学校编码：10384　　分类号_____密级 _____

学　　号：27720101154470　　UDC

硕士学位论文

加纳的股票价格和汇率的关系:实证研究

The Relationship between Stock Prices and Exchange Rates of Ghana-Empirical Analyses

Michael Owusu Appiah

指导教师姓名：	**Professor Brett Graham**
专 业 名 称：	金融学
论文提交日期：	**2013** 年 **4** 月
论文答辩日期：	**2013** 年 **5** 月
学位授予日期：	**2013** 年月

答辩委员会主席：

评阅人：

2013 年 **6** 月

厦门大学学位论文原创性声明

本人呈交的学位论文是本人在导师指导下,独立完成的研究成果。本人在论文写作中参考其他个人或集体已经发表的研究成果，均在文中以适当方式明确标明，并符合法律规范和《厦门大学研究生学术活动规范（试行）》。

另外，该学位论文为（）课题（组）的研究成果，获得（）课题（组）经费或实验室的资助，在（）实验室完成。（请在以上括号内填写课题或课题组负责人或实验室名称，未有此项声明内容的，可以不作特别声明。）

声明人（签名）：

年 2013 月 06 日 09

厦门大学学位论文著作权使用声明

本人同意厦门大学根据《中华人民共和国学位条例暂行实施办法》等规定保留和使用此学位论文，并向主管部门或其指定机构送交学位论文（包括纸质版和电子版），允许学位论文进入厦门大学图书馆及其数据库被查阅、借阅。本人同意厦门大学将学位论文加入全国博士、硕士学位论文共建单位数据库进行检索，将学位论文的标题和摘要汇编出版，采用影印、缩印或者其它方式合理复制学位论文。

本学位论文属于：

（）1.经厦门大学保密委员会审查核定的保密学位论文，于年　月　日解密，解密后适用上述授权。

（）2.不保密，适用上述授权。

（请在以上相应括号内打“√”或填上相应内容。保密学位论文应是已经厦门大学保密委员会审定过的学位论文，未经厦门大学保密委员会审定的学位论文均为公开学位论文。此声明栏不填写的，默认为公开学位论文，均适用上述授权。）

声明人（签名）：

年 2013 月 06 日 09

摘要

本文研究加纳的股票价格和汇率之间的协整关系、格兰杰因果关系。使用的数据为从1998年1月2日到2011年12月20日的加纳股票市场、汇率市场的日数据。利用 ADF 方法检验数据的单位根过程，结果显示，汇率和股价都具有一阶差分平稳性 I（1）。利用 Engle-Granger（1987）两步协整检验法检验汇率和股价之间的协整关系。结果显示，汇率和股价之间不存在协整关系。而且，本文发现，自从 2007 年 7 月 3 日，加纳货币（塞地）重新选币定值后，汇率和股价的关系存在结构性突变。事实上，本文选取选币定值前后的子样本，对股价和汇率进行了 VAR 估计，并且检验了两者的格兰杰因果关系。结果发现，在选币定值前，从汇率到股价存在着单向的因果关系，但是在加纳货币（赛地）选币定值后，两者之间不存在因果关系。

关键词：关键词; 加纳股票市场; 汇率; 股价; 协整和格兰杰因果关系

Abstract

This study investigates the cointegration relationship and the Granger causality between exchange rates and stock prices of Ghana using daily data spanning from January 2, 1998 to December 20, 2011. The Augmented Dickey-Fuller test is employed to test for unit root process in the data series and the results show that both variables are integrated at order one, I (1). I use Engle-Granger (1987) two-step cointegration test to test for cointegration between the two variables. The results show that there is no cointegration relationship between the two. Also, I find that there is a structural break in the relationship between the two variables after the redenomination of the Ghana's currency (Cedi) on July 3, 2007. In effect, I estimate the VAR between the stock price and exchange rate returns for pre-redenomination and post-redenomination sub-sample periods and consequently test for Granger causality between the two. I find that there is a unidirectional causality from exchange rates to stock prices before the redenomination but no causality between the two after the redenomination of the cedi.

Keys Words: Ghana Stock Exchange; Exchange Rates; Stock Prices; Cointegration; Granger Causality.

Table of Contents

Chapter 1 Introduction

Globalization and the continuous deepening of financial integration among global economies coupled with the economic role that stock markets play in the allocation of resources to various productive sectors has increasingly generated a lot of research interest in the relationship between exchange rates and stock prices in the recent past. Liberalization of foreign capital controls and the adoption of floating exchange rate regimes by many countries have increased the traffic of funds among economies unleashing its concomitant effects on the foreign exchange rates. The dynamic interactions between exchange rate and stock prices are explained from the two theoretical standpoints, namely, the flow-oriented model and the stock-oriented model. Dornbusch and Fischer (1980) who propounded the flow-oriented model argue that changes in exchange rates lead to changes in stock prices. Thus, if the domestic currency depreciates, the country's global competitiveness is improved. This implies that domestic firms that export have a strategic competitive edge and all things being equal implies more cash flows for the domestic firms and therefore this development may influence the stock prices of these firms positively and the opposite holds for import-oriented companies in case the domestic currency appreciates. However, the stock-oriented theory pioneered by Frankson (1983) and Branson (1993) posits that stock price changes lead to exchange rate changes. The stock-oriented model theorises that if the prices of domestic stocks rise, investors will be influenced to augment the weight of the domestic assets in their portfolio by selling-off foreign assets to obtain domestic assets. Consequently, increase in the demand for domestic currency will lead to an appreciation in the value of the domestic currency.

According to Bodnar et al. (1993), movements in the exchange rates can essentially affect the values of firms especially if the cost of input for their operations and the values of their assets are denominated in foreign currencies. Also, Kim (2003) reports that the S&P 500 stock price is causally and negatively related to exchange rate in a study conducted on the relationship among some key macroeconomic variables of US. He also argued that the consistent increases in the global trade volume and the

growing traffic in capital across economies have positioned the exchange rates as one of the cardinal determinants of business profitability and equity prices.

1.1 Motivation

The openness of a country's economy is seen as an important conduit of influence on its markets. Ghana is one of the small open economies in the world. Ghana introduced a floating exchange rate policy in 1992 which implies that its various markets, the stock markets, forex markets, etc are not immune to foreign markets' influences. Furthermore, over the past few years the Ghana cedi has depreciated against the major convertible currencies. The continuous fall in the value of the cedi is paralleled to the Ghana stock market going bearish most often over the past few years. This worrying development has a lot of serious development implications for the Ghanaian economy. Moreover, the continuous depreciation of the Ghana cedi against the major international currencies may affect the profitability of firms and by extension the performance of the Ghana Stock Exchange (GSE). On July 3, 2007 Ghana redenominated the cedi by striking off four zeros and consequently renamed the cedi as Ghana cedi. Since, the redenomination of the cedi could possibly have effect on the interactions between the Ghana cedi and the stock market prices, I find it essential to investigate the impact of this policy reform on the interactions between the two markets. Furthermore, the literature survey I conducted shows that Ghana has a research vacuum with respect to the relationship between exchange rates and stock market prices, and against this backdrop, I find it necessary to conduct studies on this issue principally because this study employs a more recent data which comparatively captures more recent developments and also fills the research gap. Moreover, considering the significant implications of changes in the exchange rates for the development of the Ghanaian economy coupled with the essential role that the stock market plays as an investment hub for the allocation of economic resources for productive activities, it is important to understand the dynamics between the exchange rates and stock markets. Thus findings from this study will help augment the information-set available to policy makers, investors and regulators alike.

1.2 Research Objectives

The objective of the research is three fold. Firstly, to investigate the long-term interactions between the foreign exchange rates and stock prices. Secondly, I investigate whether the redenomination of the Ghanaian currency had any effects on the interactions between the two markets. Thirdly, I investigate whether there is any Granger causality between the foreign exchange rates and stock price which may either be unidirectional, bi-directional or nonexistent.

1.3 Overview of the Ghana Stock Exchange

The Ghana Stock Exchange (GSE) was formed in July 1989 under Act (179) of Ghana's Companies' Code 1963 as a private company and eventually was recognised as a Stock Exchange in 1990 and the same year trading began on the floor. The initial trading began with two brokerage firms which conducted over-the-counter trading activities on behalf of foreign companies. Although the GSE is one of the most recently established stock exchanges in Africa, it has become one of the most important stock exchanges on the continent. However, the annual turnover[1] of the GSE is very volatile. The GSE recorded a turnover of 34.8% which was close to the global average of 38.2% in 1994 followed by 25.5%, 21.5%, and 16.5% in 1995, 1996 and 1997 respectively[2]. However, the turnover shot up again in 2005 with turnover of 29.8% and then nose-dived to as low as 11% in 2011. Thus, in the light of the above stated facts, the importance of the Ghana stock exchange is not limited to only the Ghanaian economy but the development of Africa as a whole.

1.3.1 Main Indices on the Ghana Stock Exchange

There are four main indices on the GSE, namely, Ghana Stock Exchange All-Share Index (GSE-ASI), GSE Composite Index (GSE-CI), CBL All-Share Index (CBL-ASI) and GSE Financial Stocks Index (GSE-FSI), and I will briefly discuss the GSE-ASI. The Ghana Stock Exchange All-Share Index comprises all listed stocks on the GSE. It has its base as the average capitalization for the period covering November 12, 1990

[1] This represents the stock market capitalisation as a proportion of GDP
[2] www.worldbank.org

to December 31, 1993 with 100 as the base and it is published by the GSE.

1.4 Overview of Evolution of Exchange Rate System in Ghana

Ghana Cedi is the name of the Ghana's currency and it is divided into 100 pesewa. The successive governments of Ghana have been faced with the tough decisions of either maintaining a fixed exchange rate system or a floating exchange rate regime. Ghana's exchange rate management policies have strongly been influenced by the different political regimes (both democratic and military) that have been in place since independence in 1957. From 1957 to 1982, Ghana adopted a fixed exchange rate regime. During this period, the Ghanaian cedi was pegged to the core international currencies, the British pound and the American dollar. The fixed exchange rate was not maintained by active intervention in the forex market, on the contrary, the exchange rate was pegged by decree and a series of administrative controls were instituted to deal with any possible excess demand for foreign currency.

In 1986, the government developed an auction market model in an attempt to speed up the adjustment of the exchange rate so as to reach the goal of trade liberalisation. This system was open mostly to importers of raw materials and components but excluded importers of consumer goods. The Bank of Ghana (BOG) accepted bids from bidders once in a week and allowed the exchange rates to float within bands that it aimed at in each week. Later in 1988, importers of consumer goods were allowed to acquire license and consequently had access to the auction market. In 1990, BOG stopped the direct sale of foreign exchange to end-users and in lieu accepted bids from licensed banks (dealers) and these licensed banks traded among themselves as well. This development helped to partially subject the market to the control of the market forces to determine the cedi-dollar exchange rates.

In 1992, the inter-bank market system was introduced. This system allows the market forces to determine the exchange rates. With respect to this particular exchange rate regime, banks trade foreign exchange among themselves whereas forex bureaux serve a number of clients including individuals, tourists, small and medium scale enterprises, etc. The inter-bank system introduced competition between the forex bureaux and the

commercial banks. From that time till present, both the commercial banks and the forex bureau have operated in a competitive environment.

1.5 Redenomination of the Cedi

According to Dogarawa (2007) redenomination of a currency is a policy to change the denomination of a currency at a particular ratio.

On July 3, 2007, Ghana redenominated the cedi by striking off four zeros and consequently renamed the cedi as Ghana cedi. Thus, one Ghana cedi was equal to ten thousand cedi (1GH¢=¢10000). The authorities at the Central Bank of Ghana explained that the former note regime placed a heavy burden inter alia and was in several folds such as the huge cost of transaction at the cashiers and high level risks involved in carrying huge amount of currency for transaction purposes and the resulting pressure it unleashed on the payments systems, particularly the automated teller machines (ATMs). The exercise included some objectives such as simplifying the understanding of large quantities, simplifying arithmetic calculations of amounts expressed in the national currency, achieving more efficient use of calculation and accounting record systems, etc. Against this background, the authorities stated that the exercise would bring about substantial efficiency gains when undertaken within the framework of strong economic fundamentals and macroeconomic stability. Thus, the redenomination exercise was aimed at helping to do business in the most effective and efficient way on the heels of sound and sustainably prudent and disciplined economic policies.

1.6 Scope of the Research

The rest of the work is organised as follows; chapter two for review of literature, chapter three for estimation techniques, chapter four for empirical results, and chapter five for conclusion.

Chapter 2 Literature Review

There is a large body of literature on the relationship between stock prices and exchange rates with a lot of mixed results. The dynamic interactions between exchange rate and stock prices are explained from the two theoretical positions, namely, the flow-oriented model and the stock-oriented model. Dornbusch and Fischer (1980) who propounded the flow-oriented model argue that changes in exchange rates lead to changes in stock prices. Thus, if the domestic currency depreciates, companies that principally rely on exports to generate revenues will gain a competitive advantage since the value of their exports will be cheaper comparatively. This positive development may influence the stock prices of these firms positively and the opposite holds for import-oriented companies in case the domestic currency appreciates. On the contrary, in the case of firms that use imported raw materials and components in the their production, the depreciation of the local currency will augment their cost of production thereby negatively affecting their performance which will reflect in their stock prices all things being equal. However, the stock-oriented theory pioneered by Frankson (1983) and Branson (1993) posits that stock price changes lead to exchange rate changes. Thus, if the prices of domestic stocks rise, investors will be enticed to increase the weight of the domestic assets in their portfolio by selling-off foreign assets to obtain domestic assets. Consequently, increase in the demand for domestic currency will lead to an appreciation in the value of it.

A vast array of empirical work has been done on the relationship between exchange rates and stock prices. Abdalla and Murinde (1997) employed a bivariate vector autoregressive model to analyse the nexus between stock prices and exchange rates for four Asian countries, Philippines, India, South Korea and Pakistan for a period ranging from 1985:01- 1994:07. The findings from the Granger-causality test showed that there was a uni-directional causality from exchange rates to stock prices in all the respective countries except Philippines where stock prices Granger-cause exchange rates. Adjasi et el. (2008) studied the effect of the exchange rate volatility on the Ghana stock exchange with data spanning from 1995 to 2005 by employing the

Exponential Generalised Autoregressive Conditional Heteroskedascity (EGARCH). They reported that there was an inverse relationship between exchange rates volatility and stock market returns with volatility transmission running from exchange rates to stock prices.

On the contrary, Ajayi et al. (1998) employed daily stock indices and exchange rates for a set of developed and developing economies by employing a Granger causality test to investigate the causal relations between stock returns and changes in the exchanges rates using data spanning from 1985 to 1991. The findings indicated a uni-directional Granger causality from the stock market to the currency market in all the developed economies however, no consistent causal relations were observed in the developing economies. Lee et al.(2011) employed Smooth Transition Conditional Correlation-Generalised Heteroskedasticity (STCC-GARCH) model to investigate the relationship between exchange rates and stock prices of six Asian countries, namely, Korea, Malaysia, Indonesia, Taiwan, Philippines and Thailand. The results showed that there was a significant spillover from stock market to foreign exchange market for Indonesia, Korea, Malaysia, Thailand and Taiwan except in Philippines. Chien-Hsiu (2011) investigated the comovement between the exchange rates and stock prices in the Asian emerging markets by adopting the Autoregressive Distributed Lag (ARDL) model developed by Pesaran et al. (2001). He concluded that the comovement between the exchange rates and stock prices during the crises period was more pronounced than during the stable period. He further argued that most of the causality ran from stock prices to exchange rates. Thus, the economic slowdown affected equity prices which prompted international investors to withdraw their investment which consequently affected the exchange rates. Moreover, Athanasios and Costas (2013) investigated the existence of the long-run relationship between exchange rates and stock prices in the European Union (EU) and United States of America (USA) during the recent financial crises using daily data ranging from January 2008 to April 2012 by employing a more recent advanced model, the structural nonparametric cointegration regression. They reported that there was a uni-directional Granger causality from stock prices to exchange rates in the long run

with respect to EU and in the short –run in the case of USA.

Furthermore, in other related studies, the researchers found feedback and no causal interactions between the two variables. Usman and Aliyu (2008) examined the short-run and long-run interactions between the exchange rates and stock prices in Nigeria based on the sample from February 1, 2001 to December 31, 2008. They divided the data into pre-crises and post-crises period (after the 2007 global financial crises). The Granger (1969) causality model was employed to establish bidirectional causality between the exchange rates and stock prices within these periods. Also, it was found that there was no causality between the exchange rates and stock prices in the pre-crises period, however there was a bidirectional causality between the exchange rates and stock prices in the post-crises model as well as the entire period model. Zhao (2009) analyzed the dynamic relationship between the exchange rates and stock prices of China using monthly data from January 1991 to June 2009. He concluded that there was a bidirectional volatility spillover effect between the two markets, indicating that past innovations in stock market have great effect on the future volatilities in foreign exchange market and vice versa. Liu and Wan (2012) investigated the relationship between the Shanghai stock market and the foreign exchange rates. They reported that there was a cross correlation between the stock prices and exchange rates. Furthermore, by employing both the linear and non-linear Granger causality tests, they found no causality between the exchange rates and stock prices before the financial crises. However, they found a uni-directional causality from the exchange rates to stock prices after the financial crises.

Chapter 3 Estimation Techniques

Researches on the causal relationship between equity prices and exchange rates have been conducted with various econometric methods. In this study, I employ the vector autoregressive model and dynamic Granger (1969) causality test to examine the relationship between the variables under study. Empirical studies which are premised on time series data assume that the underlying time series is stationary. On the contrary, many empirical studies have shown that this assumption is not always true and that a significant number of time series variables are non-stationary (Engle and Granger, 1987). Thus, employing a non-stationary time series data in a regression analysis may result in spurious results (Granger and Newbold (1974)). Therefore, embarking on studies involving time series data necessitates that stationary test is conducted to establish the underlying process of the data series.

3.1 Stationarity Test

A data generating process is considered stationary if it has time-invariant first and second moments, and the covariance of two time periods is constant notwithstanding which time periods are used and the distance between them, Gujarati (1995). The process is said to be weakly stationary if the two first conditions are fulfilled but the covariance between two time periods depends on the distance between the time periods, but not on when it is calculated. If the process is stationary around a trend, it is said to be trend-stationary. There are a variety of unit root tests used in the econometric literature principally Augmented Dickey-Fuller (ADF), Dickey-Fuller, Phillip-Perron, Ng-Perron tests, etc to investigate whether the time series data used in a study are stationary or not. I employ the Augmented Dickey-Fuller to examine the stationarity of the variables.