



Diaspora Remittances and Performance of Kenya's Securities Market: Do Foreign Exchange Reserves and the GDP Growth Rate matter?

Kogei, K. Japheth
Department of Accounting and Finance, Moi University
P.O. Box 3900-30100, Eldoret, Kenya

Email address: kogei@mu.ac.ke

Abstract

This study examined the long and short-run dynamic interactions between the performance of Kenya's securities market, diaspora remittances, foreign exchange reserves and the GDP growth rate. It sought to establish the yet unexplored moderating effects of the foreign exchange reserves and the gross domestic product (GDP) rate on the relationship between diaspora remittances and the performance of Kenya's securities market (proxied by the volume of shares traded). The study adopted longitudinal approach. A time series analysis was performed on monthly data for the period between January 2007 to December 2016. Secondary data was sourced from the Central Bank of Kenya (CBK), the International Monetary Fund (IMF), the World Bank (WB), the Nairobi Securities Exchange (NSE), and the Kenya National Bureau of Statistics (KNBS). The estimated F-statistic was 6.19 ($6.19 > 4.10$) implying that there existed a long run relationship or a co-integrating relationship between Kenya's securities market performance and diaspora remittances. The ECM model was negative and significant at one percent level. The moderation results revealed that the interaction term of GDP growth rate and diaspora remittances was positive and significant ($\beta = .51, p = .03 < .10$) whereas the interaction term of foreign exchange reserves and diaspora remittances was negative and significant ($\beta = -1.13, p = .00 < .01$). In conclusion, the findings revealed that the GDP growth rate did not moderate the relationship between diaspora remittances and the performance of Kenya's securities market while the foreign exchange reserves did. These findings validate the proposition of the Arbitrage Pricing Model that macroeconomic indicators play a key role in the relationship between diaspora remittances and performance of the securities market in Kenya. The study implies for Kenya's securities market to perform, policy makers and regulatory bodies ought to initiate measures that improve the GDP growth rate and ensure that there are enough foreign exchange reserves in the economy.

Keywords: Diaspora Remittances, Kenya's Securities Market, Macroeconomic Variables, GDP, Interaction Terms, Moderating Effect.

INTRODUCTION

The securities market performance is measured by securities market share indices, the number of shares traded, the number of transactions, and market capitalization. The market share indices are an indicator of the direction of share price movement. It is a quick measure for judging the overall direction of the market. This means that a securities market index should neither understate nor overstate the market position and should be both precise and exact. The market index comprises of a selection of listed

companies which represent a significant portion of market capitalization and trade actively.

Generally, a highly performing security markets stimulate investment opportunities by recognizing and financing productive projects that lead to economic activity, mobilize domestic savings, allocate capital efficiently, help to diversify risks, and facilitate exchange of goods and services (Caporale *et al.*, 2004). In addition, securities markets are best indicators for predicting future economic activity and describe casual effect between future economic growth and equity prices. Further, efficient securities markets provide guidelines for keeping appropriate monetary policy through the issuance and repurchasing of government securities in liquid markets, which is an important step towards financial liberalization (Caporale *et al.*, 2004).

However, review of extent literature has shown that performance of stock markets is affected by several macro and micro economic variables such as Diaspora Remittances (Abdelbaki, 2013). Billmeier & Massa (2009) investigated the link between diaspora remittances and the securities market development utilizing panel data for seventeen the Middle East and Central Asia regions and found a positive and significant relationship. Additionally, Demirguc-Kunt *et al.*, (2011) analyzed the effect of remittances on banking sector depth and breadth in Mexico and the findings showed that diaspora remittances increased the number of bank branches and accounts and the number of deposits. (Tarus, 2015) also found that diaspora remittances affect banking sector development in Sub-Saharan Africa. Further, engagement in business activity has a direct effect on banking institutions because banks offer households a safe place to store their liquidity (Demirguc-Kunt *et al.*, 2011). Other studies have found that diaspora remittances aid households to set up small commercial enterprises and facilitate business activity (Yang, 2004), which eventually leads to an increase in private investment. Indeed, there is little empirical research on the influence of macroeconomic indicators on the relationship between diaspora remittances and the performance of the securities market.

In addition, Abdelbaki (2013) indicated that many macroeconomic indicators such foreign exchange reserves and GDP growth rate as have significant effects on a securities market and its functions, development, and role in the national economy. The relationship between equity prices and macroeconomic indicators is well documented for developed nations, particularly in the United States and other major economies (Gay, 2008). From the literature reviewed, it is apparent that the research in all dimensions has been extensive for these developed economies. However, research on the relationship between real economic activity and the securities markets in developing countries, such as those of Latin American, Eastern Europe, Middle East, Africa, and South Asian countries, is scanty. As noted, evidence of securities market performance predictability using macroeconomic indicators for emerging markets is rather limited whilst abundantly available for the developed capital markets. Concerning Kenya, there's scarcity of research on the dynamic relationships between the securities market and real economic activity. On the other hand, most of the literature focuses on diaspora remittances-banking sector development or diaspora remittances-financial sector development linkages yet the effect of remittances may be different depending on the level of various macroeconomic indicators (Onyuma & Ochieng, 2017). Further, there exists scanty evidence on how macroeconomic indicators moderate the relationship between diaspora remittances and Kenya's securities market performance.

An Overview of Kenya's Securities Market

The Kenyan securities market is one of the most developed and vibrant among the Eastern and Central African countries. The Nairobi Securities Exchange is the fourth largest securities market in Africa in terms of market capitalization (Ngugi, 2003). Its history can be traced back to 1954 when the Nairobi Stock Exchange (NSE) was registered under the Societies Act (Munga, 1974). It developed in three stages. The initial stage coincided with the early economic development of the Kenyan economy (KIPPRA, 2002).

Between 1963 and 1970, the NSE operated as a regional market in East Africa, where several listed industrial shares and public-sector securities included issues by the Governments of Tanzania and Uganda (the East African Community). The Kenyan Government adopted a new policy with the primary goal of transferring economic and social control to citizens (Ngugi, 2003).

During the established stage (1970 - 1990), the government adopted a policy of diversifying the economic base of the Kenyan economy. The government focused on regulating and modernizing the capital market. It was at this stage that the Kenyan capital market witnessed significant improvements in almost every aspect including the structure, operation, and regulation. The Capital Markets Authority (CMA) was established in 1990 through the Capital Market Authority Act (Cap 485A) with its main purpose of promoting and facilitating the development of an orderly and efficient capital market in Kenya. Since then, the NSE has grown considerably and attracted international investors (Ngugi, 2003).

During the modernized stage (1990-present), the CMA increased awareness and build a stock investment culture among Kenyans and foreign investors, (Ngugi, 2003). In 1997, members of the NSE formed the Association of Kenya Stock brokers (AKS) with the objective of developing a code of conduct, promoting professionalism, and establishing examinable courses for its members as well as facilitate liaison with the CMA and the NSE. In 1998, the CMA published new guidelines on the disclosure standards by listed companies. It issued guidelines in 1999 to promote good corporate governance practices by listed companies and incorporated the Central Depository and Settlement Corporation Limited (CDSC) under the Companies Act (Cap 486) (Ngugi, 2003).

Between 2001 and 2017, the market went through several important developments. Among them was the separation of the NSE into the main investment market segment, alternate investment market segment and the fixed income securities market segment. Additionally, the NSE implemented live trading on its own automated trading systems. Followed by the establishment of the Wide Area Network platform which enabled remote trading by brokers and investment banks through terminals in their offices linked to the NSE trading engine (Ngugi, 2003).

To provide investors with a comprehensive measure of the performance of the securities market, the NSE introduced the NSE All-Share Index (NASI) in 2008 and in 2011, the business segments under which listed companies were reclassified. Other developments during the modernization stage include the NSE joining the Financial Information Services Division of the Software and Information Industry Association, approval by CMA to operate as a demutualized entity, membership in the Mondo Visione Exchanges Index as well as the launch in 2014 of a new system for trading corporate bonds and Government of Kenya Treasury Bonds. The new system enabled

the online trading of debt securities and integration with the settlement system at the Central Bank of Kenya.

Statement of the Problem

For several years now, Kenya has witnessed a surge in foreign capital inflows through diaspora remittances. For instance, diaspora remittance grew from approximately 40 billion dollars in January 2007 to approximately 160 billion dollars in August 2016. In spite of this, the moderating effect of macroeconomic indicators on the relationship between the diaspora remittances and the securities market performance has not been studied. Therefore, understanding the link between diaspora remittances and the securities market performance and how this relationship may be moderated by macroeconomic indicators is crucial. This study, focused on the moderating effects of macroeconomic indicators on the relationship between diaspora remittances and the performance of the securities market, specifically, the moderating effect of the foreign exchange reserves and the gross domestic product (GDP).

From the literature reviewed, it is apparent that the research in all dimensions has been extensive for these developed economies. However, research on the relationship between real economic activity and the securities markets in developing countries, such as those of Latin American, Eastern Europe, Middle East, Africa, and South Asian countries, is still ongoing. As noted, evidence of securities market performance predictability using macroeconomic indicators for emerging markets is rather scarce whilst abundantly available for the developed capital markets.

There is limited empirical research on the influence of macroeconomic indicators on the relationship between diaspora remittances and the performance of the securities market. On the other hand, the relationship between diaspora remittances and securities markets is gradually gaining interest in finance (Nyashs et al., 2015). Additionally, to the best of this researcher's knowledge, there is no other published study considering both, the short and long-run dynamic relationships between the Kenyan securities market performance, diaspora remittances, and macroeconomic indicators. The objective of this study was to investigate the moderating effect of macroeconomic indicators on the relationship between diaspora remittances and the securities market performance in Kenya.

REVIEW OF LITERATURE

The GDP Growth Rate, Diaspora Remittances a Performance of stock market

Clements & Galvao (2017) utilized forecasting models to assess the effect of surprises in GDP announcements on equity markets, and to analyze the impact of anticipated future revisions on announcement-day returns. the study used econometric mathematical approach. Study findings revealed that the release of better than expected third-release GDP figures give a boost to equity markets.

Khan et al., (2015) explored the explanatory power between GDP growth rate, real interest rates, real exchange rates, and the trade balance for equity returns in South Asian securities markets. The study utilized Indian, Pakistani, Bangladeshi, and Sri Lankan securities markets data for the period between 1998 and 2012. Study findings showed that the information on GDP rate activity does not explain South Asian equity market returns and further that regional GDP activity directly explains equity returns of Bangladesh and indirectly those of Pakistan and Sri Lanka.

Guo (2015) examined the causality in mean and variance between equity returns and real GDP growth rate in China before and after the outbreak of the US subprime crisis. The value-added output data were used after are adjusted by the X-12-ARIMA between January 1997–December 2012. The AR-EGARCH model was used to model stock return dynamics and real GDP growth in China. The study findings revealed no causality in mean or variance between China's equity returns and real GDP growth rate for the period before the subprime crisis. However, in the period after the crisis, the results indicated evidence of unidirectional causality in mean from real GDP growth rate to equity returns and unidirectional causality in variance from equity returns to real GDP growth rate.

Additionally, Madsen et al., (2013) did a study on stock returns and economic growth. The study analyzed securities market data for 20 Organization for Economic Co-operation and Development (OECD) countries over the period between 1916 and 1951. The results showed that the nexus between equity returns and the GDP growth rate is positive. Interestingly, no relationship between equity returns and GDP growth rate was found before and after this period. In addition, extant literature shows that diaspora remittances contribute to GDP growth, be it through positive impact on consumption, savings, or investment.

Glytsos (2002) explored the direct and indirect effects of diaspora remittances on incomes and hence on investment in seven Mediterranean countries, and discovered that investment increases with diaspora remittances in six out of the seven countries. Additionally, the findings of an investigation by (Leon-Ledesma & Piracha, 2004) for 11 emerging economies of Eastern Europe during the period between 1990 and 1999 show evidence supporting the view that diaspora remittances have a positive impact on productivity and employment directly and indirectly through their effect on investment.

Conversely, Ahamada and Coulibaly (2013) examined the causality between remittances and economic growth in Sub-Saharan African (SSA) countries. Using annual data from 1980-2007, they employed panel Granger causality testing approach that is based on seemingly unrelated regressions systems and Wald tests with country-specific bootstrap critical values. They found that there is no causality between diaspora remittances and growth in Sub-Saharan Africa (SSA). This implies that there is no causality from diaspora remittances to economic growth and vice versa. Additionally, the study findings showed that in all SSA countries, there is no causality from diaspora remittances to investment except for the Gambia.

Diaspora remittances have both short and long-run impact (Khan et al., 2015). Long-term multipliers involve positive long-term impact when diaspora remittances are increasing and negative effects when they are decreasing. Remittances enable households and small-scale entrepreneurs to surmount credit constraints and imperfections in financial markets by even promoting GDP growth through higher rates of capital accumulation. On the other hand, if diaspora remittances are purely transferred to sustain consumption, they could have negative effects on economic growth, and hence, pose a moral hazard problem (Chami, (2003). Based on this argument the study hypothesized that

H₀₁: GDP growth rate does not moderate the relationship between diaspora remittances and the performance of the securities market in Kenya.

Foreign Exchange Rate, Diaspora Remittances and Performance of stock market

Bhattacharya & Mukherjee (2001) investigated the causal relationship between equity prices, proxied by the Bombay Stock Exchange Sensitive Index, and the exchange rate, foreign exchange reserves, and value of trade balance. The study applied the unit root, the cointegration, and the Granger causality tests on monthly data for the period between 1990 and 2000. The results indicated the existence of no causal link between equity prices and the indicators.

In similar study Rahman *et al.*, (2009) investigated the relationship between money supply, interest rate, exchange rate, foreign exchange reserves, and industrial production index and equity prices for Malaysian securities market. Their study used a monthly data ranged from January 1986 to March 2008. They employed VECM. The empirical findings revealed that all the indicators contributed significantly to the co-integrating nexus. The implication was that the Malaysian securities market is sensitive to changes in the macroeconomic indicators and had stronger relationship with foreign exchange reserves and industrial production index as compared to the money supply, interest rate, and exchange rate.

In Pakistan, Muhammad Akbar (2012) investigated the link between the Karachi Stock Exchange 100 index and a set of macroeconomic indicators. using data for four South Asian emerging stock markets over the period 1998–2012. The study findings indicated that equity prices and macroeconomic indicators were co-integrated and that at least a uni-directional causality exists between the two sets of indicators. The results further revealed that equity prices were positively connected to money supply and short-run interest rates and negatively to the inflation rate and foreign exchange reserves. additionally, Muhammad Akbar, (2012) investigated the association between foreign exchange reserves and the equity market in Nigeria for the period between 1981 and 2011. The study findings indicated that a long-term link exists between the exchange rate reserves and equity market and that foreign reserves had a positive effect on equity market growth.

Khan *et al.*, (2015) explored the explanatory power between GDP growth rate, real interest rates, real exchange rates, and the trade balance for equity returns in South Asian securities markets. The study utilized Indian, Pakistani, Bangladeshi, and Sri Lankan securities markets data for the period between 1998 and 2012. Study findings showed that the information on GDP rate activity does not explain South Asian equity market returns and further that regional GDP activity directly explains equity returns of Bangladesh and indirectly those of Pakistan and Sri Lanka.

Guo (2014) examined the causality in mean and variance between equity returns and real GDP growth rate in China before and after the outbreak of the US subprime crisis. using a nonuniform weighting cross-correlation approach and the multivariate generalized autoregressive conditional heteroscedasticity model, the study findings revealed no causality in mean or variance between China's equity returns and real GDP growth rate for the period before the subprime crisis. However, in the period after the crisis, the results indicated evidence of unidirectional causality in mean from real GDP growth rate to equity returns and unidirectional causality in variance from equity returns to real GDP growth rate.

Additionally, Madsen *et al.*, (2013) analyzed securities market data for 20 Organization for Economic Co-operation and Development (OECD) countries over the period between 1916 and 1951. The results showed that the nexus between equity returns and the GDP growth rate is positive. Interestingly, no relationship between equity returns

and GDP growth rate was found before and after this period. Guided by theoretical literature on currency devaluations, Patro *et al.*, (2014) analyzed the link between the local equities market's abnormal returns on currency devaluations and the country's key macroeconomic indicators. The study indicated that securities markets decline more during a devaluation period if foreign exchange reserves are low; if the real exchange rate has depreciated over the prior years; if the capital account has declined; if the current account deficit has gone up; or if the country's credit rating has deteriorated. Furthermore, equity returns are significantly lower for greater devaluations, and if the country is an emerging market. Thus, from the review of above literature this study hypothesized that.

H₀₂: Foreign exchange reserves do not moderate the relationship between the diaspora remittances and performance of Kenya's securities market.

Theoretical Framework

The study was anchored on The Arbitrage Pricing Theory developed by Sharpe in 1964 as an alternative to the Capital Asset Pricing Model (CAPM). It relates securities market returns to macro-economic indicators which are sources of income volatility. The impact of these indicators on securities market returns depends on underlying model assumptions. The APT model is considered advantageous as it employs a multi-variable model that has more explanatory power because it allows for more than one factor (Eita, 2011).

Ross (1976) showed that there is an approximate relationship between the expected returns and the estimated β_{ik} in the first step if the no arbitrage condition is satisfied, that is, the expected return $E(R_i)$ increases as investors accept more risk, assuming all assets in the market are priced competitively.

APT does not specify the type or the number of macroeconomic indicators for researchers to include in their study. For example, although Chen, Roll, & Ross, (1986) examined the effect of four indicators including inflation, gross national product (GNP), investor confidence, and the shifts in the yield curve, they suggested that the APT should not be limited to these indicators. Therefore, there is a large body of empirical studies that have included many different macro-economic indicators, depending on the securities market studied. This study examined how the GDP growth rate and foreign exchange reserves interact with diaspora remittances to affect the securities market performance in Kenya.

Conceptual Framework

The objective of this study was to analyze the relationship between diaspora remittances and the performance of Kenya's securities market as well as the moderating influence of macroeconomic indicators on the relationship. The independent variable was the diaspora remittances, while the dependent variable was the performance of Kenya's securities market. The moderating variables were selected macroeconomic indicators; GDP growth rate, and foreign exchange reserves. The direct relationship between the dependent variable and the independent variable as well as the interactions between moderating variables on this relationship were analyzed. Figure 2.5 (<= should be 1) shows the Conceptual Framework of the study.

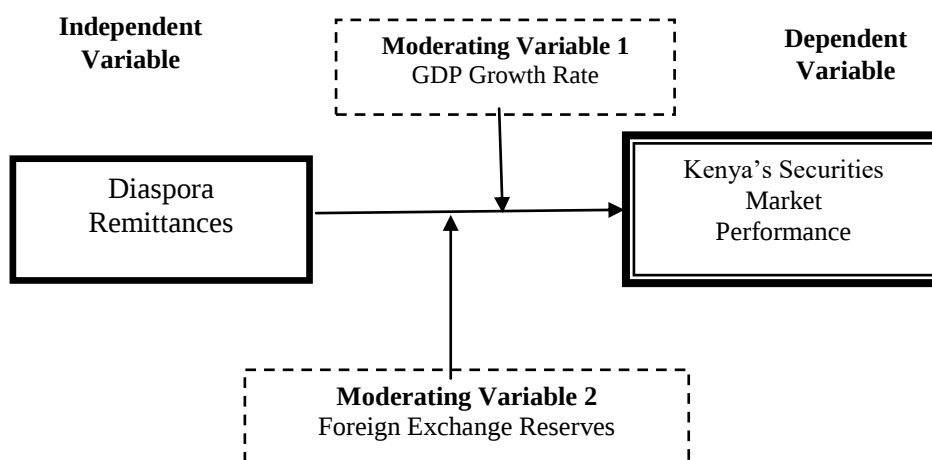


Figure 1: Conceptual Framework

METHODOLOGY

The study adopted the longitudinal research design. A time series analysis was performed on monthly data for the period between January 2007 to December 2016. Secondary data was sourced from the Central Bank of Kenya (CBK), the International Monetary Fund (IMF), the World Bank (WB), the Nairobi Securities Exchange (NSE), and the Kenya National Bureau of Statistics (KNBS).

Data

The study used monthly data for the period covering January 2007 to December 2016. Some data such as the GDP growth rate were only available in quarters and monthly values were extrapolated. A total of 120 observations were included. Secondary data on trading volume was sourced from the Kenya National Bureau of Statistics. The monthly data on macroeconomic indicators consisting of foreign exchange reserves, and GDP growth rate were obtained from the Central Bank of Kenya. Data on diaspora remittances were obtained from the World Bank database as well as from the Central Bank of Kenya. The data spans the period from January 2007 to December 2016. Macroeconomic indicators that are expected to determine the performance of the securities market in Kenya were derived from the economic theory and the literature reviewed. Descriptive and correlation analysis were used.

Analytic model

The model used in this study was derived from the theoretical and empirical literature. A similar model was adopted by Basu & Chawla, (2012). The moderating effect of each of the indicators on the relationship between diaspora remittances and volume of shares traded was established by interacting each of the moderating indicators with diaspora remittances (Malonka & Amphah, 2017). Data was analysed using Error correction model (ECM). Equation (1) was therefore modified to include each of the moderating indicators at a time.

Moderating effect of GDP growth rate on the relationship between diaspora remittances and volume of shares traded:

$$LnVTShares = \theta_0 + \theta_1 lnRem + \theta_4 lnGDPgr + \theta_5 lnFxgr + \theta_9 lnRem * lnGDPgr + u_i \quad (1)$$

Moderating effect of foreign exchange reserves on the relationship between diaspora remittances and volume of shares traded:

$$\ln \text{Shares} = \theta_0 + \theta_1 \ln \text{Rem} + \theta_4 \ln \text{GDPgr} + \theta_5 \ln \text{Fxgr} + \theta_9 \ln \text{Rem} * \ln \text{Fxgr} + u_i \quad (2)$$

Malonka & Amphah, (2017) argue that if the coefficient of the variable is significant in the base equation (equation (1) but insignificant in the coefficient of the variable multiplied by the diaspora remittances, then the variable is an explanatory variable. However, if the coefficient of the interaction term is significant but the coefficient of the variable in the base equation is not significant, then the variable is a moderating one. However, Muli (2017) assert that the variable is a moderating one if the coefficient of the interaction term is significant. Following the two authors, the coefficient of the interaction term, $\ln \text{Rem} * \ln \text{Fxgr}$ is interpreted as follows, assuming a positive and significant coefficient: An increase in exchange reserves have a positive moderating effect on the relationship between remittances and the volume of the shares traded. Alternatively, it is the increase in the slope of volume of shares traded on diaspora remittances, given a unit increase in foreign exchange reserves.

RESULTS AND DISCUSSION

This section presents a discussion of the final results and the process through which the results were obtained. The statistical methods of analysis are discussed. The descriptive results for all sectors are presented in table 1. As shown in the table, average remittances were reported to be KSh 874111 million. Stock market performance in NSE using NSE 20 share index for period 2007-2016 was at 4260.71 million while GDP was at 5.29%. Regarding foreign exchange rate (FX reserves in millions) was at 340898. Table 1 also highlights the findings on the correlation and collinearity tests.

Table 1: Descriptive and Correlation analysis

	Min	Max	Mean	SD	NSE 20 Share Index	Remittances	GDP Growth Rate (%)	FX Reserves
NSE 20 Share Index	247	5774	4260	785.382	1.00			
Remittances \$ (millions)	51.0	41.0	8741	3531	0.01	1.00		
GDP Growth Rate (%)	0	0	1.65	8.81	.272**	0.13	1.00	
FX Reserves (millions)	0.79	5938	5.29	2.15	-0.03	.892**	0.01	1.00

** p<.01

Source: Research Data (2018)

From Table 1 above, the correlation between the remittance and performance of Kenya securities market is insignificant at $p > 0.05$ (at 5 percent significant level). Furthermore, the correlation between GDP growth and performance of Kenya securities market is positive ($r = .274$). Finally, foreign exchange rate had no significant relationship with performance of Kenya securities market.

Diagnostic Statistics

The data sets were tested for the classical linear regression model assumptions before running the model. Serial Correlation Test was tested using Breusch–Godfrey which had p-value .82 greater than 0.05 hence the null hypothesis was not rejected since the error variance is constant. The Jarque-Bera Test was used to assess normality which had p Chi (2) is 22.97. The value surpasses the threshold value of 0.05, meaning there is no violation of normality. In addition, Ramsey Regression Specification Error Test (RESET) was used to test whether the model has enough regressors. The null hypothesis is that the model has no omitted variables and the alternative is that the model has omitted variables (Greene, 2012). A p was .5615 more than 0.05 leads to the acceptance of the null hypothesis that has no omitted variables, hence the model has goodness of fit.

Unit root tests

The variables were tested for stationarity before the estimation was done. The variables were found to be integrated of orders zero and one. Three different unit root test were conducted to ensure robust results: Augmented Dickey Fuller (ADF), Phillips Perron (PP) and the Kwiatkowski Philips Schmidt–Shin (KPSS) Unit Root tests. The unit root tests were conducted at level and first difference either using intercept only or trend and intercept. The process followed test for Unit Root as discussed by (Asteriou & Hall, 2015). The results showed that foreign exchange reserves, and volume of shares traded were not stationary at level. The GDP growth rate, was insignificant. The non-stationary variables were then tested for stationarity at first difference. All indicators were found to be stationary at level, but at 10 percent level of significance. This necessitated the use of autoregressive distributed lag model (ARDL). The results for the KPSS Unit Root tests are presented in Tables 2.

Table 2: KPSS Root tests at Level

Variable	Test Statistic			Newey West Bandwidth using Bartlett Kernel
	Intercept	Trend and Intercept	Conclusion	
FX reserves	—	0.22	Non-Stationary	5
GDP growth rate	—	0.07	Stationary	9
Remittances	—	0.14**	Stationary	8
VTShares	—	0.28	Non-Stationary	7

Source: Research Data (2018)

Notes: Asymptotic critical values (ACV) using trend and intercept are 0.2160 at $p = 0.01$ and 0.1460 at $p = 0.05$ at $p = 0.10$ level of significance. Using intercept only: 0.7390 at $p = 0.01$ and 0.4630 at $p = 0.01$ level of significance.

Table 3: KPSS Unit Root tests at First Difference

Variable	Test Statistic			Newey West Bandwidth using Bartlett Kernel
	Intercept	Trend and Intercept	Conclusion	
FX reserves	0.32***	—	Stationary	73
VTShares	0.31***	—	Stationary	118
GDP growth rate	0.086***	—	Stationary	5

Source: Research Data (2018)

Notes: Asymptotic critical values (ACV) using trend and intercept are 0.2160 at $p = 0.01$, 0.1460 at $p = 0.05$ and 0.1190 at $p = 0.10$ level of significance. Using intercept only: 0.7390 at $p = 0.01$, 0.4630 at $p = 0.05$ and 0.3470 at $p = 0.10$ level of significance.

In conclusion, with the exception of Philips Perron test where the GDP growth rate was stationary at second difference, other indicators were either $I(0)$ or $I(1)$. However, the three tests gave conflicting stationarity results.

Empirical Findings (Test of Hypotheses)

Hypothesis (H_{01}) stated GDP growth rate does not moderate the relationship between diaspora remittances and the performance of the securities market in Kenya. Findings from Table 4 showed that GDP growth rate does positively and significantly moderate the relationship between diaspora remittances and the performance of the securities market in Kenya ($\beta = .51$, $p = .07$). Hence, the hypotheses were rejected and conclude that under high GDP growth, remittance strongly and positively affect stock market performance. Most researchers (Kuwornu, 2011, Balde, 2011, Ouma & Muriu, 2014) investigating similar relationships utilized OLS. The coefficient of GDP growth rate*Remittances was positive and insignificant. It indicated that the relationship between diaspora remittances and volume of shares traded varied across different levels of the GDP growth rate. The GDP growth rate, therefore, marginally increases the effect of diaspora remittances on the volume of shares traded.

Table 4: Moderating Effects of the GDP Growth Rate on the Relationship between Diaspora Remittances and the Performance of Kenya's Securities Market

Variable	Coefficient	Std. Error	T-Statistic	Prob.
<i>ln</i> Remittances	0.14	0.21	0.66	0.51
<i>ln</i> GDP growth rate	-0.08	0.18	-0.46	0.65
<i>ln</i> FX reserves	-0.02	0.15	-0.16	0.88
<i>ln</i> GDP growth rate*Remittances	0.51	0.28	1.83	0.03
Constant	-4.41	1.62	-2.72	0.01
F Statistic	18.77			
Adj. R squared	57.33			
Prob.	0.00			

Source: Research Data (2018)

Hypothesis (H_{02}) postulated that foreign exchange reserves do not moderate the relationship between the diaspora remittances and performance of Kenya's securities market. Results showed that foreign exchange rate negatively and significantly moderate the relationship between diaspora remittances and performance of Kenya's securities market ($\beta = -.51$, $p = .07$). Hence, the hypotheses were rejected. It revealed that the relationship between diaspora remittances and volume of shares traded varied across different levels of foreign exchange reserves. For every 10 percent increase in foreign exchange reserves, the slope of volume of shares traded on diaspora remittances was expected to decrease by 11.3 percent. The foreign exchange reserves, therefore, decreased the effect of diaspora remittances on the volume of shares traded. Studies on the relationship between foreign exchange reserves and the performance of securities markets confirm their link. Nkoro & Uko (2013) examined the relationship between macroeconomic indicators and stock market returns in the Jordan Stock Market, using co-integration analysis, and affirmed that the trade surplus, foreign exchange reserves, the money supply, and oil prices were important macroeconomic indicators had long-run effects on the Jordanian stock market returns. Additionally, by applying the unit-root test, the co-integration, and the long-run Granger non-causality test, (Bhattacharya & Mukherjee, 2001) analyzed the causal relationships between the Bombay Stock Exchange Sensitive Index and the exchange rate, foreign exchange

reserves, and value of trade. The results suggested that there was no causal linkage between equity prices and the three indicators. However, the hypothesis focused on the moderating relationship of the foreign exchange reserves on the relationship between diaspora remittances and the performance of Kenya's securities markets. The results above confirm that indeed, foreign exchange reserves had a moderating effect on the relationship. Therefore, the null hypothesis that the foreign exchange reserves have no significant moderating effect on the relationship between diaspora remittances and the performance of Kenya's securities market was rejected.

Table 9: Moderating Effects of the Foreign Exchange Reserves on the link Between Diaspora Remittances and the Performance of Kenya's Securities Market

Variable	Coefficient	Std. Error	T-Statistic	Prob.
<i>ln</i> Remittances	0.34	0.22	1.59	0.12
<i>ln</i> GDP growth rate	-0.36	0.12	-2.93	0.00
<i>ln</i> FX reserves	-0.24	0.17	-1.43	0.16
FX reserves*Remittances	-1.13	0.38	-3.00	0.00
constant	-4.39	1.55	-2.82	0.01
<i>F</i> Statistic	20.31			
<i>Adj. R squared</i>	59.35			
<i>Prob.</i>	0.00			

Source: Research Data (2018)

POLICY IMPLICATIONS AND RECOMMENDATIONS

This study recommends that the government should put in place policies that increase economic growth as this would be beneficial to the long run performance of the securities market performance. One way is to encourage greater private investment by the diaspora community through management of funds by a state agency, a private company, and by a combination of a private company but with participation of members from the diaspora (Al-Abdallah, 2017).

In addition, the government should put measures in place to ease the process of remitting remittances into Kenya. Such measures should focus on removing barriers that hinder the flow of diaspora remittances as well as alleviate heavy taxes and charges on them. The government should create a support system that would assist in helping the remittances inflow process. It should also come up with policies and regulations of attracting more diaspora remittances into the country that would lead to positive performance of Kenya's securities market. Additionally, the government should develop and ensure that all the market players comply with the policies and regulations in a bid to ensure the efficient and effective flow of remittances inflows.

However, the study was limited to Performance of Kenya's Securities Market. Future study can consider using the four stock markets in East Africa. In addition, the study did not give results for long run, future studies should analyse impact Diaspora Remittances and Performance of Kenya's Securities Market in both long-run effect.

REFERENCES

- Abdelbaki, H. H. (2013). Casuality Relationship Between Macroeconomic Variables and Stock Market Development: Evidence from Bahrain. *The International Journal of Business and Finance Research*, 7(1), 69–85.
- Ahamada I. & Coulibaly D. (2013). Remittances and growth in Sub-Saharan African countries: Evidence from a panel causality test. *Journal of International Development*, 25, 310–324. DOI: 10.1002/jid.2830

- Al-Abdallah, S. Y. (2017). Influence of Interest Rate, Exchange Rate and Inflation on Common Stock Returns of Amman Stock Exchange, Jordan. *International Journal of Economics, Commerce and Management*, V(10), 589–601
- Asteriou D., Hall S.G (2015). Macmillan International Higher Education; UK: Applied Econometrics.
- Bald'e, Y.ero. (2011). The Impact of Remittances and Foreign Aid on Savings / Investment in Sub-Saharan Africa *. *African Development Review*, 23(2), 247–262. <http://doi.org/10.1111/j.1467-8268.2011.00284.x>
- Basu, D., & Chawla, D. (2012). An Empirical Test of the Arbitrage Pricing Theory—The Case of Indian Stock Market. *Global Business Review*, 13(3), 421–432. <https://doi.org/10.1177/097215091201300305>
- Bhattacharya, B., & Mukherjee, J. (2001). Causal Relationship Between Stock Market and Exchange Rate, Foreign Exchange Reserves and Value of Trade Balance: a Case Study for India. 2681(033).
- Billmeier, A., & Massa, I. (2009). What drives stock market development in emerging markets institutions, remittances, or natural resources? *Emerging Markets Review*, 10, 23-35.
- Caporale, Howells and soliman, (2004), "Stock Market Development and Economic Growth: A Casual Linkage," *Journal of Economic Development*, 29, PP:33-50.
- Chami, Ralph; Fullenkamp, Connel; Jahjah, S. (2005). Are Immigrant Flows a Source of Capital for Development? *International Monetary Fund*, 53(9), 1689–1699. <https://doi.org/10.1017/CBO9781107415324.004>
- Chen, N.-F., Roll, R., & Ross, S. a. (1986). Economic Farces and Stock Market. *The Journal of Business*. <http://doi.org/10.1016/j.jempfin.2005.09.001>
- Demirgüç-Kunt, A. Aggarwal, R., and Peria, M.S.M. (2011), "Do remittances promote financial development?", *Journal of Development Economics*, Vol. 96 No. 2, pp. 255-264.
- Eita, J. H. (2011). Determinants of Stock Market Prices in Namibia Determinants of Stock Market Prices in Namibia, (March).
- El-nader, H. M., & Alraimony, A. D. (2012). The Impact of Macroeconomic Factors on Amman Stock Market Returns. *International Journal of Economics and Finance*, 4(12), 202. <http://doi.org/10.5539/ijef.v4n12p202>
- Gay, Robert. (2008). Effect Of Macroeconomic Variables On Stock Market Returns For Four Emerging Economies: Brazil, Russia, India, And China. *International Business & Economics Research Journal*. 3. 10.19030/iber.v7i3.3229.
- Glytsos, Nicholas. (2002). The Role of Migrant Remittances in Development: Evidence from Mediterranean Countries. *International Migration - INT MIGR*. 40. 5-26. 10.1111/1468-2435.00183.
- Guo (2014), "Causal relationship between stock returns and real economic growth in the pre-and post-crisis period: Evidence from China," *Applied Economics*, pp. 1-20, 2014.
- Guo, J. (2015). Causal relationship between stock returns and real economic growth in the pre- and post-crisis period: evidence from China. *Applied Economics*, November 2014, 37–41. <https://doi.org/10.1080/00036846.2014.959653>
- Ketkar, Suhas L t and Manoj K. Dora. 2009, "Wealth of Recent Immigrants to the United States." Paper presented at the International Conference on Diaspora for Development, World Bank, Washington, DC, July 13-14
- Khan, Muhammad & Tantisantiwong, Nongnuch & Fifield, Suzanne & Power, David. (2015). The relationship between South Asian stock returns and macroeconomic variables. *Applied Economics*. 47. 1298-1313. 10.1080/00036846.2014.995360.
- KIPPRA (2014). Kenya Economic Report 2014; Navigating Global Challenges While Exploiting Opportunities for Sustainable Growth. Nairobi: Kenya Institute for Public Policy Research and Analysis.
- Kuwornu, J. K. (2011). Analyzing the effect of macroeconomic variables on stock market returns: Evidence from Ghana. *Journal of Economics and International Finance*, 3(11), 605–615. <http://doi.org/10.4038/suslj.v6i1.1689>
- Madsen, Jakob & Dzhumashev, Ratbek & Yao, Hui. (2013). Stock returns and economic growth. *Applied Economics*. 45. 1257-1271. 10.1080/00036846.2011.613802.
- Malonka & Amphah, (2017) Moderating Effect of Political Risk on the Relationship between Capital Expenditure and Sectoral Economic Growth in Kenya, *International Journal of Economics and Finance*; Vol. 10, No. 1; pp.129-139
- Michael P. Clements & Ana Beatriz Galvão (2017) Predicting Early Data Revisions to U.S. GDP and the Effects of Releases on Equity Markets, *Journal of Business & Economic Statistics*, 35:3, 389-406, DOI: [10.1080/07350015.2015.1076726](https://doi.org/10.1080/07350015.2015.1076726)
- Muhammad Akbar. (2012). The relationship between stock prices and macroeconomic variables revisited: Evidence from Karachi stock exchange. *African Journal of Business Management*, 6(4), 1315–1322. <https://doi.org/10.5897/ajbm11.1043>
- Ngugi R., (2003). Development of the Nairobi Stock Exchange: A Historical Perspective. KIPPRA Discussion Paper No. 27
- Nkoro, E., & Uko, A. K. (2016). Exchange Rate and Inflation Volatility and Stock Prices Volatility : Evidence from Nigeria , 1986-2012. *Journal of Applied Finance and Banking*, 6(6), 57–70.

- Nyasha, S., Africa, S., Odhiambo, N. M., Africa, S., Coelli, T. J., Wagga, W., Review, S., Hackbarth, D., Hackbarth, D., Bechtel, M. M., Fahlenbrach, R., Matsheka, A. T. C., Josic, D., Delic, D., Rasulic, N., Stajkovic, O., Kuzmanovic, D., Stanojkovic, A., Pivic, R., ... Saadi-Sedik, T. (2015). Research Center on International Cooperation of the University of Bergamo Giordano Dell-Amore Foundation volatility interactions between stock returns and macroeconomic variables : malaysian evidence Author (s): Mansor H . Ibrahim Source : Savings and D. Economic Review (01612387), 43(4), 227–269. <https://doi.org/10.1007/sl>
- Onyuma, S. O., & Ochieng, I. E. O. (2017). Moderating Effect of Economic Growth on the Relationship Between Foreign Private Capital Flows and Securities Market Development : *Evidence from Kenya*, 7(8), 14–25.
- Ouma, W. N., & Muriu, P. (2014). the Impact of Macroeconomic Variables on Stock MARKET RETURNS IN KENYA. *International Journal of Business and Commerce*, 3(11), 1–31.
- Patro, Dilip & Wald, John & Wu, Yangru. (2009). Currency Devaluation and Stock Market Response: An Empirical Analysis. *Journal of International Money and Finance*. 40. 10.2139/ssrn.1459491.
- Rahman, A. Abdul, Noor, Z. Mohd Sidek and Fauziah H. T. (2009). Macroeconomic Determinants of Malaysian Stock Market, *African Journal of Business Management*, 3 (3): 95106
- Ross, S. (1976). The Arbitrage Theory of Capital Asset Pricing. *Journal of Economic Theory*, 13, 341–360. [https://doi.org/10.1016/0022-0531\(76\)90046-6](https://doi.org/10.1016/0022-0531(76)90046-6)
- Tarus, D. K. (2015). Do diaspora remittances affect banking sector development in Sub Saharan Africa? *International Journal of Commerce and Management*, 25(3), 356–368. <https://doi.org/10.1108/IJCoMA-08-2014-0090>
- W.M.Muli & J.O. Aduda & J.L. Lishenga & D.O. Abala, 2017. "[The Moderating Effect of Economic Growth on the Relationship between Economic Integration and Foreign Direct Investment in the East African Community](#)," *Journal of Finance and Investment Analysis*, SCIENPRESS Ltd, vol. 6(3), pages 1-4. Munga, 1974
- Yang, D. (2004), "International migration, human capital, and entrepreneurship: evidence from Philippine migrants' exchange rate shocks", *Ford School of Public Policy Working Paper* No. 02-011, University of Michigan.