UNIVERSITY OF CAPE COAST

ASSESSING RISK AND RETURN RELATIONSHIP OF LISTED FIRMS ON THE GHANA STOCK EXCHANGE

EBENEZER TAKYI- DANQUAH

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BY

EBENEZER TAKYI-DANQUAH

Thesis submitted to Department of Accounting, School of Business, University of Cape Coast in partial fulfilment of the requirements for the award of Master of Commerce Degree in Finance

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature …… Date ……...…….

Name: Ebenezer Takyi-Danquah

Supervisor's Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature……..… Date…….

Name: Dr. Joseph Boateng Agyenim

Co- Supervisor's Signature…… Date ……....

Name**:** Dr. Anokye Mohammed Adam

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ABSTRACT

Generally speaking, every investment decision contains a component of risk and a component of return. The relationship amongst risk and return exists as a risk-return trade off, by which it is implied that it is just conceivable to obtain higher returns by tolerating higher risk. This risk-return relationship is very key in investment assessment. Risk and Return are emphatically connected; an expansion in one is joined by an increment in the other. Hence this study assessed the risk and return relationship of listed firms on the Ghana Stock Exchange from 1990 to 2011. Capital Asset Pricing Model (CAPM) was adopted and modified with an introduction of crises effect and the January effect. Data of daily stock prices were obtained from the Data Bank Research Unit whilst, the daily market returns was obtained from the Ghana Stock Exchange and processed with eviews and excel. The findings of the study showed that the stocks of ABL, ETI, FML, GCB, SCB, SG-SSB, TOTAL, GGBL and UNIL, and SIC had their betas predicting their returns in conformity with the position of CAPM. Other factors other than the beta contributed to the risk return relationship of the stocks of AADS, CFAO, CMLT, EBG, HFC, MLC, PKL, PZC, TBL. Stocks of AGA, BOPP, CAL, GOIL, CLYD, CPC, GOIL,GSR, GWEB, SPL and so on were at variance with CAPM. The recent financial crisis had downward significant effect on the beta of ABL, ETI, FML, SCB, SG-SSB, TOTAL, GGBL and UNIL and an upward significant effect on the betas of GCB and SIC . The January effect had upward significant effect on the beta of ABL, ETI, FML, SCB, SG-SSB, and GCB and a downward significant effect on the betas of GGBL, UNIL and SIC. In all the betas of firms in the financial industry were most affected by both Financial Crisis and the Calendar Month Anomaly hypothesis. It is recommended that, first, investors on the stock market should take into consideration both 2007/8 Global Financial crisis and the January effect when assessing risk-return relationship. Moreover, once the CAPM predicted the risk-return relationship of 10 stocks analysed, investors could rely on the preposition of CAPM in valuing their expected returns in such stocks. However, investors should not rely solely on CAPM but should use it together with other valuation models to give better predictions.

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DEDICATION

Dedicated to my dear wife, Mrs Esther Takyi-Danquah.

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LIST OF ABBREVIATIONS

ASEA	African Securities and Exchange Association
GSE	Ghana Stock Exchange
YTD	Year to date
SLB	Sharpe (1964), Lintner (1965) and Black (1972)
APT	Arbitrage Pricing Theory
CAPM	Capital Assets Pricing Model
EMH	Efficient Market Hypothesis
BE	Book-to-Equity
ME	Market value of Equity
NYSE	New York Stock Exchange
AMEX	American Stock Exchange
NASDAQ	National Association of Securities Dealers
PFE	Price-to-forward Earnings
ICE	Implied Cost-of-equity
ICAPM	Intertemporal Capital Asset Pricing Model
MIDAS	Mixed Data Sampling
KSE	Karachi Stock Exchange
BSE	Bonbay Stock Exchange
CAL	CAL bank
EBG	Ecobank Ghana
EGL	Enterprise Group Limited
ETI	Ecobank Transnational Incoporated
GCB	Ghana Commercial Bank
HFC	HFC Bank
SCB	Standard Chartered Bank
SGSSB	Societe Generale
SIC	State Insurance Company
UTB	UT Bank
CMLT	Comlot

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CLYD	Clydestone (Ghana) Limited
SWL	Samwood Limited
ACI	African Champion Industries Ltd
TRANSOL	Transol Solutions (Ghana) Limited
ALW	Aluworks Ghana Limited
PZC	PZ Cussons Limited
GWEB	Ghana Web
PBC	Produce Buying Company
AGA	Anglogold Ashanti
TOTAL	Total Ghana Limited
FML	Fan Milik
GGBL	Guiness Ghana Brewery Limited
GSR	Golden Star Resources Limited
GOIL	Ghana Oil
AADS	Anglo Gold Ashanti Limited
AYRTN	Arytin Drugs Company Limited
INDEX	Market Index
CRIS	Financial Crisis
JANE	January effect hypothesis
ABL	Accra Brewery Limited
BOPP	Benso Oil Palm Plantation
CFAO	CFAO Motors
RPKL	Pannier Kitchenware Limited
MLC	Mechanical Llyod Company Limited
SPL	Super Paper Limited
TBL	Trust Bank (Gambia)
UNIL	Unilever Ghana Limited

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CHAPTER ONE

INTRODUCTION

Background to the study

Globally stock market plays an important role in stimulating economic growth of a country. It helps to channel funds from individuals or firms without investment opportunities to firms who have them and thus improves the country's economic efficiency. It is the lifeblood of the economy of a nation that principally affects individuals, firms as well as government. However, stock market is a volatile financial market, in which various factors can affect the return that investors can gain from investing in stocks. The uncertainty of the reward from stock market is translated into risks that investors have to bear for investing in stocks (Lo, 2001).

Generally speaking, every investment decision contains a component of risk and a component of return. The relationship amongst risk and return exists as a risk-return trade off, by which it is implied that it is just conceivable to obtain higher returns by tolerating higher risk. On the off chance that an investor wishes to acquire higher returns, then the investor must welcome that this might be accomplished by tolerating a comparable increment in risk. Risk and Return are emphatically connected; an expansion in one is joined by an increment in the other. The implications for the financial manager is that, in assessing a planned investments and its viability to the entity, such a decision can't be made just by concentrating on its level of return; the planned investment level of risk should be considered simultaneously. This risk-return trade-off is central to investment (McMenamin, 1999).

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In today's financial management, the treatment of risk is the main element of financial decisions as financial decisions involves risk. For instance, an organization that borrows cash is faced with the risk that financing costs may change, and an organization that assembles another processing plant is confronted with the risk that product sales might be lower than anticipated. These and numerous different choices include future cash flows that are risky. Investors generally abhors risk, however, they are unable to maintain a strategic distance from it. The valuation for shares and debt securities shows that the price of a risky asset depends on its expected future cash flows, the time value of money, and risk. To make effective financial decisions, managers and investors need to understand what causes risk, how it should be measured and the effect of risk on the rate of return required by investors (Peirson, Brown, Easton, Howard, and Pinder, 2011).

In the period that the world witnessed the global economic crunch which has been described by analysts as the worst since the great economic depression of the 1930's, stock markets in the world including that of Ghana experienced a sudden unexpected decrease in their operations. According to the World Bank (2009), the impact of the global economic crises was so intense even in the area of private capital flow to emerging markets of which Ghana is not an exception. The report indicated that, private capital flow dropped from $928 billion in 2007 to $466 billion in 2008 – almost 50% drop.

Broadly speaking, actors in the stock market in Ghana are faced with risks that can be categorized into unsystematic risk which is firm specific as a result of company specific factors and systematic risk which is market related

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risk as a consequence of market related factors such as inflation, interest rate, foreign exchange rate and so on.

According to Markowitz Portfolio Theory (Markowitz, 1959), unsystematic risk can be diversified away, that is reduced through diversification of portfolio of assets held and thus, the capital market will not reward investors for bearing this type of risk. Instead, the capital markets will only reward investors for bearing systematic risk that cannot be eliminated through diversification.

Following the positive outlook posed by the Ghanaian stock market and the basic reason that all investors are interested in the returns on their investment, the researcher aims to investigate the risk and return relation of the listed firms on the Ghanaian stock market. Generally, the study hoped to establish a ground for investors and other actors and players in the stock market to managing risk and return while investing in the stock market.

Statement of the problem

Over the years, there have been increased activities on the Ghanaian stock market and this has translated into the impressive performance by the exchange. Coffie and Chukwulobelu (2012) carried out a study that examined whether or not the Capital Asset Pricing Model (CAPM) reasonably describes the return generating process on the Ghana Stock Exchange using monthly return data of 19 individual companies listed on the Ghana Stock Exchange during the period January 2000 to December 2009. The study was done within the Ordinary Least Square (OLS) framework and found that there is a positive linear relationship between equity risk premium and market beta, though the

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strictest form of Sharp and Lintner Capital Asset Pricing Model (CAPM) was rejected.

Antwi, Emire, Mills and Xicang (2012) did a study that compared risk and returns characteristics of stock exchange traded shares and treasury bills in Ghana to find out which of the two instruments gives better rewards to investors. The study made use of annualized returns of these instruments for the period of 1990 to 2010. The study revealed that GSE All-Shares Index has higher risk and higher return.

Acheampong and Agalega (2013), in a study examined the applicability of CAPM in explaining the risk-return relation of selected stocks on the Ghanaian stock market for the period of January 2006 to December 2010. Using linear regression, they concluded that the standard CAPM with constant beta could not be used to statistically explain the observed differences in the actual and estimated return series of the selected stocks.

Furthermore, the efficient market hypothesis (EMH) has seen a couple applications to the stock returns on the Ghana Stock Exchange (GSE) (See Ayentimi et al, 2012; Frimpong, 2008; Frimpong & Oteng-Abayie, 2008; & Osei, 2002). The findings of these studies suggest that the stock returns on the GSE are generally weakly inefficient. Such results further suggest that there may be volatility effect in the stock series that needs to be investigated.

It is the general expectation that financial crises and calendar anomaly should result in increasing systematic risk. According to Bellelah, Bellelah, Ameur and Hafsia, (2015) if the financial crisis actually affects systematic risk

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for stocks, then market participants will use such information to negotiate for stock return premium.

There have been a number of valuable studies of risk and expected return at the Ghana Stock Exchange, namely Coffie and Chukwulobelu (2012), Antwi, Fiifi Emire, Atta Mills and Xicang Zhao (2012), Acheampong and Agalega (2012), Ayentimi et al, 2012; Frimpong, 2008; Frimpong & Oteng-Abayie, 2008; & Osei, 2002, some of which present evidence of a relationship between risk and return. However, none of these studies gave consideration to the effect of the global financial crises in 2007/2008 and January effect hypothesis. This study seeks to investigate the risk- return relationship of the firms listed on Ghana Stock Exchange and how the beta of the firm changes due to financial crisis and calendar anomaly (January effect).

Objective of the study

The study analyzed risk- return relationship of the firms listed on Ghana Stock Exchange and how financial crisis and calendar anomaly (January effect) affect the risk- return relationships. Specifically, this study intended to:

(i) Explore whether CAPM is applicable in valuing securities of firms listed on the Ghana stock exchange.

(ii) Examine whether the financial crisis had an effect on risk and return relationships on the Ghana stock Exchange.

(iii) Explore whether the January effect hypothesis had an effect on the risk-return relationship of the stocks listed on the Ghana Stock Exchange

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Hypotheses

The study sought to test the following hypotheses:

H_1: CAPM is applicable in predicting risk and return relationship of stocks listed on the GSE.

H_2: The Global financial crisis of 2007/2008 had an effect on the risk and return of stocks listed on the Ghana Stock Exchange

H_3: There is evidence of the January Effect on risk and return of stocks listed on the Ghana Stock Exchange.

Significance of the study

A clear understanding of this risk-return relationship is considered as one of the most important variables for investors as well as policy makers. This could affect expected rates of return on every existing asset invested, for example it can help individual investors to make some predictions about the future. In furtherance to this, a determination of the relationship that exist between risk and return in Ghana will influence the quality of advice investment advisors, dealers and brokers give to their client.

Knowing the risk and return relationship in the stock market is crucial for investors to maximize their return and minimize their risk, and thus ensuring the attractiveness of investing in stock market. In other words, investors will be guided as to how to move their resources to maximize their return and minimize their risk thereof. For instance, in periods of economic boom firms with prospects of turning out higher returns would be targeted and vice versa.

Educational instructors across Ghana would be able to give practical illustrations in the field of Credit crunch (2007/2008 Global Financial Crisis)

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and January effect on Stock Markets in corporate finance and investment from the Ghanaian perspective. By so doing teaching and learning would become more meaningful to students. Hence this study contributed to knowledge by testing the old theory of risk and return with specific reference to the Ghanaian situation. This, in essence provided a critique to the theory to help shape the theory in the Ghanaian sense.

Delimitation the study

The study is an attempt to measure the relationship that exists between risk and return of listed firms on the Ghanaian stock exchange. It specifically seeks to test the positive relationship that exist between risk and return as postulated by Sharp and Lintner in reference to the Ghanaian situation.

Limitations of the study

The limitations to the study hinges on the fact that, the study relied heavily on secondary data. The accuracy of the secondary data is however beyond the control of the researcher. The study considers only companies listed on the Ghana Stock Exchange (GSE), principally because those companies are actively traded and information regarding such entities can easily be obtained.

Organization of the study

The study would be structured in five chapters as detailed below;

Chapter one of this study gives the background to the study, the problem statement, research objectives, research hypothesis, significance of the study and the organization of the study. Chapter two reviews existing literature and other academic works written in line with the study being conducted. In effect,

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this chapter summarises other works which are similar and relevant to the research work which would help the researcher to complete the work. Chapter three considers the methodology employed in executing the research work. In doing so the methods used in collecting and analyzing data collected will be considered. Chapter four present a detailed analysis of the data collected. Chapter five which is the final chapter brings to focus the findings of the research work based on the analysis in chapter four. The chapter closes with recommendations by the researcher based on the findings.

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CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter discusses the theoretical and empirical literature that serves as a foundation for a study such as the current one. The chapter discusses the capital asset pricing model and its implications; the arbitrage pricing model; the multi-factor models; risk-return relationship; global financial crisis effects; and the Calendar Month Anomaly (January effect hypothesis). Eventually, this study adopted and modified the CAPM with an introduction of crises effect and the January effect.

Capital Asset Pricing Model (CAPM)

The capital assets model is one of the most important model in financial economics that seek to relate systemic market condition to the behavior of stock returns. Developed and popularized by Sharpe (1964), Lintner (1965) and Black (1972), the CAPM seeks to posit that the only factor that determines the expected rate of return of an investment is the responsiveness of the stock in question to the changes in the overall market condition, measured by the beta coefficient. That is, the beta is the only factor that affect the cross sectional expected returns.

Mathematically, the CAPM model is estimated by:

$$E(r_i) - r_f = \beta_i[E(r_m) - r_f] + \varepsilon_t \qquad (1)$$

Where, $E(r_i)$ is the expected return of the individual stock in a portfolio, r_f is the risk-free rate, β_i is the beta coefficient of the stock market, $E(r_m)$ is the expected market returns and ε_t is the error term. Technically, the

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error term is known as the *alpha* itself, a measure of risk, because it connotes the difference between the actual returns and the expected returns. A higher value of the alpha implies that other variables other than the beta predict actual returns better, hence the huge gap between actual – and expected returns.

The beta coefficient emerges spontaneously when equation (1) is estimated using ordinary least square (OLS). Alternatively, the beta coefficient can be calculated using the following relations:

$$\beta_i = \frac{Cov(r_i, r_m)}{\sigma_m^2} \qquad (2)$$

Where $Cov(r_i, r_m)$ is the covariance between the returns of the individual stocks and the market returns and σ_m^2 is the variance of the market returns.

If the risk of the individual stock is the same as the market risk, the beta would be exactly equal to 1. A beta for individual stock which is greater than one shows that, the stock is aggressive meaning, the stock exhibits above average responsiveness to changes in market conditions. On the other hand, if the beta is less than one, it implies that the stock in question exhibit defensive features since it shows below average responsiveness to market swing (Bodie, Kane & Marcus, 2008). Thus, the basic premise of the CAPM is that barring other factors, the expected risk premium on a stock is the same as the product of the beta and the expected risk premium on a market (Brealey, Myers & Allen, 2008). The model cements the long standing saying that there is a linear relationship between the expected returns and the risk of a portfolio. High beta firms should generate high expected returns according to the CAPM.

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The potency of the CAPM model rests on the assumptions which defeat real world situations. First, there should be many investors who have insignificant wealth level and therefore are not in a position to dictate what goes on the market. Each investor takes the market price as given and therefore cannot buy or sell financial assets at any price he or she wishes. Similarly, the actions by investors to alter the amount of financial assets they buy or sell is also restricted. Investors can also short sell without incurring costs because they can borrow and lend at the risk-free rate. Above all, market information is freely and equally available to all market participants, in such an efficient markets. The above assumptions shows that the CAPM is only applicable when the market is a perfect one and highly competitive. Similarly, the model is a market based model which implies that stocks which are not listed on a stock exchange cannot apply the CAPM to determine the rate of returns of such stocks (González, 2001)

CAPM does not also take into consideration the real world situation that investor pay taxes on the returns that they earn. In addition, borrowing and lending must take place under the risk-free interest regime. In reality, investors borrow and lend at risky conditions which are fueled by macroeconomic instabilities like inflation that increases the risk of investment. Furthermore, the CAPM posits that investors are rational because they maximize their expected returns and minimize the risk of investment. The above requires that all investors must have the same mindset when they are analyzing securities and face similar economic situations which again defeats reality because investors in reality face different investment uncertainties.

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Finally, the model assumes that firms' internal situations and dynamics are ineffectual in determining the expected returns of its stocks.

Arbitrage Pricing Theory (APT) Model

The capital asset pricing model assumes that all stocks are affected by the same systemic factor whose magnitude is determined by the coefficient of the beta which captures all macroeconomic risks. Ross (1976) however posits in a renowned arbitrage pricing (APT) model that stock returns are determined by both macroeconomic factors and company specific factors. As expressed in Brealey et al (2008), the APT model can be represented by:

$$Return = \alpha_0 + \beta_1(r_{factor\,1}) + \beta_2(r_{factor\,2}) + \beta_3(r_{factor\,3}) + \cdots + \varepsilon_t \qquad (3)$$

Equation (3) shows that different macroeconomic factors affect stock returns. In particular some stocks are affected more by certain economic conditions than others and so the model makes provision to pinpoint those factors and determine their impact on certain industries. In addition, the model recognizes that apart from the macroeconomic dynamics, there are firm idiosyncrasies factors which affect a specific stock. These factors are represented by the noise, ε_t. The model also offer a flexible platform for so many external factors to influence stock return since it did not specifically prescribe the specific macroeconomic factors. The factors could be exchange rate factors, oil price factors, interest rate factors, unemployment factors, inflation factor, political factor, institutional factor, gross domestic product and so on. In effect, stock returns are not only affected by the beta of the market returns.

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In the model, risk emanates from both macroeconomic and firm specific factors, but diversification only eliminates the firm specific risks leaving the macroeconomic risks unresolved. Therefore, the magnitude of the noise term in equation 3 determines how risky a stock is within an industry. Ostensibly, investors must concentrate on moving socks from one industry to another if risk premium is non-zero. Diversification can therefore eliminate some risks but not all risks. In essence the correlation coefficient between idiosyncratic risks between two firms should be significantly zero.

The model also predicts possibility of arbitrage conditions when the risk premium of the stock is not the same as the risk premium on the market factors (systemic factors). Consider equation 4, the expected risk premium is the difference between the systematic (market return), r and the risk-free rate, r_f.

$$ERP = r - r_f \quad \ldots\ldots\ldots\ldots \quad (4)$$

If we put equation 3 into equation 4 we obtain equation 5 which depicts the expected risk premium in a multifactor APT model.

$$ERP = \beta_1(r_{factor\,1} \quad r_f) \mid \beta_2(r_{factor\,2} \quad r_f) \mid \beta_3(r_{factor\,3} \quad r_f) \mid \cdots \quad (5$$

Since the risk-free rate is the same for the economy, equation 5 shows that in a situation where any of the returns of the market factors exceed or fall short of 1 then, there is a possibility of arbitrage situation. In the former condition when the returns exceed 1, investors could make a risk-free (arbitrage) profit by short selling. In the later situation, investors make arbitrage profit by long selling (Brealey et al, 2008), when the idiosyncratic risk is whittled away.

We can deduce that both the CAPM and the APT assumes that total risk can be divided into systematic and idiosyncratic risks and diversification

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can be applied to remove the idiosyncratic risk but not the systematic risk. Therefore, stock returns are affected more by system wide conditions and it is unusual for idiosyncratic risks to affect stock returns. In effect, we can measure risk by either the beta of the single market returns (as predicted by the CAPM) or the betas of the multifactor returns (as predicted by the APT model). However, as expressed by Brealey et al (2008), the APT model does not specifically tell us which factors affect the stock return unlike the CAPM which explicitly states the market return as the only factor that affect the stock return. This has given birth to so many empirical models, an example of which is the three-factor model by Fama and French (1995).

Multifactor Models

Fama and French (1992) provided an extension to the characterization of average returns. In a groundbreaking empirical work that sought to investigate the joint role of market beta, size (measured by market equity, defined as the product of earning price and the number of shares outstanding) and book-to-equity (measured by the ratio of book value of equity (BE) to the market value of equity (ME) in the cross-section of average returns on the NYSE, AMEX and NASDAQ stocks. They found that apart from the market beta, two other variables namely, size and book-to-equity are stronger in predicting the behavior of the cross section average returns for the period 1963-1990. Thus, Fama and French (1992) added two other risk factors, size and book-to-equity, to the original market beta (in CAPM) to the determinants of average stock returns. Their model is therefore known as the three-factor model.

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Similarly, Fama and French (1993) provide the following relation to characterize the excess cross section expected returns:

$$E(r_i) - r_f = \beta_i\left[E(r_m) - r_f\right) + \gamma_i E(SBM) + \delta_i E(HML) \qquad (6)$$

In the model, the average excess return of a portfolio $[E(r_i) - r_f]$ depends on the sensitivity of its return to three determinants:

(i) The excess return on a broad market portfolio $[E(r_m) - r_f]$;

(ii) The difference between the return on a portfolio of small stocks and the return on a portfolio of large stocks (SMB, small minus big); and

(iii) The difference between the return on a portfolio of high-book-to-market stocks and the return on a portfolio of low-book-to-market stocks (HML, high minus low).

Since then, Carhart (1997) has also proposed a four factor model which augments the three factor model by Fama and French (1992) with a momentum factor (winner minus losser, WML).

In fact, there have been numerous follow up empirical studies on the link between risks and return in recent years. For instance, Drew, Naughton, and Veeraragavan (2005) compared the performance of the traditional CAPM with the multifactor model similar to Fama and French (1996) for equities listed in the Shanghai Stock Exchange. By applying the same model and methodology employed by Fama and French (1996), the authors tried to determine the degree of the explanatory power of idiosyncratic volatility. They also investigated the assertion that multifactor model findings can be explained by the turn of the year effect. They found that firm size, book to

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market equity and idiosyncratic and the market factor are risk factors that characterize the average return. Unlike, the traditional CAPM which negates the effect of the firm-specific factors, their model essential revealed that total risk is not limited to systematic risk caused principally by the market factor. There was also no evidence for the turn of the year hypothesis - the findings were not driven by seasonal factors.

Similarly, Theriou, Maditinos, Chadzoglou, and Anggelidis, (2005) applied a procedure that mimics Fama and French (1992) and found the size effect but not the market factor effect on the average returns of stocks on the Athens Stock Exchange. In fact, there was a significant negative relationship between the beta and the average returns, thereby defeating the positive linearity assumption in the CAPM. Drew et al. (2006) also found evidence in favour of Fama et al in Germany and England claiming that the three-factor model provides a better characterization of expected returns than the Capital Asset Pricing Model (CAPM). Thus, firm size and idiosyncratic volatility better explain expected returns than the market factor. Recently, Dash and Mahakud (2012) applied the Fama and French time series regression approach to examine the impact of market risk premium, size, book-to-market equity, momentum and liquidity as risk factors on stock return in India. Robust evidence was advanced for the multifactor model by the authors.

In a fashion similar to Ross (1976) model (the APT model), Hyde (2007) found that in addition to significant market risk, there is a significant characterization of expected return by exposure to exchange rate risk and interest rate risk in industries in France, Germany, Italy, and the UK.

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In this study, the conventional CAPM was applied to estimate the beta of the various stocks listed on the Ghana Stock exchange. In addition, the study introduces crisis effect into the model to ascertain the effect of the global financial crisis on the beta of the various stocks. Furthermore, the CAPM was also adjusted to analyze the January effect hypothesis.

Empirical review

Drew, Naughton, and Veeraragavan (2005) compared the performance of the traditional CAPM with the multifactor model proposed by Fama and French (1996) for equities listed in the Shanghai Stock Exchange. They also sought to investigate the explanatory power of idiosyncratic volatility and the possibility that the multifactor model findings can be explained by the turn of the year effect. They showed that firm size, book to market equity and idiosyncratic volatility are priced risk factors in addition to the theoretically well specified market factor. They, however, did not find any evidence in favour of the turn of the year hypothesis which means that the claim that the findings are driven by seasonal factors was not upheld.

In a related study, Drew, Malin, Naughton, and Veeraraghavan, (2006) found that, the three-factor model perform better than the CAPM when finding the relationship for the expected return, claiming that firm size and idiosyncratic volatility are related to security returns, even when different sample periods were analysed. In the same token, Lee and Upneja (2007) modified the three factor model with implied cost-of-equity method and found that, the price-to-forward earnings (PFE), using the implied cost-of-equity (ICE) approach, estimates cost-of-equity of publicly-traded lodging firms more reliably, than the traditional CAPM.

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Tauer (2002) by applying the CAPM to estimate the cost of equity for each of 62 New York dairy farms that participated in a business analysis program from 1988 through 1997 found that none of the stock had a beta that exceeded that of the market for daily farms in New York. The author realized that, the estimated betas were statistically less than one for all farms. In, the same study, risk-adjusted interest rates ranged from a high of 9.46 percent to a low of 0.72 percent, a perfect picture for these low estimated betas.

The underlying principle of the Capital Asset Pricing Model (CAPM) is that there is a linear relationship between systematic risk, as measured by beta, and expected share returns. The CAPM attempts to describe this relationship by using beta to explain the differences between the expected returns on various shares and share portfolios. The CAPM has been the subject of considerable theoretical investigation and empirical research.

Laubscher (2002) discovered in a study that CAPM is useful and has the ability to describe and explain the risk/return relationship. The author also stressed that other risk factors (i.e. other than beta) may also be useful for explaining share returns. The author eventually advised investors to be cautious when using the CAPM model to evaluate investment performance. Hence researchers should take into consideration both internal and other external risk factors when using the CAPM model.

Dolde, Giaccotto, and Mishra (2012) analyzed the potency of the two-factor intertemporal capital asset pricing model (ICAPM) against the traditional CAPM to predict the cost of equity for firms in the United States. The authors found that the cost of equity estimates of the two-factor ICAPM are reasonably close to those of either single-factor model for US firms with

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low-to-moderate foreign exchange exposure; and second, perhaps surprisingly, for US firms with extreme foreign exchange exposure, that the cost of equity estimates of the two-factor ICAPM tend to be very close to those of the domestic CAPM, and even closer than to those of the single-factor global CAPM. This means that the CAPM is still relevant in estimating the expected returns for modern financial assets.

Finally, Lettau and Ludvigson (2001) explored the ability of conditional versions of the CAPM and the consumption CAPM to predict the cross section of average stock returns. They employed log consumption–wealth ratio as a conditioning variable. They discovered that their conditional models perform far better than unconditional specifications and about as well as the Fama-French three-factor model on portfolios sorted by size and book-to-market characteristics. This was because, the conditional consumption CAPM can account for the difference in returns between low-book-to-market and high-book to-market portfolios and exhibits little evidence of residual size or book-to-market effects.

Risk-return relationship

Raputsoane (2009) analysed the intertemporal risk-return relationship in South African stock market based on Merton's (1973) single factor ICAPM framework. In the study, the GARCH-in-mean model was used to analyse the daily excess returns of market and industry stock price indexes of the firms on the Johannesburg stock exchange. After the analysis it was realized that the results generally reinforced the robust positive risk-return relationship between expected returns and the market risk premium. This proposes that the market

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and industry excess returns in the South African stock market behave according to the standard asset pricing theory.

Furthermore the rate of return on an investment is subjective to the perceived risk of investment (Lundblad, 2007). This suggests a direct correlation between market risk and return for the reason that risk-averse investors need additional benefit for assuming extra risk. Markets which are perceived by investors to be high risk related are with higher returns in order to compensate the risk involved in investing in such markets. On the other hand, lower risk markets are regarded as moderately lower returns. Thus it is unambiguous that the risk-return relationship is an essential model in investment decision making and that it is recognized as the cornerstone of rational expectations asset pricing models.

In addition, Leon, Nave and Rubio (2005) employed MIDAS (Mixed Data Sampling) to study the risk-expected return trade-off in some European stock indices. Using MIDAS, it was established that, in most indices, there was a positive significant relationship between risk and expected return. It was also found out that asymmetric specifications of the variance process within the MIDAS framework improved the relationship between risk and expected return. Finally, when bivariate MIDAS was introduced in the analysis there was an evidence of significant pricing of the hedging component for the intertemporal risk-return trade-off. Hence they concluded that Capital Asset Pricing Model (CAPM), postulates a direct relationship between expected excess stock returns and risk. The risk-return trade-off is a long standing phenomenon in investments analysis and is the foundation of financial economics.

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However a study on the tests of the capital asset pricing model by Fama and French (1992) and Baillie and DeGenmaro (1990) showed that there was no significant relationship between the average return and systematic risk of corporate stocks, while Glosten, Jaganathan and Runkle (1993) found a negative and statistically significant relationship for risk-return trade-off. Meaning, though the single factor risk-return relationship has been subjected to voluminous empirical investigation, with all these empirical studies, it still have several conflicting results on the sign and statistical significance of the coefficient of risk aversion thus beta.

Global Financial Crisis Effects

Karunanayake, Valadkhani, and O'brien (n.d) conducted a study that focused on the Asian and global financial crises of 1997-98 and 2008-09 for Australia, Singapore, the UK, and the US, to examine the nature of such a relationship between stock market returns and their volatility where multivariate generalised autoregressive conditional heteroskedasticity (MGARCH) model and weekly data (January 1992-June 2009) were used. The outcome was that there was no significant impact on returns arising from the Asian crisis and the more recent global financial crisis across these four markets. However, both crises significantly increased the stock return volatilities across all of the four markets.

Similarly, Yakubu and Akerele (2012) analyzed the impact of the 2007/2008 global financial crisis on the Nigerian Stock Exchange from 2008 to 2011. Using the ordinary least square it was found that the global financial crisis has no significant effect on the Nigerian Stock Exchange.

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On the other hand, Ali and Afzal (2012) aimed to study the impact of global financial crisis on stock markets of Pakistan and India. The study was conducted with daily data from 1st January 2003 to 31st August 2010 of KSE-100 and BSE-100 indices, representing stock markets' indices of Pakistan and India respectively. In the study EGARCH model was applied to find volatility. The study revealed the 2007/2008 global financial crisis made mild negative impact on stock returns and enhanced volatility in Pakistani and Indian stock exchanges but this impact was stronger on Indian stock market.

January effect hypothesis

The average rate of return on stocks is higher in January than for any other month of the year (Athanassakos & Ackert, 1998). Findings from empirical studies by (Athanassakos, 1995) showed that the January anomaly is associated with firm size and share price, with returns being higher in January for small firms and firms with low stock prices. However, recent research showed that the returns of widely followed firms do exhibit strong seasonality, which is opposite in direction to that reported for small, less visible, low stock price firms (Ackert & Athanassakos, 1997)

Furthermore a study conducted to investigate the existence of January effect in the Brazil, Shanghai, India, Argentina and Turkey indices with use of power ratio method. Monthly logarithmic returns of each market were used starting from the first transaction day to the December 31, 2012. Results indicated the existence of the January effect in China, Argentina and Turkey returns. However no evidence of a January effect was found at Brazil and India stock markets. According to power ratio method abnormal January returns were also observed within specified investigated periods for

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Brazil, Shanghai, Argentina and Turkey for 1994, 1993, 2002 and 1997 respectively (Guler, 2013).

Conclusion

This study applies the CAPM model to analyze the risk and return behavior of stocks on the Ghana Stock Exchange. The attraction of the CAPM is that it offers powerful and intuitively pleasing predictions about how to measure risk and the relation between expected return and risk Fama and French (2000). In other words, CAPM describe the risk-return relationship by using beta to explain the differences between the expected returns on various shares and share portfolios. It purports to provide empirical evidence of the beta levels of the individual stocks after the financial crisis including ascertaining the impact of the crisis in 2007/2008 and the January effect hypothesis on the beta of the stocks within the CAPM framework. Due to limitation of time and space, the current study did not provide empirical evidence within the conditional volatility framework proposed by Engel (1982) and Bollarslev (1986) among others.

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CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter discusses the methods used to provide empirical results in order to meet the objectives outlined in chapter one. First, research paradigm is discussed, then the research design. This is followed by Ghana Stock Exchange which is described. The review traced the history, performance, efficiency and volatility issues, which in the end should confirm the gap that necessitated the current study. The chapter proceeded with a discussion on the population of the study which confirmed that the study adopted a census between the period 1990 and 2011. In addition, the various empirical models which considered the various dimensions of the risk and return relationships have been specified. Models which concern time series characteristics of the returns on the Ghana Stock Exchange have also been specified. In addition, the data and its source had effectively been discussed. Finally, the analytical tools were discussed.

Research Paradigm

Here, an explanation is given to why this study focused on positivist, ontological, epistemological and consideration and how these influenced this research.

Positivism

This study had a Positivistic view and this means that this can be discussed since opinions vary. Although the above offers a short and clear illustration of what is meant by the term Positivism. One of the core reasons why this study had a positivistic view is because it intended to look at reality

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as it is based on conclusions drawn from scientific statements without manipulating these based on personal prior knowledge. This is especially important when performing the data collection and analysis since the data aims at regularity that can be analyzed objectively.

Ontology

Saunders, Saunders, Lewis & Thornhill (2011) definition of ontology refers to the nature of social entity and whether it exists independently or if the social actors are the ones forming it. The research aimed to expound reality with an unbiased and objective method to avoid the risk that investigations are too subjective, which can create problems with the level of validity and replicability. The failure of distinguishing between people and social institutions from the natural world when conducting studies is one of the critiques brought against quantitative researchers according to Bryman and Bell (2011). Consequently, the ontological position of objectivism reflects the objective of the study more than the antithetical approach, constructionism. According to Bryman and Bell (2011) the constructionist observation has a more subjective approach to reality as the interaction between business actors and social phenomena is emphasized while objectivism separates the meaning of these. As the study purely focus on the stock market itself and not speculate on how the business actors on the market had influenced or interpreted whatever outcome or results the data will give, the natural choice was objectivism.

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Epistemology

Epistemology is the view of what is accepted as knowledge within a subject as stated by (Hughes, 1997). A deductive method as applied in this study is commonly connected to positivism as it advocates the method by which a hypothesis is tested and knowledge is gained through collecting of data to ascertain this as indicated by (Marsh & Furlong, 2002). This position is consistent with this study, meaning it will come to conclusions based on facts found through historical data collection to empirically test data and draw conclusions to answer the research hypothesis.

Research Design

The preliminary point of the study is based on an existing theory (CAPM) and the research hypothesis are formed to test the theory's applicability on the Ghana stock market, before and after the crisis of 2008. Hence it is a deductive study, meaning that the purpose is to empirically test the theory and not the opposite as would be seen as inductive. The deductive process can be presented as a straight line where the theory is the point of departure. From this preliminary point, a hypothesis is deducted and a conclusion is drawn based on the empirical results extracted from the study. The hypothesis test is created to analyze whether the postulated risk-return relationship made by CAPM is true. The study collected and tested the historical performance of the model to see how CAPM predicts the expected return, and then compare this to the actual outcome. It was then able to confirm or discard the hypothesis.

As argued by Bryman and Bell (2003) the name deductive comes from deducting a hypothesis from a theory and is usually used in

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combination with quantitative studies. The choice of quantitative studies is more supported by Creswell, (2003) who describes the use of statistical measurements and quantification through mathematical models as quantitative studies, which are based on numerical observations.

According to Bryman (2004) research design is the framework for the collection of data and the subsequent analysis. Descriptive research which was undertaken for this research study is conducted to describe the market characteristics. It attempted to address who should be surveyed, what, at what time (pre- and post-type study), from where (the securities market) and how this information should be obtained (method of data collection). Descriptive researches are generally used in segmenting and targeting the securities market. They are mainly conducted to describe the characteristics of some relevant groups for the research, to understand the demographic and other characteristics of the population, to understand the investor perception about any stocks and to understand the degree of association between risk and return.

It was conducted on the basis of some previous understanding of the research problem and did not completely explore the research phenomenon. Specific hypotheses were formulated before conducting the descriptive research. The structural nature of this research provided it with a clear direction of information collection. Hence, information obtained from this research is not loosely structured. It involved a clear definition of the problem, formulation of specific hypothesis, and collection of structured, detailed, and relevant data (Bajpai, 2011).

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Ghana Stock Exchange

The Ghana Stock Exchange (GSE) is the principal stock exchange of Ghana. The exchange was incorporated in July 1989 with trading commencing in November 1990. It currently lists 38 equities (from 36 companies) and 2 corporate bonds. All types of securities can be listed. Criteria for listing include capital adequacy, profitability, spread of shares, years of existence and management efficiency. The GSE is located in Accra.

Since its inception, the GSE's listings have been included in the main index, the GSE All-Share Index. In 1993, the GSE was the sixth best index performing in emerging stock market, with a capital appreciation of 116 percent. In 1994 it was the best index performing stock market among all emerging markets, gaining 124.3 percent in its index level. 1995's index growth was a disappointing 6.3 percent, partly because of high inflation and interest rates. Growth of the index for 1997 was 42 percent, and at the end of 1998 it was 868.35 (see the 1998 Review for more information). The GSE continued in its activities and as of October 2006 the market capitalization of the Ghana Stock Exchange was about 111,500 billion cedis ($11.5 billion). In December 31, 2007, the GSE's market capitalization was 131,633.22 billion cedis. In 2007, the index appreciated by 31.84 percent (see the "Publications" section on the GSE's website for more information).

The manufacturing and brewing sectors currently dominate the exchange in terms of volume of trading. A distant third is the banking sector while other listed companies fall into the insurance, mining and petroleum sectors. Most of the listed companies on the GSE are Ghanaian but there are some multinationals.

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Although non-resident investors can deal in securities listed on the exchange without obtaining prior exchange control permission, there are some restrictions on portfolio investors not resident in Ghana. The current limits on all types of non-resident investor holdings (be they institutional or individual) are as follows: a single investor (i.e. one who is not a Ghanaian and who lives outside the country) is allowed to hold up to 10 percent of every equity. Secondly, for every equity, foreign investors may hold up to a cumulative total of 74 percent (in special circumstances, this limit may be waived). The limits also exclude trade in Ashanti Goldfields shares. These restrictions were abolished by the Foreign Exchange Act, 2006 (Act 723).

There is an 8 percent withholding tax on dividend income for all investors. Capital gains on securities listed on the exchange will remain exempt from tax until 2015. The exemption of capital gains applies to all investors on the exchange. There are no exchange control regulations on the remittance of original investment capital, capital gains, dividends, interest payments, returns and other related earnings.

Potential changes at the exchange include the introduction of automated trading and the listing of some state banks. The Bank of Ghana plans the development of mutual funds, unit trusts and municipal bonds at a subsequent date. These changes are aimed at making the exchange more relevant, efficient and effective. The exchange was also involved in preparing the draft law on collective investment vehicles.

Population of the study

The study included all the thirty six (36) stocks listed on the Ghana Stock Exchange from 12th November, 1990 to 25th January, 2011. Since,

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stocks on the stock exchange were considered individually, it is appropriate that a census is conducted. In this case, the balance nature of the dataset will not be affected notwithstanding the date upon which a particular stock was listed. The period for the study was specifically selected to cater for period before, during and after the global financial crisis in 2007/2008.

Model specification

The study sought to apply propositions made by Sharp, Lintner and Black (1964,1965,1972). In order to test the CAPM hypothesis by Sharp Lintner and Black the empirical model is specified for each stock on the Ghana Stock Exchange as follows:

$$E(Return_i) - Risk\ Free\ Rate_f = \beta_i\left[E(Market\ Returns_m) - Risk - Free\ Rate_f\right] + \varepsilon_t \ldots (7)$$

Subsequently, in order to ascertain the effect of the financial crisis on the beta of each stock, the study proceeded to alter equation 7 with the inclusion of a dummy variable CRIS. Therefore, equation 7 transforms into equation 8 as follows:

$$E(Return_i) - Risk\ Free\ Rate_f = \beta_i\left[E(Market\ Returns_m) - Risk - Free\ Rate_f\right] + \gamma_i CRIS + \varepsilon_t \quad (8)$$

Where CRIS is the dummy variable to control for the effect of the global financial crisis on the beta of the various stocks and γ_i is the vector of coefficients associated with the various stocks. It is imperative that we control for the financial crisis because of the premise that crises increase the systematic risk of stock Bellelah et al. (2015). If the situation is similar in Ghana, then investors would be informed as to the extent to which they should adjust their return premium to be in tune with the rise in systematic risk.

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Recently, Bellelah et al. (2015) has carried out similar investigations and found that the financial crisis had a rising effect on the beta of six stock indices in France when they applied the MA-GARCH model.

The study tested for the January hypothesis which states that nearly one-third of the volatility in the beta occurs at the first month of every year. In that regard, equation 3.1 is further modified to control for the January effect hypothesis. Accordingly, the following least square model was estimated:

$$E(Return_i) - Risk\ Free\ Rate_f = \beta_i\left[E(Market\ Returns_m) - Risk - Free\ Rate_f\right] + \gamma_i JANE + \varepsilon_t \qquad (9)$$

Where JANE is a dummy indicator for the January effect hypothesis. In this case, all trading sessions in January were assigned the value "1" and any other trading section, the value "0" was assigned. All other variables remained as explained above.

Data and data sources

The study used only secondary data for its analysis. The data collected for the study estimated the individual stock returns from the daily share prices from the period 12th November, 1990 to 25th January, 2011. In this study, simple returns were estimated in order to minimize non stationarity in the price series. Tsay (2005) specified that when simple returns are estimated from a unit root price series, the returns appear to be stationary. The daily stock prices were obtained from the DataBank Research Unit whilst, the daily market returns was obtained from the Ghana Stock Exchange. The study used Excel 2013 and EVIEWS 8 to process the data.

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Data Analysis

Descriptive analysis which involved the assessment of the first, second, third and fourth moments was used. It also involved the bivariate correlation analysis in order to ascertain whether returns within industries on the Ghana Stock Exchange linearly depend on each other. The descriptive analyses were conducted industry by industry as has been classified on the Ghana Stock Exchange. Regression analysis was the statistical technique that was used for investigating and modeling the relationship between risk and return.

Following Elsas, El-Shaer and Theissen. (2003) and Bartholdy and Peare (2005), testing the significant of the model involved three stages: firstly, the estimation of the systematic risk beta (β) of each of the stock in the sample in relation to proxy market; secondly, the estimation of market risk premium of the model with regards to the proxy market; and lastly, to test whether the model can explain the relationship between individual stock return and systematic risk, beta.

Using the selected sample, that is, the thirty six (36) listed firms, beta (β) was calculated using the CAPM formula. This study only endeavored to calculate the stock's beta since it is only systematic risk that is rewarded and tested its relationship with the return of the same stocks.

The study then modified the CAPM model by introducing crisis and January effect hypothesis individually to see their effect on the beta levels and their impact on risk and return relationship.

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CHAPTER FOUR

RESULTS AND DISCUSSIONS

Introduction

This chapter presents the empirical findings analysed from the daily stock prices obtained from the DataBank Research Unit and the daily market returns obtained from the Ghana Stock Exchange. The chapter discussed the information gathered from the analysed data industry by industry but before that characteristics of the stocks on GSE were outlined.

Series Characteristics of Stock on the Ghana Stock Exchange

Stock returns are noted for their time series features which are crucial in determining the performance and direction of investment in the associated stocks. This section describes the first, second, third and fourth moment characteristics of the individual stocks listed on the Ghana Stock Exchange representing the mean, standard deviation, the skewness and kurtosis respectively. This analysis has been conducted based on the industrial classifications of stocks by the Ghana Stock Exchange. The stocks were grouped according to their respective industries. First, Tables 1 and 2 present the descriptive analyses of stocks in the finance industry. In the table, the mean, the standard deviation, the skewness and the kurtosis are described.

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Table 1: Return Characteristics of the Individual Stocks on the Ghana Stock Exchange

	Mean	Median	Maximum	Minimum	Std. Dev.	Jarque-Bera	Prob.	Observ
RAADS	0.000419	0.000	0.15	-0.10145	0.007832	2586340	0.000	1557
RABL	0.001156	0.000	1.985075	-0.58333	0.041493	3.46E+08	0.000	3424
RACI	0.000699	0.000	0.609756	-0.19643	0.02146	9678517	0.000	3267
RAGA	8.57E-05	0.000	0.133333	0.0000	0.00338	1.56E+08	0.000	1556
RALW	0.000302	0.000	0.228571	-0.5	0.023422	1509591	0.000	2688
RAYRTN	0.000633	0.000	0.2	-0.13333	0.013835	354455.1	0.000	1105
RBOPP	0.000388	0.000	0.214286	-0.17647	0.017425	133157.9	0.000	1503
RCAL	0.000542	0.000	0.176471	-0.25	0.022343	54552.69	0.000	1466
RCFAO	0.001237	0.000	0.5	-0.33333	0.027008	1344874	0.000	3296
RCLYD	0.00022	0.000	0.115385	-0.2	0.011155	876329.1	0.000	1547
RCMLT	0.000618	0.000	0.134021	-0.05882	0.007539	2811286	0.000	2263
RCPC	0.000269	0.000	1	-0.5	0.03934	6970801	0.000	1741
REBG	0.00105	0.000	0.131757	-0.2	0.014013	174247.6	0.000	1126

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Table 1, Continued

REGL	0.004598	0.000	0.152174	-0.09091	0.039204	92.20846	0.000	45
RETI	-0.00089	0.000	0.133333	-0.8	0.033876	3724238	0.000	1085
RFML	0.002806	0.000	0.258929	-0.24033	0.023855	86035.34	0.000	3424
RGCB	0.001744	0.000	0.470588	-0.27778	0.025383	592971.8	0.000	2770
RGGBL	0.001811	0.000	0.360825	-0.2	0.023899	363217.8	0.000	3424
RGOIL	0.000769	0.000	0.142857	-0.14815	0.026493	2712.279	0.000	790
RGSR	0.00078	0.000	0.145833	-0.11864	0.012113	232245.8	0.000	730
RGWEB	0.000131	0.000	0.666667	-0.4	0.021367	35445844	0.000	1343
RHFC	0.001333	0.000	0.306122	-0.14815	0.016103	772954.6	0.000	2951
RMLC	0.001208	0.000	0.564626	-0.2	0.023081	2828549	0.000	3077
RPBC	0.000629	0.000	0.157895	-0.13333	0.016503	112967.5	0.000	2161
RPKL	0.000749	0.000	0.463415	-0.13793	0.017599	9766992	0.000	2883
RPZC	0.001621	0.000	0.416667	-0.42308	0.021834	2266366	0.000	3424
RSCB	0.002433	0.000	0.384615	-0.1625	0.019198	1137860	0.000	3424
RSGSSB	0.00108	0.000	0.535517	-0.5	0.024971	5190556	0.000	2862

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Table1. continued

RSIC	0.000813	0.000	0.15	-0.10256	0.021899	3807.315	0.000	745
RSPL	-0.00011	0.000	0.25	-0.2	0.013036	2017045	0.000	1453
RSWL	-0.00019	0.000	0.030534	-0.37736	0.009024	2.09E+08	0.000	1866
RTBL	0.000754	0.000	0.132075	-0.5	0.014796	41623560	0.000	1778
RTOTAL	0.00189	0.000	0.421053	-0.1791	0.019218	1664889	0.000	3356
RTRANSOL	0.000726	0.000	1	-0.14286	0.032821	30543993	0.000	1011
RUNIL	0.001463	0.000	0.428571	-0.8	0.025035	18424572	0.000	3424
RUTB	-0.00017	0.000	0.142857	-0.13044	0.02654	1638.587	0.000	535
RINDEX	0.00028	0.000	0.24487	-0.92819	0.020654	2.07E+08	0.000	3424

Source: Author's construct (2014).

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From Table 1 above, average returns for CAL bank (RCAL), Ecobank Ghana (REBG), Enterprise Group Limited (REGL), Ecobank Transnational (RETI) GCB (RGCB), HFC Bank (RHFC), Standard Chartered Bank (RSCB), Societe Generale (RSGSSB), State Insurance Company (RSIC) and UT Bank (RUTB) are 0.054 percent, 0.105 percent, 0.46 percent, -0.09 percent, 0.17 percent, 0.13 percent, 0.24 percent, 0.08 percent, 0.08 percent and -0.02 percent respectively. All stocks in the financial industry also reported median of 0.00 percent. The mean and the median did not coincide for all firms. The implication is that, the session returns in the financial firms are not normally distributed. This finding is corroborated by the coefficient of the Jarque-Bera which shows lack of normal distribution at the 1 percent significant level. Normality of the series has implications on the efficiency of the financial sector. When a stock is efficient, its Jarque-Bera statistics should produce an indicator for normal distribution. As it is, there is enough evidence that the returns on the financial sector of the Ghana Stock Exchange do not show that the Ghana Stock Exchange is an efficient market.

Similarly, the characteristics of stocks in the converter/IT industry are described in Table 1. From the Table, the average session returns for Comlot (RCMLT), Clydestone (RCLYD), Samwood (RSWL) RACI and RTRANSOL are 0.0618 percent, 0.022 percent, -0.0189 percent, 0.0699 percent and 0.0726 percent respectively. Moreover all stocks in the Converter/IT industry reported median of 0.00 percent. The mean and the median again did not coincide for all firms confirming that stocks on the GSE do not follow symmetric trend. The implication is that, the returns in the Converter IT industry are not normally distributed. This assertion is supported by the coefficient of the

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Jarque-Bera which shows lack of normal distribution at the 1 percent significant level. Normality of the series has implications on the efficiency of the Convertor/IT sector. There is enough evidence that the returns on the Converter/IT sector of the Ghana Stock Exchange do not show that the sector is efficient. In terms, of volatility, Table 1 shows the returns of TRANSOL is the most volatile stock as it reported the greatest level of standard deviation, which is a measure of risk. By extension, TRANSOL is the most volatile stock within the converter/IT industry.

Table 1 also describes stock returns within the manufacturing/trading industry. The average returns ranges from 0.0302 percent to 0.1621 percent attributable to Aluworks (RALW) and PZ Cussons (RPZC) respectively. In terms of returns RPZC is the best performer and RALW is the least performer. The risk level as measured by the standard deviation of the various stocks indicates that RPKL is the least risky stock within the industry with a standard deviation of 1.76 percent. The most risky stock within the market was RUNIL which reported standard deviation of 2.50 percent.

Table 1 further describes stock returns within the agric/agro processing industry. The average returns ranges from 0.013% to 0.063%% for to RGWEB and RPBC respectively. In terms of returns RPBC is the best performer and RGWEB is the worse performer. The risk level as measured by the standard deviation of the various stocks indicate that RPBC is also the least risky stock within the industry with a standard deviation of 1.65 percent making the stock most dealer for investors. The most risky stock within the market was RCPC which reported standard deviation of 3.93 percent.

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Table 1 describes stock returns within the metal/oil industry. The average returns ranges from 0.0086 percent to 0.19 percent for to RAGA and RTOTAL respectively. In terms of returns RTOTAL is the best performer and RAGA is the worse performer even though its risk level is the lowest. However, RGOIL is the most risky asset within the industry with a standard deviation of 2.65 percent.

The final set of descriptive analysis was on the pharmaceutical/beverage industry. Within this industry, RSWL is the least performer in terms of average returns. The company reported a negative mean returns (-0.019 percent) over the period. The risk level of the company as expected was also the lowest (0.90 percent) as measured by the standard deviation. RFML produced the highest returns at 0.28 percent. The riskiest asset was RGGBL which reported a standard deviation of 2.39 percent over the period. These and other dynamics within the industry are described in Table 1.

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Table 2: Stock Returns Correlation Matrix: Finance Industry

	RCAL	REBG	REGL	RETI	RGCB	RHFC	RSCB	RSGSSB	RSIC	RUTB
RCAL	1.000000									
REBG	-0.089979	1.000000								
REGL	0.001932	0.143735	1.000000							
RETI	-0.440265	-0.064349	-0.056830	1.000000						
RGCB	0.004916	-0.099480	0.035565	-0.119284	1.000000					
RHFC	0.058746	-0.139123	-0.039215	0.029080	0.046603	1.000000				
RSCB	-0.121224	0.008442	0.321366	-0.007092	0.258041	0.043921	1.000000			
RSGSSB	-0.137714	0.061326	-0.157286	0.054889	-0.058202	-0.061938	-0.250185	1.000000		
RSIC	0.219824	0.025778	0.007419	-0.076924	0.147594	0.281811	-0.004421	-0.175329	1.000000	
RUTB	0.133935	-0.375796	-0.133737	0.237452	-0.017602	0.222777	0.014383	-0.071415	0.167995	1.000000

Source: Author's construct (2014).

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From Table 2, the bivariate relationship of the stock returns in the financial sector has been established with a correlation matrix. The correlations coefficients generally showed weak relationship in either positive or negative directions. For example, there is a weak negative relationship between CAL Bank returns and Ecobank Ghana's returns with a correlation coefficient of -0.09. However, there was a weak positive relationship between the CAL Bank returns and that of HFC Bank, with a correlation coefficient of 0.06. The directions of the correlation coefficients indicate investment diversification possibilities. When the correlation coefficient is negative, it implies the returns of the two stocks move in opposite direction and therefore have different responses to stocks performance.

Investors are always advised to have portfolio of assets with negative coefficients. Because the direction of the correlation coefficients signifies possibility of investment diversification, we can infer that to reduce their risk, investors can demarcate their portfolio among CAL Bank and Ecobank; CAL Bank and Ecobank Transnational; CAL Bank and Standard Chartered Bank; and CAL Bank and Societie Generale but not between CAL Bank and Enterprise Group; CAL Bank and GCB; CAL Bank and HFC Bank; CAL Bank and State Insurance Company as well as, CAL Bank and UT Bank. Similar deductions apply to other bivariate relationships among the stock returns. The striking inference is that, in Ghana, diversification is possible among stocks within the same industry according to GSE's classification.

Furthermore, from Table 3, the bivariate relationship of the stock returns in the converter/IT industry has been established with a correlation matrix. The correlations coefficients generally showed weak relationship in

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either positive or negative directions. For example, there is a weak negative relationship between CMLT returns and CLYD as well as CMLT and SWL returns with a correlation coefficient of -0.000990 in both cases. Investors can spread their assets among these three stocks. However, there was a weak negative relationship between the TRANSOL returns and that of ACI, at -0.001288 in magnitude, which implies that diversification is also possible between those two stocks.

Table 3: Stock Return Correlation Matrix – Converter/IT Industry

	RCMLT	RCLYD	RSWL	RACIRTRANSOL	
RCMLT	1.000000				
RCLYD	-0.000990	1.000000			
CFAO	-0.000990	-0.000990	1.000000		
RACI	0.001831	0.001831	0.001831	1.000000	
RTRANSOL	0.087896	0.000697	0.000697	-0.001288	1.000000

Source: Author's construct (2014)

Table 4 shows the results on the correlational relationships of the stock returns in the manufacturing/trading industry. The correlations coefficients basically showed weak relationship in either positive or negative directions. For example, there was a weak negative relationship between RMLC returns and RPZC as well as CMLT and SWL returns with a correlation coefficient of -0.003843. Investors can spread their assets among these two stocks for diversification benefits. However, there was a weak positive relationship among all other stock returns within the manufacturing/trading industry.

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Table 4: Stock Return Correlation Matrix – Manufacturing/Trading Industry

	RALW	RMLC	RPKL	RPZC	RUNIL
RALW	1.000000				
RMLC	0.080598	1.000000			
RPKL	0.048866	0.032863	1.000000		
RPZC	0.021279	-0.003843	0.092819	1.000000	
RUNIL	0.023257	0.025727	0.016404	0.039047	1.000000

Source: Author's construct (2014)

Table 5 reports on correlational relationships of the stock returns in the agric/Agro processing industry. The correlations coefficients showed weak relationship in either positive or negative directions among the stock returns. There was a weak negative relationship between RBOPP returns and that of RPBC. In the same token, there was an extremely weak negative relation between stock returns from RCPC and RGWEB returns with a correlation coefficient of -0.000042. Investors can spread their assets among these two stocks for diversification benefits. However, there was a weak positive relationship among all other stock returns within the manufacturing/trading industry.

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Table 5: Stock Return Correlation Matrix – Agric/ Agro Processing Industry

	RBOPP	RCPC	RGWEB	RPBC
RBOPP	1.000000			
RCPC	0.045846	1.000000		
RGWEB	0.064501	-0.000042	1.000000	
RPBC	-0.030106	0.000166	0.000150	1.000000

Source: Author's construct (2014)

Table 6 reports on the correlational relationships of the stock returns in the metal/oil industry. The correlations coefficients showed weak relationship in either positive or negative directions among the stock returns. However, there was a weak negative correlation between RAGA and all other stock returns in the industry. This means any portfolio of stocks that leverages the hedging of risk may include RAGA. Similarly there was bivariate weak negative relationship between RAADS' returns and that of RGOIL. RGOIL also correlates negatively with RGSR which illustrate another well-mixed bivariate hedging situation within the metal/oil industry. Investors can spread their assets among these stocks for diversification benefits.

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Table 6: Stock Return Correlation Matrix – Metal/Oil Industry

	RAGA	RAADS	RGSR	RGOIL	RTOTAL
RAGA	1.000000				
RAADS	-0.002308	1.000000			
RGSR	-0.002386	0.070179	1.000000		
RGOIL	-0.000439	-0.089297	-0.071155	1.000000	
RTOTAL	-0.003712	-0.135186	0.057034	0.011009	1.000000

Source: Author's construct (2014)

Table 7 reports on correlational relationships of the stock returns in the pharmaceutical/beverage industry. The correlations coefficients showed weak relationship in either positive or negative directions among the stock returns. There was a weak negative relationship between RAYRTN returns and that of RFML with a reported correlation coefficient of -0.00587. Similarly, there was a weak negative relation between stock returns from RFML and RGGBL returns with a correlation coefficient of -0.03772. Investors can spread their assets among these two stocks for diversification benefits.

Table 7: Stock Return Correlation Matrix – Pharmaceutical/Beverage Industry

	RAYRTN	RFML	RGGBL	RSWL
RAYRTN	1.000000			
RFML	-0.005870	1.000000		
RGGBL	0.007111	-0.037720	1.000000	
RSWL	0.001377	0.003862	0.001467	1.000000

Source: Author's construct (2014)

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Exploring the risk level of individual stocks (1990-2011)

In Table 1, we reported that the standard deviation serves as a measure for risk of the individual stock returns. The higher the standard deviation, the higher the risk level associated with the particular stock. Conversely the average return, which is a proxy for the expected return measures favourably when it is high at a relatively lower standard deviation. The challenge is that, for comparison purposes, both the expected return and the standard deviation may give conflicting assessment of the expected return-risk optimization process. In such situations, the coefficients of variation (CV) serve as the standardized tool for comparison in terms of risk-return trade-off. Table 8 provides estimates of the CV of the individual stocks, helping us to ascertain the stock that leverages the trade – off between risk and returns. The criterion for evaluation is that, the stock that produces the lowest CV is the most efficient for investment, assuming that the market is perfect.

Table 8 also reports on the individual stock's beta level. The beta reports on the variation of the expected returns in relation to the variation in the market returns as represented by the returns on the market index. A more risky stock has its beta exceeding that of the market beta which is normally expressed in unity. When the stock beta is below the market returns, the corresponding stock returns are not as risky as the market trend dictates (Liu & Cao, 2011).

Table 8 also describes the correlational relationship between the individual stocks returns and that of the market index. The coefficients generally showed weak relationship between the individual stock returns and the market return.

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Table 8: Estimations of the Risk Level of the Individual Stocks

	Beta	Coefficient of Variation	Correlation
RAADS	-0.02508	18.69212	-0.06614
RABL	0.151835	35.8936	0.075579
RACI	0.023441	30.701	0.022561
RAGA	0.000229	39.43991	0.001399
RALW	0.014433	77.55629	0.012727
RAYRTN	-0.00082	21.85624	-0.00122
RBOPP	-0.03811	44.90979	-0.04517
RCAL	2.49E-05	41.22325	2.3E-05
RCFAO	0.041231	21.83347	0.031531
RCLYD	-0.00068	50.70455	-0.00126
RCMLT	0.002259	12.19903	0.006189
RCPC	0.001225	146.2454	0.000643
REBG	0.047463	13.34571	0.069957
REGL	0.432197	8.526316	0.227696
RETI	4.72E-06	-37.9776	2.88E-06
RFML	-9.54E-06	8.501426	-8.3E-06
RGCB	-4.37E-06	14.55447	-3.6E-06
RGGBL	-3.56E-06	13.19658	-3.1E-06
RGOIL	-2.93E-06	34.45124	-2.3E-06
RGSR	-2.98E-06	15.52949	-5.1E-06
RGWEB	-4.86E-07	163-.1069	-4.7E07

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Table 8 Continued

RHFC	-4.64E-06	12.08027	-6E-06
RMLC	-4.24E-06	19.10679	-3.8E-06
RPBC	-2.49E-06	26.23688	-3.1E-06
RPKL	-2.42E-06	23.49666	-2.8E-06
RPZC	-5.92E-06	13.46946	-5.6E-06
RSCB	-6.08E-06	7.89067	-6.5E-06
RSGSSB	-2.15E-06	23.1213	-1.8E-06
RSIC	-2.85E-06	26.93604	-2.7E-06
RSPL	3.50E-07	-121.832	5.55E-07
RSWL	6.77E-07	-47.746	1.55E-06
RTBL	-2.87E-06	19.62334	-4E-06
RTOTAL	-4.60E-06	10.16825	-4.9E-06
RTRANSOL	-2.76E-06	45.20799	-1.7E-06
RUNIL	-2.16E-06	17.1121	-1.8E-06
RUTB	8.09E-07	-157.041	6.3E-07
RINDEX	1.00E+00	73.76429	1

Source: Author's construct (2014)

The CV ranges from as low as -157. 04 to as high as 77.55629 for RUTB and RALW respectively. Therefore, RUTB is the least risky assets on the GSE but, RALW is the most risky asset on the Ghanaian bourse.

Unit root test results

This study employed both the Augmented Dickey Fuller (ADF) and the Philip-Perron (PP) approaches to determine the stationarity of the returns of the various stocks on the GSE. Both ADF and PP approaches test for the

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null hypothesis of unit root (nonstationarity) in the return series against the alternative hypothesis of stationarity in the series. The results reject the null hypothesis for the returns of all stocks including the return on the market (RINDEX). This means that returns of stocks on the Ghana stock exchange do not have unit root in them and therefore are stationary at the 5 percent significant level. Interestingly, the stationarity of the market return (RINDEX) implies that the Ghana Stock market failed to meet the weak form of market efficiency, judging from the random walk hypothesis. The GSE is hugely not efficient, implying that past returns do not predict current returns. Appendix A presents the results of the unit root test.

Assessing the Beta Level for the Period 1990-1998

Table 8 reports on the beta level of listed firms for the period 1990-2011. From that table, the study revealed that the market return was insignificant in explaining the expected returns of the individual stocks within the CAPM proposition. As a robust check for that result, the study sampled observations from 1990 to 1998, to ascertain whether the trend has always been the same. Table 9 presented the sampled result with respect to the magnitude of the beta over the period.

The results from Table 9 is monotonically different from that of the previous table. Table 9 produced a strong position that market returns had predictive power with respect to the expected returns of the individual stocks. The stock market return was significant in explaining the expected returns among all stocks.

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Table 9: Beta Levels of Stocks on the Ghana Stock Exchange (12/11/1990-1998)

Stocks	Beta	F-Statistics	DW-Statistics
RABL	0.932159	40.50(0.000)*	1.957122
RACI	0.188539	11.30(0.001)	2.011745
RALW	0.188824	5.63(0.018)	2.024318
RCFAO	0.342233	15.55(0.000)	1.478550
RFML	0.679389	100.53(0.000)	1.544164
RGCB	1.732719	255.56(0.000)	1.915659
RGGBL	0.945055	195.53(0.000)	1.567655
RHFC	0.221337	10.80(0.000)	1.810943
RMLC	0.236385	5.88(0.000)	1.931489
RPKL	0.216951	4.53(0.000)	1.917891
RSCB	0.878369	314.06(0.000)	2.028317
RSGSSB	0.882316	106.98(0.000)	1.898192
RTOTAL	0.812298	176.74(0.000)	1.990205
RUNIL	1.097808	205.58(0.000)	1.968504

*P-values in parenthesis.

Source: Author's construct (2014)

Subsequently, the study proceeded to rank the betas of the various stocks from the lowest, representing low risk stocks, to the highest, representing a high risk stock in Table 10. Table 10 showed that RACI was the most riskless stock on the GSE between its inception and by the end of 1998, with beta as low as 0.1885**.** Conversely, RGCB reported the highest beta magnitude which over shooted the market index by 73 basis points within the same period.

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Table 10: Ranking of Stocks on the Ghana Stock Exchange Based on Beta

Stocks	Beta	Ranking
RACI	0.1885	1
RALW	0.1888	2
RPKL	0.2170	3
RHFC	0.2213	4
RMLC	0.2364	5
RCFAO	0.3422	6
RFML	0.6794	7
RTOTAL	0.8123	8
RSCB	0.8784	9
RABL	0.9322	10
RGGBL	0.9451	11
RUNIL	1.0978	12
RGCB	1.7327	13

Source: Author's construct (2014)

Moreover, the study further sampled later periods (4/1/2009-15/1/2011) within the overall study period (12/11/1990-25/1/2011) to ascertain if the trend with respect to the market's ability to predict the expected return would persist. The period was purposely sampled to determine the explanatory power of the beta after the financial crisis in 2008. It is realized that, the trend is drastically different from the earlier sampled period with respect to the magnitude and the potency of the beta to predict expected returns of the various stocks.

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Table 11: Beta Levels of Stocks on the Ghana Stock Exchange (4/1/2009 – 25/1/2011)

Stocks	Beta	F-Stat	DW
RAADS	-0.084462	2.728378(0.0992)	2.047768
RABL	0.020632	0.135343(0.7131)	1.154149
RACI	-0.005853	0.053769(0.8167)	2.008130
RAGA	0.002573	0.013039(0.9091)	2.004127
RALW	0.004007	0.002051(0.9639)	1.978375
RAYTN	-0.006011	0.014411(0.9045)	2.083155
RBOPP	0.011108	0.024832(0.8748)	1.469525
RCAL	0.131577	1.309622(0.2530)	1.935250
RCFAO	-0.037911	0.075523(0.7836)	2.001226
RCLYD	-0.002419	0.013106(0.9089)	2.004008
RCMLT	-	-	-
RCPC	0.028103	0.011218(0.9157)	2.406258
REBG	0.119546	2.864511(0.0912)	1.991868
REGL	0.432197	0.655256(0.4227)	0.871991
RETG	1.356211	152.1479(0.0000)	2.218846
RFML	0.139327	2.933311(0.0874)	1.448082
RGCB	0.054079	0.244307(0.6213)	1.730632
RGGBL	0.166147	12.64683(0.0004)	1.959065
RGOIL	-0.009178	0.006115(0.9377)	1.882307
RGSR	-0.009511	0.029602(0.8635)	1.516885
RGWEB	0.014606	0.012335(0.9116)	2.000506
RHFC	0.009057	0.013391(0.9079)	2.379276
RMLC	-0.092652	3.735517(0.0538)	2.016458
RPBC	-0.092211	0.947979(0.3307)	1.923669
RPKL	-	-	-
RPZC	0.012495	0.384908(0.5353)	2.001836
RSCB	0.064418	1.950242(0.1632)	2.016798
RSGSSB	0.491480	14.25776(0.0002)	1.737933
RSIC	0.266114	8.314134(0.0041)	1.828735

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Table 11 Continued

RSPL	-0.060714	0.905652(0.3417)	2.001077
RSWL	-0.049830	0.611134(0.4347)	2.002776
RTBL	-	-	-
RTOTAL	0.097178	4.697962(0.0307)	1.916366
RTRANSOL	-0.006477	0.019873(0.8879)	2.006969
RUNIL	0.000159	1.01E-05(0.9975)	2.212360
RUTB	0.166840	2.598700(0.1076)	2.040952

Source: Author's construct (2014)

For instance, Table 11 shows that GCB was no longer the riskiest stock as measured by the magnitude of its beta. Whereas the company realized a beta of 1.7324 in the period 1990-1998, its explanatory power has dwindled to 0.054079 within the period 2009 to 2011. Various reasons could be attributed to the differences described above. Between those two periods, the financial market experienced so many development. Even though, the efficiency level has not been improved, positive political development i.e. enhanced democratic environment spearheaded by smooth transfer of power between the two major political parties (National Democratic Congress, NDC and New Patriotic Party, NPP).

Such an environment affords firms to improve their internal arrangement to compete effectively thereby mitigating the harmful effect within its industry on the expected returns that flow to investors. Furthermore, there have been an expansion of the number of listed firms in the GSE. This expansion has a root in the financial market liberalization which started after the structural adjustment programme. The influx of more stocks onto the GSE triggers companies to improve their internal processes to enhance competitive advantage. In such instances, the beta may fail to predict the expected return

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but the idiosyncratic risk can be instrumental in predicting the expected return of the various stock. Finally, the automation of the Ghanaian bourse, which facilitated trading and information flow should enhance the efficiency of the market.

Stocks Returns and their Responsiveness to the Global Financial Crises and the January Effect

The study further sought whether the recent global financial crisis might have affected the beta level of the individual stocks. In this direction, the study introduced a dummy variable, CRIS to represent the effect of the global financial crisis on the expected returns and whether the financial crisis increase market risk or otherwise for each stock. CRIS was tagged "1" during the period of the financial crisis and was tagged "0" any other period.

Similarly, the study tested the January effect hypothesis. It implies that in January stock returns are highly volatile than any other month. This study holds that if the January return hypothesis is true, then it should increase the variability of the share return for each stock and for that matter increase the beta for each of the stocks on the GSE. This study introduced the January effect into the CAPM model to address possible anomalies by using a dummy variable, JANE, to represent the January effect. It allocated '1' to any trading section within the month, January and '0' to any other trading section outside January. The expectation was that the January effect would increase the magnitude of the beta of individual stocks.

The following pages take the stocks individually and analyzes the effect of the beta, the financial crisis and the January hypothesis on each stock.

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RAADS

Tables 12 through to 20 contain the main results for individual stocks. In table 13, the first column (1) shows the coefficient of the market index (beta) for the first stock Return of Anglo Gold Ashanti (RAADS), the second column (1C) controls for the effect of the global financial crises on the stock in question and the third column (1J) controls for the January effect. The dependent variable is RAADS. For the first least square estimation, the independent variable was INDEX representing the returns of the market index on the Ghana Stock Exchange. Subsequent estimation added the CRIS into the model. Finally, CRIS was substituted with JANE in the final model. In this study the constant is a measure for the abnormal risk, that is, other factors other than the beta contributing to the risk and return relationship.

The results for RAADS show that, the systematic risk as measured by the coefficient of the market index (INDEX) was not significant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was negative and the magnitude was 0.0251, even though not significant. In the same token, the abnormal risk as measured by the coefficient of the constant was significant and positively related to the expected returns. Thus, with respect to RAADS, there was no evidence in favour of the CAPM confirming Fama and French (1992) and Baillie and DeGenmaro (1990), but there was evidence in favour of the returns anomalies.

When CRIS was introduced into the model, both the systematic risk and the abnormal risk were not significant in explaining the expected return of RAADS confirming (Yakubu & Akerele, 2012). The explanatory power (in

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absolute terms) of the market index fell from 0.0251 to 0.0236 – a fall in explanatory power by about 600 basis points (5.98%). Similarly, the explanatory power of the abnormal risk also fell from 0.0004 to 0.0002, representing exactly 5000 basis points (50%) fall in explanatory power. The financial crisis decreased internal risk of RAADS such as operational risk or business risk more than the systematic or external risk.

Conversely, when the January hypothesis (JANE) was introduced into the model, the dynamics changed. As read from column 1J, the explanatory power of the systematic risk fell by only 150 basis points which means that the January effect actually decreased systematic risk of RAADS. But, the abnormal risk's potential to predict expected returns increased from 0.0004 to 0.0005, representing an increase by about 250 basis points. This suggests that the January effect significantly increased the abnormal risk, but not the systematic risk.

Finally, by reading from row 3 against column 1C, it is realized that the financial crisis (CRIS) had an overall positive and significant effect on the expected returns of the stock RAADS at the five percent significant level contradicting with the empirical finding of (Yakubu & Akerele,2012 and Karunanayake, Valadkhani, & O'brien, (n.d)) who reported no significant impact on returns. But, the January effect had no significant but negative overall effect on the expected returns of the stock RAADS, as read from the row 4 against column 1J. This finding refutes (Guler, 2013; Athanassakos & Ackert, 1998; Ackert & Athanassakos, 1997).

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Accra Brewery Limited (RABL)

Table 12 also contains our main results for Accra Brewery Limited (ABL). In table 12, the fourth column (2) shows the coefficient of the market index (beta) for the first stock (RABL), the fifth column (2C) controls for the effect of the global financial crises on the stock in question and the sixth column (2J) controls for the January effect. The dependent variable is RABL. For the first least square estimation, the independent variable was INDEX representing the returns of the market index on the Ghana Stock Exchange. Subsequent estimation added the CRIS into the model. Finally, CRIS was substituted with JANE in the final model. In this study the constant is a measure for the abnormal risk when RABL was the dependent variable.

The results for RABL shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was significant at the 1 percent level, in explaining the expected return agreeing with Sharpe (1964) and Lintner (1965) who stated that risk-return relationship is linear (see Leon, Nave & Rubio, 2005; Raputsoane, 2009; and Lundblad, 2007). The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.1518. Similarly, the abnormal risk as measured by the coefficient of the constant was insignificant and positively related to the expected returns. Thus, with respect to RABL, there was evidence in favour of the CAPM, but there was no evidence in favour of the returns anomalies.

When CRIS was introduced into the model, the trend did not change in terms of the direction of the relationships. The systematic risk was significant but the abnormal risk were not significant in explaining the expected return of

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RABL. The explanatory power (in absolute terms) of the market index fell from 0.1518 to 0.1513 – a fall in explanatory by about 32.94 basis points. However, the explanatory power of the abnormal risk also increased from 0.0011 to 0.0013, representing exactly 1818 basis points. The financial crisis increased internal risk for RABL, such as, operational risk or business risk. But the crises decreased systematic or external risk patterning to the stock market.

Furthermore, when the January hypothesis (JANE) was introduced into the model, there was still positive and significant relationship between the market risk and the expected return for RABL. From column 2J, the explanatory power of the systematic risk increased from 0.1518 to 0.1523 – an increase by 32.94 basis points which means that the January effect actually increased systematic risk for RABL. But, the abnormal risk's potential to predict expected returns also increased from 0.0011 to 0.0012, representing an increase by about 910 basis points. This suggests that the January effect increased both the abnormal risk and systematic risk but its effect on the abnormal risk was greater (Guler, 2013 and Ackert & Athanassakos, 1997).

From row 3 against column 2C, it was found that the financial crisis (CRIS) had an overall negative (Ali & Afzal, 2012) but insignificant effect on the expected returns of the stock RABL (Ali & Afzal, 2012). The January effect also had insignificant but negative overall effect on the expected returns of the stock RABL was contrarily to the empirical findings of Athanassakos and Ackert, 1998; Ackert and Athanassakos, 1997; and Athanassakos, 1995 who reported that the average rate of return on stocks is higher in January than

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for any other month of the year as it can be read from the row 4 against column 2J.

RACI

Similar analysis had been conducted for RACI and the findings are also found in table. In table 13, the seventh column (3) shows the coefficient of the market index (beta) for the third stock (RACI), the eighth column (3C) controls for the effect of the global financial crises on the stock in question and the ninth column (3J) controls for the January effect. The dependent variable is RACI. For the first least square estimation, the independent variable was INDEX representing the returns of the market index on the Ghana Stock Exchange. Subsequent estimation added the CRIS into the model. Finally, CRIS was substituted with JANE in the final model. In this study the constant is a measure for the abnormal risk.

When the INDEX was the only independent variable, the EVIEWS output did not show any results contradicting with the proposition of (Sharpe, 1964 and Lintner, 1965). When CRIS was introduced into the model, both the systematic risk and the abnormal risk were not significant in explaining the expected return of RACI. Both were positively related to the expected return of RACI. The explanatory power (in absolute terms) of the market index was 0.023. However, the abnormal risk was significant in explaining the expected return of RACI at the 5 percent level. The coefficient showed a positive relationship between the abnormal risks and the expected return. Similarly, the explanatory power of the abnormal risk also fell from 0.0009 to 0.0007, representing exactly 2,222 basis points fall in explanatory power, when the January effect was incorporated. The financial crisis decreased internal risk of

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RACI such as operational risk or business risk more than the systematic or external risk.

Finally, by reading from row 3 against column 3C, it is realized that the financial crisis (CRIS) had an overall negative but insignificant effect on the expected returns of the stock RACI (Ali & Afzal, 2012). Similarly, Guler, 2013; Athanassakos and Ackert, 1998; Ackert and Athanassakos, 1997 do not agree to the results of this study, thus the January effect had no significant but negative overall effect on the expected returns of the stock RACI, as read from the row 4 against column 3J.

Anglogold Ashanti (RAGA)

Subsequently, the study analyzes the determinants of expected return for RAGA. In table 12, the ninth column (4) shows the coefficient of the market index (beta) for the first stock (RAGA), the tenth column (4C) controls for the effect of the global financial crises on the stock in question and the eleventh column (4J) controls for the January effect. The dependent variable is RAGA. For the first least square estimation, the independent variable was INDEX representing the returns of the market index on the Ghana Stock Exchange. Subsequent estimation added the CRIS into the model. Again, CRIS was substituted with JANE in the final model. In this study the constant is a measure for the abnormal risk.

The results for RAGA shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was insignificant in explaining the expected return which does not conform to the proposition of (Sharpe, 1964 and Lintner, 1965). In the same token, the abnormal risk as measured by the coefficient of the constant was insignificant and positively related to the

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expected returns. Thus, with respect to RAGA, there was no evidence in favour of the CAPM and the returns anomalies (Fama and French, 1992).

When CRIS was introduced into the model the results confirmed the findings of (Karunanayake, Valadkhani, & O'brien, (n.d) and Yakubu & Akerele, 2012). Thus both the systematic risk and the abnormal risk were not significant in explaining the expected return of RAGA. The explanatory power (in absolute terms) of the market index increased from 0.0002 to 0.0007 – a rise in explanatory by about 25,000 basis points. Similarly, the explanatory power of the abnormal risk also fell from 0.0001 to 0.0000, representing exactly 10,000 basis points fall in explanatory power. The financial crisis decreased internal risk of RAGA more than the systematic or external risk .

Similarly, the January hypothesis (JANE) was introduced into the model in the third estimation for RAGA. As shown from column 4J, the explanatory power of the systematic risk increased by only 5000 basis points which means that the January effect actually increased systematic risk of RAGA. But, the abnormal risk's potential to predict expected returns remained unchanged. This suggests that the January effect significantly did not have any absolute effect on abnormal risk, but had upward effect on the systematic risk. Guler, 2013; Athanassakos and Ackert, 1998; Ackert and Athanassakos 1997 who stated that the average rate of return on stocks is higher in January than for any other month of the year does not agree to the results of this study. Thus the January effect had no significant but negative overall effect on the expected returns of the stock RAGA, as read from the row 4 against column 3J

Finally, by reading from row 3 against column 4C, we realized that the financial crisis (CRIS) had an overall positive but insignificant effect on the

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expected returns of the stock RAGA as stated by (Karunanayake, Valadkhani, & O'brien, n.d and Yakubu & Akerele, 2012). Similarly, the January effect had no significant but negative overall effect on the expected returns of the stock RAGA , as read from the row 4 against column 4J

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Table 12: The Effect of the Global Financial Crises and the January Hypothesis on Returns of AADS, ABL, ACI and AGA

	1	1C	1J	2	2C	2J	3C	3J	4	4C	4J
	RAADS	**RAADS**	**RAADS**	**RABL**	**RABL**	**RABL**	**RACI**	**RACI**	**RAGA**	**RAGA**	**RAGA**
RINDEX	-0.0251	-0.0236	-0.0247	0.1518	0.1513	0.1523	0.023	0.0236	0.0002	0.0007	0.0003
	[-1.6024]	[-1.5054]	[-1.5810]	[4.4339]**	[4.4185]**	[4.4471]**	[1.2796]	[1.3166]	[0.0339]	[0.1043]	[0.0392]
C	0.0004	0.0002	0.0005	0.0011	0.0013	0.0012	0.0009	0.0007	0.0001	0	0.0001
	[2.1411]*	[0.6247]	[2.4092]*	[1.5747]	[1.7460]	[1.6815]	[2.1846]*	[1.8990]	[0.9989]	[-0.0046]	[1.0444]
CRIS		0.0008			-0.0015		-0.0013			0.0003	
		[1.9633]*			[-0.7598]		[-1.2500]			[1.4293]	
JANE			-0.0009			-0.0017		-0.0007			-0.0001
			[-1.2366]			[-0.6198]		[-0.4725]			[-0.3062]
Observations:	1557	1557	1557	3424	3424	3424	3267	3267	1556	1556	1556
R-squared:	0.0016	0.0041	0.0026	0.0057	0.0059	0.0058	0.001	0.0006	0	0.0013	0.0001
F-statistic:	2.5676	3.2134	2.0489	19.6595	10.1172	10.02	1.6341	0.9641	0.0011	1.022	0.0474
Prob(F-stat):	0.1093	0.0405	0.1292	0.0000	0.0000	0.0000	0.1953	0.3814	0.973	0.3601	0.9537

Source: Author's construct (2014)

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Benso Oil Palm Plantation (RBOPP)

The following analysis relates with BOPP. In table 13, the first column (6) shows the coefficient of the market index (beta) for the first stock (RBOPP), the second column (6C) controls for the effect of the global financial crises on the stock in question and the third column (6J) controls for the January effect. The results for RBOPP shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was not significant in explaining the expected return (Fama & French, 1992 and Baillie & DeGenmaro, 1990). The direction of the relationship between the systematic risk and that of the expected return was negative and the magnitude was -0.0381, though insignificant. In the same token, the abnormal risk as measured by the coefficient of the constant was insignificant and positively related to the expected returns. Thus, in with respect to RBOPP, there was no evidence in favour of the CAPM as the results contradict (Sharpe, 1964 and Lintner, 1965) proposition.

Studies like Yakubu and Akerele (2012) and Karunanayake, Valadkhani, and O'brien, (n.d) were confirmed when CRIS was introduced into the model, as both the systematic risk and the abnormal risk were again insignificant in explaining the expected return of BOPP. The explanatory power of the market index increased from 0.0381 to 0.0401 a rise in explanatory by about 525 basis points. Similarly, the explanatory power of the abnormal risk also increased by 10,000 basis points. The financial crisis increased internal risk of RBOPP such as operational risk or business risk but not as great as the increase in systematic or external risk.

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Nevertheless, when the January hypothesis (JANE) was introduced into the model, as can be read from column 6J, the explanatory power of the systematic risk increased by only 52 basis points which means that the January effect actually increased systematic risk of RBOPP, but not as much as the effect of the financial crisis on RBOPP. But, the abnormal risk's potential to predict expected returns fell by 2,500 basis points. Finally, the financial crisis (CRIS) had an overall negative but insignificant effect on the expected returns of the stock RBOPP. Similarly, the January effect had positive insignificant overall effect on the expected returns of the stock RBOPP which did not confirm the empirical results of (Guler, 2013; Athanassakos & Ackert, 1998; Ackert & Athanassakos, 1997; and Athanassakos, 1995).

Cal Bank (RCAL)

The results for RCAL shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was not significant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.0000, and not significant deviating from the postulate of (Sharpe, 1964). In the same token, the abnormal risk as measured by the coefficient of the constant was insignificant and positively related to the expected returns. Thus, in with respect to RCAL, there was no evidence in favour of the CAPM (Fama & French, 1992 and Baillie & DeGenmaro, 1990), as well as the returns anomalies.

When CRIS we introduced into the model, both the systematic risk and the abnormal risk were insignificant in explaining the expected return of RCAL which is not inconsonance with (Yakubu & Akerele, 2012). The

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explanatory power (in absolute terms) of the market index increased from 0.0000 to 0.0027, a very unending jump indeed. Similarly, the explanatory power of the abnormal risk also rise from 0.0005 to 0.0011, representing exactly 12000 basis points rise in explanatory power. The financial crisis increased systematic or external risk more than the internal risk of RCAL such as operational risk or business risk.

However, when the January hypothesis (JANE) was introduced into the model, the explanatory power of the systematic risk fell marginally which means that the January effect actually decreased systematic risk of RCAL. But, the abnormal risk's potential to predict expected returns remained unchanged. This suggests that the January effect was contradicting with (Athanassakos & Ackert, 1998).

Finally, it was realized that the financial crisis (CRIS) had an overall negative and insignificant effect on the expected returns of the stock RCAL. The January effect had no significant but positive overall effect on the expected returns of the stock RCAL rejecting the report of (Athanassakos & Ackert, 1998 and Guler, 2013), as can be read from the row 4 against column 7J.

RCFAO

The results for RCFAO in table 14 shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was not significant in explaining the expected return (Fama & French, 1992 and Baillie & DeGenmaro, 1990). The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.0412. In the same token, the abnormal risk as measured by the coefficient of

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the constant was highly significant and positively related to the expected returns at the 1 percent significance level (Ross, 1979). Thus, with respect to RCFAO, there was no evidence in favour of the CAPM, but there was evidence in favour of the returns anomalies.

The introduction of CRIS into the model did not change the trend - the systematic risk was insignificant in predicting expected returns of RCFAO (Yakubu & Akerele, 2012) but the abnormal risk was highly significant in explaining the expected return of RCFAO. However, the magnitude of the explanatory power (in absolute terms) of the market index fell from 0.0412 to 0.0408 – a fall in explanatory by about 97.09 basis points. Similarly, the explanatory power of the abnormal risk also increased from 0.0012 to 0.0014, representing about 1667 basis points. The financial crisis increased internal risk of RCFAO such as operational risk or business risk but, at the time, decreased systematic or external risk.

Moreover, when the January hypothesis (JANE) was introduced into the model, the explanatory power of the systematic risk monotonically fell by only 243 basis points which means that the January effect actually decreased systematic risk of RCFAO. But, the abnormal risk's potential to predict expected returns fell monotonically by about 1667 basis points. This suggests that the January effect significantly decreased the abnormal risk, but not the systematic risk.

Finally, by reading from row 3 against column 8C, we realized that the financial crisis (CRIS) had an overall negative but insignificant effect on the expected returns of the stock RCFAO (Yakubu & Akerele, 2012 and Ali & Afzal, 2012). But, the January effect had insignificant positive overall effect

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on the expected returns of the stock RCFAO thus contrarily to Athanassakos and Ackert (1998) as it be can read from the row 4 against column 8J.

RCLYO

The findings of Fama and French (1992) and Baillie and DeGenmaro (1990) confirm the results for RCLYD which shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was not significant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was negative and the magnitude was 0.0007. In the same token, the abnormal risk as measured by the coefficient of the constant was also insignificant and positively related to the expected returns. Thus, in with respect to RCLYD, there was no evidence in favour of the CAPM and the return anomalies.

When CRIS was introduced into the model, both the systematic risk and the abnormal risk were insignificant in explaining the expected return of RCLYD. The explanatory power (in absolute terms) of the market index increased from 0.0007 to 0.0020 – a rise in explanatory by about 18,571.43 basis points. Similarly, the explanatory power of the abnormal risk also increased from 0.0002 to 0.0005, representing exactly 15,000 basis points rise in explanatory power. The financial crisis had an upward pressure on both internal risk and the systematic or external risk in varying degrees (Karunanayake, Valadkhani, & O'brien, n.d)

Conversely, when the January hypothesis (JANE) was introduced into the model, the dynamics changed. As we read from column 9J, the explanatory power of the systematic risk fell by only 1428.57 basis points which means that the January effect actually decreased systematic risk of

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RCLYD. But, the abnormal risk's potential to predict expected returns remained the same. This suggests that the January effect had insignificant effect on abnormal risk, but not the systematic risk.

Finally, from row 3 against column 9C, we realized that the financial crisis (CRIS) had an overall negative but significant effect on the expected returns of the stock RCLYD (Ali & Afzal, 2012). Also, from row 4 against column 9J, the January effect had insignificant but negative overall effect on the expected returns of the stock RCLYD which is against the position (Guler, 2013)..

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Table 13: The Effect of the Global Financial Crises and the January Hypothesis on RBOPP, RCAL, RCFAO and RCLYD

Eq Name:	**6**	**6C**	**6J**	**7**	**7C**	**7J**	**8**	**8C**	**8J**	**9**	**9C**	**9J**
Dep. Var:	**RBOPP**	**RBOPP**	**RBOPP**	**RCAL**	**RCAL**	**RCAL**	**RCFAO**	**RCFAO**	**RCFAO**	**RCLYD**	**RCLYD**	**RCLYD**
RINDEX	-0.0381	-0.0401	-0.0383	0	-0.0027	-0.0004	0.0412	0.0408	0.0402	-0.0007	-0.002	-0.0006
	[-1.0913]	[-1.1468]	[-1.0975]	[0.0006]	[-0.0605]	[-0.0079]	[1.8304]	[1.8126]	[1.7852]	[-0.0306]	[-0.0883]	[-0.0265]
C	0.0004	0.0008	0.0003	0.0005	0.0011	0.0005	0.0012	0.0014	0.001	0.0002	0.0005	0.0002
	[0.8871]	[1.3653]	[0.7280]	[0.9288]	[1.4655]	[0.7399]	[2.5999]**	[2.7261]**	[2.0335]*	[0.7753]	[1.2989]	[0.8105]
CRIS		-0.001			-0.0015			-0.0011			-0.0007	
		[-1.1037]			[-1.2104]			[-0.8548]			[-1.1538]	
JANE			0.0006			0.001			0.0036			-0.0002
			[0.3998]			[0.4841]			[1.8931]			[-0.2371]
Observations:	1503	1503	1503	1466	1466	1466	3296	3296	3296	1547	1547	1547
R-squared:	0.0008	0.0016	0.0009	0	0.001	0.0002	0.001	0.0012	0.0021	0	0.0009	0
F-statistic:	1.191	1.2046	0.6751	0	0.7325	0.1172	3.3503	2.0403	3.4685	0.0009	0.6661	0.0286
Prob(F-stat):	0.2753	0.3001	0.5093	0.9996	0.4809	0.8895	0.0673	0.1301	0.0313	0.9756	0.5138	0.9718

Source: Author's construct (2014)

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Comlot Ghana Limited (RCMLT)

The next set of analysis take us to table 15. From table 15, we analyse the stocks from Comlot (RCMLT), Cocoa Processing Company (RCPC) and Ecobank Ghana (REBG). The results for RCMLT shows that, the systematic risk as measured by the coefficient of the market index (RINDEX) was not significant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.0023, even though insignificant. In the same token, the abnormal risk as measured by the coefficient of the constant was significant and positively related to the expected returns. Thus, affirming Fama and French (1992) and Baillie and DeGenmaro (1990) who reported that there was no significant relationship between the average return and systematic risk of corporate stocks when CAPM was used. In respect to RCMLT, there was no evidence in favour of the CAPM (Sharpe, 1964), but there was evidence in favour of the returns anomalies.

When CRIS was introduced into the model, the systematic risk was still insignificant but, the abnormal risk was significant in explaining the expected return of RCMLT in a positive direction. The explanatory power (in absolute terms) of the market index fell from 0.0023 to 0.0018 – a fall in explanatory by about 2173.91 basis points. Similarly, the explanatory power of the abnormal risk increased from 0.0006 to 0.0008, representing exactly 3333.33 basis points. The financial crisis increased internal risk for RCMLT such as operational risk or business but, decreased the systematic or external risk.

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On the other hand, when the January hypothesis (JANE) was introduced into the model, the dynamics changed. As read from column 10J, the explanatory power of the systematic risk increased by 1304.35 basis points which means that the January effect actually increased systematic risk as measured by RINDEX. But, the abnormal risk's potential to predict expected returns increased from 0.0006 to 0.0007, representing an increase by about 1666.67 basis points. This suggests that the January effect significantly increased the abnormal risk and the systematic risk, howbeit, the magnitude of the systematic risk was insignificant.

Finally, by reading from row 3 against column 10C, we realized that the financial crisis (CRIS) had an overall negative and significant effect on the expected returns of the stock RCMLT (Ali & Afzal, 2012) at the 5 percent significant level. But, the January effect had insignificant but negative overall effect on the expected returns of the stock RCMLT which contradicts with (Athanassakos & Ackert, 1998), as read from the row 4 against column 10J.

Cocoa Processing Company (RCPC)

The next set of analysis take us to table 15. From table 15, we analyse the stocks from RCPC. The results for RCPC shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was insignificant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.0012, even though insignificant. In the same token, the abnormal risk as measured by the coefficient of the constant was insignificant and positively related to the expected returns. Thus, with respect to RCPC, there was no evidence in favour of the CAPM (Laubscher, 2012) and the returns anomalies.

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When CRIS was introduced into the model, the systematic risk and the abnormal risk were still insignificant. The explanatory power (in absolute terms) of the market index increased from 0.0012 to 0.0031 – an increase in explanatory power by about 15833.33 basis points. Similarly, the explanatory power of the abnormal risk fell from 0.0003 to 0.0000, representing exactly 10,000 basis points fall. The financial crisis decreased internal risk for RCPC such as operational risk or business but, increased the systematic or external risk.

On the other hand, when the January hypothesis (JANE) was introduced into the model, the dynamics changed. As read from column 11J, the explanatory power of the systematic risk decreased by 5000 basis points which means that the January effect actually decreased systematic risk as measured by RINDEX. Again, the abnormal risk's potential to predict expected returns decreased from 0.0003 to -0.0002, representing an increase by about 3333.33 basis points. This suggests that the January effect decreased the abnormal risk and the systematic risk, howbeit, the magnitude of the decrease in risk was insignificant.

Finally, by reading from row 3 against column 11C, we realized that the financial crisis (CRIS) had an overall positive and insignificant effect on the expected returns of the stock RCPC at the 5 percent significant level (Karunanayake, Valadkhani, & O'brien, n.d). The January effect also had insignificant but positive overall effect on the expected returns of the stock RCPC, which contradict (Ackert & Athanassakos, 1997 and Athanassakos & Ackert, 1998) as read from the row 4 against column 11J.

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Ecobank Ghana (REBG)

The next presentation relates with REBG. The results for REBG shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was not significant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.0475. Similarly, the abnormal risk as measured by the coefficient of the constant was significant and positively related to the expected returns. Thus, in with respect to REBG, there was no evidence in favour of the CAPM (Laubscher, 2012), but there was evidence in favour of the returns anomalies.

When CRIS was introduced into the model, the systematic risk was insignificant, but the abnormal risk was significant in explaining the expected return of REBG. The explanatory power (in absolute terms) of the market index fell from 0.0475 to 0.0438 – a fall in explanatory by about 778.95 basis points. Similarly, the explanatory power of the abnormal risk increased from 0.0011 to 0.0023, representing exactly 10909.09 basis points rise in explanatory power. This was significant at the 1 percent significant level. The financial crisis increased internal risk of REBG but, decreased the systematic or external risk.

Conversely, when the January hypothesis (JANE) was introduced into the model, both the impact of the systematic and the abnormal risk remained the same by the introduction of the January Effect. However, the abnormal risk explanatory power was significant at 5 percent significant level.

Finally, by reading from row 3 against column 12C, we realized that the financial crisis (CRIS) had an overall negative and significant effect on the

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expected returns of the stock REBG at the 1 percent significant level (Ali & Afzal, 2012). But, the January effect had a positive and no significant overall effect on the expected returns of the stock REBG (Yakubu & Akerele, 2012), as read from the row 4 against column 1

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Table 14: The Effect of the Global Financial Crises and the January Hypothesis on RCMLT, RCPC, and REBG

Eq Name:	10	10C	10J	11	11C	11J	12	12C	12J
Dep. Var:	RCMLT	RCMLT	RCMLT	RCPC	RCPC	RCPC	REBG	REBG	REBG
RINDEX	0.0023	0.0018	0.0026	0.0012	0.0031	-0.0006	0.0475	0.0438	0.0475
	[0.1790]	[0.1441]	[0.2056]	[0.0157]	[0.0396]	[-0.0072]	[1.3712]	[1.2693]	[1.3706]
C	0.0006	0.0008	0.0007	0.0003	0	-0.0002	0.0011	0.0023	0.0011
	[3.9017]**	[4.4383]**	[4.0750]**	[0.2848]	[-0.0312]	[-0.1540]	[2.5414]*	[4.1188]**	[2.4317]*
CRIS		-0.0008			0.001			-0.0028	
		[-2.1098]*			[0.4969]			[-3.3119]**	
JANE			-0.0007			0.005			0.0000
			[-1.1746]			[1.4752]			[-0.0248]
Observations:	2263	2263	2263	1741	1741	1741	1126	1126	1126
R-squared:	0	0.002	0.0006	0	0.0001	0.0013	0.0017	0.0113	0.0017
F-statistic:	0.0321	2.2418	0.7059	0.0002	0.1236	1.0882	1.8802	6.4326	0.9396
Prob(F-stat):	0.8579	0.1065	0.4938	0.9875	0.8838	0.3371	0.1706	0.0017	0.3911

Source: Author's construct (2014)

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Ecobank Transnational (RETI)

In table 16, we present the results for Ecobank Transnational (RETI), Fan Milik (RFML) and GCB (RGCB). The results for RETI confirms (Lundblad, 2007), thus the systematic risk as measured by the coefficient of the market index (INDEX) was significant in explaining the expected return, at 1% level. The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was relatively high at 0.5974. But, the abnormal risk as measured by the coefficient of the constant was insignificant and negatively related to the expected returns. Thus, in with respect to RETI, there was an evidence in favour of the CAPM as proposed by Sharpe, (1964) and Lintner, (1965) but there was no evidence in favour of the returns anomalies.

When CRIS was introduced into the model, the trend did not change. The systematic risk was highly significant but the abnormal risk was insignificant in explaining the expected return of RETI. The explanatory power (in absolute terms) of the market index fell from 0.5974 to 0.5961 – a fall in explanatory by about 21.76 basis points. Similarly, the explanatory power of the abnormal risk also fell from 0.0007 to 0.0001, representing exactly 8571.43 basis points fall in explanatory power. The financial crisis decreased internal risk and the systematic or external risk of RETI. However, the magnitude with regards to internal risk was more.

However, when the January hypothesis (JANE) was introduced into the model, the trend continued at an increasing rate for the systematic risk. As read from column 13J, the explanatory power of the systematic risk increased by only 11.72 basis points which means that the January effect actually

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increased systematic risk of RETI. But, the abnormal risk's potential to predict expected returns fell from 0.0007 to 0.0006, representing a decrease by about 1428.57 basis points. This suggests that the January effect insignificantly decreased the abnormal risk, but significantly increased the systematic risk.

Finally, by reading from row 3 against column 13C, we realized that the financial crisis (CRIS) had an overall negative and insignificant effect on the expected returns of the stock RETI at the 5 percent significant level. The January effect also had insignificant but negative overall effect on the expected returns of the stock RETI, as read from the row 4 against column 13J. The result obtained as a result of introducing CRIS confirm to Yakubu & Akerele (2012) but that of the JANE did not conformed to Athanassakos & Ackert, (1998) who indicated in their empirical study that average rate of return on stocks is higher in January than for any other month of the year.

Fan Milk Ghana Limited (RFML)

The following are the results from the analysis of Fan Milk Ghana Limited (RFML). The results show that, the systematic risk as measured by the coefficient of the market index (INDEX) was significant in explaining the expected return (Lundblad, 2007; Sharpe, 1964 and Lintner, 1965). The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.0533. In the same token, the abnormal risk as measured by the coefficient of the constant was significant and positively related to the expected returns. Thus, in with respect to RFML, there was evidence in favour both CAPM and the returns anomalies.

When CRIS was introduced into the model, both the systematic risk and the abnormal risk were still significant in explaining the expected return of

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RFML. We went on to analyze the impact of the CRIS. We realized that, the explanatory power (in absolute terms) of the market index fell from 0.0533 to 0.0532 – a fall in explanatory by about 18.76 basis points. Similarly, the explanatory power of the abnormal risk remained the same at 0.0028. The financial crisis did not have any greater impact on internal risk of RFML such as operational risk or business risk. However, the financial crisis had a downward effect on the systematic or external risk (Ali & Afzal, 2012).

On the other hand, when the January hypothesis (JANE) was introduced into the model, Athanassakos and Ackert, (1998) who reported that the average rate of return on stocks is higher in January than for any other month of the year was reaffirmed. As we read from column 14J, the explanatory power of the systematic risk increased by only 56.29 basis points which means that the January effect actually increased systematic risk of RFML marginally. Similarly the abnormal risk's potential to predict expected returns increased from 0.0028 to 0.0029, representing an increase by about 357.14 basis points. This suggests that the January effect significantly increased the abnormal risk and the systematic risk.

Finally, by reading from row 3 against column 14C, we realized that the financial crisis (CRIS) had an overall negative but insignificant effect on the expected returns of the stock RFML at the 5 percent significant level. The January effect also had negative but insignificant overall effect on the expected returns of the stock RFML, as read from the row 4 against column 14J.

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GCB Limited (RGCB)

The following are the results from the analysis of GCB Limited (RGCB) which were similar to that of RFML. The results show that, the systematic risk as measured by the coefficient of the market index (INDEX) was significant in explaining the expected return (Lundblad, 2007; Sharpe, 1964 and Lintner, 1965). The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.1185. In the same token, the abnormal risk as measured by the coefficient of the constant was significant and positively related to the expected returns. Thus, in with respect to RGCB, there was evidence in favour both CAPM and the returns anomalies.

When CRIS was introduced into the model, both the systematic risk and the abnormal risk were still significant in explaining the expected return of RGCB. We went on to analyze the impact of CRIS. It is realized that, the explanatory power (in absolute terms) of the market index increased from 0.1185 to 0.1186 – an increase in explanatory by about 8.44 basis points. Similarly, the explanatory power of the abnormal risk fell by 555.56 basis points. The financial crisis did have downward impact on internal risk of RGCB such as operational risk or business risk but an upward marginal effect on the systematic or external risk.

Conversely, when the January hypothesis (JANE) was introduced into the model, the dynamics changed. As we read from column 15J, the explanatory power of the systematic risk increased by only 8.44 basis points which means that the January effect actually increased systematic risk of RGCB marginally. Similarly the abnormal risk's potential to predict expected

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returns remained the same at 0.0018. This suggests that the January effect significantly did not affect the abnormal risk but had a slightly upward effect on the systematic risk.

Finally, by reading from row 3 against column 15C, we realized that the financial crisis (CRIS) had an overall positive but insignificant effect on the expected returns of the stock RGCB at the 5 percent significant level contrarily to assertion of Ali and Afzal (2012) who conducted their study using Pakistan and Indian stock exchange. The January effect also had negative but insignificant overall effect on the expected returns of the stock RGCB which was not in line with that of Guler (2013), as read from the row 4 againstcolumn15

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Table 15: The Effect of the Global Financial Crises and the January Hypothesis on RETI, RFML, and RGCB

Eq Name:	13	13C	13J	14	14C	14J	15	15C	15J
Dep. Var:	RETI	RETI	RETI	RFML	RFML	RFML	RGCB	RGCB	RGCB
RINDEX	0.5974	0.5961	0.5981	0.0533	0.0532	0.0536	0.1185	0.1186	0.1186
	[7.0754]**	[7.0568]**	[7.0744]**	[2.7026]**	[2.6959]**	[2.7147]**	[5.3935]**	[5.3969]**	[5.3982]**
C	-0.0007	-0.0001	-0.0006	0.0028	0.0028	0.0029	0.0018	0.0017	0.0018
	[-0.6740]	[-0.0556]	[-0.5805]	[6.8512]**	[6.4347]**	[6.7582]**	[3.6879]**	[3.1247]**	[3.6963]**
CRIS		-0.0013			-0.0004			0.0006	
		[-0.6312]			[-0.3073]			[0.4740]	
JANE			-0.0007			-0.0009			-0.001
			[-0.2005]			[-0.5486]			[-0.5218]
Observations:	1085	1085	1085	3424	3424	3424	2770	2770	2770
R-squared:	0.0442	0.0445	0.0442	0.0021	0.0022	0.0022	0.0104	0.0105	0.0105
F-statistic:	50.0615	25.2161	25.0287	7.304	3.6982	3.8017	29.0894	14.6529	14.677
Prob(F-stat):	0.0000	0.0000	0.0000	0.0069	0.0249	0.0224	0.0000	0.0000	0.0000

Source: Author's construct (2014)

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Ghana Oil Company (RGOIL)

Tables 17 contain our main results for individual stocks. In table 17, we have results from Ghana Oil (GOIL), RGSR, Ghana Web (RGWEB) and HFC Bank (RHFC). The results for RGOIL shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was insignificant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was negative and the magnitude was 0.0008. In the same token, the abnormal risk as measured by the coefficient of the constant was insignificant and positively related to the expected returns. Thus, in with respect to RGOIL, there was no evidence in favour of the CAPM and the returns anomalies (Fama and French, 1992).

When CRIS was introduced into the model, both the systematic risk and the abnormal risk were still insignificant in explaining the expected return of RGOIL. The explanatory power (in absolute terms) of the market index increased from 0.0008 to 0.0011– a rise in explanatory by about 3,750 basis points. Similarly, the explanatory power of the abnormal risk also increased from 0.0008 to 0.0016, representing exactly 5000 basis points rise in explanatory power. The financial crisis increased internal risk of RGOIL such as operational risk or business risk more than the systematic or external risk, in absolute terms.

However, when the January hypothesis (JANE) was introduced into the model, the dynamics did change significantly. As read from column 17J, the explanatory power of the systematic risk fell by only 15,000 basis points which means that the January effect actually decreased systematic risk of RGOIL. But, the abnormal risk's potential to predict expected returns

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decreased from 0.0008 to 0.0006, representing an increase by about 2500 basis points. This suggests that the January effect really decreased both the abnormal risk and the systematic risk.

Finally, by reading from row 3 against column 17C, we realized that the financial crisis (CRIS) had an overall negative but insignificant effect on the expected returns of the stock RGOIL at the 5% significant level siding with (Ali & Afzal, 2012). But, the January effect had insignificant but positive overall effect on the expected returns of the stock RGOIL (Athanassakos & Ackert, 1998), as read from the row 4 against column 17J.

RGSR

The results for RGSR shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was not significant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was negative and the magnitude was 0.0070. In the same token, the abnormal risk as measured by the coefficient of the constant was insignificant and positively related to the expected returns. Thus, in with respect to RGSR, there was no evidence in favour of the CAPM and the returns anomalies (Fama and French, 1992).

When CRIS was controlled, both the systematic risk and the abnormal risk were not significant in explaining the expected return of RGSR. The explanatory power (in absolute terms) of the market index increased from 0.0070 to 0.0079 – an increase in explanatory by about 1285.71 basis points. Similarly, the explanatory power of the abnormal risk also fell from 0.0008 to 0.0000, representing exactly 10000 basis points fall in explanatory power. The

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financial crisis decreased internal risk of RGSR such as operational risk but increased the systematic or external risk.

On the other hand, when the January hypothesis (JANE) was introduced into the model, the dynamics changed. As read from column 18J, the explanatory power of the systematic risk fell by 1857.14 basis points which means that the January effect actually decreased systematic risk of RGSR. But, the abnormal risk's potential to predict expected returns increased from 0.0008 to 0.0009, representing an increase by about 1111.11 basis points. This suggests that the January effect insignificantly increased the abnormal risk, but decreased the systematic risk.

Finally, by reading from row 3 against column 18C, we realized that the financial crisis (CRIS) had an overall positive but insignificant effect on the expected returns of the stock RGSR at the 5 percent significant level as seen in the study of (Yakubu & Akerele, 2012 and Karunanayake, Valadkhani, & O'brien, (n.d)). But, Athanassakos and Ackert, (1998) position on January effect hypothesis that the average rate of return on stocks is higher in January than for any other month of the year was not confirmed. When the January effect was introduced it had insignificant but negative overall effect on the expected returns of the stock RGSR, as we read from the row 4 against column 18J.

Ghana Web Limited (RGWEB)

The results for RGWEB shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was insignificant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was

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0.0032. In the same token, the abnormal risk as measured by the coefficient of the constant was insignificant but positively related to the expected returns. Thus Fama and French (1992) and Baillie and DeGenmaro (1990) position was reaffirmed, in with respect to RGWEB, there was no evidence in favour of the CAPM and the returns anomalies.

When CRIS was introduced into the model, both the systematic risk and the abnormal risk were insignificant in explaining the expected return of RGWEB. However, the explanatory power (in absolute terms) of the market index increased from 0.0032 to 0.0044 – an increase in explanatory by about 3750 basis points. Similarly, the explanatory power of the abnormal risk remained unchanged but, the direction changed from positive to negative. The financial crisis had a directional effect on internal risk of RGWEB such as operational risk or business risk but an increase in the systematic or external risk.

However, when the January hypothesis (JANE) was introduced into the model, as read from column 19J, the explanatory power of the systematic risk decreased absolutely by 7,500 basis points which means that the January effect actually had a downward trend on systematic risk of RGWEB. But, the abnormal risk's potential to predict expected returns increased from 0.0001 to 0.0004, representing an increase by about 40,000 basis points. This suggests that the January effect significantly increased the abnormal risk, but not the systematic risk.

Finally, by reading from row 3 against column 19C, we realized that the financial crisis (CRIS) had an overall positive but insignificant effect on the expected returns of the stock RGWEB at the 5 percent significant level

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(Yakubu & Akerele, 2012). But, the January effect had significant and positive overall effect on the expected returns of the stock RGWEB at 1 percent significant level as evident in (Ackert & Athanassakos, 1997; Athanassakos & Ackert, 1998 and Guler, 2013), as one reads from the row 4 against column 19J.

HFC Bank (RHFC)

Fama and French (1992) and Baillie and DeGenmaro (1990) position was confirmed in the results for RHFC. The results showed that, the systematic risk as measured by the coefficient of the market index (INDEX) was insignificant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.0222. Similarly, the abnormal risk as measured by the coefficient of the constant was highly significant and positively related to the expected returns. Thus, with respect to RHFC, there was no evidence in favour of the CAPM, but there was evidence in favour of the returns anomalies.

Following the introduction of CRIS into the model, the systematic risk was insignificant but, the abnormal risk was significant in explaining the expected return of RHFC. The explanatory power (in absolute terms) of the market index fell from 0.0222 to 0.0217– a fall in explanatory by about 225.23 basis points. Similarly, the explanatory power of the abnormal risk increased from 0.0013 to 0.0018, representing exactly 3,846.15 basis points increase in explanatory power. The financial crisis increased internal risk of RHFC such as operational risk or business risk but not the systematic or external risk.

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When the January hypothesis (JANE) was introduced into the model, the dynamics changed. As we read from column 20J, the explanatory power of the systematic risk remained unchanged. But, the abnormal risk's potential to predict expected returns increased from 0.0013 to 0.0014, representing an increase by about 769.23 basis points. This suggests that the January effect significantly increased the abnormal risk, but not the systematic risk.

Finally Ali and Afzal, (2012) finding was evident when CRIS was introduced. By reading from row 3 against column 20C, we realized that the financial crisis (CRIS) had an overall negative and significant effect on the expected returns of the stock RHFC at the 1% significant level. But, the January effect had no significant but negative overall effect on the expected returns of the stock RHFC in contradiction to (Athanassakos & Ackert, 1998), as we read from the row 4 against column 20J.

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Table 16: The Effect of the Global Financial Crises and the January Hypothesis on RGOIL, RGSR, RGWEB and RHFC

Eq Name:	**17**	**17C**	**17J**	**18**	**18C**	**18J**	**19**	**19C**	**19J**	**20**	**20C**	**20J**
Dep. Var:	**RGOIL**	**RGOIL**	**RGOIL**	**RGSR**	**RGSR**	**RGSR**	**RGWEB**	**RGWEB**	**RGWEB**	**RHFC**	**RHFC**	**RHFC**
RINDEX	-0.0008 [-0.0091]	0.0011 [0.0134]	-0.002 [-0.0233]	-0.007 [-0.1673]	-0.0079 [-0.1868]	-0.0057 [-0.1361]	0.0032 [0.0741]	0.0044 [0.1017]	0.0008 [0.0193]	0.0222 [1.5924]	0.0217 [1.5589]	0.0222 [1.5964]
C	0.0008 [0.8119]	0.0016 [0.9769]	0.0006 [0.5787]	0.0008 [1.7216]	0 [-0.0100]	0.0009 [1.8958]	0.0001 [0.2230]	-0.0001 [-0.1522]	-0.0004 [-0.6588]	0.0013 [4.5099]**	0.0018 [5.5101]**	0.0014 [4.4707]**
CRIS		-0.0012 [-0.6158]			0.0011 [1.1338]			0.0006 [0.5287]			-0.0026 [-3.3671]**	
JANE			0.0019 [0.6027]			-0.0015 [-0.8674]			0.006 [2.9206]**			-0.0005 [-0.4241]
Observations:	790	790	790	730	730	730	1343	1343	1343	2951	2951	2951
R-squared:	0	0.0005	0.0005	0	0.0018	0.0011	0	0.0002	0.0063	0.0009	0.0047	0.0009
F-statistic:	0.0001	0.1897	0.1816	0.028	0.6567	0.3902	0.0055	0.1425	4.2677	2.5359	6.941	1.3575
Prob(F-stat):	0.9928	0.8273	0.8339	0.8672	0.5189	0.6771	0.941	0.8672	0.0142	0.1114	0.001	0.2575

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RMLC

Tables 18 analyzed the baseline results from RMLC, Produce Buying Company (RPBC), RPKL and PZ Cussons Limited (RPZC). The results for RMLC shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was not significant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.0181. In the same token, the abnormal risk as measured by the coefficient of the constant was significant and positively related to the expected returns at the 1 percent level. Thus, with respect to RMLC, there was no evidence in favour of the CAPM (Fama & French, 1992; and Baillie & DeGenmaro, 1990), but there was evidence in favour of the returns anomalies.

Following the introduction of CRIS into the model, the systematic risk was insignificant in explaining the expected return of RMLC. The abnormal risk, however, was significant in explaining the returns of RMLC. The explanatory power (in absolute terms) of the market index fell from 0.0181 to 0.0175 – a fall in explanatory by about 333 basis points. Similarly, the explanatory power of the abnormal risk increased from 0.0012 to 0.0017, representing exactly 4167 basis points increased in explanatory power. The financial crisis increased internal risk of RMLC such as operational risk or business but decreased external risk.

Conversely, when the January hypothesis (JANE) was introduced into the model, the dynamics did not change. As read from column 21J, the explanatory power of the systematic risk did not change which means that the January effect did not have any effect on systematic risk of

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RMLC. But, the abnormal risk's potential to predict expected returns increased marginally from 0.0012 to 0.0013, representing an increase by about 833 basis points. This suggests that the January effect significantly increased the abnormal risk, but not the systematic risk.

Finally, by reading from row 3 against column 21C, we realized that the financial crisis (CRIS) had an overall negative and significant effect on the expected returns of the stock RMLC (Ali & Afzal, 2012) at the 1 percent significant level. But, the January effect had insignificant but negative overall effect on the expected returns of the stock RMLC, thus this rejects the position of (Guler, 2013; Athanassakos & Ackert, 1998 and Ackert & Athanassakos, 1997) in literature, as read from the row 4 against column 21J.

Produce Buying Company (RPBC)

The results for RPBC shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was not significant in explaining the expected return (Fama & French 1992 and Baillie & DeGenmaro, 1990). The direction of the relationship between the systematic risk and that of the expected return was negative and the magnitude was 0.0184. In the same token, the abnormal risk as measured by the coefficient of the constant was insignificant and positively related to the expected returns of RPBC. Thus, with respect to RPBC, there was no evidence in favour of both the CAPM and the returns anomalies.

When CRIS was introduced into the model, the systematic risk was insignificant but the abnormal risk was significant in explaining the expected return of RPBC. The explanatory power (in absolute terms) of the market index increased from 0.0184 to 0.0192 – an increase in explanatory power by about 416.67 basis points. Similarly, the explanatory power of the abnormal risk also increase from 0.0006 to 0.0009,

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representing exactly 5,000 basis points increase in explanatory power and this was significant at 5% significant level. The financial crisis increased internal risk of RPBC such as operational risk or business risk more than the systematic or external risk.

On the other hand, when the January hypothesis (JANE) was introduced into the model, as we read from column 22J, the explanatory power of the systematic risk increased by 326 basis points which means that the January effect actually had upward pressure on systematic risk of RPBC. But, the abnormal risk's potential to predict expected returns decreased from 0.0006 to 0.0005, representing a fall by about 1,666.67 basis points. This suggests that the January effect significantly had a downward effect on the abnormal risk, but an upward effect on the systematic risk.

Finally, by reading from row 3 against column 21C, we realized that the financial crisis (CRIS) had an overall negative but insignificant effect on the expected returns of the stock RPBC at the 5 percent significant level (Ali & Afzal, 2012). But, the January effect had no significant but positive overall effect on the expected returns of the stock RPBC which rejects the position of (Guler, 2013; Athanassakos & Ackert, 1998 and Ackert & Athanassakos 1997) in literature,, as one reads from the row 4 against column 21J.

RPKL

The results for RPKL shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was insignificant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.0222. In the same token, the abnormal risk as measured by the coefficient of the constant was significant and positively related

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to the expected returns. Thus, in with respect to RPKL, there was no evidence in favour of the CAPM (Fama & French 1992 and Baillie & DeGenmaro 1990) , but there was evidence in favour of the returns anomalies.

Following the introduction of CRIS into the model, both the systematic risk was insignificant in explaining the expected return of RPKL. The explanatory power (in absolute terms) of the market index increased from 0.0222 to 0.0223 – a rise in explanatory by about 45 basis points. Similarly, the explanatory power of the abnormal risk also increased from 0.0008 to 0.0009, representing exactly 1,250 basis points rise in explanatory power and this was significant at 5% significant level. The financial crisis increased internal risk of RPKL such as operational risk or business risk more than the systematic or external risk.

However, when the January hypothesis (JANE) was introduced into the model, the dynamics changed. As read from column 23J, the explanatory power of the systematic risk rose by only 45 basis points which means that the January effect actually increased systematic risk of RPKL. But, the abnormal risk's potential to predict expected returns remained stagnant at 5 percent significant level.

Finally, Ali & Afzal, (2012) was confirmed when CRIS was introduced, by reading from row 3 against column 23C, it was realized that the financial crisis (CRIS) had an overall negative but insignificant effect on the expected returns of the stock RPKL at the 5 percent significant level. Similarly, the January effect had insignificant but negative overall effect on the expected returns of the stock RPKL which rejects the position of (Guler, 2013; Athanassakos & Ackert, 1998 and Ackert & Athanassakos, 1997) in literature, as we read from the row 4 against column 23J.

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PZ Cussons (RPZC)

The results for RPZC shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was insignificant in explaining the expected return (see Fama & French 1992; and Baillie & DeGenmaro, 1990). The direction of the relationship between the systematic risk and that of the expected return was negative and the magnitude was 0.0113. In the same token, the abnormal risk as measured by the coefficient of the constant was significant and positively related to the expected returns. Thus, with respect to RPZC, there was no evidence in favour of the CAPM, but there was evidence in favour of the returns anomalies.

When CRIS was introduced into the model, both the systematic risk was insignificant in explaining the expected return of RPZC but the abnormal risk was significant in explaining the expected return of RPZC. The explanatory power (in absolute terms) of the market index fell from 0.0113 to 0.0108 – a fall in explanatory by about 442 basis points. Similarly, the explanatory power of the abnormal risk also increased from 0.0016 to 0.0019, representing exactly 1875 basis points increased in explanatory power. The financial crisis increased internal risk of RPZC such as operational risk or business risk more than the systematic or external risk.

Conversely, when the January hypothesis (JANE) was introduced into the model, column 24J show that, the explanatory power of the systematic risk increased by only 1062 basis points which means that the January effect actually increased systematic risk of RPZC. But, the abnormal risk's potential to predict expected returns increased from 0.0016 to 0.0019, representing an increase by about 1875 basis points. This suggests that the January effect significantly increased the abnormal risk and the systematic risk.

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Finally, by reading from row 3 against column 24C, we realized that the financial crisis (CRIS) had an overall negative but insignificant effect on the expected returns of the stock RPZC at the 5 percent significant level which is an evidence of (Ali & Afzal, 2012). But contrarily to the January effect hypothesis as confirmed by (Guler, 2013; Athanassakos & Ackert, 1998 and Ackert & Athanassakos 1997), the January effect had significant but negative overall effect on the expected returns of the stock RPZC, from row 4 against column 24J.

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Table 17: The Effect of the Global Financial Crises and the January Hypothesis on RMLC, RPBC, RPKL and RPZC

Eq Name:	21	21C	21J	22	22C	22J	23	23C	23J	24	24C	24J
Dep. Var:	RMLC	RMLC	RMLC	RPBC	RPBC	RPBC	RPKL	RPKL	RPKL	RPZC	RPZC	RPZC
RINDEX	0.0181	0.0175	0.0182	-0.0184	-0.0192	-0.019	0.0222	0.0221	0.0223	0.0113	0.0108	0.0125
	[0.9087]	[0.8816]	[0.9141]	[-0.6636]	[-0.6917]	[-0.6830]	[1.4594]	[1.4486]	[1.4660]	[0.6264]	[0.5954]	[0.6902]
C	0.0012	0.0017	0.0013	0.0006	0.0009	0.0005	0.0008	0.0009	0.0008	0.0016	0.0019	0.0019
	[2.9113]**	[3.7845]**	[2.9481]**	[1.7598]	[2.2908]*	[1.4196]	[2.2988]*	[2.5268]*	[2.3877]*	[4.3350]**	[4.6349]**	[4.8749]**
CRIS		-0.0031			-0.0013			-0.0009			-0.0017	
		[-2.7533]**			[-1.5468]			[-1.0491]			[-1.6454]	
JANE			-0.0009			0.0011			-0.0009			-0.0039
			[-0.5225]			[0.8899]			[-0.6476]			[-2.6388]**
Observations:	3077	3077	3077	2161	2161	2161	2883	2883	2883	3424	3424	3424
R-squared:	0.0003	0.0027	0.0004	0.0002	0.0013	0.0006	0.0007	0.0011	0.0009	0.0001	0.0009	0.0021
F-statistic:	0.8258	4.2041	0.5493	0.4403	1.4165	0.6161	2.1299	1.6153	1.2744	0.3924	1.5499	3.6783
Prob(F-stat):	0.3636	0.015	0.5774	0.507	0.2428	0.5401	0.1446	0.199	0.2797	0.5311	0.2124	0.0254

Source: Author's construct (2014)

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Standard Chartered Bank Limited (RSCB)

The results for RSCB shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was significant in explaining the expected return at 1 percent level. The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.1502. In the same token, the abnormal risk as measured by the coefficient of the constant was significant and positively related to the expected returns at a magnitude of 0.0024. Thus, in with respect to RSCB, there were evidence in favour of both the CAPM (Leon, Nave & Rubio 2005; Raputsoane, 2009 and Laubscher, 2012) and the returns anomalies.

Following the introduction of CRIS into the model, both the systematic risk and the abnormal risk were significant in explaining the expected return of RSCB. The explanatory power (in absolute terms) of the market index fell from 0.1502 to 0.1495 – a fall in explanatory by about 46.60 basis points. Similarly, the explanatory power of the abnormal risk also increased from 0.0024 to 0.0027, representing exactly 1250 basis points increased in explanatory power. The financial crisis increased internal risk of RSCB such as operational risk or business risk but decreased the systematic or external risk.

However, when the January hypothesis (JANE) was introduced into the model, both the systematic risk and abnormal risk were significant in explaining the expected return of RSCB. As read from column 25J, the explanatory power of the systematic risk increased by about 7 basis points which means that the January effect actually had an upward effect on

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systematic risk of RSCB. But, the abnormal risk's potential to predict the expected return of RSCB remained unchanged.

Finally, by reading from row 3 against column 25C, it is realized that the financial crisis (CRIS) had an overall negative and significant effect on the expected returns of the stock RSCB (Ali & Afzal, 2012) at the 5 percent significant level. But contrarily to the January effect hypothesis as confirmed by (Guler, 2013; Athanassakos & Ackert, 1998 and Ackert & Athanassakos, 1997), the January effect had insignificant but negative overall effect on the expected returns of the stock RSCB, as read from the row 4 against column 25J.

Societe Generale (RSGSSB)

The results for RSGSSB show that, the systematic risk as measured by the coefficient of the market index (INDEX) was significant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.1018. The abnormal risk as measured by the coefficient of the constant was significant and positively related to the expected returns. Thus, in with respect to RSGSSB, there was evidence in favour of both the CAPM and the returns anomalies. Hence the position of (Fama & French, 1992 and Baillie & DeGenmaro, 1990) was affirmed.

When CRIS was introduced into the model, both the systematic risk and the abnormal risk were not significant in explaining the expected return of RSGSSB. The explanatory power (in absolute terms) of the market index fell from 0.1018 to 0.1014 – a fall in explanatory by about 39 basis points. Similarly, the explanatory power of the abnormal risk was significant and also

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increased from 0.0011 to 0.0015, representing exactly 3636 basis points increase in explanatory power. The financial crisis increase internal risk of RSGSSB such as operational risk or business risk but not the systematic or external risk.

On the other hand, when the January hypothesis (JANE) it is introduced into the model, both the systematic risk and abnormal risk were significant in explaining the expected return of RSGSSB. As read from column 26J, the explanatory power of the systematic risk sored by only 20 basis points which means that the January effect actually increased systematic risk of RSGSSB. But, the abnormal risk's potential to predict expected returns increased from 0.0011 to 0.0012, representing an increase by about 909 basis points. This suggests that the January effect significantly increased the abnormal risk and the systematic risk.

Finally, by reading from row 3 against column 26C, we realized that the financial crisis (CRIS) had an overall negative but insignificant effect on the expected returns of the stock RSGSSB (Ali & Afzal, 2012) at the 5 percent significant level. Contrarily to the January effect hypothesis as confirmed by Guler (2013); Athanassakos and Ackert (1998) and Ackert and Athanassakos (1997), in the study the January effect of also had insignificant but negative overall effect on the expected returns of the stock RSGSSB, as can be read from the row 4 against column 26J.

State Insurance Limited (RSIC)

The results for RSIC shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was significant in explaining the expected return at the 5 percent level (Leon, Nave & Rubio 2005; Raputsoane,

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2009; and Laubscher, 2012). The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.1772. However, the abnormal risk as measured by the coefficient of the constant was insignificant but positively related to the expected returns. Thus, in with respect to RSIC, there was an evidence in favour of the CAPM, but there was no evidence in favour of the returns anomalies.

Following the introduction of CRIS into the model, trend was similar as the one described in the last paragraph. The systematic risk significantly explained expected returns, unlike the unsystematic risk. The explanatory power (in absolute terms) of the market index increased from 0.1772 to 0.1802 – an increase in explanatory by about 169 basis points. Similarly, the explanatory power of the abnormal risk also increased from 0.0010 to 0.0023, representing exactly 13,000 basis points increase in explanatory power. The financial crisis increased internal risk of RSIC such as operational risk or business risk more than the systematic or external risk.

Furthermore, when the January hypothesis (JANE) was introduced into the model, the dynamics changed. As read from column 27J, the explanatory power of the systematic risk fell by 68 basis points which means that the January effect actually decreased systematic risk of RSIC. Similarly, the abnormal risk's potential to predict expected returns also fell from 0.0010 to 0.0008, representing a fall by about 2000 basis points. This suggests that the January effect significantly decreased the abnormal risk and the systematic risk.

Finally, by reading from row 3 against column 27C, we realized that the financial crisis (CRIS) had an overall negative but insignificant effect on

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the expected returns of the stock RSIC (Ali & Afzal, 2012) at the 5 percent significant level. But, the January effect had no significant but positive overall effect on the expected returns of the stock RSIC which was contrarily to (Guler, 2013; Athanassakos & Ackert, 1998 and Ackert & Athanassakos, 1997), as read from the row 4 against column 27J.

Super Paper Limited (RSPL)

The results for RSPL show that, the systematic risk as measured by the coefficient of the market index (INDEX) was not significant in explaining the expected return (Fama & French, 1992 and Baillie & DeGenmaro, 1990). The direction of the relationship between the systematic risk and that of the expected return was negative and the magnitude was 0.0164, even though not significant. In the same token, the abnormal risk as measured by the coefficient of the constant was insignificant but negatively related to the expected returns. Thus, with respect to RSPL, there was no evidence in favour of the CAPM as well as the returns anomalies.

When CRIS was introduced into the model, both the systematic risk and the abnormal risk were insignificant in explaining the expected return of RSPL. The explanatory power (in absolute terms) of the market index increased from 0.0164 to 0.0170 – an increase in explanatory by about 366 basis points. Similarly, the explanatory power of the abnormal risk also fell from 0.0001 to 0.0000, representing exactly 10,000 basis points fall in explanatory power. The financial crisis decreased internal risk of RSPL such as operational risk or business risk more than the systematic or external risk.

More so, when the January hypothesis (JANE) was introduced into the model, the dynamics changed. As read from column 28J, the explanatory

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power of the systematic risk fell by only 122 basis points which mean that the January effect actually decreased systematic risk of RSPL. But, the abnormal risk's potential to predict expected returns remained unchanged.

Finally, by reading from row 3 against column 28C, we realized that the financial crisis (CRIS) had an overall negative but insignificant effect on the expected returns of the stock RSPL at the 5 percent significant level rejecting the finding of (Yakubu & Akerele, 2012; Karunanayake, Valadkhani, & O'brien, (n.d) and Ali & Afzal, 2012). The results of January effect also had insignificant but negative overall effect on the expected returns of the stock RSPL which was contrarily to (Guler, 2013; Athanassakos & Ackert, 1998 and Ackert & Athanassakos, 1997), as read from the row 4 against column 28J.

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Table 18: The Effect of the Global Financial Crises and the January Hypothesis on RSCB, RSGSSB, RSIC and RS

	25	**25C**	**25J**	**26**	**26C**	**26J**	**27**	**27C**	**27J**	**28**	**28C**	**28J**
Dep. Var:	RSCB	RSCB	RSCB	RSGSSB	RSGSSB	RSGSSB	RSIC	RSIC	RSIC	RSPL	RSPL	RSPL
RINDEX	0.1502	0.1495	0.1503	0.1018	0.1014	0.102	0.1772	0.1802	0.176	-0.0164	-0.017	-0.0162
	[9.5769]**	[9.5361]**	[9.5788]**	[4.7241]**	[4.7084]**	[4.7339]**	[2.5116]*	[2.5525]*	[2.4940]*	[-0.6235]	[-0.6439]	[-0.6167]
C	0.0024	0.0027	0.0024	0.0011	0.0015	0.0012	0.001	0.0023	0.0008	-0.0001	0	-0.0001
	[7.3818]**	[7.7524]**	[7.1920]**	[2.3621]*	[2.8392]**	[2.5300]*	[1.2237]	[1.5732]	[0.9294]	[-0.3030]	[0.0130]	[-0.1798]
CRIS		-0.0022			-0.002			-0.0019			-0.0003	
		[-2.4320]*			[-1.6501]			[-1.0728]			[-0.4310]	
JANE			-0.0003			-0.0018			0.0025			-0.0004
			[-0.2468]			[-0.9636]			[0.8464]			[-0.3604]
Observations:	3424	3424	3424	2862	2862	2862	745	745	745	1453	1453	1453
R-squared:	0.0261	0.0278	0.0261	0.0077	0.0087	0.0081	0.0084	0.01	0.0094	0.0003	0.0004	0.0004
F-statistic:	91.7178	48.882	45.8768	22.3171	12.5266	11.6225	6.3079	3.73	3.5109	0.3887	0.2871	0.2592
Prob(F-stat):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0122	0.0244	0.0304	0.5331	0.7505	0.7717

Source: Author's construct (2014)

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Samwood Limited (RSWL)

The results for RSWL shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was insignificant in explaining the expected return thus affirming the findings of (Fama & French, 1992 and Baillie & DeGenmaro, 1990). The direction of the relationship between the systematic risk and that of the expected return was negative and the magnitude was 0.0116. Similarly, the abnormal risk, as measured by the coefficient of the constant was also insignificant and negatively related to the expected returns. Thus, with respect to RSWL, there was no evidence in favour of both the CAPM and the returns anomalies.

Following the introduction of CRIS into the model, both the systematic risk and the abnormal risk were not significant in explaining the expected return of RSWL. The explanatory power (in absolute terms) of the market index increased from 0.0116 to 0.0130 – an increase in explanatory by about 1207 basis points. Similarly, the explanatory power of the abnormal risk also fell from 0.0002 to 0.000, representing exactly 10,000 basis points fall in explanatory power. The financial crisis decreased internal risk of RSWL such as operational risk or business risk but increased the systematic or external risk.

Furthermore, when the January hypothesis (JANE) was introduced into the model, the dynamics changed. As read from column 29J, the explanatory power of the systematic risk increased by only 86 basis points which means that the January effect actually increased systematic risk of RSWL. But, the abnormal risk's potential to predict expected returns remained unchanged. This suggests that the January effect significantly increase the systematic risk.

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Finally, Ali & Afzal (2012) was evident by reading from row 3 against column 29C, it is realized that the financial crisis (CRIS) had an overall negative but insignificant effect on the expected returns of the stock RSWL at the 5 percent significant level. Contrarily to Guler (2013); Athanassakos and Ackert (1998); and Ackert and Athanassakos (1997) who found that the average rate of return on stocks is higher in January than for any other month of the year, the January effect had insignificant but positive overall effect on the expected returns of the stock RSWL, as read from the row 4 against column 29J for the study.

Trust Bank (Gambia) RTBL

Fama and French (1992) and Baillie and DeGenmaro (1990) proposition on CAPM was favoured in the results for RTBL. The shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was insignificant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was negative and the magnitude was 0.0004. In the same token, the abnormal risk as measured by the coefficient of the constant was significant and positively related to the expected returns. Thus, in with respect to RTBL, there was no evidence in favour of the CAPM, but there was evidence in favour of the returns anomalies.

When CRIS was introduced into the model, the systematic risk was insignificant whilst the abnormal risk was significant in explaining the expected return of RTBL. The explanatory power (in absolute terms) of the market index increased from 0.0004 to 0.0023 – an increase in explanatory by about 47,500 basis points. Similarly, the explanatory power of the abnormal

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risk also increase from 0.0008 to 0.0011, representing exactly 2727 basis points rise in explanatory power. The financial crisis increased internal risk of RTBL such as operational risk or business risk but with lesser extent, compared to the extent at which the crisis increased the systematic or external risk.

However, when the January hypothesis (JANE) was introduced into the model, the dynamics changed. As read from column 30J, the explanatory power of the systematic risk fell by only 5000 basis points which means that the January effect actually decreased systematic risk of RTBL. But, the abnormal risk's potential to predict expected returns remained unchanged though significant. This suggests that the January effect decreased the systematic risk.

Finally, by reading from row 3 against column 30C, we realized that the financial crisis (CRIS) had an overall negative but insignificant effect on the expected returns of the stock RTBL (Ali & Afzal, 2012) at the 5 percent significant level. The January effect had insignificant but negative overall effect on the expected returns of the stock RTBL, as read from the row 4 against column 30J which opposes Guler (2013); Athanassakos and Ackert (1998); and Ackert and Athanassakos (1997) who found that the average rate of return on stocks is higher in January than for any other month of the year.

Total Ghana Limited (RTOTAL)

Findings from Literatures like Leon, Nave and Rubio 2005; Raputsoane (2009) and Laubscher (2012) who indicated that Capital Asset Pricing Model (CAPM), postulates a direct relationship between expected excess stock returns and risk were evident as the results for RTOTAL. The

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results show that, the systematic risk as measured by the coefficient of the market index (INDEX) was significant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.1246. In the same token, the abnormal risk as measured by the coefficient of the constant was significant and positively related to the expected returns. Thus, in with respect to RTOTAL, there was evidence in favour of both the CAPM and the returns anomalies.

When CRIS was introduced into the model, both the systematic risk and the abnormal risk were significant in explaining the expected return of RTOTAL. The explanatory power (in absolute terms) of the market index fell from 0.1246 to 0.1243 – a fall in explanatory by about 24 basis points. Similarly, the explanatory power of the abnormal risk increased from 0.0018 to 0.0020, representing exactly 1111 basis points rise in explanatory power. The financial crisis increased internal risk of RTOTAL but decreased the systematic or external risk.

Conversely, when the January hypothesis (JANE) was introduced into the model, both the systematic risk and the abnormal risk were significant in explaining the expected return of RTOTAL. As read from column 31J, the explanatory power of the systematic risk remained the same relatively. Similarly, the abnormal risk's potential to predict expected returns remained unchanged. This suggests that the January effect had no significant effect on RTOTAL.

Finally, by reading from row 3 against column 31C, we realized that the financial crisis (CRIS) had an overall negative but insignificant effect on

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the expected returns of the stock RTOTAL (Ali & Afzal, 2012) at the 5 percent significant level. But, the January effect had no significant but positive overall effect on the expected returns of the stock RTOTAL, as we read from the row 4 against column 31J refuting Guler (2013); Athanassakos and Ackert (1998); and Ackert and Athanassakos (1997) who found that the average rate of return on stocks is higher in January than for any other month of the year.

RTRANS

Fama and French (1992) and Baillie and DeGenmaro (1990) proposition on CAPM was favoured in the results for RTRANS. The results shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was insignificant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.0013, even though not significant. In the same token, the abnormal risk as measured by the coefficient of the constant was insignificant and positively related to the expected returns. Thus, in with respect to RTRANS, there was no evidence in favour of the CAPM, as well as the returns anomalies.

When CRIS was introduced into the model, both the systematic risk and the abnormal risk were significant in explaining the expected return of RTRANS. The explanatory power (in absolute terms) of the market index fell from 0.0013 to 0.0001 – a fall in explanatory by about 9231 basis points. Similarly, the explanatory power of the abnormal risk also increased from 0.0007 to 0.0022, representing exactly 6818 basis points rise in explanatory power. The financial crisis increased internal risk of RTRANS such as operational risk or business risk, but decreased the systematic or external risk.

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Furthermore, when the January hypothesis (JANE) was introduced into the model, the dynamics changed. As one observes from column 32J, the explanatory power of the systematic risk increased by only 2308 basis points which means that the January effect actually increased systematic risk of RTRANS. But, the abnormal risk's potential to predict expected returns increased from 0.0007 to 0.0008, representing an increase by about 1429 basis points. This suggests that the January effect significantly increased the abnormal risk and the systematic risk.

Finally, Ali & Afzal (2012) is confirmed, thus by reading from row 3 against column 32C, we realized that the financial crisis (CRIS) had an overall negative but insignificant effect on the expected returns of the stock RTRANS at the 5 percent significant level. The January effect also had insignificant but negative overall effect on the expected returns of the stock RTRANS which is opposite to Athanassakos and Ackert, (1998) and Guler (2013) whose empirical finding was that the average rate of return on stocks is higher in January than for any other month of the year as one reads from the row 4 against column 32J.

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Table 19: The Effect of the Global Financial Crises and the January Hypothesis on RSWL, RTBL, RTOTAL and RTRANS

Eq Name:	29	29C	29J	30	30C	30J	31	31C	31J	32	32C	32J
Dep. Var:	RSWL	RSWL	RSWL	RTBL	RTBL	RTBL	RTOTAL	RTOTAL	RTOTAL	RTRANS	RTRANS	RTRANS
RINDEX	-0.0116	-0.013	-0.0117	-0.0004	-0.0023	-0.0002	0.1246	0.1243	0.1246	0.0013	0.0001	0.0016
	[-0.6534]	[-0.7269]	[-0.6576]	[-0.0151]	[-0.0793]	[-0.0081]	[7.8482]**	[7.8271]**	[7.8421]**	[0.0147]	[0.0011]	[0.0187]
C	-0.0002	0	-0.0002	0.0008	0.0011	0.0008	0.0018	0.002	0.0018	0.0007	0.0022	0.0008
	[-0.8946]	[0.1005]	[-0.9394]	[2.1474]*	[2.5477]*	[2.1907]*	[5.6117]**	[5.5262]**	[5.4023]**	[0.7032]	[1.4853]	[0.6923]
CRIS		-0.0008			-0.0011			-0.0008			-0.0029	
		[-1.6417]			[-1.3701]			[-0.9252]			[-1.3924]	
JANE			0.0002			-0.0006			0.0001			-0.0003
			[0.2876]			[-0.4755]			[0.0756]			[-0.0810]
Observations:	1866	1866	1866	1778	1778	1778	3356	3356	3356	1011	1011	1011
R-squared:	0.0002	0.0017	0.0003	0	0.0011	0.0001	0.018	0.0183	0.018	0	0.0019	0
F-statistic:	0.4269	1.5613	0.2547	0.0002	0.9387	0.1132	61.5942	31.2238	30.7908	0.0002	0.9695	0.0034
Prob(F-stat):	0.5136	0.2101	0.7752	0.9879	0.3913	0.893	0.0000	0.0000	0.0000	0.9883	0.3796	0.9966

Source: Author's construct (2014)

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Unilever Ghana Limited (RUNIL)

The results for RUNIL affirms the theory of CAPM (see examples Lundblad, 2007; Leon, Nave & Rubio, 2005 and Raputsoane, 2009) which shows that the systematic risk as measured by the coefficient of the market index (INDEX) was significant in explaining the expected return. The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.1612, even though not significant. In the same token, the abnormal risk as measured by the coefficient of the constant was significant and positively related to the expected returns. Thus, in with respect to RUNIL, there was evidence in favour of both the CAPM and the returns anomalies.

Following the introduction of CRIS into the model, both the systematic risk and the abnormal risk were significant in explaining the expected return of RUNIL. The explanatory power (in absolute terms) of the market index fell from 0.1612 to 0.1611 – a fall in explanatory by about 6 basis points. Similarly, the explanatory power of the abnormal risk also increased from 0.0014 to 0.0015, representing exactly 714 basis points increase in explanatory power. The financial crisis increased internal risk of RUNIL such as operational risk or business risk but decreased the systematic or external risk.

When the January hypothesis (JANE) was introduced into the model, the dynamics did not change relatively. Per the reading, both the systematic risk and the abnormal risk were significant in explaining the expected return of RUNIL. As read from column 33J, the explanatory power of the systematic risk fell by only 6 basis points which means that the January effect actually

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decreased systematic risk of RUNIL. But, the abnormal risk's potential to predict expected return of RUNIL remained unchanged.

Finally, by reading from row 3 against column 33C, we realized that the financial crisis (CRIS) had an overall negative but insignificant effect on the expected returns of the stock RUNIL at the 5 percent significant level confirming the finding of (Ali & Afzal, 2012). But, the January effect had insignificant but positive overall effect on the expected returns of the stock RUNIL, as read from the row 4 against column 33J which was not in favour of (Guler, 2013 and Athanassakos & Ackert, 1998).

UT Bank Limited (RUTB)

The results for RUTB shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was not significant in explaining the expected return (Fama & French, 1992 and Baillie & DeGenmaro 1990). The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.1668. In the same token, the abnormal risk as measured by the coefficient of the constant was insignificant and negative related to the expected returns. Thus, with respect to RUTB, there was no evidence in favour of both the CAPM proposed by (Sharpe, 1964) and the returns anomalies.

When CRIS was introduced into the model, both the systematic risk and the abnormal risk were not significant in explaining the expected return of RUTB. The explanatory power (in absolute terms) of the market index remained unchanged. Similarly, the explanatory power of the abnormal risk also fell from 0.0001 to 0.0000, representing exactly 10,000 basis points fall in

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explanatory power. The financial crisis decreased internal risk of RUTB but not the systematic or external risk.

Conversely, when the January hypothesis (JANE) was introduced into the model, the dynamics changed. As read from column 34J, the explanatory power of the systematic risk increased by 204 basis points which means that the January effect actually increased the systematic risk of RUTB. But, the abnormal risk's potential to predict expected returns increased from 0.0001 to 0.0003, representing an increase by about 20,000 basis points. This suggests that the January effect significantly increased the abnormal risk more than its upward effect on the systematic risk.

Finally, by reading from row 3 against column 34C Yakubu and Akerele (2012); and Karunanayake, Valadkhani, and O'brien, (n.d) finding which stated that CRIS did not have any significant effect on returns was not confirmed in the case of Ghana. From the results, it was realized that the financial crisis (CRIS) had an overall negative and significant effect on the expected returns of the stock RUTB at the 5 percent significant level. But, the January effect had no significant but positive overall effect on the expected returns of the stock RUTB, as read from the row 4 against column 34J. Hence Guler (2013) finding was not confirmed.

Aluworks Ghana Limited (RALW)

Table 21 also contains the results from RALW. The results for RALW shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was not significant in explaining the expected return (Fama & French, 1992 and Baillie & DeGenmaro, 1990). The direction of the relationship between the systematic risk and that of the expected return was

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positive and the magnitude was 0.0144. In the same token, the abnormal risk as measured by the coefficient of the constant was insignificant and positively related to the expected returns. Thus, with respect to RALW, there was no evidence in favour of both the CAPM and the returns anomalies.

When CRIS was introduced into the model, the systematic risk was insignificant but the abnormal risk was significant in explaining the expected return of RALW. The explanatory power (in absolute terms) of the market index fell from 0.0144 to 0.0139 – a fall in explanatory by about 347 basis points. Similarly, the explanatory power of the abnormal risk rose from 0.0003 to 0.0010, representing exactly 23,333 basis points increase in explanatory power. The financial crisis increased internal risk of RALW but decreased the systematic or external risk.

Furthermore, when the January hypothesis (JANE) was introduced into the model, the dynamics changed. As read from column 35J, the explanatory power of the systematic risk fell by only 139 basis points which means that the January effect actually decreased systematic risk of RAWL. But, the abnormal risk's potential to predict expected returns fell from 0.0003 to 0.0002, representing a fall by about 3,333 basis points. This suggests that the January effect decreased both the abnormal risk and the systematic risk.

Finally, by reading from row 3 against column 35C, we realized that the financial crisis (CRIS) had an overall negative and significant effect on the expected returns of the stock RAWL at the 1 percent significant level which contradicts with Ali and Afzal (2012) who stated in their study that the effect of CRIS on stock market was negative but mild. But, Guler (2013) finding was not confirmed, thus the January effect had no significant but positive overall

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effect on the expected returns of the stock RAWL, as read from the row 4 against column 35J.

Guinness Ghana Brewery Limited (RGGBL)

Table 21 finally presents the results for RGGBL. The results for RGGBL shows that, the systematic risk as measured by the coefficient of the market index (INDEX) was significant in explaining the expected return (Laubscher, 2012; Sharpe, 1964 and Lintner, 1965). The direction of the relationship between the systematic risk and that of the expected return was positive and the magnitude was 0.1576. In the same token, the abnormal risk as measured by the coefficient of the constant was significant and positively related to the expected returns. Thus, with respect to RGGBL, there was evidence in favour of both the CAPM and the returns anomalies.

When CRIS was introduced into the model, both the systematic risk and the abnormal risk were significant in explaining the expected return of RGGBL. The explanatory power (in absolute terms) of the market index fell from 0.1576 to 0.1568 – a fall in explanatory by about 51 basis points. Similarly, the explanatory power of the abnormal risk also increased from 0.0018 to 0.0021, representing exactly 1,667 basis points increase in explanatory power. The financial crisis increased internal risk of RGGBL such as operational risk or business risk more than the systematic or external risk.

However, when the January hypothesis (JANE) was introduced into the model, both the systematic risk and the abnormal risk were significant in explaining the expected return of RGGBL. As read from column 36J, the explanatory power of the systematic risk fell by only 57 basis points which means that the January effect actually decreased systematic risk of RGGBL.

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But, the abnormal risk's potential to predict expected returns decreased from 0.0018 to 0.0015, representing a decrease by about 1,667 basis points. This suggests that the January effect significantly decreased the abnormal risk more than systematic risk.

Finally, by reading from row 3 against column 36C, it was seen that the results contradicted with Ali and Afzal, (2012) who stated in their study that the effect of CRIS on stock market was negative but mild It was realized that the financial crisis (CRIS) had an overall negative and significant effect on the expected returns of the stock RGGBL at the 5 percent significant level. But, the January effect had positive overall significant effect on the expected returns of the stock RGGBL as read from the row 4 against column 36J as found by (Athanassakos & Ackert, 1998).

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Table 20: The Effect of the Global Financial Crises and the January Hypothesis on RUNIL, RUTB, RALW and RGGBL

Eq Name:	33	33C	33J	34	34C	34J	35	35C	35J	36	36C	36J
Dep. Var:	RUNIL	RUNIL	RUNIL	RUTB	RUTB	RUTB	RALW	RALW	RALW	RGGBL	RGGBL	RGGBL
RINDEX	0.1612	0.161	0.161	0.1668	0.1668	0.1702	0.0144	0.0139	0.0142	0.1576	0.1568	0.1567
	[7.8477]**	[7.8362]**	[7.8347]**	[1.6481]	[1.6464]	[1.6796]	[0.7079]	[0.6816]	[0.6961]	[8.0434]**	[8.0060]**	[7.9956]**
C	0.0014	0.0015	0.0014	-0.0001	0	0.0003	0.0003	0.001	0.0002	0.0018	0.0021	0.0015
	[3.3436]**	[3.2726]**	[3.1226]**	[-0.0558]	[0.0041]	[0.2480]	[0.6759]	[1.9626]*	[0.3810]	[4.3665]**	[4.8493]**	[3.6875]**
CRIS		-0.0006			-0.0001			-0.0036			-0.0024	
		[-0.4913]			[-0.0157]			[-3.0990]**			[-2.1210]*	
JANE			0.0007			-0.0034			0.0018			0.0033
			[0.4089]			[-0.9175]			[1.0271]			[2.0478]*
Observations:	3424	3424	3424	535	535	535	2688	2688	2688	3424	3424	3424
R-squared:	0.0177	0.0177	0.0177	0.0051	0.0051	0.0066	0.0002	0.0037	0.0006	0.0186	0.0198	0.0198
F-statistic:	61.587	30.9074	30.8696	2.7163	1.3557	1.7787	0.5011	5.0532	0.778	64.697	34.631	34.4755
Prob(F-stat):	0.0000	0.0000	0.0000	0.0999	0.2587	0.1699	0.4791	0.0064	0.4594	0.0000	0.0000	0.0000

Source: Author's construct (2014)

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CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This final chapter discusses all that had gone on in the previous chapters. First, it summarizes all the issues which bother on the problem formulation, the research objectives, the methodology employed and the key findings. In addition, based on the findings, conclusions were made based on the objectives set. The chapter provides insightful recommendations for financial market participants in Ghana as to how they can leverage the happenings from this study for investment benefits. The chapter ends with other areas that could be interestingly researchable and thus, providing suggestion for future research.

Summary

This study was initiated out of the need to investigate and furnish financial market participant in Ghana and elsewhere with current information on the risk and return relationship for stocks listed on the Ghana Stock Exchange. Such investigations specifically sought to provide investors with information that helped in determining the stock return premium they should be charged under various degrees of market risks. Furthermore, the study ascertained whether the global financial crisis had any impact on the beta of the GSE stocks. Finally, the January effect hypothesis which states that almost one-third of the annual volatility of stock beta is accounted for only in January was tested.

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In terms of methodology, the study first applied statistical procedures to investigate risk-return characteristics. Subsequently, the conventional CAPM were estimated for the various stocks to determine their systematic risk level as measured by the beta. The study also modified the CAPM model to control for the financial crisis and the January Effect hypothesis. Eventually, three equations were estimated using ordinary least square after the stationarity levels of the various stocks have been confirmed.

Key Findings

The key findings included the following:

- The stock market in Ghana is not efficient and the distribution of the market return (INDEX) is not normal.
- Despite the fact that the stock market did not exhibit any evidence of efficiency, the beta of Accra Brewery Limited, Ecobank Transnational, Fanmilk Ghana Limited, Ghana Commercial Bank Limited, Standard Chartered Bank Limited, SG-SSB Limited, Total Ghana Limited, Guinness Ghana Brewery Limited, Unilever Ghana Limited, and SIC Limited predicted their individual stock returns.
- Out of the total of thirty six (36) listed firms reviewed, twenty four (24) firms had positive relationship. These were: ABL, ACI, AGA, CFAO, CMLT, CPC, EBG, TRANS, UTBB, ETI, FML, GCB, GWEB, HFC, MLC, PKL, PZC, SCB, SGSSB, SIC, TOTAL, UNIL and GGBL. That is, the returns of these firms were positively related to their risk (beta), though only ten (10) stocks had a significant relationship. By implication, investors could rely on the CAPM model to predict their expected returns in relation to these ten stocks on GSE.

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- It should be noted that, out of the ten stocks which the CAPM predicted their relationship, seven (7) stocks namely; FML, GCB, SCB, SGSSB,TOTAL, UNIL and GGBL, had their return anomaly, that is, other internal risk factors being positive and significant. This means that, in valuing these stocks, CAPM should not be the sole model to be relied upon, but investors must also take into account other internal factors since they may have an impact in explaining the relationship better.
- Ten (10) of the reviewed stocks had a negative relationship. That is, the returns were negatively related to their risk (beta), though not significant. These includes; AADS, BOP, CAL, CLYD, GOIL, GSR, PBC, SPL, SWL and TBL.
- Seventeen (17) of the reviewed stocks had their return anomalies (other internal risk factors), being positive and significant. These were; AADS, ACI, CFAO, CMLT, EBG, FML, GCB, HFC, MLC, PKL, PZC, SCB, SGSSB, TBL, TOTAL, UNIL and GGBL. It stands to reason that, in assessing the aforementioned stocks, investors ought to take into account their internal risk factors, because they are positively related to returns and significant as well.
- The recent financial crisis had downward significant effects on the beta of Accra Brewery Limited, Ecobank Transnational, Fanmilk Ghana Limited, Standard Chartered Bank Limeted, SG-SSB Limited, Total Ghana Limited, Guiness Ghana Brewery Limited and Unilever Ghana Limited. Similarly, the financial crisis had an upward significant effect on the beta of GCB Limited and SIC Limited. In all, the betas of firms

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in the financial industry were most affected by the recent financial crises. The betas of the remaining were not significantly affected by the crisis.

- The January effect had upward significant effects on the beta of Accra Brewery Limited, Ecobank Transnational, Fanmilk Ghana Limited, Standard Chartered Bank Limited, SG-SSB Limited, Ghana Commercial Bank Limited. Total Ghana Limited was indifferent. Similarly, the January effect generally had a downward significant effect on the beta of Guiness Ghana Brewery Limited, Unilever Ghana Limited and SIC Limited. In all, the betas of firms in the financial industry were most affected by the January hypothesis. The betas of the remaining were not significantly affected by the January effect.

Conclusion

This study has provided a vivid and clear description to the risk and return relationship for stocks on the Ghana Stock Exchange. The study revealed that the stock market in Ghana is not efficient which confirm prior studies. Similarly, by applying the CAPM model the beta coefficient for stocks on the GSE the study revealed some key relationships. The study revealed that (10) of the stocks listed on the stock exchange had their beta's predicting their returns. That is to say that there was a positive relationship between risk and return for these ten listed firms. This conforms to Sharpe and Lintner's proposition. Secondly, the study revealed that in seven (7) out of the ten (10) stocks, other factors other than the beta contributed to the relationship. This means that, in dealing with those stocks, these factors ought to be considered. Finaly, some of the stocks showed a complete rejection of the

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proposition by Sharpe (1964) and Lintner (1965). This is because other factors and not the beta could explain the relationship better.

Even though, this study has introduced the crisis effect on the beta of stocks on the GSE, it appears it only had monotonic impact but not transformational effect. Therefore, the crisis adjusted CAPM did not make the beta of firms which hitherto were insignificant to be significant. Conversely, the idiosyncratic risks of most firms were significant in explaining stock returns.

Despite the above, this study has proved that even under condition of less efficiency, the CAPM model even without adjustment, has predicted the beta of stocks such Accra Brewery Limited, Ecobank Transnational, Fanmilk Ghana Limited, Standard Chartered Bank Limeted, SG-SSB Limited, Total Ghana Limited, Guiness Ghana Brewery Limited, Unilever Ghana Limited, GCB Limited and SIC Limited. Therefore, the CAPM is not completely dead in Ghana. The only defection is that the model worked even under conditions of market inefficiency. This may mean that beta also interact with certain empirical variables exogenous to the specifications in this study.

Recommendations

Recommendations for Policy Makers

- The CAPM model predicted the risk return relationship for ten (10) stocks listed on the GSE. This means that investors and other participants on the stock market could value their expected return using the CAPM model. It should be noted that, out of the ten stocks which the CAPM predicted their relationship, seven (7) stocks namely; FML, GCB, SCB, SGSSB,TOTAL, UNIL and GGBL, had their return

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anomaly, that is, other internal risk factors being positive and significant. This means that, in valuing these stocks, CAPM should not be the sole model to be relied upon, but investors must also take into account other internal factors since they may have an impact in explaining the relationship better.

- Since financial crises in 2007/2008 had been found to have affected the beta levels of certain companies in Ghana, especially the financial service companies, it is imperative that such companies position themselves to compete effectively in the global financial market for more investors if the domestic market's capacity to invest is overstretched. Sometimes, going international require syndicated arrangements with other companies to leverage delivery capacity. The companies essentially should leverage their less risky situation in the wake of crises to lure more investors domestically and internationally.
- Finally, the study revealed that, there is evidence of January effect (seasonal anomaly) in stocks listed on the GSE. It is therefore recommended that, in dealing with GSE stocks, especially the finance sector, seasonal anomaly (January effect) should be taken into account.

Suggestion for Further Studies

This study has applied the CAPM to estimate the beta of the stocks on the stock market including an adjustment of the CAPM model to account for crises and the January effect. This is a major innovation in the modelling of the risk level of the companies operating in an organized market. However, this study did not cover all the aspects that need to be known about financial markets in Ghana.

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First, there is the need to investigate the behavioural occurrences that sustain the improvement in activities of the GSE. This will augment what is already known about the positivist dimension of the stock market development.

Secondly, future empirical investigations should apply the arbitrage pricing model by Ross (1979), the 3-factor model by Fama and French (1996), and other multi-factor models to ascertain whether the variables suggested in their models will affect the expected return of the stocks on the GSE.

Lastly, future risk and returns studies should apply the conditional volatility econometric specification proposed by the likes of Engle (1987), Bollarslev et al (1992) among others within the framework of CAPM and other models to ascertain whether the findings in this study could be upheld.

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REFERENCES

Ackert, L.F. & Athanassakos, G. (1997). Institutional Investors, Analyst Following, and the January Anomaly. Working Paper, *The Mutual Group Financial Services Research Centre*, Wilfrid Laurier University,

African Securities and Exchange Association (2013). Brief on the 26th ASEA Executive Committee Meeting. Retrieve from: http://www.african-exchanges.org/event/26th-executive-committee-meeting-in-labadi-beach-hotel-in-accra/. Date: 2th August, 2016.

Acheampong, P., Agalega, E. (2013). Does the Capital Assets Pricing Model (CAPM) Predicts Stock Market Returns in Ghana? Evidence from Selected Stocks on the Ghana Stock Exchange. *Research Journal of Finance and Accounting, 4*(9), 2222-1697.

Ali, R. & Afzal, M. (2012). Impact of global financial crisis on stock markets: Evidence from Pakistan and India. *Journal of Business Management and Economics*, *3* (7), 275-282

Antwi, S. Mill, A.E.F.E. & Zhao, X. (2012) Capital Structure and Firm Value: Empirical Evidence from Ghana. *International Journal of Business and Social Science 3* (22) 103- 111

Athanassakos, G. & Ackert, L. (1998). The seasonal impact of institutional investors (The January effect). *Canadian Investment Review. 11*(3) (pp. 28-42).

Athanassakos, G. (1995). Beating January to the Punch. *Canadian Investment Review, 8* (2), (pp. 23-29).

Digitized by UCC, Library

Ayentimi, D. T., Mensah, A. E. & Naa-Idar, F. (2013). Stock market efficiency of Ghana Stock Exchange: An objective analysis. *International Journal of Management, Economics and Social Sciences, 2*(2), (pp. 54 –75).

Baillie, R. T. & DeGennaro R. P., (1990). Stock Returns and Volatility. *Journal of Financial and Quantitative Analysis, 25*, 203-214.

Bajpai, N. (2011). Business Research Methods. Dorling (India) Pvt. Ltd. doi: https://books.google.co.ke/books.

Bartholdy, J., & Peare, P. (2005). Estimation of expected return: CAPM vs. Fama and French. *International Review of Financial Analysis, 14*(4), 407-427

Bellelah, M.A., Bellelah, M.O., Ben Ameur, H., & Ben Hafsia, R. (2015). Does the equity premium puzzle persist during financial crisis? The case of French equity market. *Research in International Business and Finance,* http://dx.doi.org/10.1016/j.ribaf.2015.02.018.

Black, Fischer, Michael C. Jensen and Myron Scholes, (1972). The Capital Asset Pricing Model: Some Empirical Tests. In M. Jensen (Ed)., *Studies in the Theory of Capital Markets,* Praeger.

Bodie, Z., Kane, A. & Marcus, A. (2008). Fundamentals of investment McGraw, Hill Brasil.

Bollerslev, T. (1986) Generalized Autoregressive Conditional Heteroskedasticity. *Journal of Econometrics*, *31* (1), 307-327.

Brealey, R. A., Myers, S. C. & Allen, F. (2008) *Principles of corporate finance* (9th Edition). Boston: McGraw-Hill Irwin

Bryman, A. (2004). *Social research methods* (2nd ed.) Lund: Oxford University Press.

Digitized by UCC, Library

Bryman, A. & Bell, E. (2011). *Business Research Methods* (3th Edition). Lund: Oxford University Press.

Bryman, A. & Bell, E. (2003). *Business research methods* (2th Edition). Lund: Oxford University Press.

Carhart, M. M. (1997) On persistence in Mutual Performance. *Journal of Finance, 52*(1) 57-82

Coffie, W., Chukwulobelu, O. (2012). The Application of Capital Asset Pricing Model (CAPM) to Individual Securities on Ghana Stock Exchange. In K. Menyah & J. Abor (Eds.), *Finance and Development in Africa,* Volume 12 (pp. 121-147). Emerald Group Publishing Limited.

Creswell, J. W. (2003). Research Design: Qualitative and Quantitative and Mixed-Method Approaches. Thousand Oaks, CA: Sage Publications.

Dash, S.R. (2012). Investor sentiment, risk factors and stock return: evidence from Indian non-financial companies. *Journal of Indian Business Research*, *4* (3) 194 – 218

Dolde, W., Giaccotto, C., & Mishra, R. (2012). Should managers estimate cost of equity using a two-factor international CAPM? *Managerial Finance*, *38* (8), 708-728, DOI 10.1108/03074351211239360.

Drew, M.E., Naughton, T., & Veeraragavan, M. (2005). Pricing of Equities in China: Evidence from the Shanghai Stock Exchange. *Managerial Finance*, *31* (12), 46-57.

Drew, M.E., Naughton, T., Malin, M., & Veeraragavan, M. (2006). Idiosyncratic volatility and security returns: evidence from Germany

Digitized by UCC, Library

and United Kingdom. *Studies in Economics and Finance, 23* (2), 80-93.

Elsas, R., El-Shaer, M. & Theissen, E. (2003). Beta and Returns Revisited Evidence From The German Stock Market. *Journal of International Financial Markets, Institutions and Money 13(*1):1–18.

Engle, R. F. (1982). Autoregressive conditional heteroscedasticity with estimates of the variance of United Kingdom inflation. *Econometrica*, *50* (4), 987-1007.

Fama, E. F. & French, R.K. (1992). The cross section of expected stock returns. *Journal of Finance 47,*427—465

Fama, E. F. & French, R. K. (1993). Common Risk Factors in the Returns on Stocks and Bonds. *Journal of Financial Economics*, *33*, 3-56.

Fama, E. F. & French, R. K. (1995). Size and Book-to-Market Factor s in Earnings and Returns. *Journal of Finance*, *50*, 131-155.

Fama, E. F. & French, R. K. (1996). Multifactor Explanations of Asset Pricing Anomalies. *Journal of Finance, 51*, 55-84.

Fama, E.F. (1970). Efficient capital markets: A Review of theory trading profits. *Journal of Business, 39* (1): 226-241.

Frimpong, J. M. & Oteng-Abayie, E. F. (2008). Market returns and weak-form efficiency: The case of the Ghana Stock Exchange. Munich Personal RePEc Archive, MPRA. 7582: 1-9.

Frimpong, J. M. (2008). Capital market efficiency: An analysis of weak-form efficiency on the Ghana Stock Exchange. *Journal of Money, Investment & Banking, 5,* 5- 12.

Digitized by UCC, Library

Glosten, L. R, Jagannanthan, R. & Runkle, D. E (1993) On the Relation Between the Expected Value and the Volatility of the Nominal Excess Return on Stocks. *Journal of Finance, 48* (5), 1779-1801

Gonzalez, M. F. (2001). CAPM performance in the Caracas Stock Exchange from 1992-1998. *International Review of Financial Analysis,* 10, 333-341.

Guler, S. (2013). January Effect in Stock Returns: Evidence from Emerging Markets. *Institute of Interdisciplinary Business Research, 5(4),(pp. 1-10)*

Hughes, J. (1997). *The Philosophy of Social Research*, 3rd Ed. London: Longman.

Hyde, S., Bredin, D., Nitzsche, D. & G O'reilly, G. (2007). UK stock returns and the impact of domestic monetary policy shocks. *Journal of Business Finance & Accounting 34* (5-6), 872-888

Karunanayake, I., Valadkhani, A. & O'brien, M., (n.d) The Effects of Financial Crises on International Stock Market Volatility Transmission, School of Economics, University of Wollongong, Australia.

Laubscher, E. R. (2002). A review of the theory of and evidence on the use of the capital asset pricing model to estimate expected share returns. *Meditari Accountancy Research, 10*, 131–146.

Ho, L.C.J. Tsay, J.J & Ho, L.C. J. (2001). Option trading and the intervalling effect biase in beta. *Review of Quantitative Finance and Accounting 17* (3), 267-282

Lee, S., & Upneja, A. (2007). Is capital asset pricing model (CAPM) the best way to estimate cost-of-equity for the lodging industry? *International*

Digitized by UCC, Library

Journal of Contemporary Hospitality Management, 20 (2), 172-185, DOI 10.1108/09596110810852159)

Leon A., Nave J. & Rubio, G., (2005). The Relationship between Risk and Expected Return in Europe. DFAEII Working Papers No. 200508, University of the Basque Country - Department of Foundations of Economic Analysis II

Lettau, M & Ludvigson, S. (2001). Resurrecting the (C) CAPM: A cross-sectional test when risk premia are time-varying. *Journal of Political Economy, 109*(6), 1238-1287.

Lintner, J. (1965). Security prices, risk, and Maximal Gains from diversification. *Journal of finance, XX (* 4), 587-615

Liu, X. & Cao, H. (2011). Improvement of the VaR method for foreign exchange risk measurement based on macro information released. *Systems Engineering Procedia,*1, 440–449.

Lo, A. (2001). Risk management for hedge fund's: introduction and overview. *Financial Analysts Journal 57*, 16–33.

Lundblad C., (2007). The risk return trade-off in the long run: 1836-2003. *Journal of Financial Economics, 85*(1), 123-150.

Markovitz, H. (1952). Portfolio Selection. *Journal of Finance, 2*(3), 322-344

Marsh, D. & Furlong, P. (2002). A Skin Not A Sweater: Ontology and Epistemology in Political Science. In D. Marsh and G. Stoker (Eds). *Theory and Methods in Political Science*, (pp. 17-11).

Melton R., (1973). An Intertemporal Capital Asset Pricing Model. *Econometrica, 41,* 867-887

Mcmenamin, J. (1999). Financial Management: An Introduction. Rotledge

Digitized by UCC, Library

Osei, K. A. (2002). Asset pricing and information efficiency of the Ghana Stock Market. *African Economic Research Consortium*, *115*: 1-39.

Peirson, G., Brown, R., Easton, S., Howard, P., & Pinder, S. (2011). *Business Finance*. 11th edition. McGraw Hill.

Raputsoane, L. (2009). The risk-return relationship in the South Africa stock market. Paper presented at the 14th Annual Conference of the African Econometrics Society on Econometric Modelling in Africa, held at the Sheraton hotel, in Abuja, Nigeria

Ross, S. A. (1976). The Arbitrage Theory of Capital Asset Pricing. *Journal of Economic Theory* 13, (pp. 341-360).

Saunders, M. N., Saunders, M., Lewis, P. & Thornhill, A. (2011). *Research methods for business students.* 5th ed. India: Pearson Education

Sharpe, W.F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of finance. 3* (5) 425-442

Tauer, L. W. (2002). Estimating risk-adjusted interest rates for dairy farms. *Agricultural Finance Review*, *62* (1) 59-68.) Doi. http://dx.doi.org/10.1108/00214880280001129

Theriou, N. G., Maditinos, D. I. Chadzoglou, P, and Anggelidis, V. (2005). The Cross-Section of Expected Stock Returns: An Empirical Study in the Athens Stock Exchange, *Managerial Finance,* Vol. 31 (pp.58 – 78).

Yakubu, Z. & Akerele, A.O. (2012). An Analysis of the Impact of Global Financial Crisis on the Nigerian Stock Exchange. *Current Research Journal of Social Sciences 4* (6): 396-399

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APPENDICES

Appendix A: Unit root test esults (12/11/1990 – 25/1/2011)

Series	Order	Exogenous	ADF Test		PP Test	
			t-statistics	(p-value)	t-statistics	(p-value)
RAADS	Level	Constant	-13.75943	0.0000	-40.98909	0.0000
		Constant and linear trend	-13.89484	0.0000	-40.9747	0.0000
RABL	Level	Constant	-11.34266	0.0000	-56.85515	0.0001
		Constant and linear trend	-11.41165	0.0000	-56.87612	0.0000
RACI	Level	Constant	-21.98198	0.0000	-59.03779	0.0001
		Constant and linear trend	-21.98182	0.0000	-59.02846	0.0000
RAGA	Level	Constant	-39.43349	0.0000	-39.43349	0.0000

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		Constant and Linear trend	-39.46035	0.0000	-39.46038	0.0000
RALW	Level	Constant	-27.41648	0.0000	-50.4838	0.0001
		Constant and Linear trend	-27.55745	0.0000	-50.20361	0.0000
RAYRTN	Level	Constant	-31.99522	0.0000	-31.9954	0.0000
		Constant and Linear trend	-31.99379	0.0000	-31.9932	0.0000
RBOPP	Level	Constant	-15.52004	0.0000	-34.32326	0.0000
		Constant and Linear trend	-15.5166	0.0000	-34.30494	0.0000
RCAL	Level	Constant	-23.90632	0.0000	-35.57139	0.0000
		Constant and Linear trend	-23.90774	0.0000	-35.55881	0.0000
RCFAO	Level	Constant	-27.65316	0.0000	-50.19639	0.0001

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		Constant and Linear trend	-27.65356	0.0000	-50.21436	0.0000
RCLYD	Level	Constant	-14.73687	0.0000	-38.19559	0.0000
		Constant and Linear trend	-14.81356	0.0000	-38.17039	0.0000
RCMLT	Level	Constant	-13.04314	0.0000	-44.79028	0.0001
		Constant and Linear trend	-13.16805	0.0000	-44.75747	0.0000
RCPC	Level	Constant	-8.264783	0.0000	-49.5979	0.0000
		Constant and Linear trend	-8.27155	0.0000	-49.60132	0.0000
REBG	Level	Constant	-32.63142	0.0000	-34.83681	0.0000
		Constant and Linear trend	-32.69777	0.0000	-34.79761	0.0000
REGL	Level	Constant	-4.062507	0.0027	-3.857166	0.0048

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		Constant and Linear trend	-3.895607	0.0205	-3.578169	0.0434
RETI	Level	Constant	-32.80588	0.0000	-33.13097	0.0000
		Constant and Linear trend	-32.79545	0.0000	-33.11966	0.0000
RFML	Level	Constant	-23.30135	0.0000	-53.70977	0.0001
		Constant and Linear trend	-23.32365	0.0000	-53.62511	0.0000
RGCB	Level	Constant	-18.34889	0.0000	-51.18426	0.0001
		Constant and Linear trend	-18.34682	0.0000	-51.17594	0.0000
RGGBL	Level	Constant	-21.46996	0.0000	-52.38756	0.0001
		Constant and Linear trend	-21.49567	0.0000	-52.29094	0.0000
RGOIL	Level	Constant	-25.83287	0.0000	-26.18193	0.0000

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		Constant and Linear trend	-25.81677	0.0000	-26.16687	0.0000
RGSR	Level	Constant	-21.04701	0.0000	-22.12136	0.0000
		Constant and Linear trend	-21.15106	0.0000	-22.11357	0.0000
RGWEB	Level	Constant	-36.60739	0.0000	-36.60739	0.0000
		Constant and Linear trend	-36.61401	0.0000	-36.61401	0.0000
RHFC	Level	Constant	-11.02079	0.0000	-62.68737	0.0001
		Constant and Linear trend	-11.23599	0.0000	-61.94476	0.0000
RMLC	Level	Constant	-26.91485	0.0000	-55.92966	0.0001
		Constant and Linear trend	-27.02489	0.0000	-55.62036	0.0000
RPBC	Level	Constant	-10.31472	0.0000	-48.47035	0.0001

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		Constant and Linear trend	-10.36812	0.0000	-48.33428	0.0000
RPKL	Level	Constant	-28.20003	0.0000	-58.28145	0.0001
		Constant and Linear trend	-28.27917	0.0000	-58.02114	0.0000
RPZC	Level	Constant	-21.69953	0.0000	-54.0434	0.0001
		Constant and Linear trend	-21.72567	0.0000	-53.98578	0.0000
RSCB	Level	Constant	-21.69953	0.0000	-54.0434	0.0001
		Constant and Linear trend	-21.72567	0.0000	-53.98578	0.0000
RSGSSB	Level	Constant	-16.89493	0.0000	-63.40755	0.0001
		Constant and Linear trend	-17.09799	0.0000	-63.01211	0.0000
RSIC	Level	Constant	-25.46634	0.0000	-50.97502	0.0001

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	Constant and Linear trend	-25.50124	0.0000	-50.91652	0.0000
RSPL Level	Constant	-26.97039	0.0000	-37.23847	0.0000
	Constant and Linear trend	-26.97399	0.0000	-37.25421	0.0000
RSWL Level	Constant	-42.96373	0.0000	-42.96373	0.0000
	Constant and Linear trend	-43.02347	0.0000	-43.02328	0.0000
RTBL Level	Constant	-17.06515	0.0000	-43.94822	0.0000
	Constant and Linear trend	-17.32443	0.0000	-43.69591	0.0000
RTOTAL Level	Constant	-12.59398	0.0000	-60.49886	0.0001
	Constant and Linear trend	-12.69036	0.0000	-60.08146	0.0000
RTRANSOL Level	Constant	-31.07148	0.0000	-130.339	0.0001

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		Constant and Linear trend	-31.18033	0.0000	-128.9004	0.0001
RUNIL	Level	Constant	-24.75284	0.0000	-56.47503	0.0001
		Constant and Linear trend	-24.74981	0.0000	-56.4678	0.0000
RUTB	Level	Constant	-14.54792	0.0000	-23.65476	0.0000
		Constant and Linear trend	-23.5748	0.0000	-23.67524	0.0000
RINDEX	Level	Constant	-58.50651	0.0001	-58.50651	0.0001
		Constant and Linear trend	-58.52279	0.0000	-58.5228	0.0000

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Appendix B: Risk and return characteristics of negatively correlated portfolio (Row Counts), Daily from 1990-1998

	CI	**P(1)**	**P(2)**	**P(3)**	**P(4)**	**P(5)**	**P(6)**	**P(7)**
Ave. Returns	0.0022	0.0022	0.0028	0.0027	0.0043	0.0032	0.0037	0.0020
Std. Dev.	0.0144	0.0304	0.0512	0.0425	0.0242	0.0304	0.0495	0.0412
CV	6.60	14.64	17.51	15.09	5.5	10.49	14.25	24.16
Beta	1.00	0.492	0.584	0.545	0.550	0.511	0.872	0.701
Corr. Coeff.	1.00	0.233	0.164	0.185	0.327	0.242	0.254	0.245

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Appendix C: Durbin-Watson Estimation for beta estimates for all equations

	RAADS	RABL	RACI	RAGA	RALW	RBOPP	RCAL	RCFAO	RCLYD	RCMLT	RCPC
No Effect	2.0541	1.9487	1.9963	2.0013	1.7835	1.5427	1.7958	1.6986	1.597	1.8171	2.3179
Crisis	2.0594	1.949	1.9972	2.004	1.7899	1.5439	1.7974	1.6989	1.5983	1.8207	2.3182
January	2.0563	1.949	1.9965	2.0014	1.7841	1.5427	1.7955	1.7006	1.5971	1.8183	2.321

	REBG	RETI	RFML	RGCB	RGOIL	RGSR	RGWEB	RHFC	RMLC	RPBC	RPKL
No Effect	1.9474	2.034	1.4943	1.7964	1.8354	1.5143	2.0001	1.9595	1.8414	1.6301	1.9995
Crisis	1.9663	2.0347	1.4943	1.7965	1.8364	1.5169	2.0005	1.967	1.8459	1.6319	2.0003
January	1.9474	2.0339	1.4945	1.7965	1.8368	1.5192	2.0004	1.9595	1.8416	1.6302	1.9998

	RPZC	RSCB	RSGSSB	RSIC	RSPL	RSWL	RTBL	RTOTAL	RTRANSOL	RUNIL	RUTB	RALW	RGGBL
No Effect			1.7766	1.7123	1.9502	1.9897	1.8674		1.0819	1.9024	2.041	1.7835	1.5409
Crisis		1.9341	1.7782	1.7154	1.9504	1.9926	1.8694	1.7991	1.0839	1.9026	2.041	1.7899	1.5428
January	1.6729	1.9309	1.7769	1.7144	1.9497	1.9898	1.8677	1.7988	1.0814	1.9025	2.0431	1.7841	1.543

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