



EXCHANGE RATE FLUCTUATIONS AND THE PERFORMANCE OF NAIROBI SECURITIES EXCHANGE MARKET IN KENYA DURING THE CORONAVIRUS PANDEMIC

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ABSTRACT

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The global financial and economic shocks which were triggered by the Coronavirus pandemic prompted a market halt causing a major spark in the Nairobi Securities exchange that resulted in panic selling. The Corona virus pandemic led to volatility of exchange rates causing a sharp depreciation of the shilling which further affected the performance of the securities market. The study investigated the effect of exchange rate fluctuations on the performance of the Nairobi securities exchange for the 5 months period of the year 2020. Daily time series data collected from Nairobi Securities exchange, Central bank of Kenya and Kenya National Bureau of Statistics for the period January to May 2020 was used. The multiple regression model results pointed out that exchange rate fluctuation had a negative and statistically insignificant effect on the performance of Nairobi securities exchange in Kenya during the Coronavirus period. The results implied that exchange rate fluctuations do not affect the performance of Nairobi securities exchange market in Kenya as measured by NASI. Inflation rate results had a positive and statistically significant effect with NASI. The results implied that inflation rate affect the performance of Nairobi securities exchange market as measured by NASI. 91-day treasury bills rate had negative but statistically significant effect on NASI implying that a decrease in 91- day Treasury bill rate enhances the performance of Nairobi securities exchange as measured by NASI. Investors need to be conscious of the macroeconomic variables that influence the security prices particularly during pandemics like the Coronavirus.

Contribution/Originality: This study is one of very few studies which have used daily data to investigate the effect of exchange rate fluctuations on the performance of Nairobi Securities Exchange market in Kenya during the Coronavirus Pandemic.

1. INTRODUCTION

Fluctuations in exchange rate has increased intensely ever since the introduction of the free rate system in the early 1970s. Consequently, there is more uncertainty in the link between currency fluctuations and the performance of securities markets during the Coronavirus Pandemic period.

As the world-wide economy is gradually recovering its equilibrium after the 2007 to 2009 financial crisis and the European depression, an on-going development of tightening monetary policy by the world large economies and the US has been exerting force on the currencies of major evolving market economies. This resulted to

disintermediation of numerous currencies in the beginning of 2014 signaling a likely crunch in these countries that might disrupt the continuing international recovery course. Many emerging market economies were hit by currency crunches over the past three decades of which the most evident instance is the Asian financial crisis in 1997 to 1999 (Mahapatra & Bhaduri, 2019).

Exchange rate immovability and securities market development are the mirror image of economic goals that every nation desires to attain. This is for the reason that the financial situation of each economy either advanced or unindustrialized can be criticized by its currency rate stability. A very resilient currency rate is an indication of how robust and sustainable an economy is. However, on a different perspective, a very weak currency is a mirror of a very susceptible and vulnerable economy (Hassan & Dantama, 2017). Currency rate volatility has factual financial shockwaves due to its destructive effects on price level, companies' returns and also in an economy as a whole. Correspondingly, securities markets play a critical role in the growth of each single nation's economy. Securities exchange markets functions as a transmittal tool upon which investments are pooled and effectively disseminated through the economic segments with an intention of achieving an all-encompassing growth. Currency rates and securities price are interrelated indirectly or directly, for the reason that currently, the world is becoming an international village due to globalization and liberalization of trade. An example, international venture capitalists are trying to invest their wealth in the securities markets all over the world. The benefits of foreign investors are determined by foreign currency rates. Additionally, variability of the currency rates may bring about lack of confidence among foreign investors. Consequently, exchange rate is an imperative determining factor of securities market fluctuations (Khan & Ali, 2015).

The performance of the securities market has profound effects on a Country's economy. A sudden fall in the value of a security often carries with it the substantial possibility to cause a widespread financial meltdown. A highly volatile securities market may cause investors to lose confidence as they may be cautious from trading in that market. The securities market in Kenya has been greatly affected by fluctuations of exchange rate which has hit a low of Ksh.112 against the Dollar in Mid May 2020 since Coronavirus outbreak in Kenya. The study bridges the gap in empirical studies by using high frequency daily data to investigate the effect of exchange rate on the performance of securities exchange market during the period of Corona virus pandemic in Kenya.

1.2. Statement of the Problem

Securities markets are considered complex and multifarious and might be influenced by both country-level and internal factors. Internal dynamics can be taken to be investors and securities exchange market institutions, whereas country-level dynamics are reforms and announcements by governments or some important institutional events. Risk factors are key and significant for both local and global investors. Discrepancies in risk elements especially currency risk stand to carry diverse consequences on each nation's securities market performance. Global securities markets are quickly adjusting to the hasty occurrence of COVID-19. For instance, on 16th of March 2020, the Dow Jones Industrial Average plunged by 12.9% and the S&P 500 index lost virtually 12% in a single day. This was the very worst percentage drop since the unexpected and severe stock market crash of 1987. In February 2020, UK-FTSE dropped by 29.72%, Germany's DAX by 33.37%, France's CAC by 33.63%, Japan's NIKKEI by 26.85% and the Indian SUNSEX by 17.74% (Faheem, Mohti, & Ferreira, 2020).

The coronavirus pandemic outbreak has subjected the Kenyan shilling to uncontrollable pressure making the shilling depreciate to a low of Ksh 112 against the Dollar in Mid May 2020 due to lockdown and curfew in international supply chains causing scarcity of foreign currency. Shortage of exports as result of the pandemic further made the Kenyan shilling deteriorate. In Kenya, the value of the shilling has experienced high degree of instability since the announcement of Coronavirus pandemic. For example, statistical records showed that from March 2020 the average value of the Kenyan shilling to US dollar was Ksh 103.80, but further depreciated to an average value of Ksh 106.41 and Ksh 106.75 in April 2020 and May 2020 respectively. On a similar note, the

securities market has also been as turbulent as the foreign currency market. The NASI index on March 2020 recorded an average of 138.39, but dropped to an average of 135.82 in April 2020. The NASI index picked up and rose to an average of 139.86 by the end of May 2020 (CBK weekly report May 2020).

This study will bridge the gap in the literature by examining the influence of exchange rate fluctuations on the performance of Nairobi securities exchange market during the Coronavirus pandemic.

2. LITERATURE REVIEW

The effect of the COVID-19 is of fundamental significance, specifically since its first outbreak happened in China, which is the centre of international investment in Asia. There are numerous studies on the influence of currency rates on security returns but limited number of previous studies related to the effects of currency rate on security market performance during the infectious virus epidemic such as COVID-19.

Chun Mun (2008) did a study on the impact of differences in international currency rates on global securities exchange instability and cross-market links between the fluctuations in local currencies of the sampled nations and the U.S. securities exchange. The sampled countries included developing nations of Pacific-basin, which depended on equity flows via foreign direct investment and global trade for their growth of economy. The Asian financial crunch mirrored an era of financial chaos and oscillations in currency rates. The empirical study showed that changing exchange rates essentially contributed to increased local equity market instability and the after crisis impact of exchange rate disparity on the U.S. home-grown market relationship was relatively higher as before the financial crisis. Similarly, Zhao (2010) conducted a research to establish the dynamic connection between security prices and exchange rates in the people's republic of China through monthly data for 1991 January to 2009 June. With the help of multivariate generalized autoregressive conditional heteroscedasticity and vector auto-regression models, Hua Zhao examined the magnitude of swings in the currency rates and security prices and the findings showed that there was no long-term steady association between variables.

Mohammad and Hussain (2009) in their study explored the connection between Karachi stock market prices and systematic factors using three-monthly data over a period of 22 year from 1986 to 2008. The study utilized unit root tests and asset valuation model. The findings of moving average and auto regression revealed that past statistics of macroeconomic dynamics had an influence on security prices. Mohammad and Hussain resolved that currency rates influenced the stock prices. Kutty (2010) did a study to assess the association amongst stock index and currency rates in Mexico and discovered that the variation in exchange rates influenced stock index in the short term, nonetheless the study found out that there failed to be an association between security index and currency rates in the long run. Zaheer (2010) employed Johansen cointegration method and Granger causality test to explore dynamics of security prices and currency rates in the Asian economic block by utilizing data for the period July 1997 to October 2009. Findings indicated that causality affected foreign currency rates and stock price in Pakistan and Sri Lanka while affecting security indices and currency rate in India. Nevertheless, in the case of Indonesia and Korea, there was a bi-directional association amongst exchange rates and security prices.

Singh, Mehta, and Varsha (2011) carried out a study to scrutinize the association between systematic factors and Taiwan security prices. The study intention was to identify the casual association between systematic factors and stock market index. In their study, Singh and Mehta considered systematic factors such as exchange rate, inflation, money supply, employment rate and GDP by applying linear regression model in their analysis. The results showed that exchange rate and GDP affected every portfolio returns excluding small company's portfolio.

Khalid and Altaf (2012) in their study explored the long-term association of changes in stock prices and macroeconomic variables in Karachi stock exchange. The study comprised of stock prices data from Karachi stock exchange 100 index from January 2000 to December 2010 on a monthly basis. The study employed varied methods to discover the long-term association amongst the variables. From the correlation matrix results, there was no did

any significant association amongst the variables. Similarly, the co-integration test results did not indicate long-term association amongst the variables and the Karachi stock exchange shares.

Izunobi, Nzotta, Ugwuanyim, and Benedict (2019) employed GARCH methods to estimate the presence of high security market returns volatility and the effect of the exchange rate, interest rate and inflation on security market returns in Nigeria, using monthly series data from 1995 to 2014. Izunobi et al. (2019) findings indicated that excessive volatility deters the security market from fulfilling its role of mobilizing financial resources from surplus units to deficit units which could trigger an economic crunch. The research findings further showed that interest rate had negative relationship with stock market returns, while the inflation rate and exchange rate had positive relationship with securities market returns. The authors concluded that there was high and persistent volatility in the Nigerian security market returns with exchange rate, interest rate, and inflation significantly influencing security market return volatility in Nigeria. The study recommended that regulatory authorities should take proactive steps to minimize security market return in order to restore confidence in the market.

Kalim and Syed (2014) in their study used Granger causality test to examine the association amongst stock index and exchange rate in Pakistan using data from the year 1997 to 2013. The study findings showed that bidirectional association existed among stock index and exchange rates.

Chirchir (2014) in his research surveyed how variations in security prices and currency rates related to one another in the Kenyan market from the year 1993 to 2011. The findings indicated a bidirectional negative association amongst share prices and currency rates. The study outcomes inferred that investors could occasionally witness the portfolio approach and the traditional approach simultaneously in the Kenyan economy.

Fapetu, Adeyeye, Seyingbo, and Owoeye (2017) in their study examined exchange rate volatility and the performance of stock market in Nigeria. The research discovered that exchange rate positively relate with market capitalization rate in all the four models GARCH, ARCH, E-GARCH and TARCH that were used in the study. On the contrary, the research indicated that instability of variance of residual between the four models varied from one another. The study revealed that there was ARCH and GARCH effect in the E-GARCH model while there was no ARCH effect in the GARCH model. The four models mean equations yielded similar results, while the four models variance equations showed differences in the results. The study also found out that both long-term and bidirectional causal association amongst exchange rate and market capitalization did not exist. According to the study, there was no ARCH influence on the instability of the market capitalization rate in the Nigerian stock market. Therefore, the study adopts ARCH as the best model because it yields the least value of SIC and AIC. The net effect was that variance of the present residual did not relate to the size of the prior periods' residuals, hence currency rates did not affect the instability of market capitalization in Nigerian stock exchange. Nonetheless, exchange rate positively related with stock market capitalization in the Nigerian economy. Finally, research findings disclosed that investors could not use information from one market to predict performance in another market.

Tanveer, Azad, Razzaq, Liaqat, and Khan (2017) using secondary monthly data from January 2003 to December 2015, examined the influence of currency rates instability on security index in Pakistan security exchange. The study discovered a positive and statistically significant link on exchange rate instability and stock index of Pakistan market. Based on the results, the study recommended that investors who wished to participate in the stock and currency market must use information of main macro-economic variables in specific exchange rates instability to predict the performance of securities exchange market. Han, Xu, and Yin (2017) in their study investigated the influence of investor focus on the changes of exchange rates for nine countries. The results pointed out that lagged investor focus meaningfully upsets currency returns though the influence was short term. Further, findings exhibited an opposite similarity that fluctuations in exchange rate returns had a long-term influence on investor focus. Shadi and Nada (2017) using ten year monthly data from 2005 to 2015 studied the influence of inflation rate, currency rates, and interest rates on share returns of Amman stock exchange. Shadi & Nada findings from the multiple regressions pointed out a weak variation in share returns due to collective influence of currency

rates, inflation rates and interest rates. Their results indicated that inflation and interest rate had an important influence on stock returns of Amman stock exchange. Currency rates had no significant relationship with share returns of Amman securities exchange free float index. Additionally, Shadi & Nada findings depicted a positive association amongst share returns and inflation rate; and a negative association amongst share returns and interest rates. Bala and Hassan (2018) explored the connection among securities market and currency rate interface in Nigeria using yearly data from the period 1985 to 2015. The econometric methods used in the investigation were Phillips-Perron, Augmented Dickey Fuller, Granger-causality, and Autoregressive Distributed Lag Model (ARDL). From the results, unit root test indicated that series were static after the initial difference (I (1)). Additionally, Bound test for ARDL displayed presence of long-term association among the series. The ARDL results specified that currency rate had a positive and statistically significant effect on the stock market fluctuations in Nigeria over a long time period.

3. METHODOLOGY

The study targeted all companies listed on the Nairobi Securities Exchange during the period of the study. Time series data used in the empirical analysis is mainly secondary data collected from Central bank of Kenya and Nairobi Securities exchange. Daily data spanning from January 2020 to May 2020 was used to understand the effect of exchange rate fluctuations and the performance of Nairobi Securities exchange during the coronavirus pandemic in Kenya. Daily data was used so as apprehend better the underlying forces of currency and security market interrelationships. The performance of Nairobi Securities exchange was measured by the stock index while exchange rate fluctuations were measured by the changes in Kenya shilling to the US dollar. Inflation rate and interest rates are the intervening variables that affect both the dependent and independent variables. A multiple regression analysis estimation model was employed to analyse data with the help of SPSS statistical software. The following model was used:

$$SI_t = \beta_0 + \beta_1 EXCR_t + \beta_2 INFR_t + \beta_3 TBR_t + \mu_t$$

Where:

SI_t = The performance of Nairobi securities Exchange as measured by stock index over time t.

β_0 = The intercept.

$\beta_1, \beta_2, \beta_3$ = beta coefficients of the independent variables.

$EXCR_t$ = exchange rate as measured by changes in the USD/ KSH over time t.

$INFR_t$ = inflation rate over time t.

TBR_t = 91- day Treasury bill over time t.

μ_t = Error term over time t.

4. RESULTS

4.1. Descriptive Statistics

The descriptive statistics in Table 1 revealed that the average for NASI, exchange rates, inflation rate and 91-day treasury bill rate were 147.89, 103.10, 5.76 and 7.2 respectively. The variations from the mean are also

moderate as illustrated by the standard deviation of 15.36, 10.36, 0.33 and 0.045 for NASI, exchange rates, inflation rate and 91-day Treasury bill rate respectively.

Table-1. Descriptive statistics.

	Mean	Std. Deviation	N
NASI	147.8852	15.36201	101
Exchange rates	103.10341	10.360196	101
Inflation rate	5.755	.3315	101
91-day treasury bill rate	7.26699	.045879	101

4.2. Correlations

The correlation results presented in Table 2 indicated that exchange rate and inflation rate had a statistically significant relationship with NASI index with P- values of 0.003 and 0.000 at 5% level of significance with coefficients of -0.268 and 0.627 indicating a negative and positive correlation respectively.

91-day treasury bills rate had P- value of 0.429 which is greater than 0.05 with coefficients of 0.018 indicating a statistically insignificant relationship with NASI index.

Table-2. Correlations.

		NASI	Exchange rates	Inflation rate	91-day treasury bill rate
Pearson Correlation	NASI	1.000	-.268	.627	.018
	Exchange rates	-.268	1.000	-.351	-.141
	Inflation rate	.627	-.351	1.000	.296
	91-day treasury bill rate	.018	-.141	.296	1.000
Sig. (1-tailed)	NASI	.	.003	.000	.429
	Exchange rates	.003	.	.000	.081
	Inflation rate	.000	.000	.	.001
	91-day treasury bill rate	.429	.081	.001	.
N	NASI	101	101	101	101

Table-3. Model Summary^b.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.654 ^a	.428	.410	11.79665	.244

Note:

a. Predictors: (Constant), 91-day treasury bill rate, exchange rates, inflation rate.

b. Dependent Variable: NASI.

The model summary results in Table 3 showed that exchange rate, inflation rate and 91-day Treasury bill rate collectively explains the performance of Nairobi securities exchange market in Kenya during the Coronavirus period as indicated by an R-squared of 42.8 percent.

Table 4 results of analysis of variance exhibited that there was a statistically significant difference between exchange rate movements and the performance of Nairobi Securities exchange (NASI) in Kenya during the Coronavirus pandemic as indicated by (F (3, 97) = 24.194, with a P- value of 0.000 which is less than 0.05).

Table-4. ANOVA^a.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10100.51	3	3366.837	24.194	.000 ^b
	Residual	13498.61	97	139.161		
	Total	23599.12	100			

Note:

a. Dependent Variable: NASI.

b. Predictors: (Constant), 91-day treasury bill rate, exchange rates, inflation rate.

The multiple regression model results in Table 5 pointed out that exchange rate fluctuation had a negative and statistically insignificant effect on the performance of Nairobi securities exchange in Kenya during the Coronavirus period as illustrated by a P- value of 0.449 which is greater than 0.05. The results implied that exchange rate fluctuations do not affect the performance of Nairobi securities exchange market in Kenya as measured by NASI.

Inflation rate results had a positive and statistically significant effect with NASI as indicated by a P-value of 0.000 at 5% level of significance. The results implied that inflation rate affect the performance of Nairobi securities exchange market as measured by NASI.

91- day treasury bills rate had a negative but statistically significant effect on NASI as evidenced by a P-value of 0.023 at 5% level of significance implying that 1% decrease in 91- day treasury bill rate increases the performance of Nairobi securities exchange as measured by NASI.

Table-5. Coefficients^a.

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	434.839	192.428		2.260	.026	52.923	816.754
	exchange rates	-.093	.122	-.062	-7.760	.449	-.334	.149
	inflation rate	30.621	3.942	.661	7.767	.000	22.797	38.445
	91-day treasury bill rate	-62.426	26.942	-.186	-2.317	.023	-115.898	-8.954

Note: Dependent Variable: NASI.

5. DISCUSSION

The results of this study are not in line with the work of Izunobi et al. (2019) employed GARCH methods to estimate the presence of high security market returns volatility and the effect of the exchange rate, interest rate and inflation on security market returns in Nigeria, using monthly series data from 1995 to 2014. Izunobi et al. (2019) findings indicated that excessive volatility deters the security market from fulfilling its role of mobilizing financial resources from surplus units to deficit units which could trigger an economic crunch. The research findings further showed that interest rate had negative relationship with stock market returns, while the inflation rate and exchange rate had positive relationship with securities market returns. The authors concluded that there was high and persistent volatility in the Nigerian security market returns with exchange rate, interest rate, and inflation significantly influencing security market return volatility in Nigeria.

The findings of this study are consistent with the work of Shadi and Nada (2017) who used ten year monthly data from 2005 to 2015 and studied the influence of inflation rate, currency rates, and interest rates on share returns of Amman stock exchange. Shadi & Nada findings from the multiple regressions pointed out a weak variation in share returns due to collective influence of currency rates, inflation rates and interest rates. Their results indicated that inflation and interest rate had an important influence on stock returns of Amman stock exchange. Currency rates had no significant relationship with share returns of Amman securities exchange free float index. Additionally, Shadi & Nada findings depicted a positive association amongst share returns and inflation rate; and a negative association amongst share returns and interest rates.

The findings of this study contradicted with the work of Chun Mun (2008). Chun Mun did a study on the impact of variation in international currency rates on global securities exchange instability and cross-market links between the fluctuations in local currencies of the sampled nations and the U.S. securities exchange. The sampled countries included developing nations of Pacific-basin, which depended on equity flows via foreign direct investment and global trade for their growth of economy. The Asian financial crunch mirrored an era of financial chaos and oscillations in currency rates. The empirical study showed that changing exchange rates essentially

contributed to increased local equity market instability and the after crisis impact of exchange rate disparity on the U.S. home-grown market relationship was relatively higher as before the financial crisis

6. CONCLUSION

The multiple regression model results pointed out that exchange rate fluctuation had a negative and statistically insignificant effect on the performance of Nairobi securities exchange in Kenya during the Coronavirus period. The results implied that exchange rate fluctuations do not affect the performance of Nairobi securities exchange market in Kenya as measured by NASI. Inflation rate results had a positive and statistically significant effect with NASI. The results implied that inflation rate affect the performance of Nairobi securities exchange market as measured by NASI. 91- day treasury bills rate had a negative but statistically significant effect on NASI implying that a decrease in 91- day treasury bill rate increases the performance of Nairobi securities exchange as measured by NASI. Investors need to be conscious of the macroeconomic variables that influence the security prices particularly during pandemics like the Coronavirus.

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