The Effect of Exchange Rate Risk on Stock Returns in Kenya's Listed Financial Institutions

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Abstract
Uncertainties in the flow of FPI result in unpredictable behaviour of stock returns in Kenya's economy and also at the firm level. A huge surge of the inflows, for instance, can be very inflationary because this will force the Central Bank of Kenya to expand the country's monetary base by releasing counterpart domestic currency which eventually feeds into the inflationary process. These inflows can also cause domestic currency appreciation if they are significant enough and thereby causing a mismatch in assets and liabilities of financial institutions. The objective of this study was to find out the effect of exchange rate risk on stock returns of listed financial institutions in Kenya. The target population of the study was 21 financial institutions listed on the Nairobi Securities Exchange. The study used purposive sampling technique and concentrated on 14 financial institutions. This study used a causal research design and adopted a panel data regression using the Ordinary Least Squares (OLS) method where the data included time series and cross-sectional. Hausman test was carried out and findings indicated that random effects model was preferable for this study. Results from panel estimation showed that exchange rate risk affect stock returns of listed financial institutions in Kenya. The study recommended that the government of Kenya should enhance stability of macroeconomic factors such as foreign exchange rate through monetary policy as they affect the performance of securities exchange hence stock returns.
Keywords: Foreign portfolio equity purchases, Stock returns, financial institutions, Nairobi securities exchange, Kenya.

INTRODUCTION
During the past three decades, the relationship between firms' stock returns and foreign exchange rates have been empirically analysed. 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.

Previous literature on the behaviour of banks' stock returns has been explained primarily by a two-factor model, using the market index and interest rate index as factors. Kwan (1993) is among the researchers who have quantified this relationship. Increased globalization over the past years, coupled with greater integration among world economies, advocate that market and interest factors may not be sufficient in explaining the risks banks face today. International competition, multinational firms' growth financing, and more integrated capital markets are among the sources of an increasing number of international activities now present in commercial banks. As a result, banks today are faced with increased international risks, such as exchange rate risk.

METHODOLOGY
Introduction
This chapter presented the model, methods, data and estimation techniques used in the study to investigate the effect of foreign portfolio investment on stock returns.
Research design
The design of the study was causal as it seeks to test for the existence of cause-and-effect relationships among variables (Cooper & Schindler, 2004). This design is suitable in studies which aim to determine whether a group of variables together influence a given dependant variable (Saunders *et al.,* 2009). The design was suitable for this study as it aimed to establish the effect of foreign portfolio investments on stock returns.
Target Population
The study focused on a population of 21 listed commercial banks in Kenya. The 21 listed commercial banks trade the securities in NSE.
Data collection
The study used panel financial data over the seven year period (January 2008 to December 2014) to find the effect of foreign portfolio equity (sales, purchases and turnover) and exchange rate risk on stock returns of listed commercial banks in Kenya. Regression coefficients were interpreted using the E-views software output. To ensure that enough degrees of freedom in the models to be estimated are available, monthly data covering the

entire study period was collected resulting to 7392 observations. The method of data collection was secondary research, which essentially involved reviewing data sources that were collected for some other purpose than the study at hand. Thus, all the relevant data for this study were available in secondary form. The main sources of data were: Central Bank of Kenya, Capital markets Authority, Nairobi Securities Exchanges and Kenya Bureaus of Statistics.

Measurement of variables

Stock returns (SR)

Stock return is defined as the increase in the value of an investment over a period of time, expressed as a percentage of the value of the investment at the start of the period. Stock return in this study was computed as:

$$SR_{it} = \left[\frac{P_{it} - P_{i(t-1)}}{P_{i(t-1)}} \right] \times 100$$

It is measured by changes in share prices.

Exchange rate risk (ERR)

ERR is measured as the change in monthly exchange rate to the US dollar. Changes in exchange rate create uncertainty in the market about the stability of macroeconomic policy. Exchange rate risk reduces confidence in the market and hence affect share prices either because of uncertain future returns or because investors will be pulling out of the market. Change in exchange rate is expected to be negatively related to stock returns.

Data analysis

This study adopted a panel data regression using the Ordinary Least Squares (OLS) method where the data included time series and cross-sectional data that was pooled into a panel data set and estimated using panel data regression.

Justification for use of Panel Data Approach

Panel data is also called pooled or combined data since there are elements of both time series and cross section data. According to Damodar and Sangeetha (2007), panel data has a number of advantages. First, since panel data relate to individuals e.g. firms over time, there is bound to be heterogeneity in these units. The technique of panel data estimation takes such heterogeneity explicitly into account by allowing for individual specific variables. Secondly, by combining time series of cross section observations, panel data give more informative data, more variability, less collinearity among variables, more degrees of freedom and more efficiency. Thirdly, by making data available for several units, panel data can minimise the bias that might result if the study aggregate individuals into broad aggregates. These advantages enrich panel data empirical analysis in ways that may not be possible if only cross-section or time series data is used, hence the use of panel data in this study.

Descriptive Statistics

Descriptive statistics was essential in determining the statistical properties of the model so as to select the proper functional form of the estimable model. Therefore the study sought to determine the spread of the data which included calculating for the mean, standard deviation, standard errors, maximum and minimum values of the variables overtime. This also involved finding correlation matrix so as to check which variables were highly correlated so as to avoid the problem of multi-collinearity which is a common problem in time series data.

Model specification, estimation and rationale of variables

The study hypotheses were measured using one panel data regression equation. The equation had Stock returns (SR) as the dependent variable and Foreign portfolio equity sales (FPES), Foreign portfolio equity purchases (FPEP), Foreign portfolio equity turnover (FPET) and Exchange rate risk (ERR) as independent variables. Treasury bill rate (TBIL), Inflation rate (INFL) and Market capitalization (MCAP) were the control/intervening variables in the study. The regression analysis used E-views 7 data analysis software.

The hypotheses were tested using the following regression model;

$SR_{it} = \alpha + \beta_1 FPES_{it} + \beta_2 FPEP_{it} + \beta_3 FPET_{it} + \beta_4 ERR_{it} + \beta_5 TBILit + \beta_6 INFL_{it} + \beta_7 MCAP_{it} + \mu_{it}$

Where;

SR_{it} = Stock returns at time t

$FPES_{it}$ = Foreign portfolio equity sales at time t

$FPEP_{it}$ = Foreign portfolio equity purchases at time t

$FPET_{it}$ = Foreign portfolio equity turnover at time t

ERR_{it} = Exchange rate risk at time t

$TBILit$ = Treasury bill rate at time t

$INFL_{it}$ = Inflation rate at time t

$MCAP_{it}$ = Market capitalization at time t

α = The intercept

β_i = The parameter of explanatory variables of FPES, FPEP, FPET, ERR,TBIL, INFL and MCAP

μ_i = The disturbance term

Unit root tests

A unit root test was carried in this study to examine stationarity of variables because it used panel data which combined both cross-sectional and time series information. A variable is said to be stationary if it displays mean-reverting behaviour implying that its mean remains constant over time (Hlouska & Wagner, 2005). Any regression with non-stationary variables is invalid and hence, any time series application must start with testing stationarity of the data (Charito, 2010). This study used Levin, Lin and Chu unit root test to examine stationarity. Levin, Lin and Chu suggested the following hypothesis:

H_0 = each time series contains a unit root

H_1 = each time series is stationary

DISCUSSION OF FINDINGS

The effect of exchange rate risk on stock returns

The Hausman test results of listed financial institutions had a chi-square statistic of 0.000000 with an insignificant probability value of 1.0000 meaning that the study should reject the fixed effect model in favour of the random effects model as presented in table 1. The results from the panel estimation output for the effect of exchange rate risk on stock returns of listed financial institutions in Kenya are as indicated by Table 2.

Exchange rate risk had a negative coefficient of -0.758983 with a significant P- value of 0.0002. The panel results indicated that the estimated coefficient capturing the effect of exchange rate risk on stock returns are significant at 1% level of significance. This means that exchange rate risk affects stock returns. The results support the work of Patro, Wald and Wu (2002) who estimated a time-varying two-factor international asset pricing model for weekly equity index returns of 16 OECD countries. A trade-weighted basket of exchange rates and the MSCI world market index were used as risk factors. They found significant currency risk exposures in country equity index returns and explained these currency betas using several country-specific macroeconomic variables with a panel approach.

These findings are not in line with the work of Jorion (1991) who investigated the sensitivity of the stock prices of US MNC to changes in dollar exchange rates. Jorion concluded that the sensitivity of the stock prices to changes in exchange rate is not significant at any accepted level significance. Similarly, these findings do not support the results of previous studies (e.g. Kanas, 2000; Yang and Doong, 2004) which suggested that fluctuations in exchange rates did not have strong effects on the dynamics of stock market returns. For example, Kanas (2000) examined the volatility spill over between exchange rate and stock markets for developed countries and documents that the volatility transmission from foreign exchange markets to the stock markets is insignificant for all sample countries.

Yang and Doong (2004) had differing results for the 67 countries as they showed that changes in exchange rate have less direct effect on future changes of stock prices. Further, this study contradicted with the work of Chi et al. (2007) who indicated that there is no any significant relationship between the stock returns of their sample banks to foreign exchange rate movements. Their study explored the relationship of four major Australian banks, which have significant operations outside of Australia, with five regional banks in Australia which do not participate in any foreign business. They used the Capital Market Method to quantify this relationship over the period 1997 to 2007. The strong impact of exchange rate risk on stock returns of listed financial institutions in Kenya could be explained by unstable exchange rates in the market.

The null hypothesis that exchange rate risks do not affect stock returns in Kenya's listed financial institutions is therefore rejected in this study.

Table 1: Results for Hausman test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.0000000	7	1.0000

Table 2: Results from the panel estimation output

VARIABLE	POOLED MODEL	RANDOM EFFECTS MODEL
	Coefficient (P-Value)	Coefficient (P-Value)
ERR	-0.758983	-0.758983
	(0.0002)***	(0.0002)***
FPEP	-0.000409	-0.000409
	(0.9251)	(0.9254)
FPES	-0.002180	-0.002180
	(0.5173)	(0.5188)
FPET	-1.029565	-1.029565
	(0.4175)	(0.4191)
INFL	-1.435119	-1.435119
	(0.0120)**	(0.0123)**
MKTCAP	0.007181	0.007181
	(0.2101)	(0.2116)
TBIL	-0.159235	-0.159235
	(0.2475)	(0.2492)
C	4.036005	4.036005
	(0.0023)	(0.0024)
R- Squared	0.021380	0.021380
Prob (F- Statistic)	0.000672	0.000672
Durbin- Watson Statistic	2.375566	2.375566
N×t	1176	1176

*** Significant at 1% level of significance
** Significant at 5% level of significance
* Significant at 10% level of significance
Key:
SR: Stock returns
ERR: Exchange rate risk
FPEP: Foreign portfolio equity purchases
FPES: Foreign portfolio equity sales
FPET: Foreign portfolio equity turnover
INF: Inflation rate
MKTCAP: Market capitalization
TBIL: Treasury bills rate

SUMMARY OF FINDINGS
The effect of exchange rate risk on stock returns
Exchange rate risk had a negative coefficient of -0.7589 with a significant P- value of 0.0002. The panel results indicated that the estimated coefficient capturing the effect of exchange rate risk on stock returns are significant at one percent level of significance. This meant that exchange rate risk affect stock returns of Kenya's listed financial institutions. The null hypothesis that exchange rate risks do not affect stock returns in Kenya's listed financial institutions fails to be accepted and the alternate hypothesis fails to be rejected in this study.

CONCLUSION
The study further found that exchange rate risks do have an effect on stock returns. The exchange rate may create uncertainty in the market as the value of assets is eroded due to depreciation, thereby resulting to a fall in stock returns. The study concluded that stability of exchange rate is important in instilling confidence in the economy.

RECOMMENDATION
The government of Kenya should enhance stability of macroeconomic factors such as foreign exchange rate through monetary policy as they affect the performance of securities exchange hence stock returns.

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