Foreign Direct Investment Outflow and Securities Market Volatility in Nairobi Securities Exchange, Kenya

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Abstract

The study was undertaken to assess the effects of foreign direct investment on the securities market Volatility at NSE, Kenya. Although this topic has been the focus of financial studies, the relationship between foreign direct investment outflow and securities market volatility has not been completely analyzed. Global empirical research has produced conflicting results regarding how foreign direct investment affects the volatility of the securities market. The findings are contradictory, which calls for additional research to be done in the current study to determine how international capital outflow affects the volatility of securities traded at Kenya's NSE. The study utilized an explanatory research methodology and used secondary data to focus on the listed institution at the Nairobi Securities Exchange in Kenya. The impact of outflows of foreign direct investment on the volatility of the securities market over the research period was evaluated using the census technique. The analysis discovered a statistically significant positive link between foreign direct investment and GDP. According to the study's findings, the FDIO and SMV as represented by the NSE all share index had a favourable association. It means that adjustments to FDIO are probably going to have a noticeable impact on the volatility of the stock market. The study recommends that regulators should keep a close eye on the flow of FDIO leaving the Nairobi securities exchange market and to take precautions to prevent an excessive outflow from destabilizing the market and posing a risk to the stability of the capital market.

 Keywords: *Foreign direct investment Cash flow, Nairobi Securities exchange security market volatility*

1.0 Introduction

The liberalisation of emerging financial markets, which has brought enormous amounts of capital to the securities markets, has over time given rise to an increase in the outflow of foreign direct investment. Capital may now freely move across the various economies of the world because to globalization, which has made the entire world into a single financial center. As a result, capital movement has been acknowledged as a crucial element for promoting technology, international trade, economic progress, and financial stability (Yunxin, 2021). In addition to the fact that many investors have explored transnational transactions, it is difficult to overstate the significance of foreign capital mobility in promoting economic and financial well-being (Noman, Rahman & Naka, 2014). Concerns about the phenomena of capital flight may cause a country's rate of economic growth to slow down.

In addition to reinvested earnings and intracompany loans, FDI net outflows also includes direct investments made by citizens of the reporting economy in other countries, net of receipts from capital repatriation and loan repayment. The shares of GDP are used to express these series (Ahmed & Ibrahim, 2019). The amount of research on FDI intake is more than that on the effects of FDI outflow (Adamczyk, 2021). Additionally, FDI outflows from developing countries have increased more quickly in the past two decades than those from affluent nations. When the exchange rate is poorly handled, inflows and outflows of foreign capital are capable of causing stock market bubbles and an extraordinary expansion of local credit, according to research by Osad and Ikponmwosa (2018). Since the early 1970s, the share of developing countries in total worldwide FDI outflows has climbed more than thirtyfold, from 0.5 percent to about 16 percent in 2008. More over $300 billion USD in FDI left poor countries in 2008, more than three times the amount that left the entire world in 1970 (UNCTAD, 2020).

A record 31% of global FDI outflows, totaling over $426 billion USD, have come from developing nations (Ahmed & Ibrahim, 2019). From 1991 to 2015, the global share of outbound FDI flows from emerging and developing economies climbed by 20%. As a result of the crisis in 2007–2009, there was a significant drop in worldwide outward FDI volatility, while outward foreign direct investment (OFDI) in developing nations held up well (Bhasin & Kapoor, 2021).

1.1 Statement of the Problem

Although it has been at the center of financial studies, the relationship between foreign direct investment outflow (FDIO) and security volatility has not been completely analyzed. The connectivity between securities markets caused by the need for currencies and asset flows has increased portfolio risk globally (Hung, 2020). As it is relevant in portfolio evaluation, analysis, and management by financial agents in monetary policies variables, including interest rates, money supply, and exchange rates, which are alleged to be determining factors of stock market volatility (Marozva, 2020). When evaluating performance, stock market volatility is a crucial factor.

Global empirical research has produced conflicting results regarding how foreign direct investment affects the volatility of the securities market. Studies by Singhl and Mohan (2020); Ameer, Xu and Sohag (2021); Heng et al. (2021); Lee and Cho (2017); Gupta and Ahmed (2019) Bhasin and Kapoor (2019) reveal considerable effects, whilst others show insignificant effects. The findings are contradictory, which calls for additional research to be done in the current study to determine how foreign direct investment outflow affects the volatility of the securities market at the NSE in Kenya in an effort to close the knowledge body's current gap.

1.2 Research Objective

To assess the effect of foreign direct investment outflow on securities market volatility in Nairobi securities exchange, Kenya.

1.3 Research Hypothesis

H_0:   There is no significant effect between foreign direct investment outflow and securities market volatility in Nairobi securities exchange, Kenya

2.1 Theoretical Review

Modern portfolio theory (MPT) was first established by Harry Markowitz in 1952. The key tenet of this theory is that increased danger might result in a larger payoff. In MPT, it is anticipated that investors will avoid taking any chances (Akinmulegun, 2018). The body of thought that seeks to explain how investors might get optimal results while incurring little risk. The MPT is a framework for selecting and constructing portfolios with the goal of achieving maximum expected returns with minimum risk. This demonstrates that when given the choice between two sets of investments with the same expected return, investors will pick for the safer alternative. For this reason, a higher expected return is required before an investor will take on further risk. According to Paape and Zhu (2018), the standard deviation (a measure of risk) and expected return (a measure of profitability) must be in harmony for this hypothesis to hold. The only thing that matters to the investor is the expected value of the portfolio and the assets within it. It's built on the premise that risk-takers in the market should be rewarded.

Modern portfolio theory seeks to optimize the investment decision under uncertainty (Xu, 2015) due to the fact that future returns cannot be determined with confidence, leading to future performance estimates based on the present assets. This theory has substantial policy implications since it suggests FDIOs may influence security market volatility through their portfolio construction.

2.2 Empirical Review

In their analysis of the connection between foreign private investment and the Nigerian stock market, Osamwonyi and Ikponmwosa (2018) relied on market volatility as a dependent variable. The study analyzed data collected from 1985 to 2013. The study employed the Granger causality test, as well as the GARCH and ARCH tests. All-Share Index (ASI) volatility was calculated to measure the stock market's unpredictability. The results demonstrated that FPI helps maintain equilibrium in the capital markets while simultaneously increasing overall market volatility. Although FPI increases stock market volatility and improves capital market stability, these findings cannot be extrapolated to Kenya. Given the diversity of economies, it is critical that this study be conducted within the context of Kenya in order to clearly illustrate the causality between variables. The GARCH and ARCH models only account for independent time series variables; they do not include the possible interactions and dependencies between variables. Because it allows for the incorporation of several variables that capture effects simultaneously, the panel regression model is employed.

Using the bound testing strategy provided by the ARDL model, Singhl and Mohan (2020) analyzed the correlation between Indian FDI abroad and market volatility from 2009 to 2017. The Indian volatility index is the dependent variable, and the other three are independent (FI, FII, and FDI). This study found evidence of cointegration between the dependent and independent variables. The coefficients suggest that stock market volatility has been decreasing over time. Since the study did

not consider the moderating effect of foreign exchange in the relationship between international capital outflow and security volatility, its findings are limited to the Kenyan market and cannot be extended to other locations. In this study, a panel regression model is used instead of ARDL because it is more thorough, considering multiple variables, capturing interactions and dependencies, and providing robust estimators (whereas ARDL does not account for the potential interdependencies among multiple dependent variables or the presence of cross-sectional effects).

Ameer, Xu and Sohag (2021) analyzed aggregate and disaggregated FDI and NII outflows using common correlation effects (CS-ARDL) panel data. This analysis includes data from 1993 to 2017. There is scant evidence that foreign direct investment (OFDI) affected domestic investment in the five GCC member states (Bahrain, Kuwait, Oman, Qatar, and Saudi Arabia). The USA for Arabs. There is a strong correlation between OFDI and private formation, however the data do not show a clear relationship between OFDI and public capital production. Policy consequences arise from the limits placed on economic diversity, competitiveness, and environmentally friendly operations as a result of widespread public participation. The results of this research cannot be extrapolated to Kenya due to the uniqueness of its economy and banking system.

Heng et al (2021) explored foreign direct investment outflow evidence from China, the study period was from 2002 to 2018. The study employed panel data regression. The result of the study indicated that foreign direct investment outflow did not significantly affect the volatility of Chinese securities market. It was established that other factors such as domestic policies and economic conditions are more significant determinants of market volatility. Though this study employed the panel regression model, the findings cannot be generalized in the Kenyan context which is the interest of this study, besides, the study failed to address the moderating effect of foreign exchange in the relationship between the foreign direct investment outflow and security volatility, which is the interest of this study.

Lee and Cho (2017) explored the relationship between foreign direct investment outflow and stock market volatility, the study period is between 2002 and 2016. Using the multiple regression model, the results indicated that foreign direct investment outflow had an insignificant impact on stock market volatility in Korea. The study was based on Korean economy different from Kenyan context which is the interest of this study, besides this study employs panel regression model unlike the use of multiple regression that treats each observation independently thus failing to exploit time series correlation and potential cross-sectional, additionally multiple regression analysis treats all observations as independent and assumes a single regression equation for all individuals, ignoring potential individual effects. The study uses the panel regression model that takes into account or allows for the inclusion of various variables capturing the effects simultaneously.

Gupta and Ahmed (2019) investigated the impact of foreign investment on stock market volatility evidence from Indian stock market, covering the period 2001 – 2012, Using correlation and multiple regression model, with FDI and FPI as the independent variable and SENSEX as the proxy for Indian stock market. The results showed that increase in FDI significantly influence the fluctuations in the stock market in India. The study was based in India, the findings of the study cannot be generalized within the Kenyan set up as the economic variables are different, the current study will be based in Kenya. Besides this study employs panel regression model unlike the use of multiple regression that treats each observation independently thus failing to exploit time series correlation and potential cross-sectional, and correlation does not consider individual heterogeneity or differences among entities in the panel data. The study uses the panel regression

model that incorporates individual fixed effects or random effects which accounts for unobserved heterogeneity and provide more accurate estimates.

Bhasin and Kapoor (2019) explored the relationship of outward foreign direct investment (OFDI) with home country's exports in India. The study used panel unit root tests, panel co-integration, VECM and causality tests for BRICS between 1993- 2015. OFDI was found to have a negative and significant impact on home country exports, which implied that OFDI substituted exports in the BRICS. From the findings, MNEs did not connect with home economies firms through forward and backward linkages in value chain. The study was based in BRICS countries, the findings of the study cannot be generalized within the Kenyan set up as the economic variables are different. The current study was based in Kenya. besides this study employs panel regression model unlike the use of VECM which is designed to analyze relationships among a small set of integrated time series variables therefore not suitable for large number of variables that are not co-integrated, in contrast panel regression can handle a larger number of variables and does not require the variables to be co-integrated. Additionally, the study failed to address the outward foreign investment on security volatility, concentrating on export. The current study focuses on foreign direct investment outflow on security volatility in Kenya.

3.0 Methodology

Research Philosophy

Philosophical approaches such as positivism, realism, interpretivism, and pragmatism are all viable options in the realm of academic inquiry. These philosophical approaches may or may not be applicable for the research at hand. This research is consistent with the positivist approach, which aims to build on previously established theory in order to generate hypotheses that may then be verified and confirmed, partially confirmed, or disproved to inform the development of better hypotheses for future experiments. Knowledge, according to positivist thought, is based on hard data and objective reality, rather than on theoretical constructs or personal valuations (Alakwe, 2017).

Since the goal of this research was to determine whether or not foreign capital outflow affects security volatility on the Nairobi Securities Exchange, Positivism is a suitable philosophical framework through which to conduct the study. According to Saunders, Lewis, and Thornhill (2019), positivism promotes for the researcher to observe social occurrences in order to collect data from which hypotheses can be formed and links can be established. In addition, positivists draw from preexisting theoretical frameworks to generate research hypotheses (Creswell & Creswell, 2017). To determine how foreign direct investment outflow affected volatility on the NSE, Kenya stock market.

Research Design

A research design is a concept that focuses on techniques of gathering evidence and is a plan for gathering data that may be utilized to answer a research question (Mukherjee, 2017). The study used an explanatory research approach to assess the causal relationship between outflows of foreign direct investment, outflows and market volatility for securities at the NSE. According to (Saunders, Lewis & Thornhill, 2019), the explanatory research design is the best type for studies that examine causal relationships between study variables.

Target Population

All 63 of the NSEs' listed companies during a 16-year period beginning in 2006 and ending in 2021 comprised the study's target population (NSE, 2021). The listed companies were in 12 different industrial sectors, including banking, real estate investment trusts, construction & allied, insurance, and exchange traded funds. They also were in the agricultural, manufacturing & allied, commercial & services, and investment sectors. Due to their frequent trading at the NSE and the fact that this was a time of stock market reform and significant expansion for the Kenyan stocks market, this group of people was an ideal target for the study.

Sample and Sampling Procedures

The sample data covered a 16-year period from 2006 to 2021. To investigate the connection between global capital flight and stock market volatility. Census technique was used to evaluate how foreign direct investment outflow impacts stocks market volatility across the research period due to the availability and dependability of the data. A census design helps to increase data quality and minimize sampling error because every unit is investigated before making conclusions (Nkuru, 2017).

Data Collection Procedures

In this investigation, secondary data sources were used. In addition to visiting the institutions' websites, data for a 16-year research from 37 international institutions was gathered via audited financial accounts. The data obtained from the financial accounts was given preference because they were made available for public use. Anyone has access to data from publicly available financial reports since information is already in the public domain (Greener, 2008). Potential to destabilize it. Since the consequences on the security market were large during the research period, it was necessary to restrict the outflow.

4.0 Findings and Discussion

4.1 Descriptive Analysis

The data were transformed into natural logs to mitigate the effects of heteroscedasticity and dispersion and to enable the establishment of elasticity relationships. Descriptive statistics on the study's main variables are summarized in Table 1.

Table 1: Descriptive Statistics Results

	LN_SMV	*LN_FDIO*	*LN_FE*
Mean	4.835038	16.74679	-3.440952
Median	4.958470	16.81327	-3.537017
Maximum	5.135176	17.54306	-2.217325
Minimum	4.181554	15.86254	-4.990833
Std. Dev.	0.281587	0.567609	0.799628
Skewness	-0.993243	-0.122490	0.026400
Kurtosis	2.676073	1.672322	2.513748
Jarque-Bera	64.47927	29.01202	3.807725
Probability	0.000000	0.000001	0.148992
Sum	1846.984	6397.274	-1314.444
Sum Sq. Dev.	30.20992	122.7507	243.6134

The variables in the model were abbreviated as follows; LN_ refers to natural log of a variables, hence LN_SMV is the natural log of Securities market volatility, LN_FDIO is the natural log of

foreign direct investment outflow. Foreign direct investments outflow was also stable and did not deviate much from the mean. The mean was 16.75 with a standard deviation of 0.57. The probability value was 0.0000 and significant at 10 percent level of significance. The Jarque-Bera value was 29.01 which is far from zero. Both signify that foreign direct investment outflow was not normally distributed.

Table 2: Correlation Analysis Results

Correlation	LN_SMV	LN_FDIO
LN_SMV	1.000000	
LN_FDIO	0.853781	1.000000

Investment capital flowed out of the country moderately in tandem with the stock market's volatility (r=0.85). Foreign direct investment (FDI) is linked to market volatility, which shows that a primary motivation for FDI into emerging nations is the diversification of risk portfolios and the potential for significant profits in the short term (Allen et al., 2010).

Tests at Intercept and Level I (0)

The study, four panel root tests were used, Levin, Lin and Chu (LLC), Im, Peseran and Shin W-stat, ADF-Fisher Chi-Square and PP-Fisher Chi-square were applied to ensure that no variable exceeded the I (1) order of integration, which would result in inconsistent estimations.; These tests took into consideration the heterogeneity in the autoregressive coefficient, which was expected to shift freely throughout the study states, but they were based on the presumption that all series were non-stationary under the null hypothesis. The results of this investigation were interpreted using the Levin Lin and Chu t statistic as it provided the most comprehensive account of all the pooled variables and included a trend, a lag and a constant Chang (2004). This study made a number of assumptions on the reliability and measurement of the variables. In panel data designs, it is frequently assumed that each entity has unique traits that may or may not have an impact on the independent variables. The study used the Hausman test to resolve this and choose the best model for this investigation.

Securities Market Volatility I (0)

The Levin, Lin and Chu t-statistic for Securities market volatility at level I (0) had a probability value of 0.0000 which is significant at 5 percent level of significance. LN_SMV, the natural log of SMV was found to be stationary. This means that the null hypothesis that Securities market volatility has a unit root is rejected.

Table 3: Panel unit root test - Securities market volatility I (0)

Method	Statistic	Prob.**	Cross-sections
Levin, Lin & Chu t*	-10.7324	0.0000	37
Im, Pesaran and Shin W-stat	-6.37808	0.0000	37
ADF - Fisher Chi-square	156.979	0.0000	37
PP - Fisher Chi-square	276.030	0.0000	37

Source: Study data (2023)

Foreign Direct Investment Outflows I (0)

Foreign direct investment outflows at level I (0) was not stationary because the Levin, Lin and Chu t-statistic had a probability value of 1.000 which is insignificant at 5 percent level of significance. LN_FDIO, the natural log of FDIO was found not stationary. The null hypothesis that Foreign direct investment outflow has a unit root is accepted.

Table 4: Panel unit root test - Foreign direct investment outflows I (0)

Method	Statistic	Prob.**	Cross-sections
Levin, Lin & Chu t*	4.87740	1.0000	37
Im, Pesaran and Shin W-stat	12.5906	1.0000	37
ADF - Fisher Chi-square	1.55796	1.0000	37
PP - Fisher Chi-square	1.55542	1.0000	37

Source: Study data (2023)

Unit root tests at first difference I (1)

Since the natural log of outflows of FDI and volatility in the securities market was found to be unstable at the intercept and level I (0), the first difference was used to integrate all variables to the same depth. The foreign direct investment (DFDI) and volatility in the securities market (DSMV) are all components of D;

Securities market volatility I (1)

At the 5% level of significance, the Levin, Lin, and Chu t-statistic for first-differential volatility in the securities market (DSMC) was 0.0000. As a result, the assumption that the stock market's volatility has a unit root is rejected.

Table 5: Panel Unit Root Test - Securities Market Volatility I (1)

Method	Statistic	Prob.**	Cross-sections
Levin, Lin & Chu t*	-23.7815	0.0000	37
Im, Pesaran and Shin W-stat	-17.3234	0.0000	37
ADF - Fisher Chi-square	378.556	0.0000	37
PP - Fisher Chi-square	447.319	0.0000	37

Foreign direct investments outflow I (1)

Foreign direct investment outflows at first difference was stationary because the Levin, Lin and Chu t-statistic had a probability value of 0.0000 which is significant at 5 percent level of significance. The null hypothesis that Foreign direct investment outflow has a unit root is rejected.

Table 6: Panel unit root test - Foreign direct investments outflow I (1)

Method	Statistic	Prob.**	Cross-sections
Levin, Lin & Chu t*	-18.0683	0.0000	37
Im, Pesaran and Shin W-stat	-11.1835	0.0000	37
ADF - Fisher Chi-square	248.460	0.0000	37
PP - Fisher Chi-square	248.233	0.0000	37

4.2 Panel Regression Analysis

The major goal of this study was to examine the impact of foreign direct investment outflow on the volatility of the NSE market; the model is given as;

$$SMV_{it} = \beta_0 + \beta_1 FDIO_{It} + \mu_{it}$$

Where;

i=Multinational firms (1…37) t= time (2006-2021)

$\beta_0 =$ Constant or intercept

$SMV_{it}=$ Securities Market Volatility at year t

$FDIO_{It}=$ Foreign direct investment outflow at year t

$\beta_1 =$ Coefficient

Table 7: Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D_FDIO	0.404985	0.136534	2.966188	0.0032
C	0.061026	0.019009	3.210331	0.0014

H_{01}: There is no significant effect between foreign direct investment outflow and securities market volatility in Nairobi securities exchange, Kenya.

The analysis discovered a statistically significant positive link between foreign direct investment and market volatility. The null hypothesis was thus rejected. The results showed that, there was a substantial positive association between the foreign direct investment outflow (FDIO) and Security market volatility (SMV). Because FDIO fosters uncertainty about the economic and political climate, which can generate bigger market fluctuations, more money leaving the market can result in more volatility in stock prices. The financial market needs to be repositioned and developed in order to mitigate the effects of short-term, highly volatile capital flows that have the

The results are in line with those of Osamwonyi and Ikponmwosa (2018) in Nigeria, who studied foreign private investment and stock market volatility. Their findings revealed that FPI promotes capital market stability while also contributing to stock market volatility. The dependent and independent variables exhibit co-integration, according to Singhl and Mohan (2020) in India. The long term coefficients showed a decline in the exchange of stock market volatility. Additionally, Gupta & Ahmed (2019) in India discovered that an increase in FDI has a significant impact on stock market fluctuations there, and (Alawi, 2019) in Saudi Arabia showed that FDIO contributes to the stock market, leading to the conclusion that FDI has a significant and favorable impact on stock price volatility.

5.0 Conclusion

According to the study's findings, the FDIO and SMV as represented by the NSE all share index had a favorable association. It means that adjustments to FDIO are probably going to have a noticeable impact on the volatility of the stock market. The NSE's extreme volatility is exacerbated by FDIO. In a setting with restrictive market policies and low interest rates, investors will move their assets due to the high degree of uncertainty and risk associated with the potential rewards. There is a need to limit FDIO as this will further put pressure on a country's macroeconomic characteristics, deterring both foreign and domestic investors. According to the CMA Master Plan 2014–2024 for Regional and International Capital Flows, FDIO will hinder development and economic transformation.

6.0 Recommendations

The study offers the following policy recommendations to Capital market authority (CMA), the Kenyan government, and other decision-makers based on this observation. Based on the study's findings, policymakers are advised to carefully monitor the flow of FDIO out of the Nairobi securities exchange market and to take precautions to prevent an excessive outflow from causing

market destabilization and potential instability in the capital market. An extensive domestic economy and a well-developed financial market can offer shock absorption capacity. A Kenyan investment policy should also be examined through the ministry of foreign affairs to establish limits on how much FDIO should be let to leave the country in order to lessen the considerable impact on.

Increased FDIO may lead to higher securities market volatility. Additionally, policy makers may consider revising and strengthening the regulatory framework for both FDIO and securities market, this could involve stricter rules on foreign investment, more robust risk management requirements for market participants and enhanced regulatory oversight. FDIO can impact a country's exchange rate. If the exchange rate becomes highly volatile, policy makers need to implement measures to stabilize it such as intervening in the foreign exchange market or implementing capital controls.

To lessen their exposure to the risks connected with capital outflows, investors should be aware of the dangers related to FDIO and should incorporate this knowledge into their investment plans by diversifying their investments across various asset classes and nations. When improving domestic financial markets to lessen their reliance on outflows of foreign capital, market participants should effectively communicate their policies and activities to investors and other market participants. This will help to reduce market uncertainty and volatility. Businesses with global operations should have strong risk management plans in place to take into account the heightened market volatility brought on by FDIO. They might need to limit their exposure to changes in interest rates and currency exchange rates. Long-term planning should be used by multinational organizations operating in FDIO-sensitive sectors of the economy.

The study is limited to 16 years, from 2006 to 2021 and the data was analyzed on yearly basis. The period relays to the pre and post global financial crisis. The post global financial crisis period is characterized by volatility of financial outflows as compared to pre global financial crisis which relates to long run dynamics of NSE. Consequently, future studies can be done for the same periods with frequent observations, weekly, monthly and quarterly basis to capture short run dynamics of the securities market for comparison purposes using modern technology for analysis.

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