THE RELATIONSHIP BETWEEN EXCHANGE RATE MOVEMENT AND STOCK MARKET RETURNS VOLATILITY AT THE NAIROBI SECURITIES EXCHANGE

BY:

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DECLARATION

This Research project is my original work and has not been presented in any other University.

Signed…………………………………………… Date …………………………………..

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D61/66961/2011

This research project has been submitted for examination with my approval as University

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DEDICATION

I dedicate this project to my wife Mildred Okemo, my mother Susan Ambunya, family friend Carole Wilson, little ones Lynne Ayieko and Spencer Litali for their support in accomplishing this work. It not without pain, sacrifice and good will that it has come to an end

ACKNOWLEDGEMENT

ABSTRACT

Domestic currency depreciation makes local firms more competitive, leading to an increase in their exports. This in turn raises their stock prices. A weak or no association between stock prices and exchange rates can also be postulated. Transaction costs and sunk costs of market entry imply that only large exchange rate movements affect market structure and, thereby, firms' market value. Therefore, like prices of other assets the exchange rates are determined by expected future exchange rates. Any news/factors that affect future values of exchange rate will affect today's exchange rate. This study set to establish the relationship between exchange rate movement and stock market returns volatility at the Nairobi Securities Exchange.

The study adopted a quantitative design. The target population for this study included 56 companies quoted at the NSE as of December 2011. Since the population was small and the study is using secondary data, the study conducted a census. The study used secondary data collected from the Nairobi Securities Exchange and the Central bank of Kenya for the period 2007-2011. The study regressed stock market returns volatility against exchange rate movement.

From the regression output, the study established that exchange rate movements greatly affected the stock market return volatility owing to its information content to the investors. With high fluctuations in the exchange rates, the exchange rates movement became bigger accompanied by a huge stock market return volatility. Study concludes that there is a strong relationship between exchange rate movement and stock market returns volatility. This is especially carried through the information content of exchange rate movement on the security's business. The study concludes that exchange rate movement also affects the stock market performance greatly through its spiral effects. Through over macroeconomic variables, exchange rate movement indicates the state of the economy hence the likely future state of the economy. These variables would include things like interest rate and the money supply in the economy which has great impact on the activity level of the security's performance. The policy makers need to factor the effects of exchange rate movement on the performance of the stock exchange.

LIST OF ABBREVIATIONS

US   United States

NSE   Nairobi Securities Exchange

APT   Arbitrage Pricing Theory

CAPM   Capital Asset Pricing Model

PPP   Purchasing power parity

NPV   Net Present Value

UK   United Kingdom

OLS   Operating Least Square

ANOVA   Analysis of variance

USD   United States Dollar

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The volatility of stock returns can be explained by many factors including liquidity risk, information asymmetry, and number of informed agents, number of regulations and their imbedded costs and the impact of investibility which involves the degree to which a stock can be foreign-owned on the stock return volatility (Lesmond, 2005). All these factors have different effects on the returns from a given stock. Some factors have a positive effect on the stock return volatility whereas others have a negative one. This large number of factors does not allow disentangling the effect of each shock on the volatility.

In an international context where transactions involve different currencies, the variability of foreign exchange rates is a potentially interesting factor that drives the level of the volatility of stock returns. With the liberalization and the reduction of barriers to international investment, foreign investors can benefit from diversifying their portfolios internationally (Li, Sarkar, and Wang, 2003). When volatility is interpreted as uncertainty, it becomes a key input to many investment decisions and portfolio design for Chief finance Officers. This is because volatility is the most important variable in the pricing of derivative securities. Financial risk management, which has taken a central role in finance industry since the first Basle Accord in 1996, effectively makes volatility forecasting a compulsory exercise for many financial institutions around the world.

Stock market plays a very crucial role in assessing economic conditions of any country through improved stock returns usually signified by higher profit to firms. Benita and

Lauterbach (2004) upheld that exchange rate volatility have real economic costs that affect price stability, firm profitability and the general economic stability. Exchange rate volatility has implications for the financial system of a country especially the stock market. However a survey of the available literature revealed divergent views of researchers on the issue of whether foreign exchange rate variability influences stock market volatility or not (Kanas 2000 and Serven, 2003). Three events – Asian currency crises, the advent of floating exchange rate in the early 1970s and financial market reforms in the early 1990s prompted financial analysts into determining the link between these two markets (Mishra, 2004). In addition, the internationalization of capital markets has resulted in inflow of vast sums of funds between countries and in the cross listing of equities. This has therefore made investors and firms more interested in the volatility of exchange rate and its effects on stock market. Floating exchange rate appreciation reduces the competitiveness of export markets; and has a negative effect on the domestic stock market (Yucel and Kurt, 2003). But, for import dependent economy like Kenya, it may have positive effects on the stock market by lowering input costs. Serven (2003) used the US industry-level investment to show that exchange rate uncertainty significantly has negative long-run effects on investment.

Exchange rates, like any other commodity, are based on supply and demand for particular forms of currency. Domestic currency supply changes as a result of a country's fiscal and monetary policies. Demand for currency can be influenced by a large number of factors, including interest rates, inflation, and views on impending government regulation. There are number of macroeconomic and industry related factors that potentially can affect the stock returns of the companies. The continuing increases in the world trade and capital movements have made the exchange rates as one of the main determinants of business profitability and

equity prices (Kim, 2003). Exchange rate changes directly influence the international competitiveness of firms, given their impact on input and output price (Joseph, 2002). Basically, foreign exchange rate volatility influences the value of the firm since the future cash flows of the firm change with the fluctuations in the foreign exchange rates. When the Exchange rate appreciates, since exporters will lose their competitiveness in international market, the sales and profits of exporters will shrink and the stock prices will decline. On the other hand, importers will increase their competitiveness in domestic markets (Nieh and Nieh, 2006). Therefore, their profit and stock prices will increase. The depreciation of exchange rate will make adverse effects on exporters and importers. Exporters will have advantage against other countries' exporters and increase their sales and their stock prices will be higher (Yau and Nieh, 2006). That is, currency appreciation has both a negative and a positive effect on the domestic stock market for an export-dominant and an import-dominated country, respectively (Ma and Kao, 1990). Exchange rates can affect stock prices not only for multinational and export-oriented firms but also for domestic firms. For a multinational company, changes in exchange rates will result in an immediate change in value of its foreign operations as well as a continuing change in the profitability of its foreign operations reflected in successive income statements (Phylaktis and Ravazzolo, 2005). Therefore, the changes in economic value of firm's foreign operations may influence stock prices. Domestic firms can also be influenced by changes in exchange rates since they may import a part of their inputs and export their outputs. For example, a devaluation of its currency makes imported inputs more expensive and exported outputs cheaper for a firm. Thus, devaluation will make positive effect for export firms (Aggarwal, 1981) and increase the income of these firms, consequently, boosting the average level of stock prices (Wu,

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2000). Thus, understanding this relationship will help domestic as well as international investors for hedging and diversifying their portfolio. Also, fundamentalist investors have taken into account these relationships to predict the future trends for each other (Stavárek, 2005).

1.1.1 Exchange Rate Movement

The exchange rate is the price of a unit of foreign currency in terms of the domestic currency. Exchange rate serves as the basic link between the local and the overseas market for various goods, services and financial assets. Using the exchange rate, one is able to compare prices of goods, services, and assets quoted in different currencies. Exchange rate movements can affect actual inflation as well as expectations about future price movements. Changes in the exchange rate tend to directly affect domestic prices of imported goods and services. Exchange rate movements can affect the country's external sector through its impact on foreign trade. The exchange rate affects the cost of servicing on the country's foreign debt.

Under the system of freely floating exchange rates, the value of the foreign currency in terms of the local currency, like any commodity or service being sold in the market, is determined by the forces of supply and demand. Under a fixed exchange rate system, a par value rate is set between the local currency and the foreign currency by the central bank. The par value may be adjusted from time to time.

1.1.2 Stock Market Returns Volatility

Stock market performance is generally considered to be the reflector of financial and economic conditions of a country. Stock market volatility indicates the degree of price variation between the share prices during a particular period (Aggarwal, 1981). A certain degree of market volatility is unavoidable, even desirable, as the stock price fluctuation indicates changing values across economic activities and it facilitates better resource allocation. But frequent and wide stock market variations cause uncertainty about the value of an asset and affect the confidence of the investor (Ma and Kao, 1990). The risk averse and the risk neutral investors may withdraw from a market at sharp price movements. Extreme volatility disrupts the smooth functioning of the stock market.

Literature suggests that a wide range of factors may be relevant in explaining the stock return volatility including: goods prices, money supply, real activity, exchange rates, political risks, oil prices, trade sector, and regional stock market indices (Krainer, 2002). However, in emerging markets not all factors are at play in explaining the stock return volatility but factors like levels of political risks, goods prices, money supply and exchange rates may be analysed to see the empirical links with the stock returns volatility to find the effects of these on Fijis stock volatility further research is required.

Volatility refers to a statistical measure of the dispersion of returns for a given security or market index which can either be measured by using the standard deviation or variance between returns from that same security or market index. In other words, volatility refers to the amount of uncertainty or risk about the size of changes in a security's value. A higher volatility means that a security's value can potentially be spread out over a larger range

of values meaning that the price of the security can change dramatically over a short time period in either direction. A lower volatility means that a security's value does not fluctuate dramatically, but changes in value at a steady pace over a period of time.

1.1.3 Relationship between Exchange Rates and Stock Returns

Research on the link between stock returns and exchange rate movements has a long tradition in the international finance literature (Adler and Dumas 1984). Researchers have reported that this link is small and hardly significant (Jorion 1990, Griffin and Stulz 2001). In recent years, researchers have documented that the link between stock returns and exchange rate movements is nonlinear (Di Iorio and Faff 2000, Bartram 2004). Such a nonlinear link is consistent with, for example, models featuring transaction costs in international goods market arbitrage and sunk costs of market entry (Krugman 1989, Baldwin and Lyons 1994). Transaction costs and sunk costs of market entry imply that only large exchange rate movements affect market structure and, thereby, firms' market value. Empirical evidence of nonlinear exchange rate dynamics consistent with such models has been reported, for example, by Taylor and Peel (2000).

1.2 Statement of the Problem

Domestic currency depreciation makes local firms more competitive, leading to an increase in their exports. This in turn raises their stock prices. A weak or no association between stock prices and exchange rates can also be postulated. The asset market approach to exchange rate determination treats exchange rate to be the price of an asset (price of one unit of foreign currency). Therefore, like prices of other assets the exchange rates are determined by expected future exchange rates. Any news/factors that affect future values of exchange

rate will affect today's exchange rate. The factors/news that causes changes in exchange rates may be different from the factors that cause changes in stock prices.

Amare and Mohsin (2000) examine the long-run association between stock prices and exchange rates for nine Asian countries (Japan, Hong Kong, Taiwan, Singapore, Thailand, Malaysia, Korea, Indonesia, and Philippines). They use monthly data from January 1980 to June 1998 and employed cointegration technique. The long-run relationship between stock prices and exchange rates was found only for Singapore and Philippines. They attributed this lack of cointegration between the said variables to the bias created by the "omission of important variables". When interest rate variable was included in their cointegrating equation they found cointegration between stock prices, exchange rates and interest rate for six of the nine countries.

Locally, several studies have been done on the subject of exchange rate movement and market return volatility. Cherop (2010) did a survey on exchange rate fluctuation on tea export earnings among smallholders' tea factories in Kenya where she established that the exchange rate fluctuations greatly affected the earnings of smallholders at tea factories. During the time of depreciating local currency, the export earnings were higher even with low export quantities while export earnings reduced when the currency was appreciating. Maina (2010) did a study on the impact of exchange rate variability on investment in the electric power sub-sector in Kenya. Mania's findings show that the investments were high in the power subsector when the exchange rates were stable as compared to times of high fluctuations. From the above studies, few studies if any have been done on the relationship between stock exchange rate movement and stock market returns volatility at the Nairobi

Securities exchange. This study therefore aimed to fill this research gap by examining the relationship between exchange rate movement and stock market return volatility. This study sought to answer one question: What is the relationship between exchange rate movement and stock market returns volatility at the Nairobi Securities Exchange?

1.3 Objective of the Study

To determine the relationship between exchange rate movement and stock market returns volatility at the Nairobi Securities Exchange

1.4 Value of the Study

This study would be of benefit to several individuals including:

For the managers of companies' listed on the NSE, the findings of this study would provide information to guide their management decision following the changes in the exchange rate in Kenya. It would equip them with the necessary knowledge for taking the necessary action to protect the performance of their organizations.

For the Government through its relevant capital market regulation agencies, in the formulation and implementation of policies and regulations governing monetary policies and exchange rates to ensure stable currency rates so as to promote economic growth and reduce its spiral effects on the economy.

For the academicians and researchers, the findings of this study would be important in providing material for their reference besides suggesting areas for further research. Future scholars would find this study important because it will identify areas for further studies which future scholars can study.

CHAPTER TWO

LITERATURE REVIEW

2.1   Introduction

This chapter conducts a review of the literature on exchange rate movement and stock market returns volatility. From this review broad categories will be determined which will help easily identify the critical relationship between exchange rate movement and stock market returns volatility. Specifically, the chapter addresses the theoretical framework guiding the study, Exchange rate movement, stock market return measurement and volatility. The study then presents an empirical framework and chapter summary.

2.2 Theoretical review

The theoretical review section tries to uncover whether or not existing theories suggest that currency exposures should be priced into the stock returns of individual companies quoted at the Securities' exchange or not. The section's main purpose is to establish a solid foundation for the following empirical study, clarifying the underlying problems of the analysis. The Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT) have emerged as two models that have tried to scientifically measure the potential for assets to generate a return or a loss. They are similar in that they attempt to measure an asset's propensity to follow the overall market however APT attempts to divide market risk into smaller component risk.

2.2.1 Purchasing Power Parity Theory

Purchasing power parity (PPP) involves a relationship between a country's foreign exchange rate and the level or movement of its national price level relative to that of a foreign country.

Absolute PPP states that the purchasing power of a unit of domestic currency is exactly the same in the foreign economy, once it is converted into foreign currency at the absolute PPP exchange rate (Coakley, Flood, Fuertes, and Taylor, 2005). Purchasing power parity (PPP) is a disarmingly simple theory that holds that the nominal exchange rate between two currencies should be equal to the ratio of aggregate price levels between the two countries, so that a unit of currency of one country will have the same purchasing power in a foreign country (Taylor and Taylor, 2004). The general idea behind purchasing power parity is that a unit of currency should be able to buy the same basket of goods in one country as the equivalent amount of foreign currency, at the going exchange rate, can buy in a foreign country, so that there is parity in the purchasing power of the unit of currency across the two economies. One very simple way of gauging whether there may be discrepancies from PPP is to compare the prices of similar or identical goods from the basket in the two countries.

Relative PPP implies that changes in national price levels are set by commensurate changes in the nominal exchange rates between the relevant currencies. The voluminous research literature on PPP published in recent decades has been driven by econometric problems relating to univariate and panel unit root tests of necessary conditions for long-run absolute PPP to hold, in particular whether the real exchange rate has any tendency to settle down to a long-run equilibrium level (Coakley, Flood, Fuertes, and Taylor, 2005). These include issues such as low power, possible structural breaks, the mixture of stationary and non-stationary error terms in the relevant regressions, and neglected cross-sectional dependence when real exchange rate panel data are used (Taylor and Taylor, 2004).

2.2.2 Capital Asset Pricing Model (CAPM)

The capital asset pricing model (CAPM) states that the return on a stock depends on whether the stock's price follows prices in the market as a whole. CAPM is useful because it is a statistical representation of past risk. The original CAPM theory assumes a linear relation between the market and the individual stocks. The theory also assumes that individual companies have different correlations to the market, articulated trough the market beta. Further exploring the underlying theory of whether or not exchange rate exposure should be priced into the stock return, one can consider the CAPM model.

$$\text{CAPM: } R_{it} = r_f + \beta_{im} (r_m - r_f)$$

The main concern of investors, when evaluation portfolio investment, is the total risk exposure measured by the variance or standard deviation of the return of the portfolio. The first commonly acknowledged model, the capital asset pricing model (CAPM), identifies two kinds of risk: systematic and unsystematic. According to Fletcher (2007) only systematic risk is rewarded as unsystematic is diversifiable. Unsystematic risk is also the firm or industry specific risk, which can be utilized in form of strikes, or natural disaster hitting specific industries e.g. bad weather could be a industry specific risk for farmers, hence according to the CAPM theory firm specific risk is not included in the return of the stock and thus not rewarded. Arguing that this risk can be diversified through portfolio management. Systematic risk can however not be diversified according to Moffett, Stonehill and Eiteman (2005) and is related to the risk of the market portfolio. Identifying the type of risk, which exchange rate is derived from, does in principle appear important for investors at least according to the capital asset pricing model.

Several weaknesses of the two-factor CAPM model have later been pointed out, some originating from the CAPM theory - others from the derived two-factor model (Jorion 1990). Chen, Roll and Ross (1986) and later Jorion (1990) criticize the underlying assumption concerning market return. They imply that correlation between returns and exchange rate movement might be caused by multicollinearity between exchange rate and some omitted variables left in the error term. Chen et al suggest a multiple-factor test building on the APT theory, where different macroeconomic factor is included.

2.3 Exchange Rate Movement and Stock Market Returns

2.3.1 Exchange Rate Movement

Exchange rates, like any other commodity, are based on supply and demand for particular forms of currency. Domestic currency supply changes as a result of a country's fiscal and monetary policies. Demand for currency can be influenced by a large number of factors, including interest rates, inflation, and views on impending government regulation. There are number of macroeconomic and industry related factors that potentially can affect the stock returns of the companies. The continuing increases in the world trade and capital movements have made the exchange rates as one of the main determinants of business profitability and equity prices (Kim, 2003). Exchange rate changes directly influence the international competitiveness of firms, given their impact on input and output price (Joseph, 2002). Basically, foreign exchange rate volatility influences the value of the firm since the future cash flows of the firm change with the fluctuations in the foreign exchange rates. When the Exchange rate appreciates, since exporters will lose their competitiveness in international market, the sales and profits of exporters will shrink and the stock prices will decline. On the

other hand, importers will increase their competitiveness in domestic markets (Nieh and Lee, 2001). Therefore, their profit and stock prices will increase. The depreciation of exchange rate will make adverse effects on exporters and importers. Exporters will have advantage against other countries' exporters and increase their sales and their stock prices will be higher (Yau and Nieh, 2006). That is, currency appreciation has both a negative and a positive effect on the domestic stock market for an export-dominant and an import-dominated country, respectively (Ma and Kao, 1990). Exchange rates can affect stock prices not only for multinational and export-oriented firms but also for domestic firms. For a multinational company, changes in exchange rates will result in an immediate change in value of its foreign operations as well as a continuing change in the profitability of its foreign operations reflected in successive income statements(Phylaktis and Ravazzolo, 2005). Therefore, the changes in economic value of firm's foreign operations may influence stock prices. Domestic firms can also be influenced by changes in exchange rates since they may import a part of their inputs and export their outputs. For example, a devaluation of its currency makes imported inputs more expensive and exported outputs cheaper for a firm. Thus, devaluation will make positive effect for export firms (Aggarwal, 1981) and increase the income of these firms, consequently, boosting the average level of stock prices (Wu, 2000). Thus, understanding this relationship will help domestic as well as international investors for hedging and diversifying their portfolio. Also, fundamentalist investors have taken into account these relationships to predict the future trends for each other (Stavárek, 2005).

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2.4 Models of exchange rate movement and stock market returns

In order to test the theoretical dilemma between exchange rate movements and stock returns, Chen et al, 1986 generated different regression models from both the CAPM and APT theory using the empirical approved theories. These first two models tested whether or not exchange rate had any explanatory effect on stock return. However statistical complications were put forward when interpreting the result of these tests. Consequently two new models were derived, which take into account the statistical nuances put forward by among others Ross (1976) and Jorion (1990). Using Arbitrage Pricing model: Two-Factor, the two-factor model were derived from the popular CAPM theory. One of the major strengths of the theory is the testability of the model suggested (Chen et al, 1986). The general consensus of acknowledgment also makes this a good model to use when examining whether or not currency fluctuations and exchange rate movements should be priced in the stock return or not, defined as part of the systematic or unsystematic risk explained under the CAPM theory. The model tested is thus illustrated as follows.

$$R_{it} = \alpha + \beta_i^m \, \delta_{it}^m + B_i^s \, R_{st} + \pounds$$

Where: R_{it} is the return of stock i in excess of the risk free rate, in time t, dependent variable.

δ_{it}^M is the market return of company i in time t in excess of the risk free rate.

δ_{it}^S is the change in exchange rate for company i´s home currency in time t.

βiM and βi is the loading of the independent variables to the stock return

Finding exchange rate to be a significant would imply that currency fluctuations are priced and thus part of the systematic risk, which should be rewarded to investors. Finding no empirical grounds for exchange rates being priced, investors should not be rewarded, as it is part of the market or unsystematic risk.

2.5 Empirical review

Early studies Soenen and Hennigar (1988) in this area considered only the correlation between the two variables-exchange rates and stock returns. Theory explained that a change in the exchange rates would affect a firm's foreign operation and overall profits which would, in turn, affect its stock prices, depending on the multinational characteristics of the firm. Conversely, a general downward movement of the stock market will motivate investors to seek for better returns elsewhere. This decreases the demand for money, pushing interest rates down, causing further outflow of funds and hence depreciating the currency. While the theoretical explanation was clear, empirical evidence was mixed. It was Maysami and Koh (2000), who examined the impacts of the interest rate and exchange rate on the stock returns and showed that the exchange rate and interest rate are the determinants in the stock prices. It was in 1992 that Oskooe and Sohrabian used Cointegration test for the first time and concluded bidirectional causality but no long term relationship between the two variables.

Najang and Seifert(1992), employing GARCH framework for daily data from the U.S, Canada, the UK, Germany and Japan, showed that absolute differences in stock returns have positive effects on exchange rate volatility. Ajayi and Mougoué (1996) picked daily data from 1985 to 1991 for eight advance economic countries; employed error correction model

and causality test and eventually discovered that increase in aggregate domestic stock price has a negative short-run effect and a positive long-run effect on domestic currency value. On the other hand, currency depreciation has both negative short-run and long-run effect on the stock market.

Theoretical arguments seem to agree on giving some kind of risk factor to exchange rate risk, combined with the increasing use of foreign currency derivatives and other hedging instruments (Muffett *et al,* 2005). This suggests a strong relation between firm value and exchange rate exposure. However empirical work has found the correlation somewhat ambiguous. The following literature review implies that the risk associated with exchange rate volatility is not as easily identified as theory might suggest.

Heckermann (1972) did some of the earliest studies in this field in the beginning of the 1970´s, concentrating on changes in net present value (NPV) of foreign operations, due to currency fluctuations. This was followed by a series of articles, Adler and Dumas (1980) to mention a few, however these studies still only had their focus on current and future cash flow.

To investigate the influence of exchange rate and interest rate changes on stock returns was an important contribution towards capital market research as Joseph (2002) studied the affect of foreign exchange and interest rate changes on UK firms in the chemical, electrical, engineering and pharmaceutical industries for the period of 1988 to 2000. The study employed two different measures of foreign exchange rate, along with a measure of interest rate changes. The results revealed that industry returns were more negatively affected by interest rate changes than by foreign exchange rate changes. The negative effects of interest

rate changes and foreign exchange rate changes appeared more evident for the electrical and engineering sectors whereas these effects were positive for the pharmaceutical industry. Additionally, the results at the portfolio-level were generally similar with those based on the firm-level analysis, except that the short term foreign exchange rate impact was very weak at the portfolio level. Overall, the results at the individual firm level implied that the impact of foreign exchange rate and interest rate changes had adverse effects on stock returns.

A notable contribution in financial markets literature was made by Simpson and Evans (2003) who explored the relationships between Australian banking stock returns and major economic variables of monetary policy like exchange rate and short and long-term interest rates. They used the monthly data for the stock returns, exchange rates and interest rates for the period of January 1994 to February 2002. The study found no evidence that Australia's bank stock market returns form a co integrating relationship with short term and long-term interest rates and exchange rates over the period of study and therefore conclusions might not be drawn relating to long-term rational expectations in the Australian banking market. Similarly Ibrahim and Aziz (2003) analyzed the dynamic relationship between stock prices and four macroeconomic variables (Consumer Price Index, Industrial Production, Money Supply (M2) and Exchange Rate). The results of the study suggested the long run relationship between these variables and stock prices, particularly positive short run and long run relationship between the stock prices and consumer price index and industrial production. However exchange rate was negatively associated with stock prices and money supply M2 had an immediate positive liquidity effects and negative long run effects of money supply expansion on stock prices.

Adler and Dumas (1984) article; "Exposure to Currency Risk: Definition and Measurement." By evaluating exchange rate exposure through the eyes of stockholder, Adler and Dumas moves the focus of the analysis from the previously predominant profitably of the managers and the firm as such, to a focus on the profitability of the investor. Adler and Dumas find little evidence that expensive risk management can be vindicated on the expense of stockholder. They, however, also point to a series of shortcomings in their analysis, which among others include problems of stationarity and multicollinearity, which they leave untouched. In a later article Adler et al (1986) suggest using stock return to overcome some of these problems. The specified capital market approach used by Adler (1986) can be defined as firm total exposure to exchange rate fluctuation. This stands in opposition to work done by, for example, Ungern-Sternberg and Von Weizäcker (1990), Allayannis and Ihrig (2001), Marston (2001) whose focus has been on a more decomposed and specific exchange rate exposure.

Adlers (1986) approach measures the variance of stock return with the variance of exchange rates, looking for significant correlations. The methodology may create some statistical problems when other macroeconomic variables covary with that of the exchange rate, hence excluding them might result in exaggerated estimation of the amount of stock variance, attributed to currency movements. Jorion (1990) therefore modifies the model, using the residual of exchange rate movement against other explanatory variables, making Exchange rate exposure orthogonal to the other depended variables. Using this method Jorion finds, by using 287 US multinational firms that the majority of companies tested were insignificantly exposed at a 5% significance level. Jorion supports these findings with the article; "The pricing of exchange rate risk in the stock market" (1991), in which he tested 20 industry

portfolios, weighted against their respected value. Jorion's conclusion validates his earlier hypotheses and conclusion from the 1990 article, namely that US firms are insensitive to exchange rate movements

Muller and Verschoor (2006) found, by using European data, that European firms seemed well hedged against short-term currency fluctuations. While around 65 % of the 817 firms used in the analysis were affected by exchange rate fluctuations in the longer run. This differentiation of short and long exposure is however not pursued to the same degree in this paper.

He and Ng (1998) made a similar study of 171 Japanese firms. They found that almost 25 % of their sample was significantly exposed to exchange rate movements over a period of 14 years between 1979 to 1993. Williamson (2000) and Allayannis (2000) both did industry specific studies finding divergent results. Their studies showed some companies being significantly exposed to exchange rate fluctuations, while others did not indicate significant exposure. Their research furthermore implied significant cross sectional differences across firms and industries.

Murinde (1997) used data from 1985 to 1994, giving results for India, Korea and Pakistan that suggested exchange rates Granger cause stock prices. But, for the Philippines the stock prices lead the exchange rates. Furthering into Indian context, Abhay Pethe and Ajit Karnik (2000) investigated the inter-relationships between stock prices and important macroeconomic variables, viz., exchange rate of rupee vis - a -vis the dollar, prime lending rate, narrow money supply, and index of industrial production. The analysis and discussion

are situated in the context of macroeconomic changes, especially in the financial sector, that have been taking place in India since the early 1990s.

Arratibel, furceri, Martin and Zdzienicka (2009) discovered that lower exchange rate volatility is associated with higher growth, higher stocks of FDI, higher current account deficits, and higher excess credit. Adjasi and Biekpe (2005) showed that in the long-run exchange rate depreciation leads to increases in stock market prices in some of the countries, and in the short-run, exchange rate depreciations reduce stock market returns.

Engle and Rangel (2005) also examined the link between the unconditional volatility and a number of macroeconomic variables. Bercker and Clement (2005) extended the SPLINE GARCH model proposed by Engle and Rangel (2005) when they modeled stock market volatility conditional on macroeconomic conditions. They incorporated macroeconomic information directly into the estimation of such GARCH models. It was demonstrated that forecasts of macroeconomic variables can be easily incorporated into volatility forecasts for share index returns. Hence, their model lead to significantly different forecasts than traditional GARCH type volatility model.

Mishra (2004) identified that there is no Granger's causality between the exchange rate and stock return. The study of Mishra (2004) indicated that stock return, exchange rate, the demand for money and interest rate are related to each other though no consistent relationship exists between them. Mishra further illustrated that forecast error variance decomposition evidenced that exchange rate return affects the demand for money; interest rate causes exchange rate to change; exchange rate affects the stock return; demand for money affects stock return; interest rate affects the stock return, and demand for money

affects the interest rate. Even though, Pan et al. (2007) showed that there is no co-integration between the exchange rate and the Malaysian stock market in the long run, their pair wise causality analysis reveals that a unidirectional causality exists from the exchange rate to the stock market in the short run.

ElMasry (2006) extended previous research on the foreign exchange rate exposure of UK nonfinancial firms at the industry level over the period of 1981 to 2001. The study differed from previous studies in a way that it considered the impact of the changes (actual and unexpected) in exchange rates on firms' or industries' stock returns. The findings indicated that a higher percentage of UK industries were exposed to contemporaneous exchange rate changes than those reported in previous studies. There was also an evidence of significant lagged exchange rate exposure. The results of the study had interesting implications for public policy makers who wished to estimate relationship between policies that influence exchange rates and relative wealth affects. Joseph and Vezos (2006) investigated the impact of interest rates and foreign exchange rates changes on US bank's stock returns. The study employed an EGARCH model to account for the ARCH effects in daily returns instead of standard OLS estimation methods with the result that the presence of ARCH effects would had affected estimation efficiency. The results suggested that the market return accounted for most of the variation in stock returns at both the individual bank and portfolio levels; and the degree of the sensitivity of the stock returns to interest rate and exchange rate changes was not very pronounced despite the use of high frequency data. The study contributed to existing knowledge in the area by showing that ARCH effects had an impact on measures of sensitivity.

Ndung'u (2000) asserts that exchange rate policy in Kenya has undergone various regime shifts mostly driven to a large extent by the economic events, especially balance of payment crises. Up to 1974, the exchange rate was pegged to the dollar. Between 1974 and 1981, the movement in the nominal exchange rate in relation to the U.S dollar was quite erratic but in general the nominal exchange rate depreciated by about fourteen percent and this depreciation happened in year 1981/1982 with further discrete devaluation. Between 1980 and 1982, the shilling was devalued by about twenty percent in real terms measured against the SDR. After these devaluations the exchange rate regime was changed to a crawling peg in real terms by the end of 1982. This regime lasted until 1990 when a dual exchange rate system was adopted and lasted until October 1993 when after series of devaluations, the official exchange rate was abolished by merging the official one with the market at end thus the shilling put to a complete float.

Cherop (2010) did a survey on exchange rate fluctuation on tea export earnings among smallholders tea factories in Kenya where she established that the exchange rate fluctuations greatly affected the earnings of smallholders at tea factories. During the time of depreciating local currency, the export earnings were higher even with low export quantities while export earnings reduced when the currency was appreciating. This study centered on the tea export earnings and ignored the other larger part of firms quoted on the NSE.

Maina (2010) did a study on the impact of exchange rate variability on investment in the electric power sub-sector in Kenya. Mania's findings show that the investments were high in the power subsector when the exchange rates were stable as compared to times of high fluctuations.

Kipchirchir (2011) studied the relationship between financial performance for multinational corporations in Kenya and exchange rates volatility. Kipchirchir found that there was a strong relationship between financial performance for multinational corporations and exchange rate volatility in Kenya. This was attributed to the difference between trading currency and financial reporting currency.

2.6 Chapter Summary

This chapter covered literature review relating to the relationship between exchange rate movement and stock market returns volatility from a global perspective. First, the study looked at the theoretical framework where it outlined the theories on which the study is grounded. Two theories were identified including CAPM and APT theories. The study also looked at the models of exchange rate movement and stock returns movement in order to test the theoretical dilemma between exchange rate movements and stock returns. The general consensus of acknowledgment makes CAPM a good model to use when examining whether or not currency fluctuations and exchange rate movements should be priced in the stock return or not, defined as part of the systematic or unsystematic risk explained under the CAPM theory. Finding exchange rate to be a significant would imply that currency fluctuations are priced and thus part of the systematic risk, which should be rewarded to investors. Finding no empirical grounds for exchange rates being priced, investors should not be rewarded, as it is part of the market or unsystematic risk.

However, most of the existing literatures on foreign exchange rate movement have focused on its effects on firm performance. Kipchirchir (2011) studied the relationship between financial performance for multinational corporations in Kenya and exchange rates volatility.

This study therefore seeks to provide information that would be important in explaining the relationship between exchange rate movement and market returns volatility at the NSE.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1   Introduction

This chapter sets out various stages and phases that were followed in completing the study. In this stage, most decisions were about how research is going to be executed and how the research was to be completed. The following subsections were included; research design, target population, data collection, and data analysis.

3.2   Research Design

The study adopted a Quantitative design. Quantitative researchers calculate measures of central tendency like mean and variability like standard deviation just as they do in descriptive research, but these measures alone do not provide evidence of significant differences or relationships among the variables under study (Cooper & Schindler, 2003). Further statistical procedures were used to answer the research question. This design allowed the researcher to measure and analyse the data. The relationship between the variables was studied in detail so as to make an objective and conclusive findings of the research.

3.3 Target Population

Target population for in statistics is the specific population about which information is desired. According to Ngechu (2004), a population is a well defined or set of people, services, elements, events, group of things or households that are being investigated. The

target population for this study included 56 companies quoted at the NSE as of December 2011. Since the population was small and the study is using secondary data, the study conducted a census.

3.4 Data collection

The study used secondary data collected from the Nairobi Securities Exchange. The use of secondary data was justified on the basis that some of these sources have information that is very pivotal to this study and has been vetted and accepted.

3.5   Data Analysis

The researcher collected data on exchange rate movements for the Kenyan currency (kshs) against the United States dollar (USD).The stock market returns volatility obtained by computing the monthly returns of stock for all the 56 firms which were listed at the Nairobi Securities exchange as at 31 December 2011, for the period 2007 to 2011and then comparing the monthly returns with the previous month's returns. Using this data, the researcher conducted a regression analysis to establish the extent of relationship between exchange rate movement and stock market volatility. The study applied the following regression model

$Y = \beta_0 X_1 + \beta_I X_I + E$

Where Y = Stock market return volatility

And X_I = the exchange rate movement

β_0 and β_1 are co-efficient of the variables,

E = Error term

The researcher carried out a T-test at 95% confidence level to establish the significance of the independent variable in explaining the changes in the dependent variable.

CHAPTER FOUR

# DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents analysis and findings of the study as set out in the research objectives and methodology. The study findings are presented on the relationship between exchange rate movement and stock market returns volatility at the Nairobi Securities Exchange. This chapter looked at the data to be analyzed, the regression analysis and interpretation. The specific variables discussed in this chapter include: exchange rate movement and market returns volatility for the study period 2007 to 2011.

4.2 Exchange Rate Movement

The study computed exchange rate movement for the study period for the main foreign currency which is United States Dollar (USD) against the Kenya Shilling. The study computed these from the prevailing mean average rates collected from the Central bank of Kenya. The findings were as indicated in the figure 4.1 below:

**Figure 4.1: Exchange Rate movement**
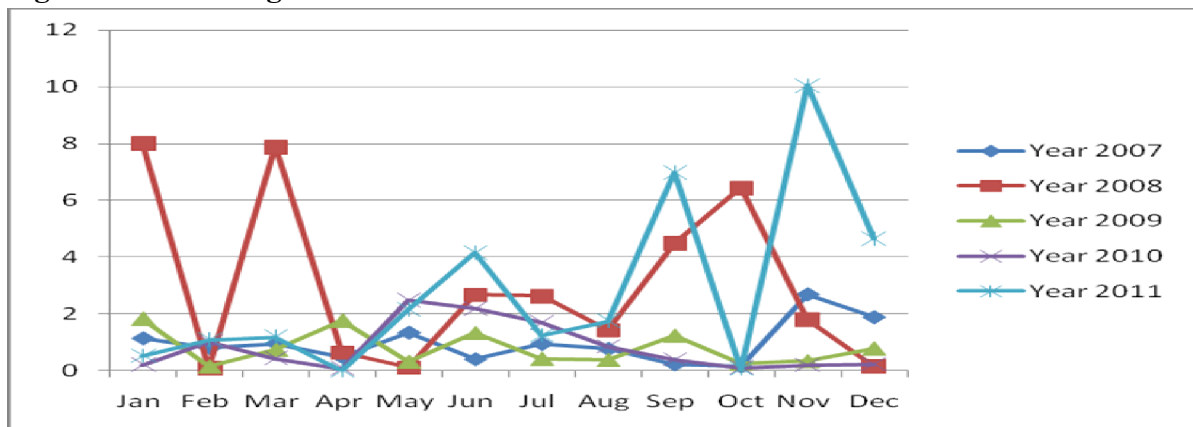
From the data presented above, the exchange rate movements recorded in the year 2007 started at 1.14 is January then reduced to below 1 to 0.804 in February, 0.952 in March, 0.475 in April and the increasing to 1.34 in May. The movements continued escalating to close the year at 1.883 points in December. For 2008, the exchange rate movement started at a high of 8.02 points meaning that the exchange rate fluctuated highly during the month. For February, the exchange rate movement was 0.078 then again increased to 7.78 in March. The movements continued throughout the year to close at 0.15 points in December. In 2009, the exchange rate movement started at 1.833 after which it reduced to 0.143 in February and 0.744 in March. The movements continued though with little variations as the highest for the remainder of the year was 1.769 in April with the lowest being 0.24 in October to close the year at 0.782. In 2010, the exchange rate movement started at 0.197 in January which was maintained low with movements maintained at below 1 until April then it rose to 2.479 in May. The changes continued to close the year at 0.222 in December 2010. For the year 2011, the exchange rate movement started at 0.52 points then increased to 1.092 in February. The exchange rate that prevailed in March stayed on in April hence posting a zero exchange rate movement. The remained months of 2011 registered high changes in the exchange rates of up to 100.57 in November and then closed the year at 4.6527. These findings are well illustrated in the figure 4.1 above.

4.3 Stock market returns Volatility

The study collected data on the stock market return volatility between 2007 and 2011. The research data was analyzed using average Nairobi Securities Exchange stock market returns volatility as indicated in the figure 4.2 below:

Figure 4.2: NSE Stock market Return volaitilty
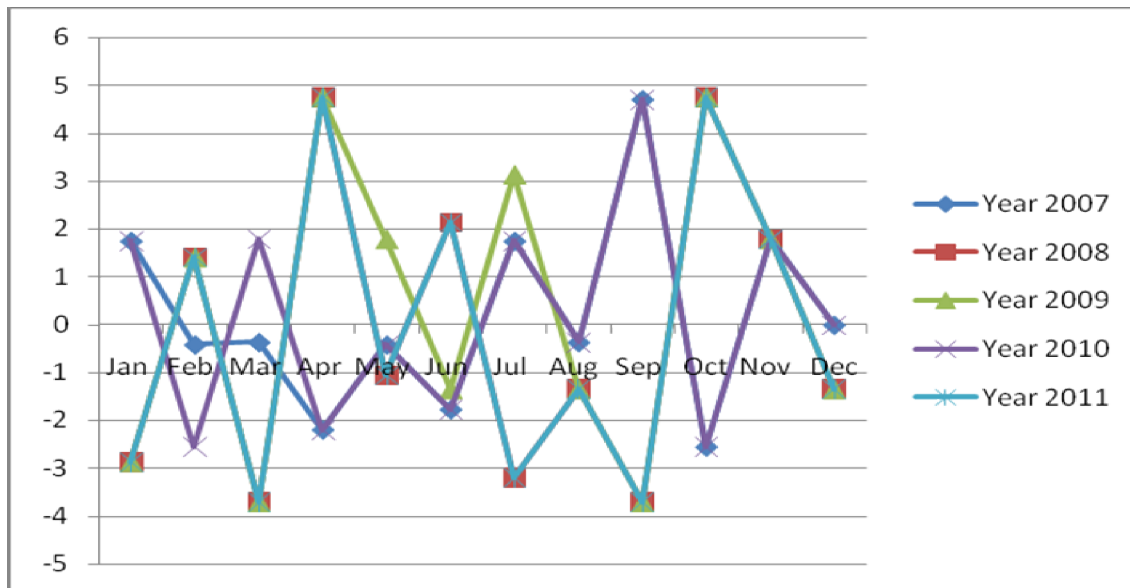
Source: (Research Data, 2012)

From the computed statistics, the market returns was 1.75 in Jan 2007 which saw the market returns fluctuate up and down to close the year at -0.01 in December. In 2008, the market returns opened at 2.88 then grew to 1.41 in February before dropping by 3.70 in March. The up and down trend continued throughout the year to close at 1.35 in December. In 2009, the market returns changes posted a decrease of 2.87 in January it was at 1.72 then fluctuated throughout the year to close at -1.32. In 2010, the returns changes were 1.72 which again fluctuated throughout the year to reach a high of 4.70 and a low of -0.012 in December. In the year 2011, the market returns opened the year at -2.8 then fluctuated during the year to reach a high of 4.71 and a low of -3.7 in April and March consecutively. The returns closed the year at -1.37.

4.4 Regression Analysis

In order to establish the relationship between exchange rate movement and stock market returns volatility at the Nairobi Securities Exchange, the researcher conducted a regression analysis. Using Statistical package for social Sciences (SPSS) version 21.0, the researcher used the regression analysis to determine the extent to which changes in the exchange rate movement are associated with changes in the stock market returns volatility. The data for a regression analysis consists of two input columns (exchange rate movement and market returns volatility). The findings are well illustrated in the table 4.1 below:

Table 4.1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.981^A	0.962	0.949	0.25522
a. Predictors: (Constant), Market Return Volatility				

Coefficient of determination explains the extent to which changes in the dependent variable (stock market returns volatility) can be explained by the change in the independent variable or the percentage of variation in the dependent variable that is explained by the independent variable- foreign exchange rate movement.

From the regression results above, it was established that exchange rate movements affected stock market returns volatility up to 94.9% as represented by the R2. This indicates that exchange rate movement has a very high impact on the stock market returns volatility. This therefore means that there are other factors not studied in this research which contributes 5.10% of the impact of the changes noted in the stock market returns volatility.

Table 4.2: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.870	.116		16.112	.001
	Exchange rate movement	5.018	.577	-.981	-8.703	.003
a. Dependent Variable: Market Return Volatility						

Using the model $Y = \beta_0 X_1 + \beta_1 X_1 + E$ in the above regression, it becomes:

$Y = 1.870 + 5.018 X_1 + E$

Therefore, it may therefore be interpreted that exchange rate movement has a positive relationship with stock market returns volatility. At 95% level of confidence, exchange rate movement affects market returns volatility significantly as indicated by a significance figure of 0.003 which is smaller than the benchmark 0.05.

CHAPTER FIVE:

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary, conclusion and recommendations of the study. The chapter presents a summary of the results on relationship between exchange rate movement and stock market returns volatility at the Nairobi Securities Exchange. Based on the findings in chapter four, the study gives recommendations after which it draws the policy recommendations. The recommendations are presented also based on the objective of the study after which recommendations for further studies are drawn.

5.2 Summary of the Findings

From the research findings presented in chapter four above, the exchange rate movements fluctuated widely reflecting the changes in the value of the local currency against the foreign currency. The exchange rate has a great impact on the participation of foreign investors in the local stock market because the ultimate return to them may be eaten away by the exchange rates fluctuations. A stable currency ensures that the market vibrancy is maintained as the investors continue with their trading. High stock market returns volatility suggests high risks as investors can not estimate precisely how their investment is likely to be at any given point in time.

From the findings, a high exchange rate movement was accompanied by a high stock market return volatility. This indicates that at times when the exchange rate movement is high, the foreign investors are reluctant to participate in the local market hence the result of high stock market return volatility reflecting the greater risks they stand to assume at this time. In addition, in times of low exchange rate movement is accompanied by a low volatility in the stock market returns.

Further, from the regression analysis summary model, the study established that exchange rate movement has a high impact on the market return volatility in Kenya. This was indicated by the high value of the R2.

5.2   Conclusions

From the findings of the study and the summary of the findings discussed above, this study concludes that there is a strong relationship between exchange rate movement and stock market returns volatility. This is especially carried through the information content of exchange rate movement on the security's business.

Further, the study concludes that exchange rate movement also affects the stock market performance greatly through its spiral effects. Through over macroeconomic variables, exchange rate movement indicates the state of the economy hence the likely future state of the economy. These variables would include things like the interest rate and the money supply in the economy which has great impact on the activity level of the security's performance.

5.3   Policy Recommendations

From the summary and conclusions above, this study recommends the following. First that the policy makers need to factor the effects of exchange rate movement on the performance of the stock exchange. This is because their policies may affect the performance despite their good intention to correct the deteriorating situations in the economy. The monetary Committee department at the Central bank of Kenya needs to maintain a stable foreign currency exchange if the activities at the Stock exchange are to be promoted. This is because huge exchange rate movements distort the trends of performance at the stock market leaving investors guessing the next cause of action because they may not be able to estimate with certainty the future state of the economy.

The study further recommends that the Security's management develop a foreign currency denominated equities so as to reduce the effects of exchange rate movement on the returns of the foreign investors. This would motivate foreign investors to invest more hence boost the vibrancy of the market.

5.4   Limitations of the Study

This study faced different challenges and limitations. The main limitations of this study were that the data used was secondary data generated for other purposes. Therefore it may not be as accurate as possible. In addition the period under study faced several challenges including the 2007/2008 post election violence which disrupted normal business in Kenya thus reducing investor confidence in the Security's exchange.

In addition, the inflation level has also been high in Kenya leading to the revision of goods making up the basket used to calculate the inflation index. This depreciated the purchasing power of many Kenyans thus leading to reduced activity at the NSE.

5.5 Suggestions for Further Studies

This study concentrated on the relationship between exchange rate movement and stock market returns volatility at the Nairobi Securities Exchange. This study therefore recommends that another study be carried out to determine the influence of macroeconomic variables on the performance of the NSE. This is because over the past few years, there have been many challenges facing the economy of Kenya leading to the Government of Kenya taking measures it had not applied for a long time. For example, following the increased inflation, the Government of Kenya raised it benchmark lending rates (Central Bank Rate) in order to reduce the money in circulation and thus reduce the levels of inflation.

The study also recommends that another study should be done in the Uganda and Tanzania's securities exchange to determine the effects of foreign exchange movement on stock market returns volatility. This will help generalize the findings to a wide area.

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APPENDICES

Appendix I: Data on Exchange Rate Movement

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007	1.14	0.804	0.952	0.475	1.34	0.402	0.945	0.761	0.223	0.143	2.69	1.883
2008	8.02	0.078	7.873	0.63	0.107	2.665	2.624	1.415	4.486	6.434	1.792	0.15
2009	1.833	0.143	0.744	1.769	0.314	1.327	0.414	0.374	1.234	0.24	0.332	0.782
2010	0.197	1.011	0.434	0.065	2.479	2.172	1.687	0.841	0.389	0.105	0.187	0.222
2011	0.52	1.092	1.187	0	2.153	4.16	1.236	1.749	6.983	0.054	10.0572	4.6527

Appendix II: Data on the stock market returns volatility

Year/Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007	1.745082	-0.42213	-0.37131	-2.19508	-0.42213	-1.77295	1.745082	-0.37131	4.703279	-2.55492	1.781148	-0.00902
2008	-2.86557	1.405738	-3.70328	4.744262	-1.05492	2.131967	-3.18689	-1.34672	-3.70328	4.744262	1.781148	-1.34672
2009	-2.86557	1.405738	-3.70328	4.744262	1.781148	-1.34672	3.127869	-1.34672	-3.70328	4.744262	1.781148	-1.34672
2010	1.745082	-2.55492	1.781148	-2.19508	-0.42213	-1.77295	1.745082	-0.37131	4.703279	-2.55492	1.781148	-0.00902
2011	-2.86557	1.405738	-3.70328	4.744262	-1.05492	2.131967	-3.18689	-1.34672	-3.70328	4.744262	1.781148	-1.34672