managers to see themselves as owners of their companies thinking and acting to promote value creation objective. If managers see themselves as owners, decisions they take will add value to the firm (Hatfield, 2002). EVA enables managerial decisions that are well-tailored toward the needs of shareholders and support the efficient allocation of resources to create value (Burksaitiene, 2009). It offers corporations the best tool to measure and evaluate performance and design an appropriate incentive pay (Singh and Mehta (2012) citing Harris and Ohlson (1992). Chen and Dodds (1997) saw EVA in the eyes of the advocate of EVA by indicating that it is the means by which companies can increase the efficiency in utilizing capital for superior stock performance.

As a compensation tool, EVA is used to reward managers whose decisions create value by giving them bonuses; managers lose their bonuses if their decisions destroy value thereby discouraging mediocre performance (Hatfield, 2002). Chen and Dodd (1997) indicated that the advocates of EVA see it as a measure useful for measuring performance that enables investors to align investment opportunities and motivate managers to make value-added business decisions.

EVA is an indication of customer satisfaction because it is assumed to be the difference between what the customer pays and the expenditure of the firm on factors of production (Rezapour, Zeyanali, & Shahvalizade, 2014). Rezapour et al. (2014) underscored that EVA is a system, a financial management system, which is used to maximize shareholder's wealth, and for setting goals, capital budget, and incentives citing Shiri, Saleh, and Bahrami (2013).

EVA captures the true economic profit of an enterprise better than any other measure (Chari, 2009) citing Stewart (1991). EVA is net income from operation without considering the

cost of capital (Balu & Morard, 2009). EVA pursues MVA better than earnings and cash flows, and it is a better indicator of stock price than other measures (Panahi et al., 2013) citing Grant (1997). To arrive at EVA, Stern Stewart suggested adjustments to information from financial statements of firms. EVA is a way of moving away from accounting profit, which is calculated using Generally Accepted Accounting Principles (GAAP) rules, to real economic value (Kyriazis & Anastassis, 2007). I'll return to these adjustments shortly.

EVA is known as one of the best performance measures because it brings attention to internal processes of companies, drives efficiency for profit maximization, and emphasizes cost minimization while encouraging the pursuit of profit for the purpose of creating value for the company (Hatfield, 2002). Citing Sland (2000), Singh and Mehta (2012) indicated that EVA gives an understanding of business units that leverage assets to generate returns and maximize value. If the main purpose of a company's existence is to create value for shareholders, then with EVA, an important tool is at hand to drive shareholders value (Burksaitiene, 2009).

Burja (2013) submitted that EVA is a measure for substantiating the strategic and operational decisions as well as assessing results of implementing those decisions. Salehi et al. (2014) underscored that EVA is used to determine how well a firm has used its intellectual capital because it is seen as an alternative measure for assessing intellectual capital. The researchers stressed that EVA does this by providing information that helps in measuring the effect of intellectual capital on a firm's performance.

EVA allows management to know and to monitor how efficiently invested capital is being used (Kyriazis & Anastassis, 2007). EVA is a performance measure as well as an integrated financial management system that enables decentralized decision making (Kyriazis &

Anastassis, 2007), citing Stern, Stewart, and Chew (1996). Further, Stewart (1994) indicated that EVA enhances the ability of investors to identify investment opportunities and motivates managers to come up with a value-added decision (Chari, 2009). Goldberg (1999) in his study alluded to EVA as means of motivating managers for quality decisions and a way of rewarding managers to act in the supreme interest of shareholders by creating value. EVA is considered an integrated decision-making framework that connects resources for the attainment of sustainable value not only for shareholders but also customers, employers, employees (Vijayakumar, 2012) who cited Stewart (1994). Citing Stern et al. (1997), Burksaitiene (2009) indicated that EVA is an integrated financial system and tool that ensures decentralized decision making that helps managers to evolve changes leading to the attainment of the creation of shareholders value. He also pointed to the study of El-Shishmi and Drury (2004) which had revealed that 23% of companies that adopted EVA using it for performance evaluation recorded significant shareholder wealth.

EVA is an excellent business tool for business planning and financial performance monitoring (Vijayakumar, 2012). It is not only seen as a way measuring performance of a firm and evaluating the activities of the company financial, but also a means of ensuring financial management based on good planning (Junior, Alves, Lima, Silva de Sousa, Queiroz, & Queiroz, 2014). Supporters and advocate of EVA include CFOs and CEOs of Coca-Cola and AT&T. These people have supported EVA claiming its adoption enables concentration of capital in highly profitable areas keeping return above the cost of capital for value creation (Chen & Dodds, 1997). For instance, this a quote from Coke's CFO: "EVA forces you to do more with less capital" (Chen & Dodds, 1997) citing (Tully, 1993, p.39).

Finally, Goldman Sachs referred to EVA as a reliable index for assessing a company's performance and identifying shareholders value (Hatfield, 2002). According to Chari (2009), Tilly (1993) sees EVA as an exciting innovation in measuring corporate success. Stewart (1991) pointed out that EVA, as a value-based performance measure, can replace traditional earning-based performance metrics used as companies' performance measures (Visaltanacho et al., 2008). All these propositions about EVA as a concept is what preempted this study. Next, it was appropriate that consideration be given to the advantage and disadvantages of this concept to the business community before moving on to adjustments needed to estimate EVA.

Advantages and disadvantages of using EVA

From the propositions of EVA, I could point to a lot of benefits using EVA. In the next two or more paragraphs, salient advantages of using EVA to the business owner were pointed out as well as some disadvantages. EVA has various advantages or uses; the following are some of them:

EVA is a managerial tool for performing managerial functions of monitoring, planning and signaling strategic changes (Alam & Nizamuddin, 2012). Alam & Nizamuddin (2012) also indicated that EVA is a means of incentivizing managers to commit to the objective of creating value as it can be used to establish bonus schemes. EVA is known to reflect all decisions taken at managerial level upon which managerial rewards are based on (Hasani & Fathi, 2012). Thus, EVA is considered as a tool for uniting all interests in pursuit of the goal of value creation; it offers a better incentivizing schemes than other known bonus schemes (Alam & Nizamuddin, 2012) citing (Jensen & Murphy, 1990). EVA can be used to determine the market value of a company because of the correlation between it and MVA (Hasani & Fathi, 2012).

After pointing out some advantages, it suffices that some of the disadvantages of EVA be pointed out. They are as follows:

It is very difficult to estimate the value of EVA due to the need to calculate the rate of return and the capital cost rate (Hasani & Fathi, 2012). Also, EVA is considered a short-term measure, which is not very suitable for companies with a long-term focus on their investments (Alam & Nizamuddin, 2012). Related to the preceding point is the difficulty in measuring the true return for the true EVA of long-term investments (Alam & Nizamuddin, 2012). Additionally, EVA is not suitable for recently established companies operating at a higher cost (Hasani & Fathi, 2012).

Economic Value Added (EVA) and Accounting Adjustments

The accounting adjustments are necessary propositions in estimating EVA. When accounting adjustments are applied in calculating economic profit, economic profit becomes EVA (Balu & Morard, 2009). Accounting adjustments are done to remove distortions that are encountered when measuring the actual economic performance of the company (Mamum, Entebeng, & Mansor, 2012). These adjustments are non-cash flow activities added to traditional financial statements so as to meet guidelines established by GAAP (Leftkowitz, 1999). They're made to net income (computation of free cash flow as envisaged by Modigliani and miller) to reflect economic realities (Goldberg, 1999). Mamum et al. (2012) cited Weissenrieder (1997) to reveal that Stewart (1994) had proposed 164 adjustments that vary from country to country because they are based on prevailing corporate situation in the country. But the authors indicated that in practice only ten adjustments are adequate citing Mouritsen (1998). It is said that accounting adjustments that do not affect cash do not affect value; net income must be without accruals for real cash flow (Goldberg, 1999).

According to Goldberg (1999), adjustments that should to be done on Net Income to determine NOPAT are many. They include Goodwill amortization, deferred taxes, LIFO inventory accounting, subscription revenues, advanced billings, research and development (R&D) expenditures, and operating leases. He further revealed some adjustments to cost of equity and cost of debt to determine invested capital. They included reserves for deferred income taxes, last in first out (LIFO) inventory valuation, cumulative amortization of goodwill, and capitalization of research and development (R&D). The rest are market-building outlays, unusual cumulative write-offs (less gain) after taxes, and allowance for warranties and doubtful accounts. Mamun et al. (2012) also cited Maditinos, Sevic, and Theriou (2006) and listed some adjustments. They included goodwill, provisions, research and development, operating lease, depreciation, revenue recognition, bad debt write off, and inflation. The rest are special issues of taxation, deferred taxes, valuation of contingent liabilities and hedges, currency translation, inventory costing, and valuation. Researchers have suggested that only adjustments that can have a material impact on EVA should be considered. To prevent the method from being costly and complicated, Young (1997) suggested that adopters should limit the number of adjustments to fewer than ten Mamun et al. (2012).

According to Nthoesane (2012), accounting adjustments are market-related measures that are done on financial statements to derive EVA so that EVA can be a more sustained and convincing measure in increasing value than the accounting variables. Adjustments remove historical accounting data from financial statements (Burksaitiene, 2009). Historical data create distortions that should be removed, so accounting profit becomes economic profit (EVA) Alam and Nizamuddin (2012). Accounting adjustments according to Alam and Nizamuddin (2012) make EVA economically viable. Singh & Mehta (2012) pointed to Winter and Young (1999)

who indicated that in adopting EVA, companies are better off making no adjustments. Also, companies can use unadjusted residual income measure in place of EVA (Singh and Mehta, 2012). What distinguishes EVA from residual income is the handling of accounting distortions, Alam and Nizamuddin (2012) submitted, citing Dodds and Chen (1997).

Alam and Nizamuddin (2012) indicated that there are up to 164 adjustments need to be done on accounting data for one to calculate EVA. However, Young (1999) alluded to about 150 adjustments, but indicated that they had shrunk over the period due to resistance to moving away from the cherished GAAP-based guidelines and the cost involved in doing the adjustments including the possibility of a laws suit.

Alam and Nizamuddin (2012) pointed out different kinds of EVA as a result of the application of accounting adjustments in calculating EVA. To him, basic EVA is the one that is unadjusted and has most of the distortions. Disclosed EVA, which was initially used by Stern Stewart, is the one that results from computing EVA using standard adjustments to accounting data. Finally, true EVA is the one that is at the extreme right with all the necessary and relevant adjustments made to the accounting data. Finally, tailored EVA, which is an EVA developed to conform to a company's organizational structure, business mix, and strategy and accounting policies.

The importance of making adjustments to accounting data to compute EVA stems from the fact that it allows for high correlation between short-term profit metric (EVA) and share prices (Young, 1999). Adjustments help in making EVA be used to achieve more divisional goals and used as a more reliable indicator of performance (Young, 1999). Young (1999) pointed out that the goal of making accounting adjustments is to bring EVA closer to cash-flow through the removal of accounting distortions. Additionally, he indicated adjustments eliminate write-

offs of goodwill, eliminate successful efforts accounting, bring off-balance sheet debt into the balance sheet, and correct biases caused by depreciation removing distortions between investment in tangible assets and intangible assets. Literature on the main adjustment items are as follows:

Research and Development (R&D)

Research and development costs are to be expended when incurred by GAAP guidelines. Hatfield (2002) underscored that US GAAP rules ask firms to expense R&D at the time in the year the expense occurs due to some intangible elements contained in them. He further queried that if R&D items are supposed to be investment items into the future, why should they be expensed? Hartfield (2002) indicated that in calculating EVA, R&D items are to be capitalized and depreciated the same way we capitalized other capital assets. Allowing R&D items to be treated as an expense is a reason for manipulation of financial statements with the attendant financial fraud.

In estimation EVA, it is required that tangible assets be capitalized, and since research and development expense is seen in the light of those investments, it should also be capitalized. If R&D expense had been written off as an expense, it should be added back to NOPAT and shareholders' equity (Young, 1999). Young (1999) pointed out that the capitalization should be done based on the period the benefits will be received from the product the R&D was used to develop. EVA advocates also say that it is unacceptable mortgaging away the company's future just to increase profit by reducing cost of R&D which is more likely event when R&D is seen as an expense instead of a cost that should be capitalized (Hatfield, 2002).

For the purpose of EVA, R&D expenditures must be adjusted and considered part of the capital. It should be treated the same way we treat tangible assets by amortizing them over the period of projected payoff (Goldberg, 1999). Young (1997) stressed that R&D cost should be amortized over an arbitrary period (Mamun et al., 2012), which is an indication it should be added back to NOPAT and to capital. A huge amount of money allotted to R& D if not capitalized overstates the EVA since it reduces equity capital (Mamun et al., 2012). Adjustments of R&D on NOPAT do not significantly affect NOPAT as much as adjustments to R&D do to capital especially if the level of R&D investment is the same for some periods (Goldberg, 1999). Since the level of capital will be too small if the adjustment for R&D is ignored, EVA would be overstated.

Provisions

Warranties and guarantees, environmental damage, sick leave, doubtful debts among others rest are considered part of the account for provisions on the balance sheet (Goldberg, 1999). These charges are incurred in the future, but according to GAAP rules, they must be included immediately in estimating net income (Mamun et al., 2012). In accounting for provisions in estimating EVA, increases in provision account are added to NOPAT because they take away profit further from cash flow and decreases are subtracted from NOPAT (Young, 1999). The goal is to bring balance because when provisions increase, changes to earnings far exceed cash expense and vice versa (Young, 1999).

According to Young (1997), the inclusion of these charges in estimating Net Income creates a recipe for managers to manipulate their profit. Managers do this by creating bulky provision account to understate profit for a specific year and overstate profit in subsequent years when performance is not high (Mamun et al., 2012). EVA allows one to add back provisions to

operating income in the year they have increased, and to subtract provisions from operating income in the year they have decreased. The balance in provisions account should be added to invested capital (Mamun et al., 2012). Goldberg (1999) indicated that an increase and a decrease in provisions reduces and increases net income respectively. He recommended that adjustments be done by adding to net income increases in these allowances, and subtracting from net income decreases in these allowances.

Deferred Taxes

The issue of deferred taxes arises from the timing difference between taxable income and book (GAAP) income. Cash not paid for taxes because of deferment (a liability, asset, and balance) should be added back to capital (Goldberg, 1999). We know that cash paid for taxes affects cash flow and hence value. The result would be an increased (decreased) in NOPAT when recorded book taxes are lower (higher) than actual taxes paid during the accounting period (Goldberg, 1999).

Goodwill

Goodwill is the excess of the purchase price of a company over the fair value of its assets (Goldberg, 1999). It is the difference between the price paid and the assets acquired (Mamun et al., 2012). Goodwill write-down varies from country to country. According to British rules, Goodwill write-down is required to be done immediately. When a write-down is done, it immediately removes a portion of the investment from the balance sheet, thus, understating equity capital and possibly overstating EVA (Mamun et al., (2012). To avoid that, amortization or immediate write down of goodwill should be added back to capital account and operating profit (Mamun et al., 2012). According to Young (1997), accumulated amortization of goodwill from prior years should be added to invested capital (Mamun et al., 2012). Goldberg (1999) also

indicated that amortization of goodwill should be added back to NOPAT, and cumulative amortization of goodwill should be added back to invested capital (Goldberg, 1999).

Operating Leases

Fixed assets such as machinery, land, building, property and plants are often acquired through leasing. The lease contracts are structured to keep debt away from the balance sheet; thus, they are called rent and treated as rent payment according to GAAP (Mamun et al., 2012). When treated as rent and not capitalized, lease payment understates asset and invested capital (Mamun et al., 2012). Goldberg (1999) underscored that a lease payment is a form of secured borrowing that should be treated as a rental expense, but not real assets and should not be put on the balance sheet. These are real debts, and so interest (capital charge) not supposed to be called rental expense (that is an accounting treatment) and made a part of NOPAT. Operating lease interest should be seen as capital charge with its present value of future lease payments added to capital (Goldberg, 1999). He also suggested that the portion of the lease payments that are interest charges added back to NOPAT.

LIFO Reserves

Last-in, First-out (LIFO) inventory costing has great tax benefits when prices are rising due to what is called "LIFO layers". LIFO layers of a product cost when used to value inventory understate it when prices are rising (Young, 1999). Liquidating LIFO layer results in an overstatement of operational income and EVA as an old cost is matched with current revenue of high prices (Young, 1999). Young (1999) indicated that LIFO reserves value is the difference between carry cost and current cash that is normally reported in notes of financial statements of companies. LIFO reserves should be added to invested capital and NOPAT when there is a year-on-year increase (Young, 1999).

Non-recurring Gains and Losses

In computing EVA, success-effort accounting that permits assets write-offs on non-operating losses and unproductive investments is eliminated (Young, 1999). Young (1999) pointed out that in calculating EVA, losses are added to NOPAT and to invested capital.

The Determinants of Economic Value Added

When capital is properly applied to investments with long-term benefits, a value is created (Courtois, Lai, & Drake, 2013). In creating the value, the goal is to invest the capital in projects that produce a return greater than the cost of capital. Thus, if EVA is an indication of how a firm has created value, the factors of EVA should include elements of cost and return. Ganea (2015) cited a publication in the "Audit Financier" issue in 12/2014, under the title some determinants of EVA. They included the rate of return for shareholders, the economic rate of return on assets, and profitability indicators such as cash flow, and turnover.

It is important we consider that any factor that can be managed to create value is an important determinant of EVA. Citing Rappaaport (1986), Vijayakumar (2012) submitted that the determinants of EVA include working capital, invested capital, cost of capital, and forecast duration. According to Vijayakumar (2012), seven drivers were identified by Rapport (1986) that can help a manager to create value and can be considered as EVA determinants. They are sales growth, operation profit margin, income tax rate, working capital, capital investment, cost of capital, and capital duration.

Gana (2015) explicitly indicated that EVA determinants include gross operating profit, capital used for funding the firm's activities, economic rate of return on the capital, average rate of cost. The rate of return on invested capital, the rate of cost of invested capital, and the average

cost for funding equity and borrowed capital make up the cost of capital (Ganea, 2015). Ganea (2015) indicated that from the gross operating profit, tax is deducted to arrive at Net Operating Profit after tax (NOPAT), which should be able to offset the cost of capital (capital invested), the cost of equity, and the cost of borrowed capital for EVA. EBIT is an important determinant of EVA. In the study of Aulova and Frydlova (2012), a steady rise in EBIT over a year was responsible for an organic farming company recording better EVA values.

Ganea (2015) added that for a positive EVA, a company must generate a return higher than related cost (the economic return on invested capital), envisage an optimal structure of invested capital, and increase its solvency ratio which has a positive impact on its indebtedness. He explained that a reduction in a firm's solvency ratio is a reduction in the company's financial autonomy increasing the risk of equity. With equity decreased, the cost of debt increases as interest rate might be pegged on an unfavorable credit market and an existing indebtedness.

It is important that the capital structure of a company be included in the determinants of EVA. The capital structure of a company includes money invested by the owner as well as money borrowed, and it represents the proportion of debt instruments, preferred stock and common stock on a company's balance sheet (Alam & Nizamuddin, 2012) citing Van Horne (2002). Capital structure is also a determinant of EVA because it determines the appropriate mix of corporate finance needed to create value. To a great extent, the capital structure of a company, as revealed in Aulova and Frydlova's (2012) study, influenced the size of EVA as an increased in the proportion of equity to total capital was the reason for agriculture companies achieving better EVA values. The capital structure of a company is determined by and centered on informed and strategic deliberations and decisions on the sources of corporate finance (Aulova & Frydlova, 2012).

Capital invested is another key element of determining EVA. It is the total asset less non-interest bearing liabilities present at the beginning of the period (Alam & Nizamuddin, 2012) citing Stewart (1990). Young (1999) supported this by indicating that invested capital is total asset net of non-interest bearing current liabilities. However, Alam and Nizamuddin (2012) signaled two ways of calculating capital invested in the company: direct method and indirect method. For the direct method, they indicated that one has to add both short and long term debt (interest-bearing debt) to owners' equity. They indicated that in calculating invested capital using an indirect method, one need to subtract from total assets or total liabilities non-interest bearing liabilities.

Radneantu, Gabroveanu, and Stan (2010) submitted that the cost of capital is not only payment or return investors expect from their investments, but also the minimum risk investors are prepared to take. Aulova and Frydlova (2012) indicated that when a company puts in place an effective capital spending measures that minimize cost, it will create positive EVA values. Thus, citing Sharma & Kumar (2010), Aulova and Frydlova (2012) indicated the cost of capital is a key determinant of EVA. The increase in the cost of capital reduces EVA. To underscore what the determinants of EVA are, Ganea (2015) applied correlation techniques to a sample of 12 Romanian companies listed on the Bucharest Stock Exchange and 2013 financial and accounting data. He showed that the determinants of EVA included economic return on invested capital, amount of capital invested, structure of invested capital, cost of capital including the cost rate of equity and the cost rate of debt, solvency ratio, and indebtedness. The cost of preferred stock, which is the cost companies incurred to make dividend payments to preferred shareholders, is also included in the equation if the company has preferred shareholders (Courtois et al., 2013). While the cost of debt is the cost incurred when a company issues a bond

or goes for a loan, the cost of equity is the rate of return required by shareholders (Courtois et al., 2013). The cost of debt, a key component of the cost of capital, is the cost of the corresponding average interest rate, determined by the price of loan, which the company is obliged to pay to its creditors (Aulova & Frydlova , 2012) citing Kislingerova (2007).

The cost of capital is best estimated using the weighted average cost of capital (WACC) according to Alam and Nizamuddin (2012) citing Copeland et al. (1990). They further underscored that the WACC is the total cost of each component of a firm's capital (sources of funds) in addition to their respective weights. In a more technical way, Alam and Nizamuddin (2012) cited Kolb Demons (1988) and explained WACC as the return forgone for an investor to invest in a firm's security. The cost of capital signals the kind of capital structure used in the company and its source of funding (Aulova & Frydlova, 2012).

The cost of equity, a component of the cost of capital, is an important determinant of EVA. It is estimated using Capital Asset Pricing Model (CAPM) and other models. Supporting Courtois et al. (2013), Ganea (2015) underscored that cost rate of equity capital is estimated using CAPM, bond output plus a risk premium, and the discounted dividends method. CAPM has been explained in chapter 1 under theoretical framework section, so there is no further explanation of it in this chapter. The bond output plus premium or bond yield plus risk premium is based on the financial premise that there is a higher cost associated with riskier cash flows than less risky ones (Courtois et al., 2013). For that reason, the cost of equity is estimated by adding a risk premium to the before-tax cost of debt. The dividend discounted approach estimates that cost of equity as the intrinsic value of a share of stock estimated as the present value of the expected future dividends of the share (Courtois et al., 2013).

Citing Peter Drucker, Alam and Nizamuddin (2012) indicted that when a business is not returning a profit greater than the cost of capital, it operating at a loss. He continued by indicating that to operate at a loss means the business is not adding anything to the economy, not creating wealth, but destroying wealth. Therefore, for a positive EVA, a determinant of EVA must be increased. One sure way of increasing average rate of return, for instance, is Privatization. Privatization, the transfer of property ownership from government or public sector to a private entity or private sector, has been seen as a way to increase performance as it is associated with cost reduction, quality of service, increased expertise etc. (Rezapour. Zeyanali, & Shahvalizade, 2014). With the aim to investigate the extent to which privatization affects economic value, Rezapour et al. (2014) used companies that had given 50% of public shares to the private sector, and found a significant difference between average rate of return on capital of the company before and after privatization.

EVA and the Stock Price/Return

There is a theoretical relationship between EVA and stock prices and revenue. The relationship is that an increase in EVA increases the value of the firm captured by high prices of the share of the firm (Maitah et al., 2015). However, stock price alone does not constitute the return of a stock. To estimate the return on a stock, one must include the dividend paid for the stock. Thus, the return of the stock or share of a company is the difference between the final price and initial price plus dividend received all divided by the initial price of the stock (Nakhaei et al., 2013). If a company doesn't pay a dividend, the return of the company's stock or share is the capital gain (the final price, P1, minus the initial price, Po) divided by the initial price, which is expressed as: $\frac{(P1-P0)}{Po}$. Studies such as Balu and Morard (2009) and Mamum and Mansor (2012**)** have supported that EVA has a higher explanatory power of stock returns than accounting

variables. An equally good number of studies including Shah and Rehman (2012) have pointed to accounting variables as better predictors of stock returns than EVA.

The study of Maitah, Saleem, Malec, Boubaker, and Gouda (2015) tested the relationship between stock price and EVA and stock price and earnings with data collected from a sample of over 40 businesses in Egypt. The study questioned the alleged superiority of relationship between EVA and stock returns and revenue. They found out that investment policies strategies that were based on accounting measures to achieve normal returns were higher than those were based on EVA.

EVA is deemed as a quantitative performance measure that enables investors to evaluate a company's business activities using its financial statements (Ismail, 2013). Ismail's (2013) conducted an exploratory study using a correlational method with the purpose to explore the relationship between EVA and stock return as compared to stock return and traditional measures. His study used EVA per share to determine whether or not EVA is better than traditional measures in predicting corporate performance (stock return) in Malaysia. The researcher used panel pool single and multiple regression together with common and period specific coefficients least square that had white's heteroscedasticity-consistent variances and standard errors for data analysis. With these statistical tools, Ismail (2013) analyzed data collected from a sample of publicly listed companies in Bursa Malaysia and showed that EVA per share had a better relationship with stock return than traditional measures which included ESP.

Saji's (2014) study was meant to show the association between EVA and stock returns during a recessionary period of 2008 to 2013 in the India, a merging market. The researcher relied on pooled times series data correlational data from companies listed on NSE of India. It

was found out that EVA made no significant influence on stock return variation at the time. However, the study established that changes in EVA and cost of capital of the firm have an impact on stock price in the subsequent year.

Singh and Mehta (2012) applied EVA in a comparative manner comparing its prediction of stock returns with the predictions of traditional measures. The researchers used data from a sampled IT companies between 2003/4 to 2007/8 and analyzed the data using a linear regression and multiple regression. They concluded that IT companies must maximize shareholder value for their stocks to stand a chance in the market.

Vijayakumar (2012) investigated why supporters say EVA has a better predictive power than traditional measures. The researcher compared EVA with traditional measures such as EPS, ROCM, RONW, capital productivity, and labor productivity. Using a sample of automobile India companies, data from 1996/7 to 2008/9 period was collected and analyzed using various statistical techniques including standard deviation, variance, kurtosis, and regression. It was concluded that sales and profit after tax strongly related to EVA supporting Stewart's claim that EVA is superior to traditional measures in predicting performance.

Chen and Dodds (1997) set out to investigate with an empirical support that EVA is a better predictor of stock return than traditional measures. They analyzed public filings for information as well as collected data from computstate PCPlus and Stern Stewart Management Service database of 1000 companies. The applied multiple regression in the analysis of data. The study revealed and concluded that using EVA to measure corporate performance is great, but it is not as perfect as advocate say. Additionally, their study showed that EVA is not the sole performance measure that provides a superior stock returns.

Hasani and Fathi (2012) investigated the relationship between EVA and stock returns and some profitability ratios. They used a regression model with stock market value as the dependent variable and the independent variables of EVA and some traditional accounting variables. They analyzed data using statistical methods that included regression techniques as well as Levin, Lin, and Chu test; lm, Pearson and shin test, Breitung and Fisher-type test with AD. They concluded that a significant relationship was found between the value of the stock market and EVA, return on investment (ROE), Earnings per share, and profitability, but found no significant relationship was found between return on assets and the value of the stock market.

How Economic Value Added (EVA) has been applied in Previous Studies

The central premise driving this study was that EVA as a value-based measure was significant in predicting of stock returns during the Great Recession. Studies including Hamilton et al. (2009) had indicated that value-based measures were better indicators of a firm's performance (measured by stock return) than accounting measures. Others had indicated the opposite as we have seen. The ensued paragraphs present other ways EVA has been used in studies.

Hamilton, Rahman, and Lee (2009) examined why EVA adopters outperform a peer group of non-adopters over the long time horizon. They found during the period of the study that EVA adopters exhibit less negative performance than non-adopters. Adopters' performance improved in a positive direction while non-adopters experienced a decline in performance. Additionally, adopting firms had high earnings growth and high returns supporting the fact that EVA adopters have a better stock market performance than non-adopters.

Abdeen and Haight (2002) compared the performance of EVA-user Fortune 500 companies with non-use Fortune-500 companies between 1997 and 1998. It was found that

users' performance (as measured by profit as a percentage of revenue, asset, and stockholder's equity) was higher than the means of non-users. However, the study also discovered that the means for 1998 EPS, EPS change from 1997, and EPS growth for years 1988-1999 were lower for EVA user companies.

Stewart (1991), in his book, *the quest for value*, underscored how useful EVA is. He conceptualized it as the basis for performance measurement of companies and management at a total or a divisional level (Kyriazis & Anastassis, 2007). Citing Wallace (1996), Lehn and Makhija (1997), and Kleiman (1999), Balu and Morard (2009) indicated that EVA has the highest explanatory power of stock return (a measure shareholders value) than other traditional measures. Thus, EVA is a more useful tool for increasing operational efficiency.

Aulova and Frydlova (2012) used EVA as a tool for a financial analysis of two agricultural enterprises in the Czech Republic, a conventional farming company, and an organic farming company. Their goal was to determine how WACC impacts the value of EVA and to evaluate how invested capital with the capital structure can be put into efficient use. They monitored the financial statements of the two companies from 2006 to 2010. The study revealed that the organic farming achieved better EVA values, but there was no confirmation of an efficient use of invested capital. It was also revealed that the improvement in the EVA values was due to the reduction in the cost of debt and a steady increase in EBIT.

Panahi, Preece, Zakaria, and Rogers (2014) investigated the correlations of EVA and MVA as measures of stock price behavior. They used a sample of 40 companies selected from a population 567 companies on the Tehran Stock Exchange in a three-year sample period of 2010, 2011, and 2012. They calculated the required information such as Return on Invested Capital (ROIC), WACC, Invested capital (IC), and NOPAT from the companies' financial statements.

These researchers run a bivariate regression model and analyzed it with the stock price as the criterion and EVA and MVA as predictors. It was revealed that there was a meaningful correlation between EVA and MVA with stock price with companies at Tehran stock exchange. It also revealed that there was an interdependence between EVA and MVA, which was in conformity with studies that included Walbert (1993), Grant (1996), etc.

The study of Owusu-Antwi, Mensah, Crabbe, and Antwi (2015) was done to ascertain the determinants of performance of banks in Ghana between the periods of 1988 to 2011. They used Generalized Method of Moment (GMM Model) in evaluating the determinants of Banks' performance claiming the model allows for an easier way of testing the specification of the proposed model for models that have greater moment's conditions than model parameters. The researchers had two models with EVA and ROA as dependent variables and the cost of income ratio, liquid assets, total asset, total assets, inflation rate and unemployment rate as other variables in consideration. The result showed GMM model as an excellent model for doing the study's estimation and that EVA and ROA used as performance measures are strongly determined by the liquid assets of the banks. The researchers also indicated that a detailed analysis showed EVA with a positive impact on the cost of income ratio, the liquid assets as well as total assets. They concluded among other things that EVA does a better job explaining the banks unemployment performance than Return on Assets (ROA) and that inflation rate and unemployment rate have no significant effect on the performance of the banks.

More studies on EVA have pointed to a positive relationship between EVA and a firm's performance. O'Byrne (1996) showed in his study that EVA outperforms earnings in explaining changes in stock returns (Visaltanachoti et al., 2008). Tamjidi, Hushmandi, and Habashi (2012) pointed to the study by Hehn and Makhija (1996) who had investigated the relationship between

EVA, Market value added (MVA), and stock returns. The researchers used 241 sampled companies in the US in the years of 1987, 1988, 1992, and 1993. A stronger correlation was found between EVA and stock return than EVA and market value added (MVA) and stock return. Mamum and Mansor (2012**)** used young (1997) model and Issam et al. (2008) model and concluded that there is a better relationship between EVA-based financial parameters and stock return in Malaysia. Visaltanachoti et al. (2008) made reference to Lehn and Makhija (1997) study. The study examined the value-relevance of accounting measures (ROA and ROE) and value-based measures which included EVA and concluded that EVA is a more useful performance measure.

Jao, Sutton, and Chan's (2009) study aimed at showing that EVA is a more preferred means of evaluating a firm's performance. Using manufacturing firms during 1998 to 2000 period, they found, among other things, that a high correlation exists between IT spending and firm performance. They also saw that the use of EVA and increasing investment in IT results in an increased wealth creation.

On the reverse side, Goldberg (1999) pointed to the study of Briddle, Bowen, and Wallace (1998). This study used a sample of 6174 firm-year observations for 773 firms as well as data from Stern Stewart. A regression analysis method was used to investigate the relative abilities of EVA and earnings. It was found that earnings outperformed EVA in explaining stock return. Ivanov, Leong, and Zaima (2014) used a portfolio formed from firms with negative EVA, tracked the portfolio from 2004 through 2009. The study found that stock returns correlated to return on asset (NOPAT/TA), market-to-book ratio, leverage, and size. They concluded that firms defined as the least negative EVA and second least negative EVA generate(d) positive abnormal return.

Visaltanachoti et al. (2008) studied the association between EVA and other traditional accounting measures (Cash flow from operation, Residual income, earnings per share) and sector returns. The researchers used a sample of 4,700 firms (14,359 firm-year observations) from 90 sectors. They retrieved most of the data from DataStream and used simple regression analysis and panel regression analysis for data analysis together with the use of t-value and r-squared. They found that EBIT is more associated with sector returns than RI, CFO, and EVA. They also noticed that the accrual component of EVA contributes significantly to the association between EVA and sector return.

Khan, Shah, and Rehman (2012) compared the relationship between stock return and economic value added and the relationship between stock return and other variables such as net income (NI) and operating cash flow (OCF) in the Pakistani stock market. They a sample of 60 firms registered at Karachi Stock Exchange between 2004- 2010 and correlation and regression analyses (pooled OLS technique), They concluded that EVA had a lower coefficient value of -53.83, indicating a weaker contribution in predicting stock returns. EVA's contribution was lower than the contributions of Cash Flow from Operating Activities and Net Income to the predictions of stock returns. The contributions of Cash Flow from Operating Activities and Net Income had coefficient values of 96.2388 and 51.0941 respectively.

Nakhaei, Hamid and Anuar (2013) used the same statistical analytic tool (SPSS); I intend to use for this study. The tools were used to find the correlation coefficient and coefficient of determination in a multivariate regression analysis. The goal was to determine or examine the relationship between economic criteria (EVA, REVA, & EVA momentum) and accounting performance measures (ROA & ROE) and stock return in Bursa Malaysia between 2001 and 2010. Secondary data from these companies' financial statement were used to calculate EVA,

REVA, EVA momentum, ROE, and ROA and estimates entered into SPSS multiple regression. It was discovered that the evidence didn't support that EVA and EVA-related measures were better financial performance measures.

Opponents criticize EVA's use of book value in the calculation of the cost of capital. It is assumed that it (book value) can be affected and manipulated by inflation (Tamjidi, Hushmandi, & Habashi, 2012). Other opponents say EVA does not have a better explanatory power as claimed by supporters. For instance, Dodd and Chen (1996) examined 566 American companies between 1986 and 1992 and found that EVA explains only 20% of changes in stock returns (Kyriazis & Anastassis, 2007).

The studies have been inconclusive as it can be observed from the above reading. Parvaei and Soran (2013) studied Net Income, residual income, EVA, and Free cash flow with the aim of determining whether EVA has a better ability to predict a firm's performance. The study also wanted to know if EVA was/is better in evaluating a firm's performance measured by current and future stock returns. The authors relied on data from Tehran stock exchange between 2005 and 2009 and used pooled regression method as well as f-test, adjusted r-squared, and Haussmann-test for data analysis. Their results supported Stewart's (1993) conclusion that EVA is a better measure in explaining stock returns compared to the other measures. However, EVA's predictability of a firm's performance couldn't be proven to be stronger. EVA was not stronger because neither EVA nor change in EVA had the largest information content or incremental information content. Hamilton et al. (2009) cited Dodd and Johns (1999) and Ehrbar (1999) to indicate that EVA, compared to accounting measures, is a better performance measure that aligns management and stockholders incentives. Hamilton and Co (2009) pointed to the study of

Buddle et al. (1997) to underscore that Earnings is highly related to stock returns than residual income, cash flow from operation, and EVA.

Salehi, Enayati, and Javadi (2014) aimed to ascertain the association between independent variables (Economic Value Added, intellectual capital efficiency, relational capital efficiency, and human capital efficiency and structural capital efficiency) and a firm's financial performance measured by ROA - the dependent variable. They used data from 39 Chemical and Pharmaceutical Companies selected from Tehran Stock Exchange from 2007 to 2010. The results from multivariate linear regression analysis showed a significant relationship between the financial performance and all the independent variables. However, the result from a fuzzy regression (a simple linear regression defined based on probability distribution) with fuzzy coefficients indicated a significant relationship between a firm's financial performance and intellectual capital efficiency, relational capital efficiency, and human capital efficiency, but not structural capital efficiency and economic value added (EVA).

Chen and Dodd are noted critics of EVA. They have through thorough and extensive works criticize EVA, but it is said "their negative statements about EVA come across as jealousy than a sincere quest for knowledge" (Lefkowitz, 1999, p20). In one of their studies, they concluded that "although improving EVA performance is associated with a higher stock return, but the association is not as perfect as claim by advocates" (Lefkowitz, 1999, p20) citing (Chen and Dodd, 1997b, 318). In the same study, Chen and Dodd acknowledged that EVA is stronger than traditional measures in explaining stock returns. However, they more or less negate that by saying accounting earnings were still of significant incremental information value in addition to EVA (Lefkowitz, 1999, p20) citing (Chen and Dodd, 1997b, 318). Lefkowitz (1999) indicated that a study of Chen and Dodd concluded that EVA performance system has a more significant

information value beyond the traditional accounting measures. They simply meant that EVA has a better explanatory power on stock returns than the traditional accounting measures. Lefkowitz (1999) pointed out that Chen and Co (1997) again negated their conclusion by indicating that the evidence did not suggest replacing traditional accounting measures with EVA.

Literature Comparing Economic Value Added (EVA) to Other Related Measures, Variables, or Concepts

The first four or five variables that were discussed had great resemblance with EVA. In this section, I showed how these variables differ from each other. I proceeded immediately with the literature review on Net income that was considered an important variable in estimating EVA and most of the independent variables.

Economic Value Added (EVA) and Economic Profit

Economic profit was a notion coined by Alfred Marshall in 1890. He referred to it as the real profit a company obtains after covering all its costs including various operating cost and the cost of invested capital (equity and debts) Balu and Morard (2009). EVA and Economic Profit are based on the same principle of including the cost of equity in the estimate, but EVA is a modified version of economic profit. EVA is economic profit with accounting adjustments as suggested by Stern Stewart (Lefkowitz, 1999). The modification is due to accounting adjustments made to" improve the correctitude of real economic profit calculation as a measure of value creation" (Balu & Morard, 2009, p2). We assume that accounting rules as provided by GAAP and accounting directives in Europe distort the proper measurement of invested capital, cost of capital, and operating income, thereby substantially reducing them.

Economic Value Added (EVA) and Refined Economic Value Added (REVA)

Due to the shortcomings of EVA, financial experts proposed an advanced form of it, Refined Economic Value Added (REVA), in which the importance of information is emphasized. Balu and Morard (2009) cited Bacidore et al. (1997) to underscore that the calculation of REVA should involve the use of assets' market value because a firm's capital charge is based on market-based weighted average cost of capital (WACC). In computing REVA, the opportunity cost of capital of resources is calculated using the market value of the resources instead of the book value. Balu and Morard (2009) study pointed out that REVA explains abnormal returns better than EVA. They also cited Seoki Lee and Woo Gon Kim (2009) to assert that incremental explanatory power of REVA is higher than EVA, MVA, and three other traditional accounting measures. Tamjidi, Hushmandi, and Habashi (2012) found a significant relationship between EVA and Earnings per Share (EPS), but not between REVA and EPS between 2005 and 2007.

Nakhaei, Hamid, and Anuar (2013) also indicated that EVA uses the book value in calculating the opportunity cost of resources used; REVA does the same calculation using the market value. Thus, the authors found REVA to be more in line with investors' objective because the researchers indicated that investors sell their assets at market value and invest proceeds in an asset of an equal risk. In doing so, they expect a return equal to the weighted average cost of capital (WACC) in a firm's overall market value (not only return to the book value of the investment showing in the balance sheet). They pointed out that REVA provides an analytical framework for evaluating operating performance that result in shareholder value creation. Additionally, they asserted that REVA is a tool for assessing whether or not a company's performance was an indication of good financial performance in the past. Khan,

Shah, and Rehman (2012) cited Bacidore, Boquist, and Milb (1997) to indicate that EVA and REVA are both used to evaluate the efficiency of the firm, but REVA is superior to EVA in that regard.

Economic Value Added (EVA) and Market Value Added (MVA)

MVA has an excellent correlation with changes in stock return, and EVA's association with MVA is an indication of how EVA and stock return correlate. MVA is defined by Brigham and Gapenski as "the market value of debt and equity minus the amount of debt and equity capital invested into the company since its inception" (Lefkowitz, 1999). The author goes on to say that MVA is a way for investors to know how much they have made on their investments in the company. When a company's EVA is increased, the market value of the company also increases; deducting capital from market value gives market value added (MVA) (Maitah, Saleem, Malec, Boubaker, & Gouda, 2015). Thus, MVA is the net present value of EVA, and when the economy is steady, MVA is calculated by dividing EVA by the required rate of capital, the cost of capital (Maitah et al., 2015).

Like EVA, MVA incorporates the cost of capital (Lefkowitz, 1999). Balu and Morard (2009) revealed that EVA explains a significant portion of MVA citing Grant (1996). Their assertion is in line with the findings of Ehrbar (1998) who indicated that no performance measure explains as much change in MVA as EVA does (Lefkowitz, 1999). Kyriazis and Anastassis (2007) indicated that Stewart examined the informational content of EVA using 613 American companies and comparing two periods, 1984-85 and 1987-1988. He found a strong correlation between EVA and MVA especially when changes in EVA and MVA are considered (Kyriazis & Anastassis, 2007). Stewart (1994) studied the performance of the largest 1,000

American companies. He discovered that changes in EVA explain 50% change in MVA with the other 50% change in EVA explain by future EVA (Kyriazis & Anastassis, 2007). Balu and Morard (2009) also asserted that EVA explains more variations in MVA than EPS, ROE, ROA, and net income, citing Uyemura et al. (1996).

Stewart (2009) asserts that MVA is the spread between invested capital and market value of the company; it is an indication of whether value has been created or not. Stewart (2009) also defines MVA as the present value of expected future EVA, which was re-emphasized by Panahi et al. (2014) who cited Ehrbar (1999). When the expected future EVAs are discounted using the cost of capital, MVA results; when MVA is greater than the cost of investment, value is created which is similar to net present value. Thus, to discount expected future cash flow to NPV is similar to discounting EVA to MVA. Stewart (2009) further pointed that changes in MVA are closely related to changes in EVA. Panahi, Preece, Zakaria, and Rogers (2014) pointed EVA's power as the link between EVA and MVA. They viewed EVA as a measure to evaluate a company's internal performance, whereas MVA evaluates the company's external performance.

Nakhaei, Hamid, and Anuar (2013) cited Milunovich and Tseui (1996) to underscore that MVA and EVA are better correlated than the correlation between MVA and EPS. Their correlation is also better than the correlations between MVA and EPS growth, ROE, FCF and FCF growth. These authors studied the relative performance of EVA-related measures in predicting stock returns in Malaysia. They found that a better association between increasing NOPAT each year and the MVA each year than the association between EVA each year and MVA each year. Their study supported Fernandez (2001) while revealing that that the correlation between EVA and MVA was negative for 210 firms. Citing (Lehn & Makhija, 1996), Panahi et

al. (2014) pointed out that EVA and MVA are applied as tools for internal and external evaluation of companies' performance more than any other tool available.

Economic Value Added (EVA) and Economic Value Added (EVA) Momentum

According to Nakhaei, Hamid, and Anuar (2013), EVA momentum is a registered trademark of EVA dimensions. Further, they indicated that Stewart (2009) defined EVA momentum as the ratio that tells the whole story. He defined it as an increase or decrease in economic profit divided by prior period sales. It is calculated as:

$$\text{EVA Momentum} = \frac{EVA1 - EVA\ 0}{Sales\ o}$$

Where EVA 1 = Economic value added in period one; EVA 0 = Economic value added in the prior period, and sales 0 is revenue for the prior period. Thus, it is a change in the economic profit of the firm in a given period divided by its sales in the prior year (Stewart, 2009). EVA momentum is the ratio that consolidates the pluses and minuses of decision making for a reliable score that increases the creation of value, which is contrary to the Jensen's rule that such as ratio doesn't exist (Stewart, 2009). Stewart (2009) pointed out that EVA momentum's benefits, comparing with other performance measures, include but not limited to the following:

1. Unlike other measures, EVA momentum is based on economics and gives the real economic profit because all capital charges (equity and debt) are deducted.
2. It is seen as the only ratio firms can maximize without being misled to do unacceptable things because of a trailing sales denominator that is fixed prior to the beginning of the period.

3. It enables comparison among bigger and smaller companies and across companies because it neutralizes sizes and situations.
4. It is an excellent tool for setting planning targets that are challenging, but realistic while providing the means of assessing performance towards the target and encouraging the unity needed for achieving the financial objective of the firm.

Economic Value Added (EVA) and Net Income

Net income was an important variable in this study. It was important because it's used to estimate independent variables or because of its role in computing EVA and the other predicting variables. Net income is Income from operation minus tax and cost of debt (interest expense). EVA, which is a variant of residual income, is adjusted net income from operation (net operation profit) after tax (NOPAT) minus the adjusted cost of capital (both equity and debt) Goldberg (1999). Unlike Net income, EVA accounts for the full cost of capital that reflects the cost of the limited resources (Capital) used by the company during the period (Nakhaei et al., 2013).

When adjustments are made to Net Income, we derive Net Operating Income after Tax (NOPAT) (Lefkowitz, 1999). NOPAT minus the cost of capital gives EVA for a particular year (Lefkowitz, 1999) citing Brigham and Gapenski (1997). Net income is an accounting profit, and maximizing profit is the final objective of an enterprise. EVA, on the other hand, is linked to economic profit with the ultimate goal being the maximization of shareholders' wealth (Balu & Morard, 2012). As underscored by Goldberg (1999), Net Income (NI) is determined under Generally Accepted Accounting Principles (GAAP) by subtracting interest expense on debt from EBIT. However, it does not take into consideration the cost of equity capital (Goldberg, 1999). EVA takes into consideration the cost of equity capital, which is normally bigger than the cost of

debt (Balu & Morard, 2009). EVA is derived (and not residual income) so as to be consistent with economic theory by making some adjustments to net income and capital (Goldberg, 1999).

Unlike EVA, NI, like other earnings-based measures, ignores the cost of equity making it difficult to know whether or not the company has created wealth. The correlation between NI (earnings) and stock returns has been reported to be low in various studies. Citing Sloan (1993), Visaltanachoti et al. (2008), indicated that earnings reflect how business-specific factors affect changes in stock prices and not stock price change with respect to external environment factors. That notwithstanding, Net income, in most studies, has been seen to perform better than EVA in explaining stock returns. European study by Peixoto (2002) used a sample of 39 Portuguese companies during 1995 and 1998. The study found a higher informational content for net income over EVA and Operating Profit (Kyriazis & Anastassis, 2007). Also, in the study of Briddle et al. (1997), earnings were discovered to have outperformed EVA (Visaltanachoti et al., 2008).

EVA and Net Present Value (NPV)

EVA and NPV have some things in common. For instance, they are both value-based approach used in determining the ability of a firm to create value (Burksaitiene, 2009). Just like NPV, EVA is a measure of the degree to which companies earn a rate of return above the cost of capital (Burksaitiene, 2009), citing Anand et al. (1999). A positive EVA, an indication that value has been created, is attained when NOPAT is above the cost of capital. A negative EVA, on the hand, means value is destroyed. The value of a company is destroyed when NOPAT is below the cost capital. Similarly, when NPV is positive, a value is created. A value is created when the present value of future cash flows is above the initial cost outlay. Also, when the initial cost outlay of the project is above the present value of future cash flows, NPV is negative, and value is destroyed. Notwithstanding the similarities, there are some remarkable differences. The

differences between the two concepts include the fact that whereas, in EVA framework, it is economic profit being discounted, in NPV, we discount cash flows (Burksaitiene, 2009). Burksaitiene (2009) claimed that EVA is a throwback on NPV. He explained this as the equality of the present value (PV) of EVA by a project over its useful life and PV of the project.

Economic Value Added (EVA) and Other Traditional Accounting Measures

EVA is distinguished from other accounting measures in the fact that the EVA, unlike accounting measures, uses the cost of capital invested (equity and debt) in estimating profit (Kyriazis & Anastassis, 2007). Accounting measures are considered one-dimensional and deficient in adequately assessing firms' strategic accounting, firms' strategic outcomes and performance, Mamma et al. (2012) citing Venktraman and Ramanujam (1986). They are also considered lagging indicators that make no provision for how things should be done differently in the future (Ismail, 2013).

In the study of Visaltanachoti et al. (2008), it was indicated that accounting measures (including EPS) are used to supplement earning-based performance measures to evaluate the creation of shareholders' value. The same study cited to Briddle et al. (1997) to indicate that conventional accounting measures (EPS, ROA, and ROE) are better measures of a firm's performance than EVA. Moghaddan and Shoghi (2012) found that MVA was more correlated with EPS than REVA. Owusu-Antwi, Mensah, Crabbe, and Antwi's (2015) study assessed the financial performance of the banking industry in Ghana. The study showed EVA as a better tool for measuring the Banks' performance than Return on Asset (ROA). Owusu-Antwi et al. (2015) stressed that NI, EPS, ROA, and ROE have failed to explain how management has maximized shareholders' wealth.

Dodds and Chen (1996) discovered that EVA and ROA explain 20% and 24.5% of stock returns respectively (Kyriazis & Anastassis, 2007). Kyriazis and Anastassis (2007) pointed to the study of Dodds and Chen (1996) who indicated that EVA's explanatory power was higher than ROE and EPS. As already indicated, Balu and Morard (2012) cited Uyemura et al.(1996) to support that EVA is better than EPS, ROE, ROA, and net income in explaining variations in MVA. Citing (Rapport, 1986:31), Nakhaei, Hamid, and Anuar (2013) indicated that ROE together with ROA is among the all-time favorite measures of measuring corporate financial performance. Additionally, the authors cited Monteiro (2006:3) to indicate that ROE is among the most important ratio an investor should consider.

EVA includes the opportunity cost of all capital invested in the firm, but accounting measures such as EPS and ROA ignore the cost of capital (Farslo & Degner, 2000). Khan, Shah, and Rehman (2012) cited Lehn and Makhija (1997) and Zimmerman (1997) to stress that EVA is better than the traditional accounting measures in explaining the value of the firm in the form of stock returns. They also revealed that EVA is a better indicator of operating efficiency in the firm. Also, Nakhaei, Hamid and Anuar (2013) buttressed the assertion that EVA is not stronger in predicting stock returns by pointing to the studies of Lehn and Makhija (1997) and Kim (2006). Kim (2006) indicated that EVA is not a better than Earnings and cash flow in predicting the market value of equity. Additionally, Nakhaei and friends (2013) also cited Clinton and Chen (1998) to underscore that residual cash flow had a greater explanatory power and a better significant relationship with stock return compared with EVA.

Saji (2014) showed support for EVA pointing to the study of Zimmerman (1997) which showed EVA as more powerful in explaining stock returns than accounting measures. Burksaitiene (2009) asserted that EVA has a relatively higher explanation power than residual

income, net income, and operating income. Vijayakumar (2012) pointed to the study of Banerjee (1997) that compared ROI and EVA and showed that EVA was superior to ROE as a performance indicator.

However, Saji (2014) pointed out that studies such as Peterson and Peterson (1996), Chen and Dodds (1997) and Bridle et al. (1997) have all indicated that profits and earnings are better in predicting stock/returns than EVA. Also, EVA in the study of Patel and Patel (2012) was insignificant in explaining stock prices of financial institutions in India. Saji (2014) indicated that residual income is more significant in predicting stock price than EVA pointing to studies like Abdoli et al. (2014). Net income was shown as higher in predicting stock returns than EVA and residual income in India (Saji, 2014) citing Shubita and Fawzi (2010).

Though studies are inconclusive about the performance of EVA as a better predictor of returns, adjustments make EVA more viable. Accounting adjustments make EVA economically more viable than accounting measures because accounting measures may contain false information that indicate the business is viable while it might not (Nizamuddin, 2012). He further indicated that EVA makes a business manager know whether or not the business is returning a profit greater than the cost of capital.

The Effect of a Recession on a Firm's Performance

An Economic recession can shrink aggregate demand reducing capacity utilization and slowing growth. The picture presented by the Census Bureau on household net worth underscores the challenges businesses are likely to face during the period of a recession. Census Bureau's numbers released for 2005 and 2010 indicated that the net worth of the median US household fell by 35% in the period (Trumbull, 2012). During the recessionary period, household

net worth calculated as financial assets minus debt fell from $102, 844 in 2005 to $66,740 in 2010 (Trumbull, 2012). When income falls like this, demand falls affecting the ability of firms to increase profit margins and create value.

Saji (2014) underscored the pervasiveness of 2007 to 2009 financial crisis indicating that it had its reverberation in all over the world even affecting corporate sectors and the stock markets even as far as India. Also, Radneantu, Gabroveanu, and Stan (2010) underscored the far-reaching effect of recession. They indicated that the period of recession can affect every fabric of life as everyone has become so dependent on the market economy and its constituents of banking system, financial-lending policies, and the security markets. They noted that the effect of the Great Recession went over and across international markets affecting both micro and macro structures. However, Saji (2014) did cite Saji et al. (2013) and indicated that some companies are fundamentally strong and can come out of recessionary period unhurt.

In the study of Ismail (2014) showed how 1997 Economic Crisis in Malaysia impacted the effect of size and leverage on company performance. The study revealed that the size of the company (measured by the market value of equity) negatively correlated to EVA. Increasing size increases the cost that destroys value as returns of big size companies were below their cost of capital. The study found size to negatively correlates with performance during a recession period but found no association between performance and leverage. In the period of an economic downturn, increasing the size destroys value as the cost of capital exceeds returns. However, reducing size and increasing operational efficiency enhance value. Ramakrishman and Ragothaman (2014) alluded to a positive impact of a recession on the ability to increase profitability and create value. They indicated that in the period of crisis, large firms can reduce building up in liquidity, cut back on capital expenditure that reduces cost of capital and increase

overall efficiency to provide opportunity for improved profitability and value creation. The study indicated that 2007 to 2009 great recession allowed large firms to cut cost and improve overall efficiency for improved profitability and value creation. Srinivasan et al. (2011) indicated that the period of recession doesn't have a direct effect on performance even with managerial actions geared toward increasing profitability. They underscored that whether or not a firm's expenditure on research and development and advertisement, for instance, will improve a firm's performance depends on its market share, financial leverage, and its product-market profile.

Mandal and Bhattacharjee (2012) looked at how the Indian stock market reacted to the Great Recession. The study was conducted to show the behavior of the Indian stock market before and after the Great Recession. It revealed that in the period of a stable economic environment, volatility does not spread across countries, but during recession time, it does. Their study showed that the Indian market was highly affected by the volatility in the world market during the period of economic recession. It further revealed that the worldwide economic recession made returns of the Indian stock market, which had had positive daily returns, negative.

Bello (2009)'s study was conducted to show the performance of five categories of US domestic equity mutual funds during the 1990 and 2001 recessions and twelve months following each recession. It revealed that during the 2001 recession, four of the five mutual fund categories and the S&P 500 Index recorded negative returns. Additionally, all the five fund categories and the market (S&P 500) recorded negative return in the 12 months following the recessions. It also shows that the impact of a period of a recession on returns is not the same when a fixed rule of thumb is used. While following the rule of thumb yielded good returns after the 1990 recession, the result was opposite after 2001 recession.

Haworth (2012) alluded to the fact that the 2008 financial crisis was an affront on the effectiveness or viability of financial models and theories underlying the capital market allowing financial authors to criticize theories/models underlying the financial system. He submitted in his September 20, 2012 article that "the 2008 financial crisis exposed dangers in following the flawed assumptions of constant volatility and correlations inherent in the Modern Portfolio Theory (MPT)" (Haworth, 2012, p.2). This article and another by Mr. Swedore in 2012 implicitly indicated that financial models and theories have inherent weaknesses exposed when faced with an economic crisis. The crisis exposed flaws in MPT. In this study, how the crisis impacted the relatively predictive strength of EVA was investigated. The goal was to determine if there was a justification for promoting it as a robust predictor of stock performance to encourage its adoption.

Conclusion

This study was conducted to determine how EVA would perform when used to predict stock returns during the Great Recession adding to EPS, ROE, ROA, and P/E. The findings of Stewart (1991, 1993, and 1994) pointed to EVA as a better indicator of stock returns than accounting measures (Mamun & Mansor, 2012). Balu and Morard (2009) cited Uyemura et al. (1996) to support the argument by indicating that EVA is better than EPS, ROE, ROA, and Net Income in explaining variations in MVA. The present value of future expected EVAs give MVA. Changes in MVA and stock returns are not necessary the same but are much related. Lefkowitz, (1999) saw that MVA is highly associated with stock returns. Since MVA is a concept that comes closely to EVA, we can infer that EVA is highly related to stock returns. MVA is highly related to stock returns because it is a way for investors to know how much they have made on their investments in the company. Like EVA, MVA incorporates the cost of all capital. Another

important EVA-related variable is EVA momentum; it is defined as an increase or decrease in economic profit divided by prior period sales. There is also REVA, which is estimating EVA using the market value of the cost of capital (opportunity cost of resources used) instead of book value on the balance sheet. These EVA-related variables were not variables in the study but were included in the discussion to show how they differ from EVA.

Dodds and Chen (1996) saw that EVA and ROA explain 20% and 24.5% of stock returns respectively. However, EVA's explanatory power was discovered to be higher than ROE and EPS, Kyriazis and Anastassis (2007) submitted. Other studies did show that EVA was not a better performer. Goldberg (1999) pointed to the study of Briddle et al. (1998) who used data from Stern Stewart Co and a regression analysis and found that earnings outperform EVA in explaining stock return. Thus, studies had been inconclusive about the relative strength of EVA as a predictor of stock return.

Moreover, research on the effect of recession on a firm's performance had not pointed to any clear direction. It looked like the state of macroeconomic variables had little impact on how well a firm performs. For instance, Owusu-Antwi et al. (2015) evaluated the performance of Banks in Ghana using EVA and ROA and indicated that inflation rate and unemployment rate, great economic indicators, have no significant effect on the performance of Banks in Ghana during the study period. This study was intended to look at how 2007 to 2009 Great Recession impacted the relative effectiveness of EVA in predicting stock returns to fill the gap in literature.

In the next chapter, the research design and sampling and sampling procedures were described as well as data collection and analysis strategies. Additionally, I also outlined threats to the study's validity and underscored how ethical issues involved were addressed.

Chapter 3: Methodology

Introduction

The purpose of the study was to examine the strength of EVA and its relative performance as an indicator of stock returns of Fortune-500 Companies during 2007 to 2009 Great Recession. The goal was to determine whether or not an economic downturn (a Great Recession) would offer an insight into the relative strength of EVA as performance indicator when compared with traditional measures such as earnings per share (EPS), return on asset (ROA), return on equity (ROE), and price/earnings ratio (P/E).

In this chapter, I discussed the rationale for study's design, its methodology (including data collection and analysis techniques), instrumentation and 'operationalization', threats to the study's validity, and ethical issues involved in this study. The discussion on the methodology included an explanation of target population, sampling and sampling procedures used in selecting the secondary data, as well as other data collection and analysis techniques. While the data collection techniques discussion included the appropriateness for the study, a discussion about data analysis techniques included a discussion on data analysis plan and the software used for the analysis. The final section of this chapter discussed issues relating to threats to the study's validity and procedures in place to tackle ethical concerns.

Research Design and Rationale

The design

The study was a quantitative one with cross-sectional design because the hypothesis that a model with EVA and accounting variables was a better predictor of stock returns was tested

using secondary data mostly retrieved from sampled companies' websites. EVA, as a performance indicator of stock return, was compared with traditional performance measures like Earnings per share (EPS), return on asset (ROA), return on equity (ROE), and price-to-earnings ratio (P/E) during the 2007 to 2009 Great Recession.

The Research Question and Hypotheses

The purpose and nature of the study demanded the ensued research question be answered.

Could a better job be done in predicting stock returns of Fortune-500 Companies by considering EVA in addition to accounting variables [Earnings per Share (EPS), Return on Asset (ROA), Return on Equity (ROE), and Price-to-Equity ratio (P/E)] during the period of the Great Recession? The research question called for two statistical regression models, Model 1 and Model 2. The first regression model had only accounting variables. The second regression model included EVA in addition to the accounting variables in the first model.

Model 1: $Y = \beta0 + \beta1\ (EPS) + \beta2\ (ROA) + \beta3\ (ROE) + \beta4\ (P/E) + e$

Model 2: $Y = \beta0 + \beta1\ (EPS) + \beta2\ (ROA) + \beta3\ (ROE) + \beta4\ (P/E) + \beta5\ (EVA) + e$

Y = dependent variable, the stock returns

$\beta0$ = regression constant; it is the value of Y when the sum of the parameters of the predictors is zero

βs = Regression coefficients of individual predictors

e = the error term

I coined the following null and alternative hypotheses from the models:

Ho: The Regression Coefficient of EVA is equal to zero in the model that included EVA in addition to the accounting variables.

Ho: $\beta 5$ (EVA) = 0

Ha: The Regression Coefficient of EVA is not equal to zero in the model that included EVA in addition to the accounting variables

Ha: $\beta 5$ (EVA) $\neq 0$

I critically analyzed the beta-values and the b-values of the variables to show the contribution of each variable.

Rationale for Design

A qualitative approach to this study wouldn't have been appropriate because the study was not meant to explore or understand meaning to any social problem where a case study approach, phenomenological approach, or narrative approach would have been needed. Creswell (2009) explained that a case-study approach is needed for exploring in-depth a social problem, activity, or process, and a phenomenological strategy is used to identify the essence of one's experience about a phenomenon as described by participants. For narrative qualitative approach, Creswell (2009) submitted that the researcher studies the life-stories as told by individuals in the study. None of these approaches to research studies is in tandem with my research objective.

In this study, the pattern of relationship among dependent and independent variables needed to be described making correlational design or cross-sectional design the most appropriate design to use. Field (2013) explains that cross-sectional design or the correlational design allows for the observation of what naturally goes on in the world without directly

interfering in it. He stressed that by measuring several variables at a point in time and analyzing data using statistical techniques one can look at the relationship between naturally occurring variables without making any statement about cause and effect. The variables measured and statistically analyzed were stock returns (the dependent variable) and EVA, ROA, ROE, and P/E (the independent variables). There was no statement of cause and effect using statistical relationships among variables based on the secondary data collected. The design chosen was best suited to answer the question of whether or not a model with EVA did a better job predicting stock returns and to determine if EVA was better than traditional measures in predicting stock returns during the period of the Great Recession.

There are several types of correlational design; they include explanatory design, predictive design, regression design, path analysis design, cross-lagged panel design, etc. (Cleave, 2009). This study used predictive design as well as a multiple regression design. The design is a predictive design because the goal was to determine which variable among the independent variables was a better predictor of stock return (the dependent variable) during 2007 to 2009 Great Recession. Multiple regression design was used because once it's determined that a correlation relationship exists between the independent and dependent variables, there was a need to know how well an independent variable can predict the outcome variable. Since there were several predictors involved in predicting the outcome variable, the regression I used is a multiple regression (Cleave, 2009). There was no need for path analysis and cross- lagged panel designs because as already indicated this study was not about cause and effect relationship.

Some Constraints

The estimation of EVA demands that companies make some adjustments to the estimation of their net income. However, in this study I made the assumption that all the 93 companies had the same method of calculating EVA, which is Net Income – cost of Equity. The assumption would be at variance with reality, thus, becoming a strong constraint to this study. There were also resource and time constraints to this study. One other constraint was that the data for study did not reflect current reality because some companies that had ranked among the best 500 companies in 2007, 2008, or 2009 were not among the best ranked 500 companies at the time of the study. The study was limited to the use of multivariate linear regression and simple linear regression as appropriate techniques to find answers to the research questions. Past data or secondary data were needed to estimate the values of variables under investigation. These quantitative measures were consistent with correlation or cross-sectional design approach to research.

The Methodology

Population

The population for the study was selected from the Fortune 500 companies for the three years (2007, 2008, and 2009). The Fortune magazine rates companies on the basis of their revenue by ranking them from 1 to 500+ for 2007, 2008, and 2009, but this study looked at the first 500 companies for those years. About 402 companies appeared on the Fortune 500 companies list for all the three years. I re-ranked them combining their rankings for the three years for the average ranks. Then, a sample of 43 companies was chosen using a simple random sampling and 55 companies later added to make the sample size 98. 'Outlier' values were taking out reducing the sample to 93 companies. With SPSS, all the estimates of variables from the 93

companies were entered into the software for the F-test and T-test. My approach to this study was in tandem with the method used by Khan et al. (2012). They used a sample of 60 companies from 2004 to 2010 and analyzed the data using SPSS software to calculate t-values and f-values.

Table 1

The list of the first 60 Fortune-500 Companies for 2007, 2008, and 2009

Companies' rank	2007	2008	2009
1	Walmat Inc.	Walmat Inc.	Exxon Mobile
2	Exxon Mobile	Exxon Mobile	Walmat Inc.
3	General Motor	Chevron	Chevron
4	Chevron Corp	General Motors	Conoco Philips
5	Conoco Philips	Conoco Philips	General Electric
6	General Electric	General Electric	General Motors
7	Ford Motors	Ford Motors	Ford Motors
8	Citigroup, Inc.	Citigroup, Inc.	AT&T, Inc.
9	Bank of America	Bank of America	Hewlett Packard
10	America Internat Grp	AT&T, Inc.	Valero Energy
11	J.P Morgan Chase	Berkshire Hathaway	Bank of America
12	Berkshire Hathaway	J.P Morgan Chase	Citigroup, Inc.
13	Verizon Com	American Internat. Grp	Berkshire Hathaway
14	Hewlett Packard	Hewlett Packard	Internat Busi. Mach
15	Internat. Busi. Mach	Internat. Business Mac	McKesson Corp
16	Valero Energy	Valero Energy	JP Morgan Chase
17	Home Depot	Verizon Communi	Verizon Comm
18	McKesson Corp	McKesson Corp	Cardinal Health

19	Cardinal Health	Cardinal Health	CVS Care
20	Morgan Stanley	Goldman Sachs	Proctor & Gamble
21	United Health	Morgan Stanley	United Health
22	Merrill Lynch	Home Depot	The Kroger Company
23	Altria Group	Proctor & Gamble	Marathon oil
24	Goldman Sach	CVS Care	Costco
25	Proctor & Gamble	United Health Group	The Home Depot
26	Kroger Companies	Kroger Company	Amerisource
27	AT&T, Inc.	Boeing Company	Archer-Daniels
28	Boeing, Inc.	Amerisource	Target Group
29	Amerisource	Costco	Johnson & Johnson
30	Marathon Oil	Merrill Lynch	Morgan Stanley
31	State-farm	Target Corp	State Farm Insurance
32	Costco	State-farm Insurance	WellPoint Inc.
33	Target Corp	WellPoint, Inc.	Dell, Inc.
34	Dell, Inc.	Dell, Inc.	The Boeing Comp
35	WellPoint, Inc.	Johnson & Johnson	Microsoft Inc.
36	Johnson & Johnson	Marathon Oil	Walgreen, Co
37	MetLife, Inc.	Lehman Brothers	United Tech
38	Sears Holdings	Wachovia Corp	The Dow Chemical
39	Pfizer, Inc.	United Tech	MetLife, Inc.
40	Dow Chemical	Walgreen Co	The Goldman Sach
41	Well Fargo	Wells Fargo	Wells Fargo
42	United Tech	Dow Chemical	Sunoco, Inc.
43	United Parcel Services	MetLife	United Parcel Service

44	Walgreen Co	Microsoft Inc.	Caterpillar, Inc.
45	Lowe's Company	Sears Holdings	Medco Health Solution
46	Wachovia	United Parcel	Pfizer, Inc.
47	Lehman Brothers	Pfizer, Inc.	Lowe's
48	Time Warner	Lowe's	Time Warner Inc.
49	Microsoft, Inc.	Time Warner	Sears Holding
50	Freddie Mac	Caterpillar, Inc.	Safeway, Inc.
51	CVS/Caremark	Medco Health	Super Value Inc.
52	Motorola, Inc.	Archer-Daniels	Pepsi Co
53	Sprint Nextel	Fannie Mac	Kraft food
54	Medco Health Solution	Freddie Mac	Lockheed Martin
55	Caterpillar, Inc.	Safeway	Hess Company
56	Safeway, Inc.	Sunoco, Inc.	Best Buy
57	Lockheed Martins	Lockheed Martins	Cisco System
58	Care Mark Rx, Inc.	Sprint Nextel	Johnson Control
59	Archer-Daniels	Pepsi Co	FedEx
60	Sunoco Inc.	Inter Corp	Walt Disney

Source: (Fortune.com, 2014)

Sampling and Sampling Procedures

A simple random sampling technique was used to pick a sample of 98 companies from the population of 402 Fortune-500 companies (selected from three lists of Fortune 500 companies for 2007, 2008, and 2009). The number was reduced further to 93 after taking out the outlier values. I used a basic probability sampling method because it ensures that each sampling unit had an equal and known non-zero probability of being selected (Frankfort-Nachmias & Nachmias, 2000). My sampling process had three steps:

1. A list of Fortune-500 companies for each year
2. Picked companies that appeared in the Fortune-500 companies for all the three years
3. Used a simple random sampling technique (using the table of random digits) to select the initial 98 companies for both t-test and F-test. The G-Power analysis below shows that 55 companies were needed for t-test and 92 companies for F-test, I finally picked 93 companies after accounting for outliers. With the SPSS, I was able to do t-test and f-test simultaneously.

Using the steps above, I picked companies that appeared on all the Fortune-500 companies lists for 2007, 2008, and 2009 as the population of the study (a total population of 402 companies). The indication was that 402 companies were able to make the Fortune-500 list in all the three years (2007, 2008, and 2009). A sample of 98 initially was chosen for the T-test and F-test using a simple random sample technique (random digit table), though a sample of 92 companies was needed. I re-ranked the companies using the average ranking of the companies for the three years. I followed the example in Exhibition 8.1 at page 170 of the book [Frankfort-Nachmias and Nachmias (2000)] and came up with a sample consisting of companies ranked with the following numbers:

Table 2. T-test sample

104	023	053	156	090	218
223	010	005	164	161	032
241	070	259	186	214	180
375	326	097	304	215	

289	293	179	166	275
094	024	145	389	115
103	296	349	316	374
071	007	089	039	309

NB: 43 Companies were initially selected

From each of the 43 companies selected, I estimated the total annual stock returns value, EVA, EPS, ROA, ROE, and P/E for 2007, 2008, and 2009 as well as the average of the years. I followed the same pattern in picking and estimating variables of an additional 55 companies (also selected using simple random sample - table of random digits) for a total sample of 98 for the T-test and F-test. The sample size was later reduced to 93 after accounting for outliers.

Table 3.

An additional 55 Companies for F-test

083	368	205	003	333	381	143	255	224	298
239	127	042	351	332	052	156	225	055	
99	213	264	167	009	303	290	062	288	
150	323	47	350	124	329	258	110	048	
69	270	185	202	080	012	017	054	390	
143	330	295	194	211	64	015	337	256	

NB: 55 more companies are selected and added to the 43 already selected

Power Analysis for Linear Multiple Regression

It is said that the ability to find a statistically significant difference when the null is false is the statistical power of the study (Field, 2013). That is the power of the study is the probability

of rejecting the null hypothesis when it is false, which is the opposite of type 2 error (1-β). The power of the study is measured by the sample size, an alpha level, and the effect size (Field, 2013)

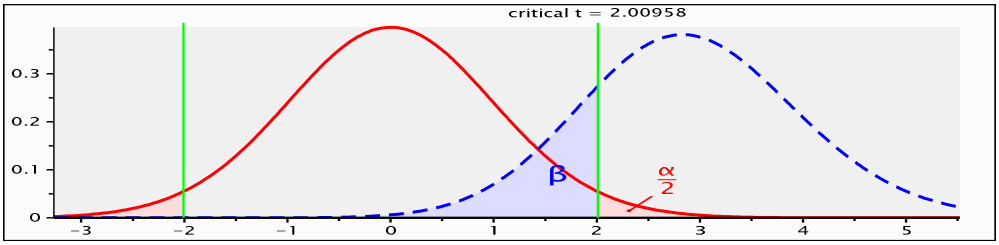


Figure 1: T-Test

Table 4

Information on t-test

Effect Size	0.15	Non-Centrality parameter δ	2.8722813
Power (1-β ar prob)	0.8	Critical t	2.0095752
Err pro	0.05	Df	49
Sample Size	55	Actual Power	0.8038932

Source: G-Power

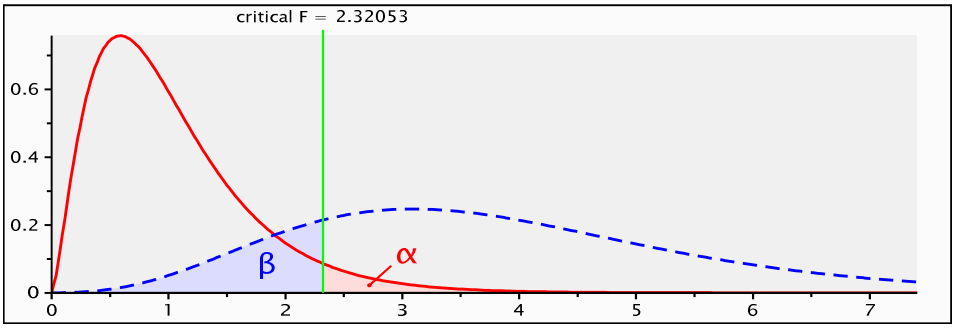


Figure 2. F-Test

Table 5

Information on F-Test

Effect Size	0.15	Non-Centrality parameter δ	13.800000
Power (1-β ar prob)	0.8	Critical F	2.3205293
Total Sample Size	92	Numerator df	5
Number of Tested Predictors	5	Denominator df	86
Total Number of Predictors	5	Actual Power	0.8041921

Source: G-Power

A sample of 92 Companies was needed for both the t-test and F-test, but I chose to go one more above the required sample size to 93. There are two errors that can occur when the sample is used to draw conclusion about a population: type-one error and type-two error. In type one error, which is called alpha (α), the null hypothesis is rejected when it is true. The probability of type-one error is the level of significance (5%). Type-one error risk is controlled by establishing a risk level in which one can tolerate in rejecting a true null hypothesis. The risk level alpha (α) is selected which is contingent on the cost of making a type 1 error. When the alpha level and the effect size are specified, we derive the type-two error, the beta (β), which occurs when the researcher fails to reject a false null hypothesis.

Procedure for Data Collection

Fortune magazine lists the best five hundred companies ranking them based on their revenue. I picked a sample of 93 companies and accessed the relevant data from Nasdaq.com and finance.yahoo.com that are reputable websites to investigate the financial and operational performance of these companies. The annual reports and 10-k forms of sampled companies were examined for the three years via the internet for data on their EVA, NI, ROA, ROE, and P/E.

Nasdaq.com provided information on the stock prices and other relevant financial information of the companies. I used the accessed information to estimate the variables under consideration for each of the 93 companies included in the sample. In chapter 4, I have presented some of the names of companies that would make up the sample, their estimated variables to be entered into the SPSS for the statistical analysis, and show how the estimates were computed.

Operationalization

The Dependent Variable

In the study of Nakhaei et al. (2013), total return was estimated as the ending stock price (P1) less initial stock (P0) plus dividend paid during the period all over the ending stock price. I followed the same method in estimating the total stock return in a year. I estimated the annual stock returns value for each company using the stock price at the beginning of the fiscal year, stock price at the end of the fiscal year, and the total dividends paid in the year. The stock returns values for each company were estimated for 2007, 2008, 2009, as well as the average of the years for the four datasets. For instance, for Company A, I estimated 2007 Stock Returns, 2008 stock Returns, 2009 Stock Returns, and mean values Stock Returns. The estimation wouldn't have been needed if the information were already available at the company's website or database.

The Independent Variables

The estimation of Net income (NI) was the starting point for calculating most of the predicating variables. Net income is EBIT- interest – taxes. It is sales (revenue) minus variable expense minus fixed expense minus depreciation and amortization minus interest and tax. NB.: EBIT = Earnings before interest and tax.

Economic value added (EVA). EVA is net operating profit after tax less invested capital multiply by the weighted average cost of capital. EVA = EBIT-T – (Invested capital x WACC). Invested capital = equity and debt but not non-interest bearing current liabilities (Balu & Morard, 2009). WACC = cost of debt [{total debt/ (total debt + CMVE)] (1-tax)} + {cost of equity x [CMVE/ (Total debt + CMVE)]}. CMVE = Company's share price x total share outstanding. However, in its simplest calculation, EVA = NI – Cost of Equity (Balu & Morard, 2009). I followed the same principle in estimating EVA in this study.

Earnings per share (EPS). For simplicity, EPS was defined as NI divided by a number of shares outstanding for the period. In this study, I used the diluted EPS values reported in the financial reports of the sampled companies.

Return on asset (ROA) and return on equity (ROE). For these two variables, their calculations were kept very simple. ROA is the ratio of Net income over the total asset. This is in tandem with the study of Salehi, Enayati, and Javadi (2014) in which ROA was used as the dependent variable to measure performance and calculated as: ROA = Net Income/Total asset. Similarly, ROE was also calculated as: Net Income divided by total equity.

Price/equity. This is a share price over Earnings per Share (EPS).

How the Variables were Scored and Measured

The variables were calculated using information obtained from the financial statements and financial reports of sampled companies accessed from Nasdaq.com. I estimated the values of the variables for the three years for three datasets and used the averages of the three years for the fourth dataset. The estimated values of the variables were entered into multiple regression models.

Data Analysis Plan for this Study

I used the SPSS to analyze the data. The data on values for both the dependent variable and the independent variables were loaded into the SPSS software. The data on the variables were entered in the SPSS's untitled-SPSS-data-editor starting by entering data in row 1, column 1(Green & Salkind, 2011). To ensure that the assumption of linearity was met, the scatter plots of SPSS was observed for linearity. The scatter plots were used to determine if a reasonable linear relationship existed between predictor variables and the outcome variable. The scatter plots examination was the first part of data exploration, also an aspect of the analysis. The scatter plots examination was followed by other methods of presenting and analyzing the data. These methods included descriptive statistical measures like histogram and other relevant graphs. A summary of model output gave the values of R and its corresponding R^2, and the adjusted R^2 , which can all be used to estimate the F-ratio. The values for the F-ratio are provided by the ANOVA table. The model parameter output provided the b-values and standardized beta values. From R, corresponding R^2, and the adjusted R^2 , b-values and beta-values, the effect sizes of the variables are measured (Green & Salkind, 2011).

In the SPSS, the intention was to use hierarchical method in entering the values of variables into the software because of its advantages over other methods. In the SPSS and under linear regression (statistics) button, there are several options. I chose all options except the covariance matrix. Before commenting on the options, let me throw some lights on correlation and regression as presented by the SPSS software.

Correlation and Regression Analyzes

The starting point to correlation analysis was to look at some scatter plots of the variables to be measured (Field, 2013); these graphs were produced by SPSS. The linear relationship among variables (outcome and predictors) ranges from negative 1 for perfect negative correlation up to positive 1 for perfect positive correlation. When *r* is zero, it means there is no correlation between the dependent and independent variables. The tests were conducted to show how well dependent variable (Y) correlated with independent variables; then, how well the dependent variable was predicted by independent variables. SPSS provided explanatory power and correlations of predictors to the outcome variable (stock return). The part and partial correlation option was checked for the part and partial correlations among predictors and the outcome variable in the model.

Regression analysis enables the estimation of the total sum of squares, which is a measure of variation of the independent variables around their means (Field, 2013) citing Berenson and Levine (1992). The total sum of squares is decomposed into explained variation and unexplained variation. The explained variation is attributed to the relationship between the independent variables and dependent variable, and the unexplained variation is attributed factors other than independent variables not included in the regression equation (Field, 2013). The explained variation represents the difference between the average values of the independent variables and their predicted values using the regressions equation (Field, 2013). The unexplained variation represents that part of an independent variable unexplained by the regression (Field, 2013). This variation is calculated as the sum of squared difference between the actual values of independent variables(Y) and the predicted value (Y') (Field, 2013). The process applied to this study too.

My conclusion was drawn about the population slope and the population coefficient, r, to determine whether there was a linear relationship between the dependent variable and independent variables (Field, 2013). This linear relationship determination was done by testing whether the true slope was equal to zero and whether the slope of EVA was less or equal to zero (Field, 2013). A slope equal to zero meant changes in independent variables did not correspond to a change in the dependent variable. Since the changes were not zero, but positive, there was the need to look at whether or not the slope of EVA was greater than the slopes of other predictors. The regression models also enabled me to test whether a significant relationship existed between the dependent variable and independent ones, and also to determine the size of individual slopes (Field, 2013). The first thing I tested was if the slopes of β1, β2, β3, β4,and β5 were equal to zero, and tested if the slope of β5 was greater than either β1, β2, β3, or β4.

The test statistic is given by:

For EVA, $t = \frac{b_1 - \beta_1}{S_1}$

Where:

b_1 = is the estimated slope of the sample

β_1 = is the true slope for the population

s_1 = is the standard error of b_1, calculated as: $\frac{\sqrt{\sum(Yi-Y')^2/(n-2)}}{\sqrt{\sum(Xi-X')^2}}$

The sample correlation coefficient, r, is another way of checking for the existence of a linear relationship between two variables. It is the same as testing if there is any significant

correlation between them (Field, 2013) citing (Berenson and Levine 1992, p.632). The correlation coefficient test used to determine the relationship among variables was done by testing whether or not the true slopes of predictors were equal to zero. The hypotheses for population correlation coefficient, r, are: Ho: r = 0; Ha: r ≠ 0 for all the predictors. These hypotheses were also used to determine the relative strength of the correlation coefficients of the predictors. The t-statistic is estimated by the formula: $t = \frac{r}{\sqrt{1-\frac{r^2}{n-2}}}$; where r is equal to population correlation coefficient.

Confidence Interval

The confidence interval option provided by SPSS produced confidence interval for each of the 'unstandardized' regression coefficients. The software produced 'unstandardized' beta values that had confidence intervals (they are accurate only if the assumptions are met) (Field, 2013). Field (2013) also indicated that a good model will have a small confidence interval. A small confidence interval indicates that the value of b, for instance, in the sample is closer to the b -value in the population. According to Field (2013), the confidence interval of 'b' is calculated from scores of samples. With 95% or 99% confidence intervals, it is an indication that 95% or 99%, respectively, of these confidence intervals would contain the true value of 'b'.

Fitting the Model

An important option was the model fit option. This option gave the statistical model's ability to predict the outcome variable (the F-test) by showing value of R and its corresponding R^2, and the adjusted R^2 (Field, 2013). It was from these values I estimated the F-Test. There is the R-square change option that gave the change in R^2 as a result of the addition of

a new predictor or block of predictors. These indices measured the effect sizes and helped to assess how well the predictor variables, in linear relation with the criterion, predicted the criterion variable (Green & Salkind, 2011). They also helped in assessing the contribution of new predictor or block of predictors (Model 2) in explaining variance in the model (Field, 2013). The multiple correlation (R) ranges from 0 to 1(Field, 2013). Zero (0) means no linear relation, and 1 means the linear relationship between the predictor and criterion is a perfect one (Green & Salkind, 2011).

With the descriptive option, I assessed whether multicollinearity existed. It exists when there is a strong correlation between two or more independents. Using the SPSS, I looked at collinearity diagnostics for variance inflation factor (VIF) and tolerance statistics (1/VIF) (Fields, 2013). The model was fitted to the data collected by estimating the parameters using the method of least square. The hypotheses were tested about the parameters by computing test statistics and their associated probabilities (p-values). The p-value was 0.05. In the model, the predictor variables described the model and parameters gave the relationship between the predictors and the outcome variable. The correlation coefficients (bs) in regression analysis are 'unstandardized' measures of the relationship between the outcome variable and predictor variables. There is also a parameter 'β0' that tells the value of the outcome when the sum of predictors is equal to zero (Field, 2013).

$$Y = \beta 0 + \beta 1\ (EPS) + \beta 2\ (ROA) + \beta 3\ (ROE) + \beta 4\ (P/E) + \beta 5\ (EVA) + e$$

This model was described entirely by β0 and parameters associated with each predictor (the βs) (Field, 2013). The model's goodness of fit was assessed by using the method of least squares to look at the deviation between the model and the actual data collected (Field, 2013).

The ‘options’ button in SPSS was used to estimate coefficients of the regression model (estimates for b-values). The SPSS also gave the test statistics and their significance for each regression coefficient (Field, 2013).

F-test sums of squares in assessing the model:

$$F = \frac{amount\ of\ systematic\ variance}{amount\ of\ unsystematic\ variance};\ F = \frac{mean\ squares\ for\ the\ model(MSm)}{the\ residual\ mean\ squares(MSr)}$$

There was a comparison of the means of how much the model had improved the prediction of the outcome to the level of inaccuracy of the model. A good model would have a large ‘MSm’, which meant an improvement in prediction by the model (Field, 2013). A small ‘MSr’ meant the difference between the model and observe data was small (Field, 2013). On the average, sizes of Msms were relatively higher than MSrs

The magnitude of F-ratio was assessed by using a critical value for the corresponding degree of freedom; it was also used to calculate the significance of R^2. The equation is given as:

$$F = \frac{N-k-1)R^2}{K(1-R^2)}$$

N = number of cases or participants

K = Number of predictors in the model

Testing the Hypotheses: Key Parameter Estimates and Probability Values

The study’s goal required that I used a multiple regression analysis to answer the ensued research question. Could a better job be done of predicting stock returns be done by a model with EVA added to accounting variables? Two multiple regression models needed to be created. The

first regression model included only accounting variables. The second regression model had EVA in addition to the accounting variables in the first model.

Model 1: $Y = \beta0 + \beta1\ (EPS) + \beta2\ (ROA) + \beta3\ (ROE) + \beta4\ (P/E) + e$

Model 2: $Y = \beta0 + \beta1\ (EPS) + \beta2\ (ROA) + \beta3\ (ROE) + \beta4\ (P/E) + \beta5\ (EVA) + e$

On the basis of the research question and the regression models above, I put forward the following hypotheses:

Ho: The regression Coefficient of EVA is equal to zero in the model that included EVA in addition to the accounting variables.

Ho: $\beta5\ (EVA) = 0$

Ha: The regression Coefficient of EVA is not equal to zero in the model that included EVA in addition to the accounting variables

Ha: $\beta5\ (EVA) \neq 0$

The SPSS's model parameter output gave the b-values and beta-values of predictors. These values helped to ascertain the degree to which a predictor affects the outcome.

The sampling distribution and the sample statistics were determined to make a decision on a statistical hypothesis testing based on the sampling distribution. In most studies, in making the decision on the null hypothesis, the critical value for the statistical distribution is determined, which divides the non-rejection region from the rejection region (Berenson and Levine, 1992, 361-62). Field (2013) also indicated that the appropriate test statistic is computed by dividing it into a region of rejection and a region of non-rejection. If test statistics falls in the region of

rejection, the null hypothesis is rejected. At the region of rejection, the values of the test statistic are unlikely to occur if the null hypothesis were true; the values are likely to occur because the null hypothesis is false (Field, 2013). The null hypothesis is rejected because the probability that the null hypothesis is true is too low (Field, 2013). It was not the case with this study.

I used an alternative method: P-value. The P-value is considered the smallest level of significance by which the null hypothesis can be rejected; the smaller the P-value the stronger the evidence against the null hypothesis (Defusco, Mcleavey, Pinto, & Runkle, 2012). Thus, when the P-value is less than the specified level of significance, which in our case was 0.05, the null hypothesis is rejected; otherwise we don't reject the null hypothesis (Defusco, Mcleavey, Pinto, & Runkle, 2012). The SPSS software produced p-values for b-values and beta values (unstandardized and standardized coefficients respectively) and showed their levels of significance when compared with a specified level of significance (critical-value). If the p-values were lesser than the specified level of significance, the test would have been deemed significant.

Testing for the Assumptions

In the SPSS, the linear regression has another area called the plots. These plots enabled me to establish the validity of the regression assumptions. For instance, ZRESID (plotted on the Y-axis) against ZPRED (on the X-axis) was used to test the assumptions of independent errors, homoscedasticity and linearity (Field, 2013). Bootstrap is normally run to determine normality and a case of heteroscedasticity (using Levene's test), and it is normally followed up by running weighted least squares regression.

The test of the independence of errors in this study was done using Durbin-Watson test, which tested for serial correlation between errors. The goodness of fit measure was done by

running R-square (to know that proportion of variance explained by the model). F-ratio was meant to show variance explained relative to error in the model under 95% confidence level. The t-test was used to know if a parameter was different from zero for normality (Field, 2013). Collinearity diagnostics button gave the VIF, tolerance, and eigenvalues for assessing homoscedasticity. As already indicated, the assumption of independent errors was checked using Durbin-Watson button.

The Problem of Heteroscedasticity

The assumption is that the variance of the outcome variable is stable at every level of the predictors, which is met when one uses the method of least square at an optimal level for a linear model. In using weighted least square, a case is weighed by the function of its variance (Field, 2013). Thus, citing Hayes & Chai (2007), Field (2013) pointed out that one does not need to worry about homoscedasticity when using least square method. I checked for homoscedasticity using the Durbin-Watson statistics produced by the SPSS.

Detecting Multicollinearity

A strong correlation between two or more independent variables represents the problem of Multicollinearity. The problem occurs when there is a perfect collinearity between predictors with a correlation coefficient of one or closer to one (Field, 2013). According to Field (2013), it is a problem if the figure is 0.9. When this problem occurs, the 'bs' become untrustworthy, the size of R becomes limited, and the importance of individual predictors becomes very difficult to be assessed (Field, 2013). The various collinearity diagnostics values that included variance inflation factor (VIF) and tolerance statistics (1/VIF) were observed to detect multicollinearity (Field, 2013). The SPSS produced VIF and the tolerance statistics (1/VIF) (Field, 2013).

Interpretation of the Results

I pointed out that the SPSS software produced outputs categorized as descriptive, summary of model, model parameters, excluded variables, assessing multicollinearity, bias in the model (case wise diagnostics), and bias in the model (assumptions) (Field, 2013). It was based on these categories that I interpreted study's results. The following were how the various outputs were used to interpret the results of the study.

Descriptive Output

This output gave the mean and standard deviation values of each variable in a tabular form summarizing the data. Also, the output showed correlation matrix in which the value of Pearson correlation coefficient between every pair of variables; it also gave one-tailed significance of each correlation (Field, 2013). Thus, through these correlation values, I assessed the strength of the relationship between predictors and the outcome variable. These values were also used to check for the presence of multicollinearity in the data. Multicollinearity exists when there is a very high correlation among the predictor variables ($r = 0.9$) (Field, 2013).

The Summary of Model Output

This output was important because it showed the overall description of the model. It indicated whether or not the model was successful in predicting the outcome variable. In choosing the hierarchical method in entering data into SPSS, the summary output gave two models with the first one being the first stage of the hierarchy in which EVA was excluded, and the second model was at the second stage where all the predictor variables (including EVA) were included (Field, 2013). This output also gave the values of R, R-squared, adjusted R-square, R

squared change, and Durbin-Watson. The indices were used to estimate the F-ratio, which was also given by the ANOVA table.

The Model Parameters Output

This output gave the values of the parameters (b-values and the beta-values) of the models. The values showed predictors' contributions to the model, the relationship between predictors and the outcome, and the degree of effect a predictor had on the outcome holding all effects of other predictors constant (Field, 2013).

Other Outputs

The *excluded variables output* provided summary of variables excluded from the model; while the *assessment of multicollinearity output* provided an indication of the presence of collinearity in the data by providing the values for VIF and 1/VIF (Field, 2012). Again, VIF indicated whether a predictor had a strong linear relationship with another predictor. If VIF is greater than 10, there is a cause for concern (Field, 2013) who cited (Bowermen & O'Connell, 1990; Myers, 1990). There would have been a cause for alarm if the average VIF had been substantially greater than 1. Also, Field (2013) indicated that there is an indication of a serious problem if the tolerance statistics is below 0.1[citing Menard (1993)] and a potential problem if the tolerance statistics is below 0.2.

The SPSS also provides another important output used for checking bias (that is examining extreme cases) called *bias-in-the model output*. This output produces a two-stage means of checking for bias: case-wise diagnostics and assumptions. The case-wise diagnostic shows the difference between observed value of the outcome and the predicted value of the

outcome, of which we standardize that difference (standardized residual) expecting 95% of it to fall within the range of -2 to + 2 for an ordinary sample (Field, 2013). The output wasn't needed.

Scatter plots were used to check for collinearity in data, and Durbin-Watson used to check for the independence of residuals in the model. For heteroscedasticity and non-linearity, standardized residual values were plotted against standardized predicted values (Field, 2013).

Threats to Validity

Biases in the research process affect our ability to measure the variables the way they should be measured. Validity issues in this study broadly fell under three general headings: content validity, empirical validity, and construct validity (Frankfort-Nachmias & Nachmias, 2000), and cross-validity (Field, 2013).

In the realm of content validity, we have face validity and sampling validity. Face validity is a more of a subjective approach to assessing whether every element of the issue being studied is captured**.** The study passed for face validity. Sampling validity deals with whether all the components sampled had properly captured the variables under study. This study, to a larger extent, came through with sampling validity because all the variables under study were calculated or estimated from information provided by companies' financial statements and fed into the SPSS software. I estimated EVA for each company following recommendation by Balu and Morard (2009) that EVA is equal net income less the cost of equity (NI- Cost of Equity). Not only did this method provide the easiest way of estimating EVA, but it also provided a uniform method in estimating EVA for all the 93 companies.

The comparative approach adopted for this study established the element of empirical validity as the degrees of correlation, measured by the correlation coefficients of predictors, were

compared between times. For empirical validity, the measuring instrument is valid if there is a strong relationship between the results it predicts and the results it obtains when measuring the same or related variable (Frankfort-Nachmias & Nachmias, 2000). The validity of the measuring instrument was taken care of by using cross-validity (see the last sentence in the paragraph below). Additionally, the data were obtained from the financial reports of sample companies. These data were publicly accessible and were data that aligned with the research questions and the research analysis.

Things that could have led this study to a wrong conclusion are called biases, which were also issues of validity for this study. The biases in this study could have emanated from violating key assumptions in this study and outliers. The assumptions have been discussed above. An outlier is a score outside from the rest of the data (Field, 2013). Biases affect parameters estimates including sample size as well as standard errors and, therefore, the confidence interval (Field, 2013). The test statistic is based on standard error or something related to it, so a biased standard error would have given biased test statistic and a biased p-value that would have led to a wrong conclusion (Field, 2013). Finally, I checked the cross-validity of the statistical model by applying Stein's formula to get an adjusted value of R^2 and comparing it to the observed value of R^2 (Field, 2013). The calculation for the cross-validity can be found at the appendix pages.

Ethical Procedures

Ethical issues involve a dilemma involving two diametrically opposed causes of action that support worthwhile competing values (Loudon & Laudon, 2007). Research is both scientific and humanistic in which there is an objective of developing systematical, verifiable knowledge while striving to protect companies and human privacy. For this study, privacy issues revolved

around divulging companies' financial information that presented ethical issues that were not taken for granted while seeking to develop systematic, verifiable knowledge. Privacy concern hovered around disclosing sensitive information, the setting in which observations were made, and the dissemination of information (Frankfort-Nachmias & Nachmias, 2000). It was the dissemination of information that was of paramount concern; it was done in an ethically acceptable manner. The study didn't have human subjects, and the absence of human subjects ruled out the issue of informed consent of participants. Last but not the least, I provided for the anonymity of participating companies. To ensure anonymity of participating companies, I avoided divulging sensitive company information, except the information the companies provided the general public.

I minimized ethical concerns in this study by:

- Ensuring that companies used for my study are not denied the benefits of the knowledge that come out of the study.
- Avoiding biases in the design: tests such as independence error test, multicollinearity test were designed to achieve that goal.
- Ensuring full and complete interpretation of results and preventing attempts to misrepresent research report.
- Ensuring that parties contributing to the study were credited as well as crediting all sources (Frankfort-Nachmias & Nachmias, 2000).

Summary

This quantitative study was conducted using a correlational design (multiple regression analysis. I chose a correlational design because I was determining the predictive strength of

EVA and comparing it with the strengths of traditional accounting variables during 2007 to 2009 Great Recession. There were one outcome variable and four (4) predictor variables for the first model, and one outcome variable and five (5) predictor variables for the second model. I needed that both models provide a good fit for the data collected from the sample. Initially, I chose a sample of 98 companies from the population of the study (Fortune-500 companies for 2007, 2008, and 2009) using simple random sampling technique. The sample size was reduced to 93 after taking out the outliers. Data for the study came from a secondary source: financial information contained in the companies' financial statements, annual reports, and form 10-k as well as those that came from various financial websites including yahoo finance. The values of variables in comparison were estimated and entered into the SPSS software. The SPSS software is statistical software that provides various statistical analyses including multiple regression analysis. Under, the multiple regression analysis, this software produced: 1. 'descriptives' output, which helped to determine correlation among variables; 2. summary of model, had estimates for R, and R^2 , and the F-ratio, which were used to check goodness of fit of the model; 3.model parameters output had estimates for b-values. Other outputs were 'excluded variables' output, which gave collinearity statistics (values for VIF and1/VIF), and Bias in the models – case-wise diagnostics and assumptions - for assessing assumptions underlying this study (Field, 2013).

The validity issues involved in the study were stressed. They included checking for cross-validity that was done by applying Stein's formula to get an adjusted value and to compare it to the observed value of R^2. This study relied on secondary data so ethical issues that are mostly centered on getting participants' consent were not major concerns. However, I have pointed out steps I took to ensure that other ethical concerns were met. They included avoiding bias in the design, ensuring full interpretation of results and avoiding attempts to misrepresent the result,

crediting sources of information, and ensuring that companies used for the study would benefit from the knowledge from this study. In the next chapter, I began by reviewing the purpose of the study, research question, and the research hypotheses. The data collection issues that followed included the calculation of variables I estimated from the financial information of the sampled companies. As earlier mentioned, I have presented a table showing some of the initial 98 companies with the variables (outcome variable and predicting variables) as well as an explanation of how the variables were estimated. The process of reporting results outlined in this chapter was followed in presenting the results of the study.

Chapter 4: Results

Introduction

This study used a quantitative approach to examine the relationship between stock returns, Economic Value Added (EVA), and some accounting variables during the period of the Great Recession. The study was guided by a research question and related hypotheses. Could a better job of predicting stock returns of Fortune-500 Companies be done by considering EVA in addition to accounting variables which included Earnings per Share (EPS), Return on Asset (ROA), Return on Equity (ROE), and Price-to-Equity ratio (P/E) during the period of a great recession? The question suggested two regression models; the first model considered only accounting variables, and the second added EVA to the accounting variables.

Model 1: $Y = \beta0 + \beta1\ (EPS) + \beta2\ (ROA) + \beta3\ (ROE) + \beta4\ (P/E) + e$

Model 2: $Y = \beta0 + \beta1\ (EPS) + \beta2\ (ROA) + \beta3\ (ROE) + \beta4\ (P/E) + \beta5\ (EVA) + e$

The hypotheses based on the research question and the regression models are/were stated as:

Ho: The Regression Coefficient of EVA is equal to zero in the model that included EVA in addition to the accounting variables.

Ho: $\beta5\ (EVA) = 0$

Ha: The Regression Coefficient of EVA is not equal to zero in the model that included EVA in addition to the accounting variables

Ha: $\beta5\ (EVA) \neq 0$

This chapter was organized into three broad segments. They encompassed the examination of sampling data collection techniques applied in the study, the results of the study including an evaluation of statistical assumptions of the study, and statistical analysis on hypotheses. The first segment, the examination of sampling and data collection techniques, provided a brief description of the selection of the 93 sampled Fortune-500 companies and their financial information retrieved from their websites. The report of the characteristics of the sample included an explanation of the representativeness of the sample as well as the sample techniques used. The discrepancy in data collection as against what was envisaged in chapter three of the study was stressed. The second part analyzed of the statistical assumptions of the study and gave implications of the study as well as the descriptive statistics characterizing the sample. The third part included statistical analyses based on the research hypotheses and any additional and necessary statistical tests of hypotheses.

Sampling and Data Collection Techniques

The Time-frame of the Collection

The study used secondary data that were available to the public at the sampled companies' websites and at Nasdaq.com. Most of the financial information that constituted the data came from Nasdaq.com, retrieved after putting in the company's symbol in the search engine on the website. The data were collected to cover 2007 to 2009 Great Recession. Since the data were all public information and readily available on the internet, their retrieval was a quick process.

Sample's Proportion and Representativeness

The population for the study was Fortune-500 Companies on the Fortune-500 companies list for 2007, 2008, and 2009. There were 402 companies in all constituting the total population. A

Simple random technique was used to select an initial sample of 98 Fortune-500 companies from a population of 402 companies that appeared in all Fortune Magazine's lists of Fortune-500 Companies for 2007, 2008, and 2009. I replaced companies in the sample that had their fiscal year-end dated differently from the year-end date of 12/31. I also added the highest performing company, Walmart, to the sample. Walmart and Dillard have a fiscal year of 01/31; 01/31 is close enough to 12/31. As already indicated, a simple random technique was used to select an initial 98 companies that was reduced to a sample to 93 after taking out the outliers. I came up with four datasets:

1. 2007 Dataset
2. 2008 Dataset
3. 2009 Dataset
4. Mean value Dataset (using average values of data from 2007, 20008, and 2009)

The first three datasets were used to test the hypothesis on a yearly basis. The fourth dataset was an aggregate data used to test the hypotheses for the entire recessionary period using the average values of the variables for the three years.

Estimation of Variables of the Sampled Population

As already pointed out, information for the estimation of the variables of interest came from 2007, 2008, and 2009 annual reports of the initial sampled of 98 Fortune-500 companies. I retrieved the information of the dependent variable and independent variables of the study from NASDAQ. The information on the independent variables was obtained from the companies' 10-k forms of SEC filings at NASDAQ. Of the initial 98 companies selected, only the companies with their fiscal year ending on 31 December were used for uniformity. Meaning the 2007, 2008, and 2009 balance sheets and income statements of these Companies had fiscal years ending on

31st December. Only two companies had January 31 as fiscal year-end date, which I deemed okay. The 98 companies were reduced to 93 to remove outliers. The values of the variables were calculated as follows:

Stock Returns (the Dependent Variable): The return of the company's stock or share is the capital gain (the final price, P1, minus the initial price, Po) plus Dividend paid in the year divided by the initial price, which is expressed as:

$$\frac{(P1-P0+D)}{Po}$$

The stock returns value was calculated that way in the study of Nakhaei et al. (2013) to imply total return. Stock returns, total return, was calculated same way in this study. It's done using the stock price at the beginning of the year (fiscal year for most of the companies) as the initial price (P0), stock price at the end of the year (the fiscal year for most of the companies in the sample) as the final price (P1), and total dividend per share paid by the company during the year as dividend (D). It must be noted that for Walmart and Dillard, the initial prices were prices of the stock at the beginning of their fiscal year, which were first trading days after Jan 31, and the final prices were the stock prices at last trading days of the end of their fiscal year, Jan 31.

Economic Value Added (EVA): EVA's calculation was as follows:

From equation three, EVA = NI – rc

rc = Cost of Equity

Where:

r = rate of return on capital of equity, calculated using the Capital Asset Pricing Model (CAPM);

c = value of total equity available at the end of the year

From equation 5, it was indicated that CAPM is represented by the equation below:

$re = Rf + \beta i [(Rm) – Rf)$

re = expected return of the stock

Risk-free return (Rf): This is represented by the return of three-month rate of the Treasury bill for the year. For the years under consideration, the risk-free rates were as follows:

2007: 4.64%

2008: 1.59%

2009: 0.14% (Damodaran, 2015)

Return of the market (Rm): This is also represented by the return of the S&P500. The annual returns of the S&P 500 as at 31st December of the years under study were as given as:

December 31, 2007: 5.49%

December 31, 2008: -37.00%

December 31, 2009: 26.46 % (Damodaran, 2015)

The Beta of a stock: As already underscored, the beta is the correlation between market and asset divided by the standard deviation of market (Singal, 2012). It is the measure of the stock's volatility relative to the market. Beta is calculated as the covariance of asset and market (S&P500) divided by their historical volatilities that are correlation means of their moves divided by their corresponding probabilities (ivoliatity.com). The 10-day, 30-day, 60-day, 90-day, and 180-day values for the betas of the companies were obtained from iVolitality.com. In this study, the 180-day beta values were used. The 180-day beta values for some of the sampled companies are shown below:

Table 6

180-day beta values of the first 31 Fortune-500 companies in the initial sample

Companies	180-beta value, 2007	180-beta value, 2008	180-beta value, 2009
Walmart	0.7634	0.6749	0.9873
Chevron	1.1373	1.1563	0.9134
Conoco Philips	1.092	1.2167	1.1298
Ford Motors	1.1288	1.3771	1.3501
Bank of America	1.0912	1.9317	2.3757
Berkshire Hatha. A	0.2395	0.6034	0.6122
Verizon Com	0.7612	0.8302	0.4667
Cardinal Health	0.5998	0.7083	0.9537
CVS	0.5801	0.7121	0.4598
Costco	0.8059	0.6855	0.6852
Boeing Inc.	0.7194	0.9075	1.0806
Target	1.2336	1.0947	0.8646
Dow Chemical	1.1212	1.0082	1.7772
Microsoft	0.9164	0.9509	0.7299
Caterpillar	0.9912	1.0161	1.6167
Medco Health	0.4778	0.7518	0.3823
Pepsi co	0.5698	0.5558	0.4305
Intel Corp	1.1375	0.985	0.8669
Allstate	0.9456	1.3275	1.4047
Ingram Micro Inc.	0.9144	0.8005	0.9554
EP Du Ponte De	0.8687	1.0313	1.4766
Comcast	0.8243	1.1819	1.034

Alcoa	1.3919	1.5884	2.0332
Tyson Food	1.1539	1.1325	0.7684
Travelers Company	1.083	1.2731	0.9462
Int Papers Company	1.0652	1.1845	2.1207
Merck & Co	0.7427	0.8839	0.5236
3M Company	0.7978	0.713	0.9691
McDonalds Corp	0.5248	0.6173	0.3768
Tech Data	0.8172	0.6193	0.9778
Occidental Petrol	1.2663	1.4844	1.3685

Source: ivolitality.com

Net Income (NI): Net income was very important variable because it formed the base used to estimate the variables. It is all revenue minus all expenses (Henry, Robinson, & Greuning, 2012). The study used NI values found in the annual income statements of sampled companies found in the form 10-k of SEC filings stored at the NASDAQ.com

Return on Asset (ROA): In this study, a sampled company's reported NI at the end of the fiscal year divided by its corresponding total asset (TA) gave the ROA. The net income was obtained from the income statement while the total assets come from the balance sheet. As already indicated, a higher ROA means the company is generating more income by a given level of assets (Henry et al., 2012).

Return on Equity (ROE): Similar to the estimation of ROA, Return on Equity (ROE) was estimated simply by dividing the reported NI at the end of the fiscal year by the corresponding total equity reported on the balance sheet.

Earnings per Shares (EPS): I used the diluted EPS reported in the company's financial statements as the EPS. Diluted EPS is the ratio of adjusted income available for ordinary shares (reflecting conversion of diluted securities) to the weighted average number of ordinary and potential ordinary shares outstanding (Henry et al., 2012).

Price/Earnings Ratio (P/E): The share price at the end of the fiscal year was divided by the company's diluted EPS for P/E. P/E shows the amount of investment in common stock costs per dollar of earnings (Henry, Robinson, & Greuning, 2012).

In the table below, I have shown the top six companies, middle five companies, and bottom five companies of the sampled companies and their estimated variables for the year 2007, the year the Great Recession began.

Table 7

15 of the initial 98 companies and their estimated variables for 2007

Companies	St. Return	EVA	NI	EPS	ROA	ROE	P/E
Walmart	0.0865	9,441.03	12,863	3.16	0.078	0.199	16.05
Chevron	0.31359	14,357.14	18,688	8.77	0.125	0.24	10.642
Conoco Phili.	0.267	6,926.53	11,891	7.22	0.066	0.13	9.547
Ford motors	-0.1097	-3,231.01	-2,223	-1.41	-0.009	-0.35	-4.773
Bank of Ame	-0.1824	7,358.40	14,982	3.3	0.009	0.102	12.5
Berk. Hatha	0.3	7,362.32	3,213	5.7	0.048	0.109	16.6
Progressive	-0.217	925.20	1,183	1.65	0.062	0.24	11.612
Textron Inc.	0.535	666.92	866	3.4	0.043	0.25	20.797
PG & E	-0.0585	558.28	1,020	2.78	0.028	0.12	15.5

Suntrust Bank	-0.2283	554.25	1,593	4.52	0.009	0.087	13.825
EMC Corp	0.404	863.68	1,599	0.74	0.071	0.122	26.098
Asbury Auto	-0.3668	16.64	50	1.38	0.0246	0.083	10.905
DaVita	-0.0062	297.03	382	3.53	0.054	0.22	7.9366
Hersley Corp	-0.191	180.8	214	0.93	0.05	0.343	42.366
Pitney Bowel	-0.168	337.75	367	1.66	0.039	0.653	22.915
Scanner Corp	0.07149	164.74	320	2.74	0.031	0.108	15.383

Source: Estimated with information from Nasdaq.com

The above table points out that most of the companies recorded negative returns in 2008. As already indicated, the stock returns value was calculated using the price of a stock at the beginning of the year, the price of a stock at the end of the year, and dividends paid during the year.

Issue of Non-Proportional Sampling and External Validity Issue

The study used a probability sampling technique, simple random sampling technique, which gave members of the study population each and known chance of being selected. Out of the initial 98 companies selected to represent the sample only two companies were chosen using convenience sampling technique to replace two others that had a different fiscal-end year from the rest. Five companies were later dropped to remove outliers for a sample size of 93.

Results of the Study

Descriptive Statistics on the Sample

The tables below give mean and standard deviation values for each variable in the four datasets. The mean value dataset gives the average value of each variable for the three years. The average stock returns for 2007, 2008, 2009, and the mean values were 0.0832, -0.406, 0.608, and

0.09265 respectively. The stock returns value on the average was higher in 2009 than the other years. It could have been attributed to the fact that the later part of 2009 was the mild part of 2007 to 2009 Great Recession. The corresponding standard deviation values were relatively higher in 2009 than the other years, indicating a higher risk of investing in the period. Only ROE had a negative average value for the three recessionary years.

As indicated by Field (2013), the descriptive tables do not interpret a regression model but provide useful summaries of the datasets. N is the number of cases making up the sample of the study. N for each analyzed dataset was 93.

Table 8

2007 Descriptive Statistics

	Mean	Standard Deviation	N
St Returns	0.0832	0.36013	93
EPS	2.5589	2.8728	93
ROA	0.05059	0.07786	93
ROE	0.135	0.31181	93
P/E	10.7122	41.02273	93
EVA	1029.017	4204.922	93

a. Stock Returns (St. Returns): Dependent Variable

Table 9

2008 Descriptive Statistics

	Mean	Standard Deviation	N

St Returns	-0.406	0.24364	93
EPS	0.1692	7.148	93
ROA	0.01528	0.12011	93
ROE	-0.10378	1.1459	93
P/E	7.9121	28.39667	93
EVA	5324.10	10062.93	93

a. Stock Returns (St. Returns): Dependent Variable

Table 10

2009 Descriptive Statistics

	Mean	Standard Deviation	N
St Returns	0.608	0.8691	93
EPS	1.2848	2.635	93
ROA	0.02868	0.0617	93
ROE	0.01148	0.6284	93
P/E	17.565	27.7745	93
EVA	-1927.1886	4423.669	93

a. Stock Returns (St. Returns): Dependent Variable

Table 11

Mean Value Descriptive Statistics

	Mean	Standard Deviation	N
St Returns	0.09265	0.248896	93

EPS	1.27386	3.41509	93
ROA	0.03046	0.0757	93
ROE	-0.04998	0.8247	93
P/E	11.2860	17.058	93
EVA	873.3287	6602.941	93

a. Stock Returns (St. Returns): Dependent Variable

Evaluation of Statistical Assumptions of the Study

Check for normality of errors (homoscedasticity): Homoscedasticity or independence of errors was checked by observing the Durbin-Watson statistics for the datasets. The Durbin-Statistics indicated whether or not the assumption of the independent error was met. The rule of thumb is it is better if the value is not less than 1 and not greater than 3. The Durbin-Watson statistics values for the 2007 dataset, 2008 dataset, 2009 dataset, and mean value dataset were 1.864, 1.961, 2.302, and 2.179 respectively, all indicating that the assumption was met for all three datasets used for the study.

Table 12

2007 Model Summary

Model	R	R Sq	Adj R Sq	Std Err of the Esti	Change Statistics					Durbin Watson
					R- Sq Ch	F Ch	Df1	df2	Sig F Ch	
1	0.379	0.144	0.105	0.34071	0.144	3.697	4	88	0.008	
2	0.386	0.149	0.100	0.34156	0.005	0.561	1	87	0.456	1.864

a. Predictors (Constant), PE, ROA, EPS, ROE

b. Predictors (Constant), PE, ROA, EPS, ROE, EVA

c. Std Err of the Esti: Standard Error of the Estimate

d. Dependent Variable: StReturn

Table 13

2008 Model Summary

Model	R	R Sq	Adj R Sq	Std Err of the Esti	Change Statistics					Durbin Watson
					R- Sq Ch	F Ch	Df1	df2	Sig F Ch	
1	0.470	0.221	0.185	0.2199	0.221	6.234	4	88	0.000	
2	0.485	0.236	0.192	0.2190	0.015	1.691	1	87	0.197	1.961

a. Predictors (Constant), PE, ROA, EPS, ROE

b. Predictors (Constant), PE, ROA, EPS, ROE, EVA

c. Std Err of the Esti: Standard Error of the Estimate

d. Dependent Variable: StReturn

Table 14

2009 Model Summary

Model	R	R Sq	Adj R Sq	Std Err of the Esti	Change Statistics					Durbin Watson
					R- Sq Ch	F Ch	Df1	df2	Sig F Ch	
1	0.555	0.308	0.277	0.73910	0.308	9.804	4	88	0.000	
2	0.561	0.315	0.276	0.7397	0.007	0.858	1	87	0.357	2.302

a. Predictors (Constant), PE, ROA, EPS, ROE

b. Predictors (Constant), PE, ROA, EPS, ROE, EVA

c. Std Err of the Esti: Standard Error of the Estimate

d. Dependent Variable: StReturn

Table 15

Mean values Model Summary

Model	R	R Sq	Adj R Sq	Std Err of the Esti	Change Statistics					Durbin Watson
					R- Sq Ch	F Ch	Df1	df2	Sig F Ch	
1	0.297	0.088	0.047	0.2430	0.088	2.123	4	88	0.085	
2	0.302	0.091	0.039	0.2440	0.003	0.292	1	87	0.590	2.179

a. Predictors (Constant), PE, ROA, EPS, ROE

b. Predictors (Constant), PE, ROA, EPS, ROE, EVA

c. Std Err of the Esti: Standard Error of the Estimate

d. Dependent Variable: StReturn

Assessing collinearity and multicollinearity: First, I looked at the collinearity between the variables at the first year of the recession (2007) by including the root variable of the variables (NI). I used the initial 198 companies for this assessment. Appendix A shows the Pearson correlation between the variables for 2007. The idea was to ascertain how the variables in the study correlated with each other and more importantly with NI, the root variable for most of the variables. From the Appendix A, the Pearson's correlation coefficients between every pair of variables revealed the following:

- In 2007, the results showed a strong relationship between Return on Assets (ROA) and all the independent variables but P/E.

- Since NI was the root of most of the variables under analysis, it was added to the analysis to see how it correlated with the other variables. The results as indicated in the table below showed a very strong relationship NI and EVA. It's understandable because EVA was defined as Net Income – Cost of Equity. The strong relationship between EVA and NI provides a vindication for excluding NI from the study since EVA and NI almost measured the same thing during this period of the Great Recession. NI had relatively a significantly higher relationship with all the variables (EPS, ROA, and ROE) because these variables were estimated from NI
- The correlations between the variables were moderately high since they were all calculated from NI
- The results showed a lower correlation between EVA and stock returns than the correlations between stock returns and EPS, ROA, and ROE
- All the correlations between the variables were significant except the ones involving P/E and the correlation between EVA and Stock Returns
- None of the correlations between the variables is 0.9, the benchmark for multicollinearity (Field, 2013)

Appendices B, C, D, and E give the zero-order correlation values that are simple person correlation coefficients between the predictors and the outcome variable using the 93 sampled companies. P/E and ROE were the least correlated variables with stock returns in 2007 and 2008 with Pearson coefficients of 0.025 and 0.062 respectively. In 2009, the coefficient values for all the predictors were negative except EVA with 0.089. Using the average values of the three years, none of the variables had a positive relationship with stock returns. If the effects of the other predictors are controlled, the relationships between stock returns and the predictors were

negative combining the three datasets. The relationship between the outcome variable and the P/E was more negative than any other variable throughout the study period. Using 2009 and the average datasets, stock return relationship with the predictors was negative except that the relationship with EVA was positive with the 2009 dataset.

The outputs shown in appendices B, C, D and E provided values for VIF and tolerance statistics measures for checking for multicollinearity in the datasets. The simple rule was to see if the largest VIF was greater than ten (10). A value greater than ten (10) would have been a cause for concern. There were also values provided by the tolerance statistics, which if they were below 0.1 and 0.2, would have indicated a serious problem and potential problem respectively. By glancing through the output table above, the VIF values were below ten (10) and the tolerance statistics were all above 0.2. So there was no collinearity within the datasets.

*Checking multicollinearity using collinearity diagnosti*c: Another way of checking for the presence of multicollinearity is by using collinearity diagnostics outputs below. Using this method, 2007 and the average value datasets showed no collinearity problem. The final dimensions in the first model and second model had condition indexes around four which when compared with the condition indexes of the other dimensions was not all that massive. It didn't show collinearity existed in any of the four datasets (2008 dataset, 2009 dataset, and the average value dataset) using this criterion. When I checked multicollinearity using the variance proportion criterion (the proportion of each predictor's regression coefficient attributed to a small eigenvalue), there's no problem with the 2007dataset and average value dataset. However, the only small concern was with the 2008 and 2009 datasets because there were relatively higher proportions of variance of coefficients on small eigenvalues for EPS and ROA. However, in 2009, the proportions were 0.77 and 0.92 for EPS and ROA respectively, with the EPS'

proportion less than 90% (the threshold). In 2008, the proportion of ROA on the lowest eigenvalue with was also less than 90%. Thus, the datasets for the study for most part passed the multi-collinearity test.

Table 16

2007 Collinearity Diagnostics

					Variance Proportions				
model	dimen	Eigen	Con In	const	EPS	ROA	ROE	PE	EVA
1	1	3.109	1.00	0.03	0.02	0.02	0.03	0.02	
	2	0.849	1.913	0.02	0.01	0.01	0.00	0.91	
	3	0.636	2.211	0.51	0.00	0.03	0.17	0.02	
	4	0.223	3.731	0.42	0.52	0.05	0.57	0.03	
	5	0.182	4.130	0.01	0.44	0.88	0.23	0.02	
2	1	3.595	1.000	0.02	0.02	0.01	0.02	0.01	0.02
	2	0.942	1.954	0.05	0.00	0.01	0.00	0.59	0.08
	3	0.771	2.159	0.32	0.02	0.00	0.03	0.27	0.05
	4	0.361	3.156	0.03	0.00	0.00	0.60	0.13	0.32
	5	0.202	4.216	0.36	0.96	0.07	0.04	0.00	0.04
	6	0.129	5.287	0.23	0.00	0.91	0.31	0.00	0.50

a. Dependent Variable: StReturn
b. Dimen: Dimension
c. Con In: Condition Index
d. Const: Constant

Table 17

2008 Collinearity Diagnostics

					Variance Proportions				
model	dimen	Eigen	Con In	const	EPS	ROA	ROE	PE	EVA
1	1	2.086	1.000	0.00	0.05	0.06	0.06	0.02	
	2	1.285	1.274	0.33	0.00	0.00	0.08	0.27	
	3	0.767	1.649	0.03	0.02	0.04	0.56	0.37	
	4	0.708	1.716	0.60	0.01	0.01	0.28	0.34	
	5	0.153	3.687	0.03	0.92	0.90	0.03	0.00	
2	1	2.408	1.000	0.02	0.03	0.04	0.03	0.02	0.05
	2	1.449	1.289	0.19	0.02	0.01	0.11	0.10	0.05
	3	0.810	1.725	0.05	0.00	0.00	0.10	0.83	0.07
	4	0.737	1.807	0.12	0.03	0.04	0.74	0.04	0.02
	5	0.442	2.334	0.60	0.02	0.03	0.00	0.01	0.80
	6	0.153	3.964	0.02	0.90	0.89	0.03	0.00	0.00

a. Dependent Variable: StReturn
b. Dimen: Dimension
c. Con In: Condition Index
d. Const: Constant

Table 18

2009 Collinearity Diagnostics

					Variance Proportions				
model	dimen	Eigen	Con In	const	EPS	ROA	ROE	PE	EVA
1	1	2.646	1.000	0.04	0.03	0.03	0.03	0.04	
	2	1.152	1.516	0.15	0.01	0.01	0.23	0.15	
	3	0.662	2.000	0.02	0.06	0.04	0.41	0.40	

	4	0.380	2.639	0.79	0.06	0.02	0.31	0.41	
	5	0.161	4.057	0.00	0.85	0.89	0.02	0.01	
2	1	2.661	1.000	0.03	0.03	0.03	0.03	0.04	0.00
	2	1.466	1.347	0.07	0.01	0.01	0.08	0.05	0.20
	3	0.781	1.845	0.02	0.01	0.00	0.49	0.04	0.34
	4	0.634	2.048	0.02	0.04	0.03	0.12	0.67	0.10
	5	0.301	2.972	0.82	0.14	0.01	0.24	0.19	0.30
	6	0.156	4.134	0.04	0.77	0.92	0.04	0.01	0.05

a. Dependent Variable: StReturn
b. Dimen: Dimension
c. Con In: Condition Index
d. Const: Constant

Table 19

Mean Value Collinearity Diagnostics

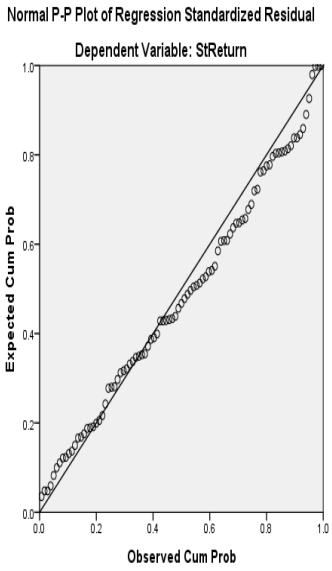
					Variance Proportions				
model	dimen	Eigen	Con In	const	EPS	ROA	ROE	PE	EVA
1	1	2.458	1.000	0.05	0.04	0.05	0.01	0.05	
	2	1.142	1.467	0.12	0.03	0.01	0.46	0.06	
	3	0.734	1.830	0.08	0.09	0.08	0.47	0.17	
	4	0.441	2.360	0.73	0.01	0.01	0.04	0.65	
	5	0.225	3.302	0.02	0.83	0.85	0.02	0.06	
2	1	2.640	1.000	0.04	0.04	0.04	0.01	0.04	0.03
	2	1.170	1.502	0.15	0.02	0.01	0.34	0.08	0.05
	3	0.877	1.735	0.03	0.00	0.00	0.39	0.05	0.49

4	0.652	2.012	0.03	0.14	0.09	0.19	0.14	0.40
5	0.438	2.456	0.74	0.00	0.02	0.04	0.63	0.02
6	0.224	3.435	0.02	0.80	0.85	0.02	0.06	0.01

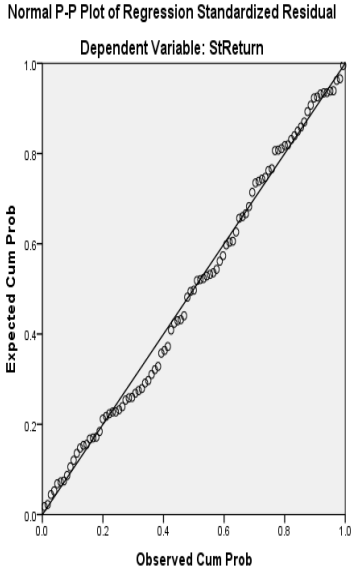
NB: Dependent Variable: StReturn

a. Con In: Condition Index
b. Const: Constant

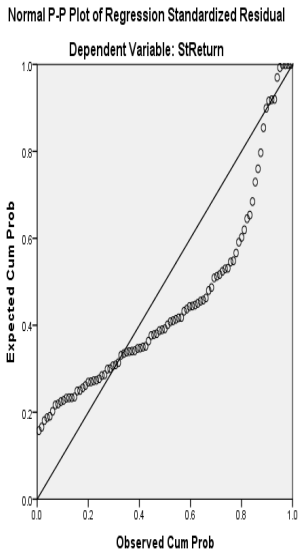
The check for Normality: To check for normality, I looked at Figures 3 and 4 below. Figure 3, P-P Plots are all indicators of a normal distribution. It was observed that all the histograms were symmetrical and approximately bell-shaped, all indicating a normal distribution.



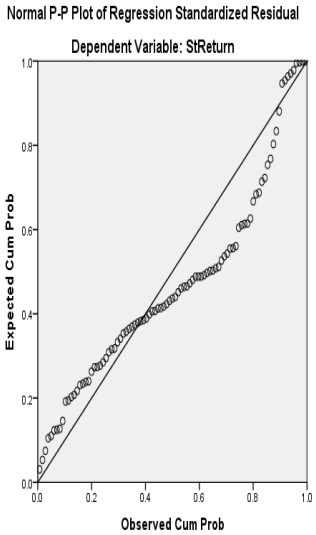
2007



2008

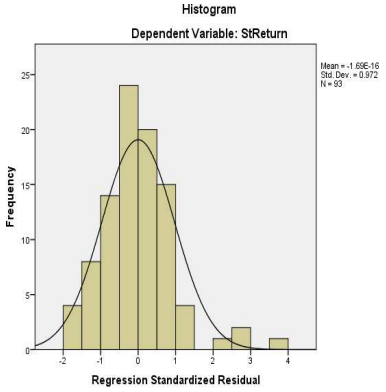


2009

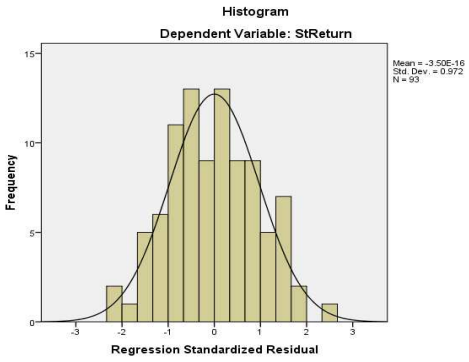


Mean values

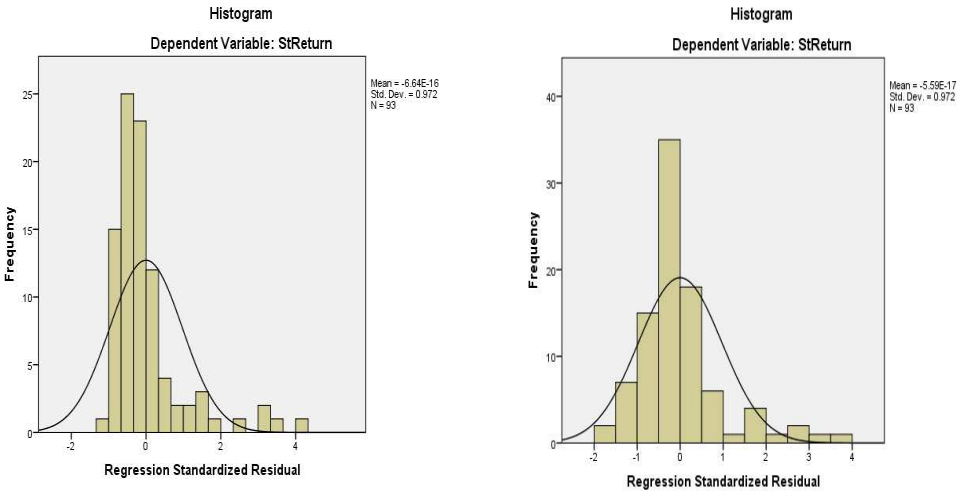
Figure 3: Normal P-P Plots



2007



2008



2009 Mean Values

Figure 4: Histograms

Checking for linearity: The following graphs supported the linearity of the models. The outcome variable is formed by the linear combination of the individual predictors (Green & Salkind, 2011). Graphs showing the linearity of each predictor to the outcome are shown below:

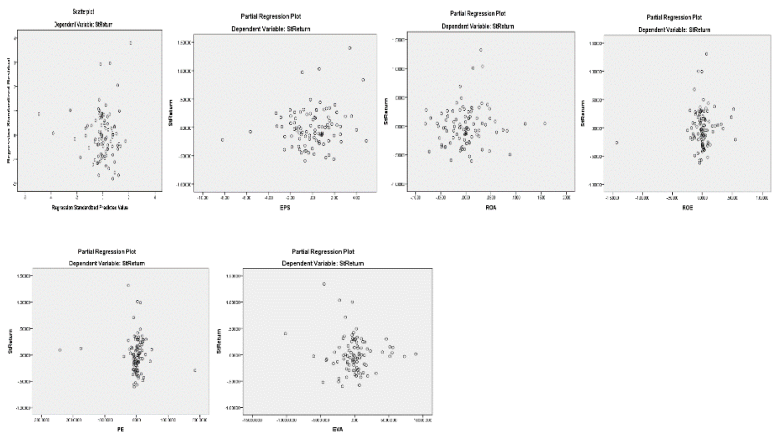


Figure 5: 2007 Partial Regression Plots

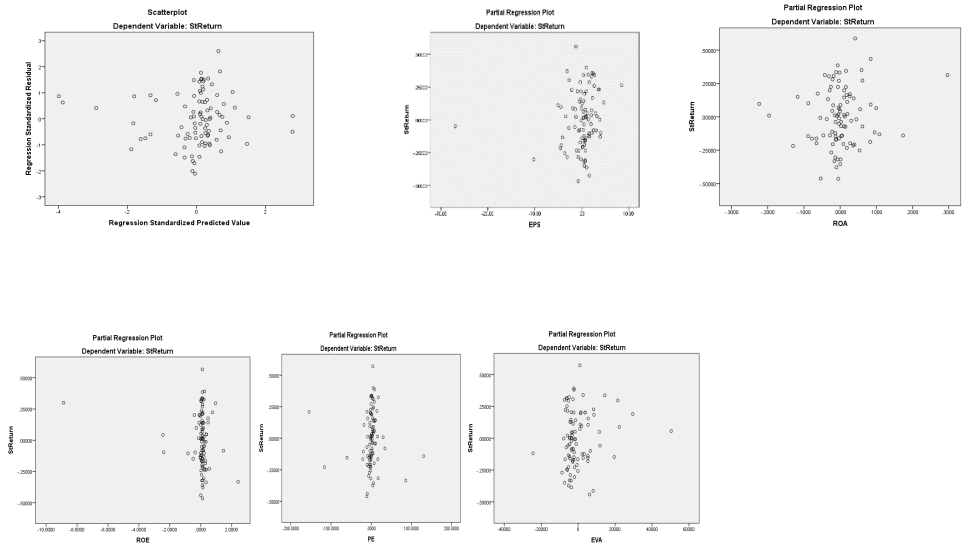


Figure 6: 2008 Partial Regression Plots

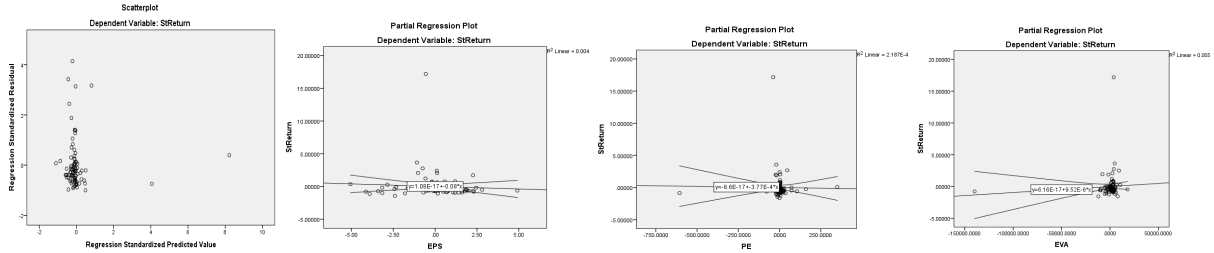


Figure 7: 2009 Partial Regression Plots

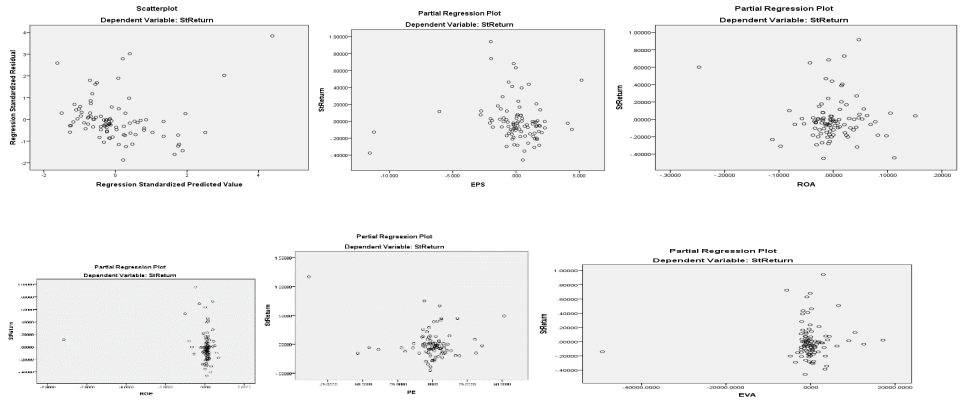


Figure 8: Mean values Partial Regression Plots

More on the Statistical Assumptions

The statistical assumptions examined in the study included checking for linearity, normality, homoscedasticity, and detecting multicollinearity. These statistical assumptions were

random-effect model assumptions (Green & Salkind, 2011). Various measures were used to determine how these assumptions were met. To check the linearity, I used the regression plots; for multicollinearity, the variance inflation factor (VIF) and tolerance statistics (1/VIF) were used. The values are presented in Appendices B to E. Finally; I checked for homoscedasticity and normality using Durbin-Watson statistics and the P-P Plots respectively. The values and plots were all in acceptable ranges.

Linearity: The additive and linearity assumption was that the outcome variable (the dependent variable) was assumed to be linearly related to the predictors in a relationship summed up by a straight line. The partial regression plots were needed to check for this assumption. The plots in the Figures 5, 6, 7, and 8 showed that the assumption was met proving that the equation b1X1 + b2X2 + ……bnXn is held to be true. It also meant that the combined effect of predictors was described by adding together their individual effects (Field, 2013).

Normality of the Distribution: This assumption gave support to the preceding one, the linearity assumption. It was pointed out in chapter three that the assumption of standard normal distribution was needed to compute confidence interval as well as in estimating the b-values in the regression equation. A normally distributed data enable the testing the null hypothesis and affirming the accuracy of the test statistic and p-value estimates (Field, 2013). The P-P plots were indicative that the data sets were normally distributed confirming that the only statistical relationship that existed was a linear one (Green & Salkind, 2011).

Homoscedasticity: This assumption indicated that cases in a random sample of a population were independent of each other just as scores on variables were independent of other scores on other variables (Green & Salkind, 2011). It also meant that the variance of the outcome variable was stable at all levels of the predictor variables (Field, 2013). The Durbin-Watson

statistics values from the analyses of the various datasets showed the values were greater than one but not greater than three. The values are presented in Appendices B to E. It meant that the errors were independent of each other meaning that the using standard error to compute confidence interval and significance tests did not give invalid estimates.

Multicollinearity: there is a multicollinearity problem if there is a perfect collinearity between predictors with the correlation coefficient of 0.9. From the table at Appendix 'A', it was seen that the other variables highly correlated with the Net Income as the correlation coefficients were around 0.9 causing the removal of Net Income was removed from the picture. I also checked for multicollinearity using the variance inflation factor (VIF) and tolerance statistics (1/VIF) values, and as it could be observed from tables of "coefficients conti" tables (Appendices B to E) at the Appendix section, the values were mostly in the acceptable range.

On the whole, the assumptions of the study were met. These assumptions met meant there were minimum or no biases in this study. If any of these assumptions had been violated, the test-statistics and p-value would have been inaccurate resulting in a wrong conclusion. Given that the study scored high marks on the assumptions, the ensued statistical analysis yielded results that were generalizable.

Generalizability of the Sample and Validity

The simple probability random sampling technique was used to select the 98 companies from the population of 402 companies, which was later reduced to 93. Thus, with the population and the sample size, there was no question about the generalizability of the sample. The generalizability of the sample was further tested by using Stein's cross-validity formula. Field (2013) indicated that value of adjusted R-squared from SPSS is estimated from Wherry's equation that does not help in using the model to predict different samples from the same

population. I used Stein's formula for cross-validity to curb the problem noted in the preceding sentence. The closer the values from Stein's formula are to the R-square values produced by SPSS, the better the predictive strength of the model (Field, 2013). The information showing how the Stein formula was used can be found at the appendix pages, appendix F. 2007, 2008, and 2009 data sets' SPSS values were not that different from the values calculated from the stein's formula. All in all, the values provided by using the Stein formula didn't deviate that much from the values produced from the Model summary tables 12 to 15 above.

Evaluation of Statistical Analysis and Findings

With the examination of statistical assumptions and the indication that most of the assumptions were met, a positive light was given to indicate that the model had the ability to predict stock returns. I then proceeded to analyze the models to find the answer to the research question testing the hypotheses using the statistical analysis from the SPSS.

The Research Question

Could a better job of predicting stock returns of Fortune-500 Companies be done by considering EVA in addition to accounting variables which include Earnings per Share (EPS), Return on Asset (ROA), Return on Equity (ROE), and Price-to-Equity ratio (P/E) during the period of the Great Recession?

The question demanded that two models be formulated as follows:

Model 1: $Y = \beta 0 + \beta 1\ (EPS) + \beta 2\ (ROA) + \beta 3\ (ROE) + \beta 4\ (P/E) + e$

Model 2: $Y = \beta 0 + \beta 1\ (EPS) + \beta 2\ (ROA) + \beta 3\ (ROE) + \beta 4\ (P/E) + \beta 5\ (EVA) + e$

The Test of Goodness of Fit

An important thing I needed to do was to check the quality of the two models. In evaluating the models to determine if they were better in predicting the outcome than using the mean as the best guess, I fell on the ANOVA tables below.

Table 20

2007 ANOVA

model		Sum of Sq	df	Mean Sq	F	sig
	Regression	1.717	4	0.429	3.697	0.008
1	Residual	10.215	88	0.116		
	Total	11.932	92			
	Regression	1.782	5	0.356	3.055	0.014
2	Residual	10.150	87	0.117		
	Total	11.932	92			

a. Sum of Sq: Sum of Squares
b. Mean Sq: Mean Square

In 2007, there was a better goodness of fit for the models than not fitting the models or using the mean as the best guess.

Table 21

2008 ANOVA

model		Sum of Sq	df	Mean Sq	F	sig
	Regression	1.206	4	0.301	6.234	0.000
1	Residual	4.256	88	0.048		
	Total	5.461	92			

	Regression	1.287	5	0.257	5.364	0.000
2	Residual	4.174	87	0.048		
	Total	5.461	92			

a. Sum of Sq: Sum of Squares
b. Mean Sq: Mean Square

In 2008, there was a better goodness of fit for the models than using the mean as the best guess.

Table 22

2009 ANOVA

Model		Sum of Sq	df	Mean Sq	F	sig
	Regression	21.424	4	5.356	9.804	0.000
1	Residual	48.073	88	0.546		
	Total	69.497	92			
	Regression	21.893	5	4.379	8.002	0.000
2	Residual	47.603	87	0.547		
	Total	69.497	92			

a. Sum of Sq: Sum of Squares
b. Mean Sq: Mean Squares

In 2009, just like the two preceding years, the Models provided a better goodness of fit than not fitting the model.

Table 23

Mean value ANOVA

Model	Sum of Sq	df	Mean Sq	F	sig

	Regression	0.502	4	0.125	2.123	0.085
1	Residual	5.198	88	0.059		
	Total	5.669	92			
	Regression	0.519	5	0.104	1.743	0.133
2	Residual	5.180	87	0.060		
	Total	5.699	92			

a. Sum of Sq: Sum of Squares
b. Mean Sq: Mean Squares

On the average, there was a better goodness of fit for the models than not fitting the models or using the mean as the best guess.

A Detailed Analysis of the Models

To determine the usefulness of each model to the process, a deeper analysis was needed. The analysis started by first looking at the B-values and the Beta values of the models and then their F-ratios. The study proceeded with an examination of the R-square values, associated probabilities, and implications of these values for the hypothesis. I stressed on the measurement of the effect sizes to answer the research hypothesis.

Measuring Predictors to Answer Research Questions: The B-values and Beta Values

The b-values and beta-values gave an insight into the models. They were obtained from the summary of model tables, which also gave information about the parameters of the models. The b-values and beta-values were almost taking about the same thing, although the latter did a better job. On a whole, the null hypothesis was not rejected because the results were insignificant showing that EVA was not better than accounting variables in predicting stock returns during the Great Recession. I started with the analysis of the b-values.

Analyzing the B-values

Field (2013) pointed out that the b-values give information about the relationship between the outcome and the predictors and the degree to which a predictor affects the outcome if the other predictors are held constant. Below, I have presented multivariate regression equations for models 1 and 2 using only the b-values from the coefficient tables.

For 2007

Model 1: St. Ret = -0.022 + 0.027EPS + 0.441ROA + 0.150ROE - 0.001PE

Model 2: St. Ret = -0.036 + 0.030EPS + 0.829ROA + 0.143ROE - 0.001PE + 1.028EVA

For 2008

Model 1: St. Ret = -0.418 + 0.010EPS + 0.491ROA - 0.031ROE – 1.281PE

Model 2: St. Ret = - 0.434 + 0.009EPS + 0.412ROA - 0.031ROE + 3.27EVA

For 2009

Model 1: St. Ret = 0.541 - 0.014EPS + 2.277ROA – 0.828ROE + 0.002PE

Model 2: St. Ret = 0.589 - 0.014 EPS + 1.790ROA – 0.828ROE + 0.002PE + 1.723EVA

On the average

Model 1: St. Ret = 0.134 – 0.001EPS - 0.376ROA – 0.036ROE - 0.003PE

Model 2: St. Ret = 1.134 – 0.002EPS - 0.433ROA – 0.036ROE - 0.003PE + 2.248EVA

In Model 2, all the variables were included for analysis. The b-values had assigned t-statistics, associated probabilities, confidence interval that were tested to see if the b-values were significantly different from zero. The b-values with their t-statistics and corresponding probabilities showed they were not significantly different from zero. However, the b-values are unstandardized so they could not be used use to make a proper comparison for a decision on the research hypothesis to be made. The standardized b-values (the β-values) were used to make the decision on the hypothesis.

B-values and Probabilities

- 2007 (Ho is not rejected)

1. EPS (b = 0.030): t (87) = 1.667, p > 0.05
2. ROA (b = 0.829): t (87) = 0.179, p > 0.05
3. ROE (b = 0.143): t (87) = 0.123, p > 0.05
4. P/E (b= -0.001): t (87) = - 0.071, p > 0.05,
5. EVA (b = 1.028): t (87) = -0.120, p > 0.05

- 2008 (Ho is not rejected)

1. EPS (b = 0.009): t (87) = 1.461, p > 0.05
2. ROA (b = 0.412): t (87) = 1.153, p > 0.05
3. ROE (b = -0.031): t (87) = -1.448, p > 0.05
4. P/E (b = 0.00): t (87) = - 0.012, p > 0.05
5. EVA (b = 3.27): t (87) = 1.301, p > 0.05

- 2009 (Ho is not rejected)

1. EPS (b = -0.014): t (87) = -0.282, p > 0.05
2. ROA (b = 1.790): t (87) = 0.806 p > 0.05

3. ROE (b = - 0.828): t (87) = -5.729, p > 0.05
4. P/E (b = 0.002): t (87) = 0.576, p > 0.05
5. EVA (b = 1.723): t (87) = 0.926, p > 0.05

- Mean (Ho is not rejected)

1. EPS (b = -0.002): t (87) = -0.146, p > 0.05
2. ROA (b =-0.433): t (87) = -0.842, p > 0.05
3. ROE (b = -0.036): t (87) = -1.125, p > 0.05
4. P/E (b =-0.003: t (87) = - 1.704, p > 0.05
5. EVA (b = 4.977): t (87) = 0.541, p > 0.05

N.B.: The p-values are greater than the critical values indicating insignificant results. The null hypothesis is not rejected. EVA is not better than accounting variables in predicting stock returns. The probabilities and the 95% level of confidence lower and upper values were the same for both b-values and β-values. B-values give the degree to which a predictor affects the outcome holding the other predictors constant (Field, 2013). The relationships between stock returns (the outcome variable) and the predictors were not significant as the t-values values associated with the b-values had *sig values* greater than 0.05. However, it was important to show what these insignificant relationships mean. Using the b-values from the coefficient tables, in 2007, increasing EPS by a unit increased stock returns by 0.030, which reduced to 0.009 in 2008. In 2009, there was a negative relationship between stock returns and EPS, increasing EPS by a unit reduces stock return by 0.014. Using the average values for the three years, a unit increase in EPS reduced stock returns by 0.001 indicating a negative relationship. Increasing ROA in 2007 by a unit increased stock returns by 0.150, which reduced to 0.491 in 2008. In 2009, there was a positive relationship between stock returns and ROA, increasing ROA by a unit increased stock

return by 1.790. Using the average values for the three years, a negative relationship existed between stock returns and ROA, a unit increase in ROA reduced stock returns by 0.433.

In 2007, a unit increase in ROE and P/E increased stock returns by 0.152 and reduced stock returns by 0.001 respectively. In 2008, P/E had no relationship with Stock returns as a unit increase in P/E had zero effect on stock returns, but a unit increase in ROE reduced stock returns by 0.031. In 2009, however, a unit increase in ROE reduced stock returns by 0.828, and a unit in P/E increased stock returns by 0.002. Using the average values for the three years, the relationships between stock returns and the predictors were all negative. Increasing ROE and P/E by a unit each reduced stock returns by 0.036 and 0.003 respectively.

Finally, the relationship between stock returns and EVA was positive throughout the period of the study. In 2007, increasing EVA by a unit reduced sock returns greatly by 1.028. The relationship improved in 2008 and 2009 as a unit increase in EVA increased stock returns by 3.279 in 2008 and by 1.723 in 2009. EVA and stock returns relationship using the average values for the years was also positive as a unit increase in EVA increased stock returns by 2.248.

Analyzing the Beta-values

In testing the hypothesis, I used the standardized version of the b-value, which is the β-value. The β-value has an associated error that indicates the extent to which values change across samples, hence the value of the beta of predictors is not dependent on other predictors (Field (2013). Field (2013) indicated that the β-value is the number of standard deviation an outcome will change as a result of a one standard deviation change in a predictor. The β-values were used for comparing predictors' contributions to the model and for making a decision on the research hypothesis because they are standardized values.

To evaluate the importance of a variable in the model, the beta of the variable was used because it provided the value in a standardized form, which was good for comparison. The contributions of predictors to the model in the years using the second model that had all the variables were as follows:

For 2007

Model 2: St. Ret = -0.036 + 0.236EPS + 0.179ROA + 0.123ROE - 0.071PE - 0.120EVA

For 2007, the highest contribution came from ROA, and the least contribution was from P/E. Further analysis is as follows:

EPS (standardized β = 0.236; standard deviation = 2.873): When EPS increased by one standard deviation (2.873), Stock Return increased by 0.678 (0.236 x 2.873) of a dollar of a share. Every $2.873 of EPS received, raised stock returns by $0.678.

ROA standardized β = 0.179; standard deviation = 0.078): When ROA increased by one standard deviation (0.078), St. Return increased by 0.0139 (0.179 x 0.078) of a dollar of a share. Every $0.078 of ROA received, raised stock returns by $0.0139.

ROE (standardized β = 0.123; standard deviation = 0.312): When EPS increased by one standard deviation (0.312), Stock Return increased by $0.0384 (0.123 x 0.312) of a dollar of a share. Every $0.312 of EPS received or earned, raised stock returns by $0.0384

P/E (standardized β = - 0.071; Standard deviation = 41.02): When P/E increased by one standard deviation (41.02), stock return reduced by 2.912 (-0.071 x 41.02) of a dollar of a share. Every $41.02 of EPS received a reduced stock returns by $2.912. A negative relationship is shown.

EVA (standardized β = - 0.120 standard deviation = 4204.922): When EPS increased by one standard deviation (4204.922), stock return reduced by 505(-0.120 x 4204.92) of a dollar of a share. Every $ 4204.922 earned, reduces stock returns by $505. A higher negative relationship exited.

For 2008

Model 2: St. Ret = -0.434 + 0.261EPS + 0.203ROA -0.146ROE - 0.012PE + 0.135EVA

In 2008, EVA had the highest association with stock returns and the lowest came from ROE. Further analysis is given below:

EPS (standardized β = 0.203; standard deviation = 7.148): when EPS increased by one standard deviation (7.148), stock return increased by 1.451(7.148 x 0.203) of a dollar of a share. Every $7.148 of EPS received increased stock returns by $1.451.

ROA standardized β = 0.203; standard deviation = 0.120): When P/E increased by one standard deviation (0.120), stock return increased by 0.02436 (0.120 x 0.203) of a dollar of a share. Every 0.120 of ROA received increased stock return by $0.02436.

ROE (standardized β) = -0.146; standard deviation = 1.146): When ROE increased by one standard deviation (1.146), stock returns decreased by 0.1673 (- 0.146 x 1.146) of a dollar of a share. Every 1.146 of ROE received reduced stock return by $0.1673.

P/E (standardized β) = - 0.012; standard deviation = 28.397): When P/E increased by one standard deviation (28.397), stock return reduced by 0.341 (-0.012 x 28.397) of a dollar of a share. Every $28.397 of P/E received reduced stock return by $0.341. A negative relationship existed.

EVA (standardized β) = 0.135; standard deviation = 10062.926): When EVA increased by one standard deviation (10062.93), stock return increased by 0.002695 (0.135 x 10062.93) of a dollar of a share. Every $10062.93 of EVA received increased stock returns by $1358.496.

For 2009

Model 2: St. Ret = 0.589 – 0.042EPS +0.127ROA – 0.598ROE + 0.052PE + 0.88EVA

In 2009, EVA had the highest contribution to stock returns among the variables. The ROE was the least contributor to the model. Further analysis is shown below

EPS (standardized β = -0.042; standard deviation = 2.63510): When EPS increased by one standard deviation (2.635), stock return reduced by 0.111 (-0.042 x 2.635) of a dollar of a share. Every $2.63510 of EPS received reduced stock returns by $0.111. A negative relationship did exist.

ROA (standardized β = - 0.127; standard deviation = 0.0617): When ROA increased by one standard deviation (0.0617), stock return reduced by 0.07683 (-0.127 x 0.0617) of a dollar of a share. Every 0.0617 of ROA received reduced stock return by $0.007836. A negative relationship is shown here too.

ROE (standardized β) = -0.598; standard deviation = 0.6284): When ROE increased by one standard deviation (0.628), stock return reduced by 0.3758 (-0.598 x 0.6284) of a dollar of a share. Every 0.6284 of ROE received reduced stock returns by $0.3758. Again, a negative relationship is shown here.

P/E (standardized β) = - 0.052; standard deviation = 27.77): When P/E increased by one standard deviation (27.77), stock reduced by 0.02955 (-0.052 x 27.77) of a dollar of a share. Every 27.77 of P/E received reduced stock return by $1.444. A negative relationship is shown here.

EVA (standardized β) = 0.088; standard deviation = 4423.69): When EVA increased by one standard deviation (4423.69), stock return increased by 389.28 (0.088 x 4423.69) of a dollar of a share. Every $4423.69 of EVA received increased stock return by $389.28.

In 2009, EVA was the only variable with a positive relationship with the outcome variable.

On the Average

Model 2: St. Ret = 0.134 – 0.022EPS – 0.132ROA – 0.120ROE - 0.183PE + 0.060EVA

On the average, during the period of the Great Recession, EVA became the only positive contributor to the model making the highest contributor to the model with ROA as the least contributor. A further analysis is ensued.

EPS (standardized β = -0.022; standard deviation = 3.415): When EPS increased by one standard deviation (3.415), stock return reduced by 0.75 (-0.022 x 3.415) of a dollar of a share. Every 3.415 of EPS received reduced stock returns by $0.75. A negative relationship is shown here.

ROA standardized β = - 0.132; standard deviation = 0.0757): When ROA increased by one standard deviation (0.0757), stock return increased by 0.00999 (0.132 x 0.0757) of a dollar of a share. Every 0.0757 of ROA received increased stock return by $0.00999.

ROE (standardized β) = -0.120; standard deviation = 0.8247): When ROE increased by one standard deviation (0.8247), stock return reduced by 0.09896 (-0.120 x 0.8247) of a dollar of a share. Every 0.8247 of ROE received reduced stock returns value by $0.09896. A negative relationship is shown here.

P/E (standardized β) = -0.183; standard deviation = 17.05): When P/E increased by one standard deviation (17.05), stock returns value reduced by 3.12015 (-0.183 x 17.05) of a dollar of a share. Every 17.05 of P/E received reduced stock returns value by $3.12015. Again, a negative relationship is shown here.

EVA (standardized β) = 0.060; standard deviation = 6602.94): When EVA increased by one standard deviation (6602.94), stock returns value increased by 396.176 (0.060 x 0.6602.94) of a dollar of a share. Every $6602.94 of EVA received increased stock returns value by $396.176.

The F-ratios of the Models

Information on the Models for a discussion on their F-ratios are shown by the coefficient outputs, model summary outputs**,** and the ANOVA outputs**.**

Model 1: $Y = \beta0 + \beta1\ (EPS) + \beta2\ (ROA) + \beta3\ (ROE) + \beta4\ (P/E) + e$

Model 2: $Y = \beta0 + \beta1\ (EPS) + \beta2\ (ROA) + \beta3\ (ROE) + \beta4\ (P/E) + \beta5\ (EVA) + e$

Y = dependent variable, the stock returns

β0 = regression constant; it is the value of Y when the sum of the parameters of the predictors is zero

βs = Regression coefficients of individual predictors

e = the error term

Recall that F-ratio is the ratio two mean squares, MSm and MSr. According to Fields (2013), the F-ratio is a ratio of an improvement in prediction from the model divided by the inaccuracies existing in the model. Mathematically,

F-Ratio:$\frac{MSm}{MSr}$; where MSm = mean square of the model; MSr = the residual mean squares

For 2007, the F-ratio for the Model 1, the initial Model, was 3.697, $p < 0.05$; and the F-ratio for Model 2 was 3.055, $p < 0.05$. In 2007, the R^2 of Model 1 increased from 0 to 0.144, which was a change indicating the amount of variance explained that resulted in an F-ratio of 3.697. For model 2, R^2 increased by 0.005 making the R-square of the new model 0.149. This resulted in an F-ratio of 0.561. The adjusted R-square reduced from 0.105 to 0.100 with the addition of EVA to the model of accounting variables.

For 2008, the F-ratio for the Model 1 was 6.234, $p < 0.05$, which was very significant; the F-ratio for Model 2 was 5.364, $p < 0.05$, also significant. The addition of EVA to the model significantly performed below expectation. In 2008, Model 1 caused R^2 to move from 0 to 0.221 which was a change indicating the amount of variance explained that resulted in an F-ratio of 6.234. For Model 2, the addition of EVA changed R^2 to 0.236, which was not significant. The adjusted R-squared also changed from 0.185 to 0.192, but the change was not significant. The F-ratio changed from 6.234 to 5.364, which was significant ($p < 0.05$). The significant reduction of the F-ratio with the addition of EVA was an indication that EVA didn't improve the model.

For 2009, the F-ratio for the model 1, the initial Model, was 9.804, $p < 0.05$; and the F-ratio for Model 2 was 8.002, $p < 0.05$. There was an indication that the addition of EVA to the

model significantly reduced the performance of the model. In 2009, Model 1 increased R-square from 0 to 0.308 which was also a change indicating the amount of variance explained that resulted in an F-ratio of 9.804. For Model 2, in which EVA was added, R^2 increased by 0.007 making the R-square of the new model 0.315. The change wasn't significant, so the F-ratio reduced to 8.002.

Using averages of the data for the analysis, that is on the average, the F-ratio for the model 1, the initial model, was 2.123, $p > 0.05$; and the F-model for model 2 was 1.743, $p > 0.05$.The changes were not significant. On the average, model 1 caused R^2 to move from 0 to 0.088, a change indicating the amount of variance explained that resulted in an F-ratio of 2.123. For model 2, in which EVA was added, R-square increased slightly to 0.091, the $p > 0.05$ indicating that changes were insignificant. The addition of EVA didn't improve the model. Model 1 was better than Model 2 in the ability to significantly improve prediction of the outcome variable instead of not fitting the Model. Therefore, EVA was not a useful addition to the model with accounting variables in predicting stock returns during the Great Recession.

Effect Size values, Models and their Probabilities, and Implications on the Hypothesis

In 2007, I indicated that Model 1 increased R^2 from 0 to 0.144, which gave an F-ratio of 3.697. The change was significant change because the probability was less than 0.05 ($p < 0.05$). It is stated as: $R^2 = 0.144$, $F(4, 88) = 3.3.697$, $p < 0.05$. I also stated that for Model 2, R-square increased by 0.005 making the R-square of the new model 0.149, reducing the F-ratio to 3.055, which was significant because the probability was more than 0.05 ($p < 0.05$). $R^2 = 0.149$, $F(1, 87) = 3.055$, $p < 0.05$. The addition of EVA to the model with accounting variables significantly reduced the stock returns prediction of the model. The null hypothesis (Ho) is not rejected.

I also underscored that in 2008, Model 1 caused R^2 to move from 0 to 0.221, a change that resulted in an F-ratio of 6.234. It's a significant change because of the probability of less than 0.05 ($p < 0.05$). $R^2 = 0.221$, $F(4, 88) = 6.234$, $p < 0.05$. For Model 2, when EVA was added, R^2 did change to 0.236 but not it was not significant change because the p-value was greater than the critical value. The resultant F-ratio of 5.364 was less than the previous one, which was also significant. The additional of EVA to the model reduced the F-ratio significantly. $R^2 = 0.201$, $F(1, 87) = 5.364$, $p < 0.05$. The model didn't do a better job with the addition of EVA. Therefore, the null hypothesis (Ho) is not rejected.

I pointed out that in 2009, Model 1 increased R^2 from 0 to 0.308 for an F-ratio of 9.804. The change was significant because the probability was higher than 0.05 ($p > 0.05$). $R^2 = 0.308$, $F(4, 88) = 9.804$, $p < 0.05$. For Model 2, in which EVA was added, R^2 changed by 0.007 making the R-square of the new model 0.315. However, this change was not significant because $p > 0.05$. This resultant F-ratio was 8.002, which is less than the previous one, and significant. $R^2 = 0.315$, $F(1, 87) = 8.002$, $p < 0.05$. Ho is not rejected because the additional of EVA to the model with accounting variables significantly reduced the F-ratio of the model.

Finally, on the average, Model 1 caused R-square to move from 0 to 0.088, a change with an F-ratio of 2.123 , not a significant change because the probability is greater than 0.05 ($p > 0.05$). $R^2 = 0.088$, $F(4, 88) = 2.123$; $p > 0.05$. Also in Model 2, in which EVA was added, R^2 changed slightly making the R-square of the new Model to be 0.091. The F-ratio was 1.743, which wasn't significant because the probability was more than 0.05. The R-Squared = 0.091, $F(1, 87) = 1.743$, $p > 0.05$; it wasn't significant. The addition of EVA to the model with accounting variables reduced or lowered F-ratio on the average, which wasn't significant. The null hypothesis is again not rejected because adding EVA reduced the F-ratio underscoring that

adding EVA to a model with accounting variables in predicting stock returns during 2007 to 2009 Great Recession didn't help the process. Ho is not rejected.

Measuring the Effect Sizes to Answer the Research Question

Using the information from the Model summary output (Below) and the ANOVA tables, the effect sizes were measured to answer the research question one. The effect sizes were measured using values for R, R-squared, and Adjusted R-squared to answer the first research question. For the years under consideration, there was no indication that adding EVA to a model with accounting variables does or did a better job predicting stock returns. Model 2 was not a useful addition because adding EVA reduced the F-ratio and insignificantly increase the R-squared in few cases. Therefore, model 2 was not better than Model 1. The Model summary output showed the value of stock returns (dependent variable) from a given values of predictors underscored by key indices. As pointed out in chapter three, R values are values of multiple correlation coefficients between the predictors and the outcome. R-square is the measure of how much of the variability in the outcome variable is accounted for by the predictors. The adjusted R-square shows how well models generalize using the population of the sample (Field, 2013). In all these measures if effect size, Model didn't do a better job. Therefore, the null hypothesis (Ho) is not rejected.

The effect sizes summary. In 2007, the R and R-squared were 0.379 and 0.144 respectively for Model 1. By including EVA for Model 2, R increased to 0.386; R-squared increased to 0.149. The adjusted R-squared was 0.105 with the initial model; it reduced to 0.105 in the latter model. For the first Model, the R- square value of 0.144 meant that the predictors accounted for 14.4% variability in stock returns of Fortune-500 in 2007. The result is significant because $p < 0.05$. When EVA was added to the Model (Model 2), the R-Squared value increased

to 14.9% meaning the EVA alone explained additional 0.5% (14.9% - 14.4%) variability in stock return. The result is or was not significant because $p > 0.05$. In 2008, the R and R-squared increased to 0.470 and 0.221 respectively for Model 1. The result was significant because $p < 0.05$. When EVA was added, Model 2, had an increase in R and R-squared, but the result was insignificant because the $p > 0.05$. It meant Model 1 accounted for more variability in stock returns in 2008 than in 2007, but the inclusion of EVA for Model 2 had an impact that was not significant.

The R and R-squared values in 2009 for Model 1 to 0.555 and 0.308 respectively. Again, the result was Significant because the p-value was lower than the critical value. However, the inclusion of EVA (Model 2) increased R to 5.61% (an increase of 0.6%) and R-squared to 3.15%. The result of the performance of Model 1 was significant because $P < 0.05$. The addition of EVA gave a result that was not significant because the $p > 0.05$. On the average, R and R-Squared for Model 1 were 0.297 and 0.088 respectively; the inclusion of EVA (Model 2) had no significant impact. Therefore, a model with EVA added to accounting variables does not do a better job than a model with only accounting variables. Ho is not rejected.

It would have been better if the value of the adjusted R-squared was the same or closer to the value of R-squared. In 2007, the adjusted R-square was 0.105 for model 1. It's slightly reduced to 0.100 in Model 2 when EVA was added. Thus, the ability of the model to generalize well if it were using the population of the sample was negatively impacted by the inclusion of EVA. In 2008, adjusted R-squared of Model 1 was 0.185, about 0.080 increase from the 2007 figure. However, the adding EVA (Model 2) increased the strength of the model in generalizing by a little below 7%. The adjusted R-squared value for Model 1 in 2009 was 0.277, which was reduced slightly when EVA was added. On the averaged (using the mean data for the analysis,

the adjusted R-squared for Model 1 and Model 2 were 0.047 and 0.039. They results were insignificant leading the conclusion that adding EVA to a model with accounting variables in predicting stock returns was not better during the period of the Great Recession. Therefore, the Ho is not rejected.

Answering Research Question

The above examination of R, R-square, adjusted R-square and the F-ratios indicated Model 2 didn't do a better job than Model 1 in predicting stock returns during the 2007 to 2009 Great Recession. The findings showed a poor result considering EVA in addition to accounting variables in predicting stock returns during the period of the Great Recession.

Testing the hypotheses

Let's recap the hypotheses for the question One

Ho: The Regression Coefficient of EVA is equal to zero in the model that included EVA in addition to the accounting variables.

Ho: $\beta 5\ (EVA) = 0$

Ha: The Regression Coefficient of EVA is not equal to zero in the model that included EVA in addition to the accounting variables

Ha: $\beta 5\ (EVA) \neq 0$

Beta is the slope of the regression line of the model that includes EVA, and β5 is the regression coefficient of EVA in the model. Looking at the coefficient tables (tables 28 to 31), the following are reported: The beta for EVA in 2007 was -1.028, which was insignificant (p >

0.05). Ho is not rejected. For 2008, the beta value for EVA was positive but only 3.279, which was also insignificant ($p > 0.05$). The beta value for EVA in 2009 was also positive, 1.723, but it was not significant ($p > 0.05$).). Ho is not rejected. On the average, as revealed by mean values data, the beta for EVA was 2.248, $p > 0.05$, there was a positive contribution of EVA to stock returns, but the contribution was insignificant and not strong. Ho is not rejected.

Summary of Findings on Hypothesis Testing

The null hypothesis tested in answering question one was not rejected. The addition of EVA to accounting variables in predicting stock returns (Model 2) during the Great Recession was not better than Model 1 (which had only accounting variables).

Table 24

2007 Coefficients

Model		Unstand. Coeffi.		Stand. Coe			Confide for B	
		B	Std Erro	Beta	t	sig	lower	upper
	constant	-0.022	0.048		-0.45	0.652	-0.118	0.074
1	EPS	0.027	0.017	0.214	1.549	0.125	-0.008	0.061
	ROA	0.441	0.731	0.095	0.603	0.548	-1.012	1.895
	ROE	0.150	0.174	0.130	0.861	0.391	-0.196	0.496
	PE	-0.001	0.001	-0.066	-0.64	0.524	-0.002	0.001
	Constant	-0.036	0.052		-0.70	0.487	-0.140	0.067
2	EPS	0.030	0.018	0.236	1.667	0.099	-0.006	0.065
	ROA	0.829	0.858	0.179	0.924	0.358	-0.955	2.614
	ROE	0.143	0.175	0.123	0.815	0.418	-0.205	0.490

	PE	-0.001	0.001	-0.071	-0.69	0.494	-0.002	0.001
	EVA	1.028	0.000	-0.120	-0.75	0.456	0.000	0.000

a. Unstand Coeffi: Unstandardized Coefficient
b. Stand Coe: Standardized Coefficient
c. Std Erro: Standard Error

Table 25

2008 Coefficients

Model		Unstand. Coeffi.		Stand. Coe			Confide for B	
		B	Std Erro	Beta	t	sig	lower	upper
	constant	-0.418	0.024		17.3	0.000	-0.466	-0.370
	EPS	0.010	0.006	0.281	1.570	0.120	-0.003	0.022
	ROA	0.491	0.354	0.242	1.388	0.169	-0.212	1.194
	ROE	-0.031	0.022	-0.146	-1.44	0.155	-0.074	0.012
	PE	-1.281	0.001	-0.001	-0.16	0.988	-0.002	0.002
	Constant	-0.434	0.027		16.18	0.000	-0.487	-0.381
	EPS	0.009	0.006	0.261	1.461	0.148	-0.003	0.021
	ROA	0.412	0.357	0.203	1.153	0.252	-0.298	1.123
	ROE	-0.031	0.015	-0.146	-0.14	0.151	-0.074	0.012
	PE	0.000	0.001	-0.012	-0.13	0.898	-0.002	0.002
	EVA	3.279	0.000	0.135	1.301	0.197	0.000	0.000

a. Unstand Coeffi: Unstandardized Coefficient
b. Stand Coe: Standardized Coefficient
c. Std Erro: Standard Error

Table 26

2009 Coefficients

Model		Unstand. Coeffi.		Stand. Coe			Confide for B	
		B	Std Erro	Beta	t	sig	lower	upper
	constant	0.541	0.100		5.416	0.000	0.343	0.740
	EPS	-0.014	0.049	-0.041	-0.28	0.780	-0.111	0.083
	ROA	2.277	2.156	0.162	1.056	0.294	-2.008	6.563
	ROE	-0.846	0.143	-0.611	-5.91	0.000	-1.130	-0.561
	PE	0.002	0.003	0.052	0.581	0.563	-0.004	0.007
	Constant	0.589	0.112		5.240	0.000	0.365	0.812
	EPS	-0.014	0.049	-0.042	-0.28	0.779	-0.111	0.083
	ROA	1.790	2.221	0.127	0.806	0.423	-2.625	6.205
	ROE	-0.828	0.144	-0.598	-5.72	0.000	-1.115	-0.540
	PE	0.002	0.003	0.052	0.576	0.566	-0.004	0.007
	EVA	1.723	0.000	0.088	0.93	0.357	0.000	0.000

a. Unstand Coeffi: Unstandardized Coefficient
b. Stand Coe: Standardized Coefficient
c. Std Erro: Standard Error

Table 27

Mean value Coefficients

Model		Unstand. Coeffi.		Stand. Coe			Confide for B	
		B	Std Erro	Beta	t	sig	lower	upper
	constant	0.134	0.031		4.264	0.000	0.071	0.196
	EPS	-0.001	0.011	-0.017	-0.11	0.913	-0.023	0.021

ROA	-0.376	0.501	-0.114	-0.75	0.455	-1.371	0.620
ROE	-0.036	0.032	-0.120	-1.13	0.262	-1.00	0.027
PE	-0.003	0.002	-0.181	-1.70	0.094	-0.006	0.000
Constant	0.134	0.031		4.263	0.000	0.072	0.197
EPS	-0.002	0.011	-0.022	-0.15	0.884	-0.024	0.020
ROA	-0.433	0.514	-0.132	0.84	0.402	-1.454	0.589
ROE	-0.036	0.032	-0.120	-1.13	0.264	-0.100	0.028
PE	-0.003	0.002	-0.183	-1.7	0.092	-0.006	0.000
EVA	2.248	0.000	0.060	0.541	0.590	0.000	0.000

a. Unstand Coeffi: Unstandardized Coefficient
b. Stand Coe: Standardized Coefficient
c. Std Erro: Standard Error

Summary of Answer to the Research Question:

Findings

As to whether a better job of predicting stock returns was done by the second model, the answer can be found in the ensued lines. Three indices R (multiple correlation coefficient), R-squared (a squared multiple correlation), and adjusted R-Squared tell how well the linear combination of the independent variables predict stock return (Green & Salkind, 2011). The three indices measure the effect sizes. R-Squared is a determination of how much of the variability in the outcome is accounted for by the predictors, and a single most useful index for determining how well a model did (Field, 2013). Model 2 with more predictors was supposed to have a higher R-squared than Model one with few predictors. The results showed in most cases Model 2 had lower values for these indices and where these values were higher, they were not significant because the p-value was higher than the critical value of 0.05. To find the significance

of the change in R Squared, I looked for the F change in the same tables. Looking at R, in 2007, the new model improved the model, but the change was non-significant ($p > 0.05$). Ho is not rejected. That is adding EVA to accounting variables to predict stock returns improved the R of the model by 0.007 and R-Squared by 0.005. In 2007, the R and R-square values were not significant; Ho is not rejected. Model 2 did not do a better job predicting stock.

In 2008, the addition of EVA to the model didn't not improve the ability of the model to predict stock returns using R and R-squared criteria. It could have been attributed to the severity of the recession in 2008. Though the R and R-squared values improved, they were insignificant because the p-values were greater than the critical values. With the addition of EVA, R and R-squared increased from 0.470 and 0.221 to 0.485 and 0.236 respectively. However, these increases were not significant with $p > 0.05$. Ho is not rejected. In 2009, the new model's R was 0.006 above the initial model; similarly, its R-square was 0.007 greater than the initial model, but these results were not significant because $p > 0.05$. The null hypothesis (Ho) is not rejected. On the average, the new model offered 0.005 more in R value and 0.003 more in R-Squared value than the initial model, but results were all insignificant with $p > 0.05$. Ho is not rejected. Using R and R-squared as criteria for determining the predictive strength of the model, the results showed that Model 2 did not do a better job in predicting stock returns. The effect sizes of the contribution of Model 2 to the prediction of stock returns using R and R-square were statistically non-significant. Ho is not rejected.

The adjusted R-squared shows how a model is to be generalized across samples in the population. In 2007, the adjusted R-square for Model 1 and Model 2 were 0.105 and 0.100 respectively; in, 2008 the adjusted R-squared of the new model was 0.007 more than the initial Model with $p > 0.05$. In 2009, the adjusted R- square value for the mew model was higher than

the initial model, but not significant with $p > 0.05$. On the average, using adjusted R-square used as the basis for determining the model's strength in generalizing, model 2 did a poor job that was insignificant. Ho is not rejected.

F-change measures the significance of R-squared change. Using this criterion, we again fall on the model summary tables. In 2007, the F-change value for Model 1 and Model 2 were 3.697 and 0.561 respectively. In 2008, it was 6.234 for Model 1 and 1.691 for Model 2. In 2009, it was 2.123 for model 1 and 0.292 for Model 2. On the average, the F-change value for model 1 was 2.123 and 0.292 for model 2. The obvious conclusion is that Model 1 offered higher F-change values than Model 2 during 2007 to 2009 Great Recession.

To determine whether Model 2 did a better job in providing a goodness of fit than Model 1, let's turn to the ANOVA tables for the F-ratios. F-ratio is the ratio of improvement in prediction from the model divided by noise or inaccuracies in the model (Field, 2013). For 2007, the F-ratio for the Model 1 (3.697) was higher than model 2 (3.055), which was significant at $p < 0.05$. In 2008, again Model 1 offered a higher F-ratio (6.234) than Model 2 (5.364), which was also significant at $p < 0.05$. In 2009, the F-ratio of Model 1 (9.804) was higher than the F-ratio Model 2 (8.002), but it was significant at $p > 0.05$. On the average, the F-ratio for the Model 1 was 2.123, and 1.743 for Model 2. They were all insignificant result because $p > 0.05$. Model 1 did a better job that was not statistically significant. However, on more indices, Model 2 performed poorly, with most of them statistically insignificant. Thus, a model with EVA in additional to accounting did relatively a poor job predicting stock returns during the period of the Great Recession. The study revealed that the contribution of EVA to Model 2's prediction of stock returns was not significant, so EVA was not a better addition accounting variables in predicting stock returns. Ho is not rejected.

I tested the research hypothesis to answer the research question and found it necessary not to reject the null hypothesis. The addition of EVA to accounting variables in predicting stock returns (Model 2) during the Great Recession was not better than Model 1 (which had only accounting variables). In conclusion, EVA was not a better predictor of stock returns than accounting variables during the period of the Great Recession.

In the next chapter, I have given some interpretations of the findings capturing the limitations of the study. Additionally, I have provided some recommendations for further studies and practices and given implications of the study.

Chapter 5: Findings, Interpretations, Implications, and Recommendations

Introduction

Proponents, through various studies, had indicated that EVA was a value-based metric that connected better with a firm's performance than accounting variables. Critics found evidence to suggest that accounting variables do a better job predicting stock returns than EVA. This study set out to investigate the 'log-jam' further including the effect of 2007 to 2009 Great Recession. The findings were mixed, but a little bit tilted against EVA as the model with EVA in addition to accounting variables did not perform better in predicting stock returns. The beta values of EVA were mostly greater than the beta values of accounting variables, but the figures were mostly insignificant. The chapter, the final chapter of the study, proceeded with a reiteration of the purpose, nature, and significance of the study, and a brief summary of the findings of this study. Other sections included interpretations of findings, implications of the study, and recommendations for further studies.

The purpose of the study was to examine the relative strength of EVA as a predictor of stock returns during the period of the Great Recession. The study was conducted to determine the relationship between stock returns and Economic Value Added on one hand, and between stock returns and accounting variables on the other hand during 2007 to 2009 Great Recession using a sample of 93 Fortune-500 Companies. Studies had compared EVA and accounting variables in predicting stock returns, and the results had been inconclusive, but in this study, the goal was to see how the period of recession would shape the discussion. I applied multiple regression analytic techniques via the SPSS for the analysis of data collected from a sample of 93 Fortune-500 companies for 2007, 2008, and 2009 to address the research gap. The study went on to examine how the prediction of stock returns by a model that included EVA and accounting

variables was different from a model that had only accounting variables during the period of the Great Recession.

The study was a quantitative study with cross-sectional design undertaken with data on variables retrieved from a sample of 93 Fortune-500 companies. The sample was selected from a population of the highest ranked 402 of the Fortune 500 companies during the period of the Great Recession. The study was a quantitative study because it was carried out to test or examine the relationship between stock returns and EVA, ROE, EPS, ROA, and P/E using a secondary data stored at Nasdaq.com. The design I used was a cross-sectional or correlational design because it allowed for the description of the pattern of relationship between the outcome variable and predicting variables as suggested by Frankfort-Nachmias and Nachmias (2000). The data were measured and statistically analyzed using the SPSS to answer the research question by testing the research hypothesis.

Scores of studies had been carried out to tout EVA as a financial metric known not only for creating value for shareholders but also as a better predictor of stock returns. For instance, Ivanov et al. (2014) indicated that EVA is an excellent tool for creating value for shareholders. Balu and Morard (2009) pointed out that EVA has the highest explanatory power of stock return than traditional measures. With this background, the study was designed to add a new dimension to the discussion by investigating how the period of the Great Recession would affect the relative strength of EVA in predicting stock returns. The goal was to contribute to the knowledge base on EVA, draw attention to EVA as a value creation metric, and ascertain whether EVA was robust enough to encourage its use as viable value-creating metric. The study was an effort to promote research on EVA and to ascertain whether or not it's worth being promoted as a robust value-creation metric that is a better indicator of a firm's performance. The path to a positive social

change is evident: creating value for shareholders gives them the incentive to contribute capital to fund positive NPV- projects for positive social change

In this study, the research hypothesis was tested in answering the research question in which the null hypothesis was not rejected. The addition of EVA to accounting variables in predicting stock returns (Model 2) during the Great Recession was not better than Model 1 (which had only accounting variables). The b-values and beta-values of EVA were on the average higher than most of the values of accounting variables. However, they were statistically insignificant. The findings were irrefragable that EVA was not a better predictor of stock returns than accounting variables during the period of the Great Recession.

Interpretation of the Findings

Findings Confirmation or Disconfirmation of Peer-Reviewed Studies in Chapter 2

The main objective of the study was to determine whether or not EVA is/was significant in predicting stock returns in addition to accounting variables. The values of R, R^2, and adjusted R, and F-ratio of Model 2 all pointed to the fact that adding EVA to the model of accounting variables didn't result in a better prediction of stock returns during 2007 to 2009 Great Recession. EVA did not do a better job in predicting Stock returns during the Great Recession.

The findings didn't support the early work and prepositions of supporters of EVA as a better predictor of stock returns. The findings contradicted studies from Stewart (1991, 1993, and 1994). The study's outcome on the relative predictive strength of EVA was also at variance with the study of Hamilton et al. (2009). Hamilton et al. (2009) had indicated that value-based measures are better indicators of a firm's performance (measured by stock returns) than accounting measures. Also, Dodds and Chen (1996) also indicated that the explanation power of

EVA was higher than explanatory powers of ROE and EPS. Additionally, Zimmerman (1996) had shown that EVA was more powerful in explaining stock returns than accounting measures. Panahi, Preece, Zakaria, and Rogers (2014) investigated the correlations of EVA and MVA as measures of stock price behavior and found a meaningful correlation between EVA and MVA and stock price with companies at Tehran stock exchange. Balu and Morard (2009) saw EVA with the highest explanatory power of stock return (a measure shareholders value) than other traditional measures and saw EVA as a more useful tool for increasing operational efficiency. The Findings of the above-stated studies were contrary to how EVA performed in this study, during the period of the Great Recession. The study's findings were at variance with other studies on EVA including the study of Mamum and Mansor (2012) who used the models of Young (1997) and Issam et al. (2008) and found a stronger correlation between EVA and stock return.

Studies like Visaltanachoti et al. (2008), Khan, Shah, and Rehman (2012) and Nakhaei, Hamid and Anuar (2013) were all in line with the insignificance of this study's findings. Their studies gave credence to the relatively lackadaisical performance of the EVA. Visaltanachoti et al. (2008)'s study found a better association between EBIT and stock returns than between stock returns and other variables that included EVA. Khan, Shah, and Rehman (2012) found a lower regression coefficient for EVA in predicting stock returns than the contributions of Cash Flow from Operation and Net income. Finally, the insignificance of the performance of EVA of this research was also in line with the study of Nakhaei, Hamid and Anuar (2013). The researchers relied on SPSS for analysis and found no evidence to support that EVA and EVA-related measures were better financial performance measures than ROE and ROA. Further, Maitah, Saleem, Malec, Boubaker, and Gouda (2015) saw that investment policies and strategies based

on accounting measures showed a better stock returns performance than those based on EVA. These studies' outcomes were in tandem with this study's outcome supporting that EVA's relative superior performance is a mirage.

The possible reason for the poor performance of EVA in predicting stock returns in this study is the Great Recession. The period of a recession is a period of economic uncertainties. Dorsey et al. (2012) underscored the impact of the strength of the economy on the profitability by indicating that profitability is positively correlated with the strength of the economy. High profitability increases return above cost for value creation, which is a challenge during the period of recession because in most cases business activities slow and profit margins dim. Haworth (2012) had alluded to the ability of the 2008 financial crisis to negatively affect the effectiveness of financial models and theories by indicating that the 2008 financial crisis exposed the weakness inherent in the Modern Portfolio Theory. The predictive strength of EVA underscored by proponents did not come through during the Great Recession.

Researchers had suggested recession would have a negative effect on performance. Bello (2009) showed the poor performance of most US domestic equity mutual funds during the 1990 and 2001 recessionary periods. The findings of the study of Mandal and Bhattacharjee (2012) did show that the period of the Great Recession negatively affected the stock returns performance of the Indian Stock Exchange. All these studies' findings did show that predicting stock returns during the period of a recession is difficult. This study's findings also underscore the difficulties in capturing desired returns during the period of an economic downturn. Mamun et al. (2012) had said that Hamilton (1777) and Marshall (1980) encouraged that firms' earnings should be greater the cost of debt and the cost of equity to create wealth. In this study, there is evidence that it is difficult for firms' earnings to be greater than the cost of debt and equity to predict

returns during the period of a recession. Mandal, Bhatta and Charjee (2012) clearly explained the relationship between stock returns and recessions. They indicated that when the economy is unstable, volatility spread, and underscored that the Great Recession had a devastating effect on returns of the Indian stock markets.

In concluding, studies had pointed to inconclusive results as to whether accounting variables or value-related variables are better in predicting stock returns. The main reason is that these variables are closely related in pointing to the financial efficacy and the operational efficiency of a firm. In this study, none of the variables under consideration excelled in predicting stock returns alluding to the devastating effect of a recession on the performance of these financial measures. Parvaei and Soran (2013) offered mix signals on EVA's relative performance. They saw EVA as a better measure in predicting stock returns than other measures but didn't see EVA as a stronger measure of a firm' s performance. In the period of a financial downturn or an economic meltdown, this study's findings suggest that EVA's relative advantage over accounting measures is insignificant. It seems that the relative strength of EVA in predicting stock returns might have been negatively affected by the period of the Great Recession, which buttresses Haworth (2012)'s assertion on the effect of a recession on the effectiveness of financial models. Saji (2014) saw that changes in EVA and Cost of Capital had an impact on stock returns during a recessionary period of 2008 to 2013 in India. In the same vain the impact of the predictability of EVA of stock returns during the period of the Great Recession was weak.

Analysis and Interpretation of Findings in the Context of the Theoretical Framework

EVA is a value-based measure used to represent the value a firm creates when the return of investment is greater than the cost. EVA, according to Brewer, Chandra, and Hock (1999), is

operation income after tax, income received from an investment, in excess of the cost of the investment. The cost of investment is the cost of Invested Capital including both the Cost of Equity and the Cost of Debt, but not non-interest bearing current liabilities (Chari, 2009). The investment capital is the book value of capital used in the company, Tamjidi, Hushmandi, and Habashi (2012), citing Stewart (1991). In arriving at EVA, the necessary adjustments are needed to improve the correctitude of calculating EVA (Balu & Morard, 2009). When Cost of Debt and Cost of Equity are deducted, and the necessary adjustments are made, what we get is a figure reflecting value. Thus, EVA, by its estimation, is the economic value in dollar term because cost including cost of debt and cost of equity are taken into account (Abdeen & Haight, 2002). Economic value has been around ever since dating back to the time of Hamilton (1777) and Marshall (1890). These scholars pushed for wealth creation indicating that firms needed to earn above the Cost of Equity and Cost of Debt in creating wealth. Economic profit was the economic term used for wealth creation, and it was replaced by the term residual income. This research's findings showed a reduction in strength of EVA in predicting stock returns in the period of the Great Recession**.** *The study's findings explicitly showed that using value-based metrics to predict effectively stock returns is a herculean task in an unfavorable economic environment*. The relationship between stock returns and value creation is impacted adversely by an economic recession. Stock returns value is estimated as (the price of a share at the end of the year less the price of share at the beginning of the year plus dividend paid during the year)/price of the share at the beginning of the year. The definition depicts returns received from investing in the stock of the firm. Value is created when returns from an investment exceed all cost incurred in undertaking the investment. But when cost is rising higher than returns due to a period of a recession, value can't be created. Thus, if the Chief financial officers of Corporations aim to

create value for their shareholders, they should be mindful of the economic situation. The study supports the goal of corporate management of creating value for shareholders. Value creation is an indication of a superior performance of a company, but it is revealed in this study to be greatly impeded by an economic downturn. The vision of creating value and promoting the use of EVA was caught by companies such as General Electric and Coca-Cola in the 1980s, which saw their companies breaking new grounds. However, this study seems to suggest that adopting EVA without giving consideration to the economic environment would not yield the required result.

The findings underscore a slim gap between accounting profit and value creation by way of predicting stock returns during the time of a recession. An accounting profit only considers the cost of debt that is Operation profit less interest. EPS is estimated by dividing accounting profit by the number of shares outstanding; ROE and ROA are estimated by dividing total equity and total asset by accounting profit respectively. EVA, on the other hand, is Net Operation Profit after tax less cost of capital or operation profit minus interest (cost of debt) minus cost of equity. The study's outcome is the testament to the vulnerability of EVA as well as its robustness.

Interpretation is within the Data, Findings, and Scope

The study was undertaken by relying on data from Fortune-500 companies on their ROA, ROE, EPS, P/E, and EVA to see how they related with stock returns during 2007 to 2009 Great Recession in the USA. The findings were interpreted within the realms of the companies and their locations and influence, EVA is reported to have a higher link with stock returns than ROA, ROE, EPS, and P/E, but the strength of the relationship is insignificant during the period of the Great Recession. It should be noted that most of these companies are multinational organizations with subsidiaries all over the world, and so the interpretation goes beyond the border of USA.

Additionally, Fortune-500 companies have great influence or control of the world economy to the degree that their effectiveness spar up the effectiveness of companies in other parts of the world. Therefore, even though the study undertaking using companies located in the US, the implications should vibrate all over.

Limitations of the Study

Issue of Generalizability when Conducting the Study

The representativeness of the sample in that the sample covered fortune-500 companies of different sizes and purposes makes it possible to generalize across. The companies that had appeared among the list of Fortune-500 companies for 2007, 2008, and 2009) (402 in total) had equal chances of selection to constitute the sample. Companies that were removed from the sample due to non-availability of key data and incomparable fiscal year were replaced with companies of the same or equivalent size and rank. Therefore, 93 companies constituting the sample represented a diversified corporate world. Generalization across samples was checked using the Stein formula. The external generalization of findings is possible due to the diversified nature of companies chosen for the sample. The internal structures or systems of Fortune-500 companies represent organizational and economic complexities of the business world. Therefore, it shouldn't be extremely difficult generalizing the findings.

Issue of Trustworthiness during the Execution of the Study

The information used for the computation or estimation of variables of the study were retrieved from SEC filings stored at NASDAQ.com, a credible financial website. The credibility of data built with SEC guidelines and stored on NASDAQ.com can't be overemphasized. I relied on the SPSS software for the statistical analysis, which accurately estimated R, R-square, adjusted R-square, b-values, beta values used to make the statistical decisions. It should be

underscored that some companies that were on Fortune-500 Lists from 2007 to 2009 are not on the list as I write. Wachovia is a case in point. The absence of these companies didn't affect the importance of the study and how the study was conducted.

I alluded to some limitations in Chapter 1 relating to the use of CAPM to estimate the Cost of Equity, broad adoption of the concept due to the cost of its implementation, and the fact that the study is not a current reflection of reality. The use of CAPM in estimating the cost of equity is known and accepted in the financial world as the best way to estimate the cost of equity. Thus, it didn't diminish the relevance of the study. The cost of implementing EVA might not be an issue of the companies belonging to or seen as a Fortuine-500 Company.

The focus of the research was on EVA and how effective it is in predicting stock returns when compared to accounting variable using Fortune 500 companies, American companies, during 2007 to 2009 Great Recession. For a company to be seen as a Fortune-500 company, it should have demonstrated an operational and financial strength in its industry with a level of competitive edge and a mark of successful business operations. The study was centered on these companies because they had all the ingredients needed to define the level of business activities defining the economy of the United States, the economic capital of the world. I limited the discussion to one value based measure, EVA, and four accounting measures, EPS, ROA, ROE, and P/E due to the popularity of those concepts and the ease with which those accounting measures could be estimated. The data was collected to cover the period and the variables under consideration, which reflected the prevailing economic conditions at the time. Stock returns values during the period were mostly negative especially 2008, the year that the recession was at its peak. Nevertheless, the effect of the recession and its relevance were envisaged to transcend times enabling decisions with future goals in mind.

Recommendations for Future Studies

Based on the Strength of the Study

Model 1 and 2 performed sluggishly in predicting the stock returns at the time of the economic downturn, but the performance of model 2 (the addition of EVA) was worse. Models with different accounting variables and EVA can be investigated to ascertain how different accounting measures would perform with EVA, or how differently EVA would perform when compared with other accounting measures in a more favorable environment.

Based on the Limitations of the Study

Other studies can increase the number of value-based measures in the model and see how that would impact the performance of the second model. An equal number of accounting measures and value-based measures in the second model would provide a different result in a more favorable economic environment. Future studies can look at a model of accounting variables compared to a model of an equal number of value-based measures at a favorable or unfavorable economic environment. There can also be a study comparing a model different accounting variables with a model with EVA.

Based on the Literature Review in Chapter 2

Several studies on the comparative approach to EVA as a predictor of stock returns have come from developed and emerging markets. In most of these areas, the capital markets are well developed enabling data availability and accuracy. Testing similar models in the least developed countries, especially African countries, would give the field the clue on whether the level of financial capital development of an area has an influence on the effectiveness of return-predicting models. This research study was conducted on the prediction of stock returns; a

similar study can be on sector returns pitting EVA or/and other value-related variables with different or similar accounting variables.

Implications of the Study

This research's findings showed that EVA was not strong in predicting stock returns during 2007 to 2009 Great Recession. The implications of the findings are enormous. Among them is the role of recession. The Great Recession influenced profitability and value creation, and that's why there was not a strong performance from any of the variables in predicting stock returns during the period. Also, the recognition that EVA and the accounting variables fell flat in predicting stock returns is why firms need to exercise great caution in operating at an economically challenging period. Optimum allocation of resources to create value as advised by Jahankhani and Zarifard (1995) can't be appropriately done during an economically chaotic period.

Adopting bonus schemes to inspire value creation during recessionary periods will do more harm to the company than good. The findings also suggest the need to thread carefully in emphasizing accounting measures or value-based measures as indicators of performance during the period of a recession. As pointed out in the preceding paragraph, an efficient allocation of scare economic resources should be not encouraged when there is an economic recession.

A chaotic business environment will offer a little insight on efforts needed to yield required returns. Promoting value creation coupled with the understanding of the prevailing economic situation is a necessary concomitant to minimizing cost and maximizing revenue or returns. Professionals and practitioners in the field of finance must promote the use of EVA in this light. Saji (2014) asserted that EVA as a way of measuring value and performance is loved by financial managers with the desire to create value and improve performance. But to think

about promoting EVA and value creations efforts without regards to the prevailing economic situation would be catastrophic.

Making an effort to create value is an effort to increase capital from equity because investors are 'value' lovers who would invest knowing of the possibility of having the value of their shares raised. However, such an effort should take into cognizance the prevailing economic situation. Positive-NPV projects can turn out to be negative when the investment is done at the wrong time. The right timing of investment efforts increases profitability and creates value for resources needed to drive positive social change. Companies that create value have the competitive advantage over competitors according to Brewer, Gyan, and Hook (1999) citing Tully (1993), and those companies can invest in socio-economic projects that drive social change. Thus, Burga (2013) noted that the main condition for improving the standard of living and the quality of life of individuals in societies or nations is for firms to improve value. The findings of this study suggest that value-increasing efforts should be done at the right economic environment.

Recommendation for Practice

The study's outcome is a testament to both the vulnerability and the robustness of EVA as a value-based metric for planning and making decisions in the corporate world. According to Hamilton, Rahman, & Lee (2009), EVA, as a value-creation metric, is an important decision-making tool for improving the efficiency of an organization on all fronts. They argued that to create value, the business processes and practices must be improved, which is a recipe for a long-term competitive advantage. The conclusion of this study is that in the period of the Great Recession, EVA did not do well in predicting stock returns. Thus, while I recognize that it is important for firms to put emphasis on value creation, it is important that the prevailing

economic situation of the business environment is taken into consideration before a decision to create value is made. As this study's outcome suggests, the economic situation of the geographical epoch a company intends to operate can impact the ability to create value and drive returns. To improve corporate performance efforts, the laser focus should be placed on the need for value creation (Return – cost) at the right economic environment. General Electric and Coca-Cola caught the vision at a point in time; others should follow or revisit the idea and double efforts to apply its principles in their companies considering the economic situation at the time so they can positively transform their companies and the world.

Conclusion

The financial performance of a firm is important to investors who measure it using metrics such as EPS, ROA, ROE, and P/E. Every company aims at improving its financial performance as well as creating value for shareholders. EVA is a measure coined and supported by Stewart and Co in the 1990s. It is another name for residual income or economic profit, which has been portrayed as a better measure of a firm's performance in predicting stock returns than accounting variables in some studies. Other studies have indicated that accounting variables are better in predicting stock returns. Therefore, research results on the issue have been inconclusive. I investigated the issue again in this study with the inclusion of the effect of 2007 to 2009 Great Recession. I found that adding EVA to a model of accounting variables resulted in an abysmal performance of the model in predicting stock returns during the period of the Great Recession. This study didn't find support for EVA as a better predictor of stock returns during the Great Recession. Therefore, I conclude that EVA is not a better predictor of returns during the period of a recession. Firms are unlikely to succeed creating value for shareholders and get the needed

returns for investments that bring a positive social change in an unfavorable economic condition or environment.

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Appendix A

2007 Correlation analysis with NI

		St. Ret	NI	EPS	ROA	ROE	P/E	EVA
	St. Ret	1.00	0.204	0.325	0.323	0.304	0.017	0.213
Pearson Corre	NI	0.204	1.00	0.550	0.656	0.458	0.095	0.972
	EPS	0.325	0.550	1.000	0.658	0.581	0.166	0.582
	ROA	0.323	0.656	0.658	1.00	0.717	0.156	0.755
	ROE	0.304	0.458	0.581	0.717	1.000	0.287	0.537
	P/E	0.017	0.095	0.166	0.156	0.287	1.000	0.082
	EVA	0.213	0.972	0.582	0.755	0.537	0.082	1.00
Sig (1-tailed)	St. Ret		0.022	0.001	0.001	0.001	0.433	0.017
	NI	0.022		0.000	0.000	0.000	0.177	0.000
	EPS	0.001	0.000		0.000	0.000	0.051	0.000
	ROA	0.001	0.000	0.000		0.000	0.062	0.000
	ROE	0.001	0.000	0.000	0.000		0.002	0.000
	P/E	0.433	0.177	0.051	0.062	0.002		0.210
	EVA	0.017	0.000	0.000	0.000	0.000	0.210	
N	St. Ret	98	98	98	98	98	98	98
	NI	98	98	98	98	98	98	98
	EPS	98	98	98	98	98	98	98
	ROA	98	98	98	98	98	98	98
	ROE	98	98	98	98	98	98	98

P/E	98	98	98	98	98	98	98
EVA	98	98	98	98	98	98	98

N.B.: Only one-year data is presented to know how well NI correlated with the other variables in the analysis. Th correlation was strong so NI was removed from the analysis.

Appendix B

2007 Coefficients Conti

model		Correlations			Collinearity	
		Zero-order	partial	part	Tolerance	VIF
1	Constant					
	EPS	0.346	0.163	0.153	0.509	1.964
	ROA	0.324	0.064	0.060	0.389	2.570
	ROE	0.311	0.091	0.085	0.427	2.339
	PE	0.025	-0.068	-0.063	0.913	1.095
	Constant					
2	EPS	0.346	0.176	0.165	0.488	2.051
	ROA	0.324	0.099	0.091	0.260	3.853
	ROE	0.311	0.087	0.081	0.426	2.347
	PE	0.025	-0.073	-0.068	0.909	1.100
	EVA	0.225	-0.080	-0.074	0.380	2.629

Appendix C

2008 Coefficients Conti

model		Correlations			Collinearity	
		Zero-order	partial	part	Tolerance	VIF
1	Constant					
	EPS	0.430	0.165	0.148	0.277	3.604
	ROA	0.434	0.146	0.131	0.291	3.434
	ROE	0.032	-0.151	-1.135	0.860	1.162
	PE	0.062	-0.002	-0.001	0.980	1.021
	Constant					
	EPS	0.430	0.155	0.137	0.275	3.630
2	ROA	0.434	0.123	0.108	0.283	3.535
	ROE	0.032	-0.153	-0.136	0.860	1.162
	PE	0.062	-0.014	-0.012	0.972	1.028
	EVA	0.301	0.138	0.122	0.810	1.234

Appendix D

2009 Coefficients Conti

model		Correlations			Collinearity	
		Zero-order	partial	part	Tolerance	VIF
1	Constant					
	EPS	-0.175	-0.030	-0.025	0.358	2.795
	ROA	-0.171	0.112	0.094	0.335	2.982
	ROE	-0.540	-0.533	-0.524	0.735	1.360
	PE	-0.035	0.062	0.051	0.968	1.033
	Constant					
2	EPS	-0.175	-0.030	-0.025	0.358	2.795
	ROA	-0.171	0.086	0.071	0.316	3.160
	ROE	-0.540	-0.523	-0.508	0.722	1.385
	PE	-0.035	0.062	0.051	0.968	1.033
	EVA	0.089	0.099	0.082	0.878	1.139

Appendix E

Mean Values Coefficients Conti

model		Correlations			Collinearity	
		Zero-order	partial	part	Tolerance	VIF
1	Constant					
	EPS	-0.170	-0.012	-0.011	0.453	2.208
	ROA	-0.206	-0.080	-0.076	0.446	2.240
	ROE	-0.167	-0.120	-0.115	0.920	1.087
	PE	-0.230	-0.178	-0.173	0.910	1.099
	Constant					
2	EPS	-0.170	-0.016	-0.015	0.451	2.218
	ROA	-0.206	-0.090	0.086	0.428	2.339
	ROE	-0.167	-0.120	-0.115	0.920	1.087
	PE	-0.230	-0.180	-0.174	0.909	1.100
	EVA	-0.032	0.058	0.055	0.859	1.164

Appendix F

Using the Stein's Formula to estimate the Adjusted R-squared

For 2007:

Adjusted R-squared = 1- $[(\frac{n-1}{n-k-1})(\frac{n-2}{n-k-2})(\frac{n+1}{n})](1-R^2)$

Adj R^2 for model 1 = 1- $[(\frac{93-1}{93-4-1})(\frac{93-2}{93-4-2})(\frac{93+1}{93})](1-0.144)$

1 – [1.10527914 x 0.856]

= 0.054

Adj R^2 for model 2 = 1- $[(\frac{93-1}{93-5-1})(\frac{93-2}{93-5-2})(\frac{93+1}{93})](1-0.149)$

1 – [1.1309834 x 0.851]

= 0.037

For 2008

Adjusted R-squared = 1- $[(\frac{n-1}{n-k-1})(\frac{n-2}{n-k-2})(\frac{n+1}{n})](1-R^2)$

Adj R^2 for model 1 = 1- $[(\frac{93-1}{93-4-1})(\frac{93-2}{93-4-2})(\frac{93+1}{93})](1-0.221)$

1 – [1.10527914 x 0.779]

= 0.1389

Adj R^2 for model 2 = 1- $[(\frac{93-1}{93-5-1})(\frac{93-2}{93-5-2})(\frac{93+1}{93})](1-0.236)$

1 – [1.1309839 x 0.764]

= 0.136

For 2009

Adjusted R-squared = 1- $[(\frac{n-1}{n-k-1})(\frac{n-2}{n-k-2})(\frac{n+1}{n})](1-R^2)$

Adj R^2 for model 1 = 1- $[(\frac{93-1}{93-4-1})(\frac{93-2}{93-4-2})(\frac{93+1}{93})](1-0.308)$

1 – [1.10527914 x 0.692]

= 0.235

Adj R^2 for model 2 = 1- $[(\frac{93-1}{93-5-1})(\frac{93-2}{93-5-2})(\frac{93+1}{93})](1-0.315)$

1 – [1.1309838954 x 0.685]

= 0.225