EXTERNAL FINANCIAL FLOWS AND ALL SHARE INDEX IN THE NIGERIAN CAPITAL MARKET: VECM FRAMEWORK

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ABSTRACT

In many economies, the capital markets play a vital role as one of the most powerful drivers of economic growth and wealth creation. This research work aims to assess the dynamic effects of external financial flows on the All-Share Index of Nigerian capital market over the period 1981-2020. The study employed the VECM and regressors' and ECT t-statistics causality approaches to establish the short, long and strong relationship. The study found that FPI, remittance from personal transfers, remittance from compensation of employees, TOP and ODA have positive impacts on ASI in the long run except for the FDI. The findings on ECT t-statistics causality relationship were mixed-revealing, the result shows that some variables were statistically significant in the short-run and also in the long-run, these joint statistically significance between the variables in the short-run and long-run implies strong causal relationship among the variables. This implies that external financial flows tend to generate unpredictable and a typical influences on long-term capital market development in Nigeria, although it gives little room for short-run development of the market. The study suggested that the policy measures aimed at directing long run capital inflows should not be the same as those aimed at changing the short run patterns of flow. Thus, policy makers must develop policy directions to suit the time horizon of capital flows in enhancing market value, price stability and liquidity.

KEYWORDS: External Financial Flows, All-Share Index, Nigeria, VECM Framework

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1. INTRODUCTION

The slow speed of development within developing countries is typically traceable to inadequate resources to speed up economic processes and development, as saving in this part of the globe is often less than investment needs (World Bank's Global Development Horizon, 2018; Olowe et al., 2022; Emiola & Fagbohun, 2021). Thus, economies have resorted to foreign borrowings and other forms of external finance inflow through the capital market to stimulate development.

In recent years, the Nigerian economy has received a significant volume of inflows of foreign capital inflows compared to other developing economies. This is primarily attributable to the country's attempts to execute responsible macroeconomic policies to draw foreign direct investment and an investment-friendly environment for investment to thrive in the economy (Ashakah & Ogbebor, 2020; El-Rasheed & Abdullahi, 2022).

The capital market has therefore been identified as one of the key factors that influence the inflow of capital into an economy toward economic growth (Iortyer & Maji, 2022; Iyaji & Onotaniyohwo, 2021). As a result, the role that capital markets play in financing the expansion of infrastructure, large corporations, and Small and Medium-Sized Enterprises (SMEs), as well as the links between these elements and economic growth, are becoming increasingly more prominent (Nkemgha et al., 2023; Azimi, 2022; Ezeibekwe, 2021). These funds are usually intermediated through the financial market to facilitate domestic investment in the host country. The capital market is unique because it provides cheap long-term financing as well as liquidity in the market. Capital markets are a network of specialized financial institutions, a collection of infrastructure, processes, and mechanisms that facilitate connections between providers and consumers of long-term capital (Abayomi & Yakubu, 2022; Omimakinde & Otite, 2022). To attract adequate foreign capital needed for investment, the capital market has been identified as one of the veritable means through which foreign investment flows into an economy.

One of the major problems or challenges facing most developing economies is an inadequate domestic investment that could ensure the achievement of desired economic growth. This is because there is an imbalance between the required capital and the available saving capability. It is noteworthy that external financial flows have become an increasingly imperative source of capital for Nigeria and other emerging economies (Imoughele, 2020). The Nigerian economy is an integral part of the global capitalist economy which has experienced a very rapid pace of globalization since the 1980s. Consequently, it is thus obvious that capital markets are important because they allow for real sector expansion by giving producers of goods and services as well as organizations in charge of developing infrastructure access to long-term financing(Abayomi & Yakubu, 2022; Ayeni & Fanibuyan (2022); Musa et, al, 2022).

The Nigerian capital market has performed fairly despite the numerous challenges. The market has witnessed tremendous evolution over the years, evidenced by the increased level of participation of private and public investors on the floor of the stock exchange and in various public offers of quoted companies. The liberalization of the Nigerian financial markets in mid-2000 resulted in the internationalization of the Nigeria Stock Exchange (NSE) now known as Nigerian Exchange (NGX) Group and has led to an increased inflow of foreign investment into the nation through the capital market. The emerging market has also attracted and embraced the attention and interest of international investors, thus increasing capital inflow. The NGX All-share Index is a total market (broad base) index, reflecting a total picture of the behavior of the common shares quoted on the Nigerian Stock Exchange. All-share Index (ASI) is a series of numbers showing the changing average value of the share prices of all companies on a stock exchange and is used as a measure of how well a market is performing.

The NSE All Share Index was formulated in January 1984 with a base value of 100. Only ordinary shares are included in the computation of the index. The index is value-relative and is computed daily and the data is updated monthly, available from Jan 1985 to date. The data reached an all-time high of 65,652.4 points in Feb 2008 and a record low of 111.3 points in Jan 1985. Nigeria NSE All Share closed at 40,270. 42 points in December 2020 (CBN, 2020). The Nigerian Stock Exchange All Shares Index (NSEASI) rose by 50.3% by December 2020. This

represented one of the highest equity market returns for any of the global stock markets in 2020. Despite this, foreign investors are still bent on leaving the local Nigerian market and the current market yield may at best be considered tentative (NGX, 2020).

Thus, this study sought to determine the extent to which external financial flows will influence capital market performance in Nigeria proxied by all share indices. Because an increase in external financial flows is expected to increase capital market performance as it leads to an increase in the volume of transactions by listed firms on the stock exchange. The fundamental objective of this research work is to empirically examine the dynamic effects of external financial flows on all share index in the Nigerian capital market. In other words, the study is interested in the effects of external financial flows on all share index in the Nigerian capital market, while the research question is "do external financial flows have any significant impact on all share index in the Nigerian capital market?

This study provides a more comprehensive picture of the effects of external financial flows on all share index in the Nigerian capital market. Since studies on the determinants of financial development have dominated the last decade both in developing and developed countries. The current study addresses the weakness by focusing on external financial determinants of capital market development in Nigeria. Apart from FDI and FPI, factors such as remittance, trade openness, and official development assistance were also found by the empirical literature to be the main variables that were instrumental in influencing capital market performance. With this, the need for empirical investigation to fill the gap cannot be overemphasized. Therefore, this study set out to fill this gap by investigating the dynamic effects of external financial flows on the All-Share index as a proxy for capital market performance.

The intermediation role of the capital market in mobilizing long-term debt and equity finance for investments in long-term asset positions, renders it a critical institution in driving investment, economic activity, and by extension, economic growth, and development. Gbalam et al. (2020). The level of development of the capital market and the external factors affecting its performance is therefore an important issue for policymakers and market practitioners alike. Filling this gap by using a better methodology to analyze the dynamic relationship between external financial flows and all share index in the Nigerian capital market is the chief objective of this study.

2. LITERATURE REVIEW

2.1 Theoretical Literature

2.1.1 The Capital Market Theory

The three major theories of capital market efficiency and investors' prospect, incorporate the Efficient Market Hypothesis (EMH), Modern Portfolio Theory (MPT), and therefore the Capital Asset Pricing Model (CAPM). Capital market theories offer the muse for the event of monetary asset pricing models. The EMH is considered the basic theory supporting all areas of investments. Likewise, Modern Portfolio Theory (MPT), pioneered by Markowitz (1952) and also the separation theorem of Tobin (1958) makes available explanations for risk-averse investors to apportion assets in a resourceful capital market. Beneath the norms of MPT, risk-averse venture capitalists have similar outlooks concerning the mean, variance, and covariance of asset earnings, and wish at make the most of their expected utility when making investment choices. The CMT makes an effort to explain and forecast how capital (and occasionally financial) markets will develop over time (Qi et al., 2023). Furthermore, in studying the CMT, managers deal with issues like the role of the capital markets (this

emphasizes its relevance to this study), the major capital markets, the initial public offerings, and the role of the venture capital in capital markets.

2.1.2 The Bottom Broadening Theory

Base Broadening theory was proposed by Merton (1987). The idea strives that enhance the quantum of investors, through the opening up of the financial markets, to incorporate investors from foreign countries risk would result in improved diversification. Accordingly, increased diversification results in lower and ultimately lowers the desired risk premium. This has the effect of accelerating capital availability within the exchange, liquidity, and price stability hence resulting in the event of the exchange (Galindo, Schiantarelli & Weiss, 2007). The opening up of the financial markets results in increased market efficiency and enhanced distribution of assets to the foremost optimum users within the local capital markets (Odior & Nwaogwugwu, 2016).

2.2 Empirical Literature

The study reviews several related and contemporary empirical literature. Anthony and Ogbuabor (2018) study, examined how the development of the Nigeria capital market stimulates the inflow of capital from overseas and how this foreign capital support economic growth in Nigeria. To achieve this, real gross domestic was used as the dependent variable, while market capitalization, all share index, aggregate savings, foreign capital inflow, degrees of trade openness, and real exchange rate. Historical data spanning from 1985 to 2016 was called and analyzed using the ordinary least square technique and Johansen co-integration technique to ascertain if a long-run equilibrium relationship exists or not in the model. The co-integration results indicated the existence of the long-run equilibrium relationship in the model. The error corrections result further indicate that foreign exchange rate, degree of exert negative and statistically insignificant impact on economic growth at the 5% tolerance level. The results further averred that market capitalization stimulates economic growth positively and significantly.

According to Subair and Salihu (2013), stock market can be measured by market capitalization (MCAP). Lawal and Ijirshar (2013) further explained that market capitalization is also another major measurement of stock market performance. Market capitalization (also known as market value) is the share price times the number of shares outstanding. However, Zubair (2013) asserted that the All Share Index (ASI) can also be used to measure stock market performance. The stock market is one of utmost importance as a means through which companies raise needed capital. This allows businesses to be publicly traded or raise additional capital for expansion by selling shares of ownership of the company in a public market (Mishkin, 2001).

Akinmulegun (2018) used the vector error correction mechanism from 1985 to 2016 to study the nexus between foreign portfolio investment inflow and capital market development in Nigeria. The study showed an appreciatively significant relationship between foreign portfolio investment and the Nigerian All Share Index as well as a negative significant relationship between foreign portfolio investment and market capitalization in Nigeria. In another study, Iriobe, Obamuyi, and Abayomi (2018) investigated the impact of foreign portfolio investment inflows on the performance of Nigeria's capital market, using data spanning from 2007 to 2017. The study, therefore, relied on the *ex post facto* research design to examine the impact of the dependent variable of stock market development and the independent variable, foreign portfolio investment inflows in Nigeria using the autoregressive distributive lag model. The

study showed that foreign portfolio direct investment inflows are a catalyst in the performance of the Nigerian capital market.

Cliff et. al. (2020) investigated the effects of diaspora Remittances and Stock Market Development at the Nairobi Securities Exchange, Kenya. Diaspora remittances, unlike other external sources of financing, tend to be more stable making remittances a reliable source of financing for emerging economies. Despite the consistent upward trend in diaspora remittances, emerging capital markets are typically characterized by a few number of listings and very high volatility. This study therefore sought to establish the effect of diaspora remittances on stock market development at the Nairobi Securities Exchange, Kenya. The study covered the period from 2008-2018 and quarterly time series data was analyzed using correlation analysis and the Autoregressive Distributed Lag Model. The study findings documented a significant positive effect of diaspora remittances on stock market development in the short run as evidenced by the negative and significant coefficient of the Error Correction Term (ECT). Equally, diaspora remittances had a significant positive effect on stock market development in the long run. In view of the foregoing findings, the study recommends that the Kenya government should create a department of economic relations located at all Kenyan foreign embassies abroad to educate Kenyans abroad on the available investment opportunities at the Nairobi Securities Exchange and the importance of investing back at home.

Njoroge (2014), sought to determine the effect of Diaspora remittances on stock market performance using evidence from the Nairobi Securities Exchange. Stock market performance was measured by The Nairobi Securities Exchange All Share Price Index (NASI). Inflation, interest rates, and exchange rates were used as control variables. Time series monthly data for seven years from February 2008-May 2015 was obtained from the Nairobi Securities Exchange and the Kenya Central Bank was used for the purpose of meeting the study objectives. The study applied both descriptive analysis and multiple regression analysis. The study findings indicated that Diaspora remittance had a strong and significant positive effect on stock market performance. The current study however analyses the relationship between diaspora remittances and stock market development using the autoregressive distributed lag model.

Raza and Jawaid (2014) studied the effect of remittances on stock market development in 18 Asian countries. The study covered the period from 2000 to 2010 and time series data was analyzed using ARDL cointegration and Toda and Yamamota causality tests. The findings indicated remittances had a significant effect on stock market development. Toda Yamamoto causality test indicated a bi-directional causal relationship. Especially, this study is conducted beyond the context of the emerging African stock markets.

Nikmanesh (2016) investigates the relationship between trade openness and stock market volatility in the ASEAN-5 countries, using data on the composite price indices and trade openness in these countries from 1990 to 2013. A two-step methodology was employed. Originally, the volatilities of stock indices are estimated using GARCH family. Also, panel and the seemingly unrelated regression (SUR) methods are utilized to find the linkage between trade openness and stock market volatility. The results prove that the SUR method can efficiently handle certain limitations of the panel regression method in the present study. The results concerning the whole sample period demonstrate that trade openness affects the stock market volatility in Indonesia and Malaysia positively, and in Thailand negatively. Although the effect of trade openness on the Philippine and Singaporean stock market volatilities is not significant during the whole sample period, trade openness is found to influence stock market volatility in the Philippines and Singapore in the subsamples.

Nikhil Joshi (2016) examines the effects of all three sources of external development finance and foreign exchange earnings (FDI, ODA, and remittance) on economic growth in South Asia. By using Gross Domestic Product (GDP) as the dependent variable and FDI, ODA, and remittances as the independent variables, while controlling for population, life expectancy, capital formation, and economic openness calculated by trade shares. The study identifies an econometric model that properly portrays this relationship and analyzed the effect of external development finance and foreign exchange earnings on economic growth in South Asia. A Fixed Effect panel model is developed using data from Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka ranging from 1960 to 2014. These findings suggest that only remittance have a consistent positive effect on growth, whereas Foreign Direct Investment and foreign aid have varying effect dependent upon model specification.

Muhammad, Shamila, and Shujahat (2017) studied the influence of stock exchange performance on foreign portfolio assets in China. By means of periodical statistic data from 2007 to 2015, the study espoused an autoregressive distributed lag model. The outcomes of the study revealed that exchange performance contains a substantial optimistic influence on foreign portfolio assets, while inflation was adversely related to foreign portfolio assets. The study further exposed that proceedings like the Asian financial crisis of 2008 and also the Shanghai Composite index number of 2015 expressively affected foreign portfolio assets in China. The influence of a main variety of foreign capital flow (FDI) on securities market performance through the network of economic processes collaborated as Arčabić, Globan, and Raguž (2013) examined the connection between the securities market and foreign direct investment in Croatia with outcomes indicative of within the short run that upward movement on the stock exchange definitely affects Croatian FDI stock, as actions on the securities market signalize the vivacity and outlay climate of the local marketplace to foreign financiers. Therefore, the outcomes achieved are according to the hypothetical expectations because the securities market did persuade are a vital short-term determinant of FDI in Croatia.

3. METHODOLOGY

3.1 Theoretical Framework

The Capital Market Theory

The capital market theory was used as the theoretical framework for this study. Based on the assumption of market efficiency and the principle of diversification, Markowitz (1952) developed the first theory that incorporates the concept of risk in the portfolio management process. The attitude of investors towards risk in the portfolio theory of Markowitz (1952) is based on the concept of risk aversion described by the expected utility theory, which is expressed by the conventional utility curve illustrated in Figure 1. Using the asset position as a suggestion of wealth, the positive slope of the utility function indicates that the higher the asset position, the higher the investor's utility. However, the utility function is concave; indicating that the marginal utility derived from the growth in the asset position is diminishing. This implies that investors will reject a risky venture without adequate compensation for its risk (Bodie, Kane, & Marcus, 2008).

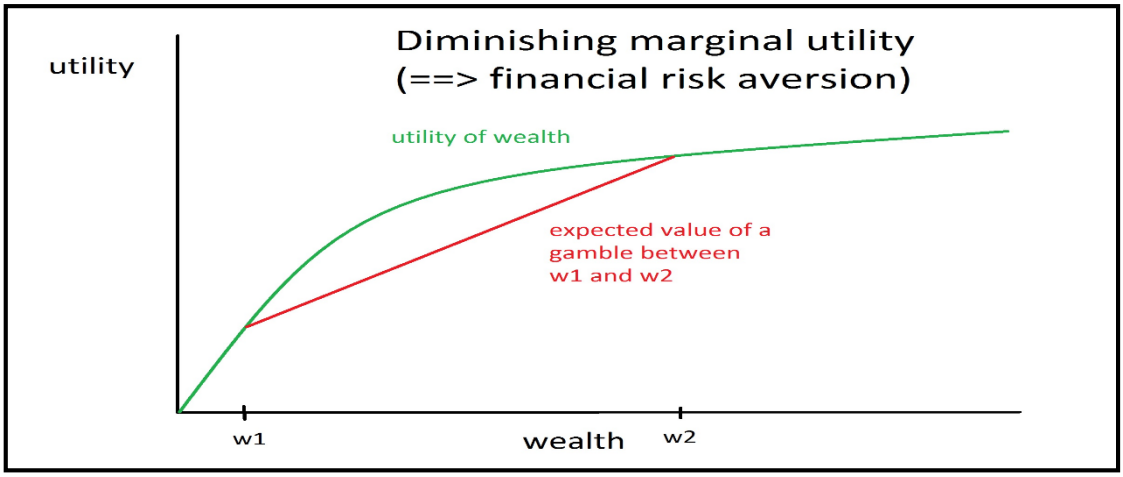

Figure 1: Risk Aversion and Marginal Utility

Under the expected utility theory, investors make decisions between alternative investments based on the expected utility that can be achieved from the respective investments as shown in Equation 1 (Kahneman & Tversky, 1979):

$$E(U) = (p_1 u(x_1) + p_2 u(x_2) + \cdots + p_n u(x_n)) \quad (1)$$

Where: $x_1, x_2 \cdots x_n$ are the possible asset positions of the investment; and

$p_1, p_2 \cdots p_n$ are probabilities assigned to the possible asset positions of the investment.

The decision-making process based on the utility function depicted by Equation 1 is rational and not subject to psychological biases since the decision relies purely on the probabilities of the various possible asset positions of an investment. Applying the concept of risk aversion to the portfolio construction process, rational investors will prefer to include assets that offer a higher expected return for a given level of risk, or a lower risk for a given level of expected return in their portfolios. Equations 2 and 3 mathematically demonstrate the expected return and the variance of a portfolio that consists of two assets i and j. The weights carried by constituents i and j are proportional to their relative market values:

$$E(R_\rho) = (w_i \times E(R_i)) + (w_j \times E(R_j)) \quad (2)$$

$$\sigma_p{}^2 = (w_i^2 \sigma_i^2) + (w_j^2 \sigma_j^2) + (2 w_i w_j \sigma_i \sigma_j p_{ij}) \quad (3)$$

w_i and w_j are the weights of constituents i and j in portfolio p;

σ_i and σ_j are the standard deviations of constituents i and j in portfolio p; and

p_{ij} is the correlation coefficient between the returns of constituents i and j in portfolio p

While the expected return of a portfolio is computed as the weighted average of the expected returns of its constituents, the portfolio risk measured by the standard deviation (square root of variance) of historical returns is less than the weighted average of the standard deviations of its constituents. This is because the returns of the constituents in a portfolio are likely to be less than perfectly correlated, and hence the firm-specific risk of a large portfolio is effectively diversified away. As shown in Equation 3, the lower the correlation coefficient between the returns of the constituents in the portfolio, the lower is the variance and hence the standard deviation of the portfolio. As a result, the total risk of the portfolio does not increase in the same proportion as the increase in the portfolio expected return when a new asset with higher

expected return is added to the portfolio.

Incorporating the concept of diversification discussed, the Markowitz efficient frontier of risky assets is derived from efficient mean-variance optimization with the objective of maximizing the expected return of the portfolio at each level of portfolio standard deviation from the feasible set of risky assets. Figure 3.2 illustrates the umbrella-shaped Markowitz efficient frontier of risky assets. The assets plotted on the efficient frontier represent the mean-variance efficient risky assets attainable from the feasible set of risky assets. The risky assets plotted on the efficient frontier are preferred by risk-averse investors to other assets in the feasible set as they offer the highest attainable returns for the given levels of risk.

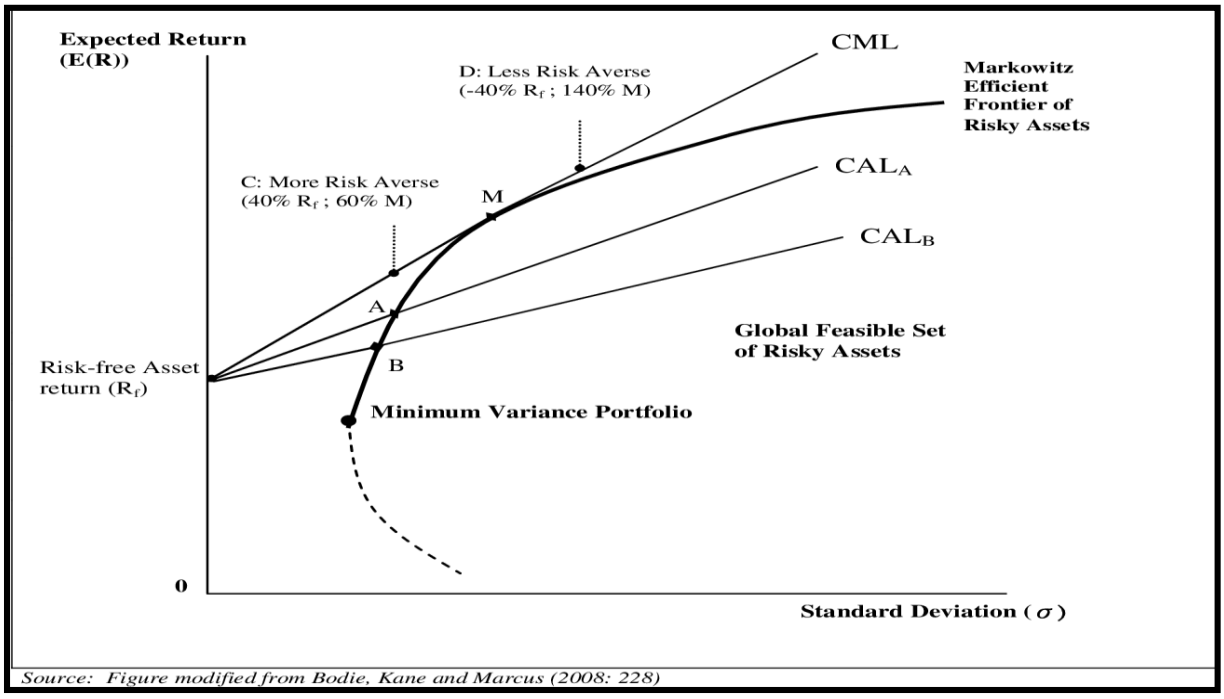

Figure 2: Markowitz Efficient Frontier of Risky Assets

The Markowitz efficient frontier is comprised of only risky assets. To manage the risk of the portfolio effectively, investors can invest a fraction of their capital in an asset that provides returns of certainty. The proxy for the risk-free asset is usually a highly liquid Treasury security with low probability of default. Consider the mean- variance efficient portfolios A and B in Figure 2. Any combination of portfolio A and the risk-free asset in an investor's portfolio can be represented by a linear capital allocation line (CALA) drawn from the risk-free rate (Rf) through A.1 Similarly, CALB represents any combination of portfolio B and the risk-free asset in an investor's portfolio. CALA dominates CALB because combinations of portfolio A and the risk-free asset provide a higher expected return at any given level of risk than combinations of portfolio B and the risk-free asset. Therefore, all investors would prefer to form their portfolios using the risk-free asset with portfolio A rather than with portfolio B. In this manner, one can continue to ratchet the CAL upward until it reaches the ultimate point of tangency with the efficient frontier of risky assets at M.

The ultimate CAL tangent to the optimal risky portfolio is termed the capital market line (CML), which offers the highest possible expected return for any given level of risk, and the lowest possible risk for any given level of expected return. Equation 4 depicts the

mathematical representation of the CML, which states that the expected return on an efficient portfolio is equal to the return on the risk-free asset (R_f) plus a market risk premium $(E(R_M) - R_f)$ proportional to the total risk of the portfolio (σ_p^2) relative to the total risk of the market portfolio (σ_M^2):

$$E(R_\rho) = R_f + \sigma_p^2 \times \left(\frac{E(R_M) - R_f}{\sigma_M^2} \right) \quad (4)$$

Where:

$E(R_\rho)$ is the expected return of portfolio P;

$E(R_M)$ is the expected return of the market portfolio M;

R_f is the return on the risk-free asset;

σ_p^2 is the variance of portfolio P; and

σ_M^2 is the variance of the market portfolio M.

The tangency portfolio M is termed the market portfolio, which is regarded as the optimal risky portfolio on the Markowitz efficient frontier of risky assets. The market portfolio is also a completely diversified portfolio, which contains not only domestic stocks and bonds, but also real estate, options, art, stamps, coins, human capital, foreign stocks, and bonds, etc. In addition, supply and demand ensure that all assets included in the market portfolio are in proportion to their respective market values in equilibrium (Reilly & Brown, 2003). According to the separation theorem of Tobin (1958), the identification of the market portfolio is the first step in the asset allocation process. Investors, having homogeneous expectations, would arrive at the same optimal risky portfolio.

The second task of the asset allocation process involves the determination of the split between the risk-free asset and the market portfolio (that is, choosing the best point on the CML). This task, however, depends on a particular investor's risk preference. If an investor is relatively risk-averse, he might lend some part of his portfolio at the risk-free rate (for example, 40%) by buying some risk-free assets and investing the remainder (60%) in the market portfolio (see point C in Figure 2). On the contrary, if an investor prefers more risk, he might borrow funds at the risk-free rate (for example, -40%) and invest everything (all of his capital plus what he borrowed, that is, 140%) in the market portfolio (see point D in Figure 2). The separation theorem serves as the guideline for rational investors with different degrees of risk aversion to allocate assets in an efficient capital market.

3.2. Method of Analysis

To analyze the dynamic relationship between external financial flows and all share index in the Nigerian capital market, the study employed the Vector Error Correction Model (VECM), the error correction model, the impulse response function, variance decomposition and causality approaches to examine the long-run and short-run relationship between the dependent and the independent variables. Annual data from 1985-2020 were sourced from the Central Bank of Nigeria Statistical Bulletin (CBN, 2020), Nigeria National Bureau of Statistics (NBS) (2020), World Bank Reports (World Bank, 2020) and publications of Nigerian Stock Exchange (NGX, 2020). The VECM approach combined all non-integrating tests in establishing a uniform, coefficient and reliable estimates devoid of multiple testing procedures to overcome the likely

shortcomings of traditional methods and utilized the co-integration restriction information into its specifications.

3.3 Model Specification

Based on the above theoretical framework, the model for this study is anchored on the modern portfolio theory developed by Fama (1965, 1970 & 1991) and Markowitz (1952). It is an investment hypothesis centered on the idea that risk-averse investors can construct portfolios to optimize expected return based on a given level of market risk. Thus, the response of foreign investors in constructing a portfolio of various assets depends on the development of the capital market to guide against the vulnerability of investors' funds. Investment funds from these sectors having homogeneous expectations would arrive at the same optimal risky portfolio as explained in equations 3-4. The main objective of this study is to estimate the dynamic relationship between external financial flows and ASI of the Nigeria capital market. The econometric specification of this general model expressed in full-log. Thus, the equation in its empirical form is specified below:

$$\log \boldsymbol{ASI}_t = \beta_0 + \beta_1 \log \boldsymbol{FDI}_t + \beta_2 \log \boldsymbol{FPI}_t + \beta_3 \log \boldsymbol{REPT}_t + \beta_4 \log \boldsymbol{RECE}_t + \beta_5 \boldsymbol{TOP}_t + \beta_6 \log \boldsymbol{ODA}_t + \mu_t \quad (5)$$

Where, ASI_t is the NGX All-share Index is a total market (broad base) index, reflecting a total picture of the behavior of the common shares quoted on the Nigerian Stock Exchange. ASI_t are proxy for capital market performance; they are in taken as the explained variables in our study. FDI_t is the foreign direct investment at time t. FPI_t is foreign portfolio investment at time t. It defines as a grouping of assets such as stocks, bonds, and cash equivalents. foreign portfolio investment is the entry of funds into a country where foreigners deposit money in a country's bank or make purchases in the country's stock and bond markets, sometimes for speculation.

$REPT_t$ and $RECE_t$ are the values of personal remittances at time t. Personal remittances are the sum of personal transfers and compensation of employees. Where $REPT_t$ is the sum remittance from personal transfers or personal transfers in form of remittance at time t. While $RECE_t$ is the remittance from compensation of employees' compensation from the rest of the world at time t. They are define as a non-commercial transfer of money by a foreign worker, a member of a diaspora community, or a citizen with familiar ties abroad, for household income in their home country or homeland. Money sent home by migrants competes with international aid as one of the largest financial inflows to developing countries. Workers' remittances are a significant part of international capital flows, especially about labor-exporting countries.

Personal transfers represent a broader definition of worker remittances. Personal transfers include all current transfers in cash or in kind between resident and non-resident individuals, independent of the source of income of the sender (and regardless of whether the sender receives income from labor, entrepreneurial or property income, social benefits, and any other types of transfers; or disposes assets) and the relationship between the households (regardless of whether they are related or unrelated individuals). Compensation of employees refers to the

income of border, seasonal, and other short-term workers who are employed in an economy where they are not resident and of residents employed by non-resident entities. TOP_t is trade openness at time t. It is a measure of participation of a country in international trade. This is measured by the ratio of the value of imports and exports of a given country to its domestic product. $TOP_t = (IMP_t + EXP_t / GDP_t$, where IMP is defined as Value of imports and EXP defined as Value of exports. ODA_t is defined as official development assistance. It is comprising of official aid and other official flows. b_0 is constant parameter, b_1 - b_5 are slopes parameters and μ_t ~NIID (0, 1) thus, a white noise stochastic disturbance term and time t is in annually.

Based on the above theoretical consideration, the following provides a summary of the expected relationships between the explanatory variables, The NGX All-share Index and the foreign direct investment, foreign portfolio, personal remittances, remittance from compensation of employees' compensation, trade openness and official development assistance.

$ASI = f(\underset{+}{FDI}, \underset{+}{FPI}, \underset{+}{REPT}, \underset{+}{RECE}, \underset{+}{TOP} \underset{\pm}{ODA})$. The sign beneath each variable shows the expected direction of ASI in response to the corresponding explanatory variable. The a-priori assumptions for model in equation (5) are: b_1 - b_5 to be greater than zero while β_6 is expected to be either greater than or less than zero. It implies a positive relationship between the dependent variable and independent variables. This implies that an increase in these independent variables will lead to an increase in β,s > 0 means that there is a positive relationship between the dependent variable and the independent variables. And this will lead to an increase in total ASI on the Nigerian Stock Exchange (NSE) and vice-versa.

3.4 Estimation Procedure

This study aimed at investigating the dynamic and conditional relationship between external financial flows and ASI of the Nigeria capital market as well as to construct a model using multivariate. The goal of this study is achieved in these following steps: first, this study used, Unit Root Test, the determining the Optimal Lags Length for the series, the Johansen Cointegration Test, the Vector Error Correction Model (VECM) and then ECT t-statistics Causality Test.

3.4.1 Testing for Stationarity: This study takes into consideration the problem of non-stationarity. A time series is said to be stationary if it's mean, variance and covariance remain constant with respect to time. Regression of a non-stationary time series on another non-stationary time series may produce unstable regression result. To avert the problem of spurious regression result and erroneous inference, the researcher will conduct the unit root test to determine the stationarity or otherwise of the time series data, using Augmented Dickey-Fuller (ADF) unit root test, the most widely used (Dickey & Fuller, 1979). Augmented Dickey-Fuller (ADF) test statistics for unit root is adopted in this study, because ADF has stood the test of time as robust tool that appears to give good result over a wide range of applications. This will enable us to ascertain the order of integration of each variable if stationary at levels I (0) or at first difference I (1).

3.4.2 Determining the Optimal Lags Length for The Series in The Model: Choosing appropriate lag length is important in VAR or VEC modelling. This is very necessary to enable us to know the number of Lags to include in the VAR or VEC models. Because too many lags lose the degree of freedom and the coefficients will be statistically insignificant due to present of multicollinearity, while too few lags lend to specification errors. Optimal number of lags can be selected by using available lag length selection criteria. Most popular criteria are Akaike Information Criterion (AIC), Schwartz Bayesian Criterion (SBC), and Hannan Quinn criterion (HQC).

3.4.3 Cointegration Testing: Johansen's Procedure: This study use Johansen Cointegration to test cointegrating relationships between several non-stationary time series data. To verify further, the relevance of the model is required, there is need to test for cointegration. That is, can we assume a long run relationship in the model even though the series are drifting apart or trending either upward or downward? If there is cointegration, we specify the long-run model and estimate VECM.

3.4.4 Vector Error Correction Model (VECM) and Error Correction Mechanism (ECM)

The study use VECM to examine long and short-run dynamics of the cointegrated series. It restricts the long-run behavior of endogenous variables to converge to their cointegrating relationships. The cointegrating term is known as the error correction term (ECT) since the deviation from long run equilibrium is corrected gradually through a series of partial short run adjustment. VECM representation has more efficient coefficient estimates. If the variables are I (1) and there exists a cointegration relationship, then Error Correction Model (ECM) can be derived or if u_t is I (0) and variables are I (1) there exists a cointegration relationship

3.4.5 Short Run, Long Run and Strong Causal Analysis: We use the regressors' and ECT t-statistics approach to check for the short run, long run and strong causal effects among the variables. If regressors' and ECT t-statistics are statistically significant, the short run, long run and strong causal effects are inferred.

3.4.6 Dynamic Specification of Level Models

Estimated VECM with All Share Index (ASI) as Target Variable

Recall equation (5) the multiple relationship.

We have the corresponding VEC models of ASI written as.

$$\begin{aligned}\Delta\log ASI_t = \beta_{0ASI} + \sum_{i=1}^{k-1}\beta_{1i}\Delta\log ASI_{t-i} + \sum_{i=1}^{k-1}\beta_{2i}\Delta\log FDI_{t-i} + \sum_{i=1}^{k-1}\beta_{3i}\Delta\log FPI_{t-i} + \sum_{i=1}^{k-1}\beta_{4i}\Delta\log REPT_{t-i} \\ + \sum_{i=1}^{k-1}\beta_{5i}\Delta\log RECE_{t-i} + \sum_{i=1}^{k-1}\beta_{6i}\Delta TOP_{t-i} + \sum_{i=1}^{k-1}\beta_{7i}\Delta\log \mathrm{ODA}_{t-i} + \lambda_{ASI}\varepsilon_{t-i} + u_{1ASIt}\end{aligned} \quad (6)$$

Short run Model

We will obtain the short run dynamic parameters by estimating a VECM or an ECM associated with long run estimation.

Error Correction Model for ASI Model is given as

$$\Delta \log ASI_t = \beta_{0\log ASI} + \theta_{\log ASI} ECT_{t-1} + \sum_{i=1}^{k} \beta_1 \Delta \log ASI_{\text{t-i}} + \sum_{i=1}^{k} \beta_2 \Delta \log FDI_{\text{t-i}} + \sum_{i=1}^{k} \beta_3 \Delta \log FPI_{\text{t-i}} + \sum_{i=1}^{k} \beta_4 \Delta \log REPT_{\text{t-i}} + \sum_{i=1}^{k} \beta_5 \Delta \log RECE_{\text{t-i}} + \sum_{i=1}^{k} \beta_6 \Delta TOP_{\text{t-i}} + \sum_{i=1}^{k-1} \beta_{7i} \Delta \log \text{ODA}_{t-i} + u_{\log ASI\, t} \quad (7)$$

Adjustment parameter is θ determines speed of adjustments of the models, while $\beta_1 - \beta_6$ are the short run dynamic coefficients of the ASI model. However, the difference Δ represents only the short-run change in the time series but totally misses out the long-run information.

Long Run Model

Cointegrating Equation for ASI Model is given as:

$$\varepsilon_{\text{t-1}} = \boldsymbol{ECT}_{t-1} = \log \boldsymbol{ASI}_{\text{t-1}} - \varphi_0 - \varphi_1 \log \boldsymbol{FDI}_{\text{t-i}} - \varphi_2 \log \boldsymbol{FPI}_{\text{t-i}} - \varphi_3 \log \boldsymbol{REPT}_{\text{t-i}} - \varphi_4 \log \boldsymbol{RECE}_{\text{t-i}} - \varphi_5 \boldsymbol{TOP}_{\text{t-i}} - \varphi_6 \log \boldsymbol{ODA}_{\text{t-i}} \quad (8)$$

ECT represents the long run operator or the long relationship in the model (the cointegrating equation and long run model in VECM). Note: ECT_{t-1} can be rewrite as ε_{t-1}. $\varphi_1 - \varphi_5$ are the long run coefficients of the ASI model.

4. RESULTS AND DISCUSSION OF FINDINGS

4.1 Unit Root Test

In this study, to determine the order of integration, we test for the presence of unit root, using the Augmented Dickey-Fuller (ADF) test statistic, and the summary of the results of the tests are presented in Table 1.

Table 1: Summary of Results of ADF Unit Root Tests at First Difference

Series	ADF t-Stat at 1st Diff.	Critical value		Prob.	AIC, Maxlag	Order of Integration	Randomness
D(LOGASI)	-5.403262	1% level	-4.252879	0.0005	**1**	**I(1)**	**Constant**
		5% level	-3.548490				
		10% level	-3.207094				
D(LOGFDI)	-5.666173	1% level	-4.211868	0.0002	**1**	**I(1)**	**Constant**
		5% level	-3.529758				
		10% level	-3.196411				
D(LOGFPI)	-6.019295	1% level	-4.211868	0.0001	**1**	**I(1)**	**Constant**

		5% level	-3.529758				
		10% level	-3.196411				
D(LOGREPT)	-6.696055	1% level	-4.211868	0.0000	**1**	**I(1)**	**Constant**
		5% level	-3.529758				
		10% level	-3.196411				
D(LOGRECE)	-6.878784	1% level	-4.211868	0.0000	**1**	**I(1)**	**Constant**
		5% level	-3.529758				
		10% level	-3.196411				
D(TOP)	-8.420136	1% level	-4.211868	0.0000	**1**	**I(1)**	**Constant**
		5% level	-3.529758				
		10% level	-3.196411				
D(LOGODA)	-5.705578	1% level	-4.219126	0.0002	**1**	**I(1)**	**Constant**
		5% level	-3.533083				
		10% level	-3.198312				

The optimum lags length for the ADF determined by Schwarz Information Criterion (SIC).
Source: Author's Computation (2023)

From the ADF test statistics, comparing the variables *p* values levels with the first difference ADF unit root test statistic and various probabilities, the results show all the included variables were integrated at order one, that is I(1) or they were stationary at first difference. Eight variables were statistically significant at 1%, 5% and 10% critical values in first difference.

From the results in the above tables' summary, there is an existence of unit root. This implies that all the series are non-stationary at levels. Therefore, the null hypothesis ($\rho = 1$) is accepted at levels and the null hypothesis ($\rho = 1$) that the series are non-stationary after the first difference is rejected for all the series. Therefore, concluded that the series are of order one I(1). These are MacKinnon critical values for the rejection of hypothesis of a unit root. All the series were integrated at first difference, they are integrated of the same order, I(1). The implication of this is to test for cointegration.

4.2 Determining the Optimal Lags Length for The Series in The Model

Table 2: Summary of the Results of the Optimal Lag Length

Endogenous variables: LOGASI						
Lag	LogL	LR	FPE	AIC	SC	HQ
1	-2.102395	115.6892	0.074540	0.162157*	0.331103*	0.271937
Endogenous variables: LOGFDI						
Lag	LogL	LR	FPE	AIC	SC	HQ
1	-23.36518	136.6843*	0.222513*	1.335010*	1.421198*	1.365675*
Endogenous variables: LOGFPI						
Lag	LogL	LR	FPE	AIC	SC	HQ
1	-44.98599	43.40048*	0.694313*	2.472947*	2.559135*	2.503612*
Endogenous variables: LOGREPT						
Lag	LogL	LR	FPE	AIC	SC	HQ
1	-43.81302	130.2708*	0.652745*	2.411212*	2.497400*	2.441877*
Endogenous variables: LOGRECE						
1	-60.15201	60.24775*	1.542460*	3.271159*	3.357347*	3.301824*
Endogenous variables: TOP						
Lag	LogL	LR	FPE	AIC	SC	HQ
1	-133.1449	26.06235*	71.88801*	7.112889*	7.199078*	7.143554*
Endogenous variables: LOGODA						
Lag	LogL	LR	FPE	AIC	SC	HQ
1	-36.01379	115.5897	0.432984	1.945035*	2.086914*	2.031391
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

Source: Author's Computation (2023)

The criterion that gives the lowest value is the best. The Table 2 shows that the optimal lags length for all the series in the model is 1 and the selected criteria is Akaike Information Criterion (AIC). It is the criterion that gives the lowest values.

4.3 Johansen Cointegration Test

In this study, a co-integration test for the variables in the models using Johansen cointegration test for a single-equation test. The result of co-integration for the variables is shown in Table 2 below. The result shows that there exists one co-integrating equation at 1%, and 5% level of

significance. This result indicates that there is a long-run relationship between the dependent and all the independent variables used in both models.

Table 3: Summary of Cointegration Test Level Result for Model

Sample (adjusted): 1987 2021							
Included observations: 35 after adjustments							
Trend assumption: Linear deterministic trend							
Series: LOGASI LOGFDI LOGFPI LOGREPT LOGRECE TOP LOGODA							
Lags interval (in first differences): 1 to 1							
Unrestricted Cointegration Rank Test (Trace)							
Hypothesized		Trace	0.05				
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**	Remark		
None *	0.847489	193.9375	125.6154	0.0000	We reject H_0 at 5%		
At most 1 *	0.710898	128.1194	95.75366	0.0001	We reject H_0 at 5%		
At most 2 *	0.666194	84.68521	69.81889	0.0021	We reject H_0 at 5%		
At most 3	0.539994	46.28341	47.85613	0.0697	We fail to reject H_0 at 5%		
At most 4	0.277656	19.10534	29.79707	0.4854	We fail to reject H_0 at 5%		
At most 5	0.197429	7.721473	15.49471	0.4957	We fail to reject H_0 at 5%		
At most 6	0.000679	0.023760	3.841466	0.8774	We fail to reject H_0 at 5%		
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level							
* denotes rejection of the hypothesis at the 0.05 level							
**MacKinnon-Haug-Michelis (1999) p-values							
1 Cointegrating Equation(s):			Log likelihood		-229.3632		
Normalized cointegrating coefficients (standard error in parentheses)							
LOGASI	LOGFDI	LOGFPI	LOGREPT	LOGRECE	TOP	LOGODA	
1.000000	0.229495	-0.261534	-0.156193	-0.316657	-0.044580	-0.203467	
	(0.06987)	(0.04667)	(0.05397)	(0.05459)	(0.00697)	(0.07741)	

Source: Author's Computation (2023)

The result showed 7 hypothesized number of cointegrating equation (CE). The 7 variables are LOGASI, LOGFDI, LOGFPI, LOGREPT, LOGRECE, TOP and LOGODA formed the null hypothesis equations. Using the Trace Statistic, the series displayed four cointegrating vector, as suggested by the Trace and Johansen test for cointegration, when tested with constant and without a trend. Looking at the "None" with the asterisk sign (*). Once the hypothesis is asterisk, it gives the likelihood of rejection. For example, in Table 4.5, the Trace Statistic (193.9375) > 5% CV (125.6154) and the probability value is < 0.000. And given the results generated, study reject the null hypothesis (H_0) that says there is "no cointegrating equation in the model. That is, no cointegration at 5% level is rejected. And accept H1, which implies that the variables are cointegrated. Having 3 cointegrating equations at the 0.05 level, it implies that there exist a long run relationship between the dependent variable (LOGASI) and the included independent variables. And the variables can be combined in linear fashion. That is, even if there are shocks in the short run, which may affect movement in the individual series, they would converge with time (in the long run).

Normalized cointegrating coefficients (standard error in parentheses)

In the Normalized cointegrating coefficients (standard error in parentheses, in the long run the signs of the coefficients are revised in the long run. Theoretically, the result showed that are

consistence with the model a priori expectation, that all the independents' variables except FDI, have negative impacts on LOGASI in the long run.

4.4 The Vector Error Correction Model (VECM) Analysis

Estimating an ECM-VECM with ASI as Target Variable. The cointegration test indicates only 3 cointegrating equations at the 0.05 level. Thus, specifying an ECM for the target variable LOGASI. Table 4 summary the result output of the VECM model.

Table 4: VEC Estimation Output for LOGASI Model

Vector Error Correction Estimates							
Sample (adjusted): 1987 2021							
Included observations: 35 after adjustments							
Standard errors in ( ) & t-statistics in [ ]							
First Part: Cointegrating Equation (Long-run Model)							
Cointegrating Eq:	CointEq1						
LOGASI(-1)	1.000000						
LOGFDI(-1)	0.229495						
	(0.06987)						
	[3.28459]						
LOGFPI(-1)	-0.261534						
	(0.04667)						
	[-5.60330]						
LOGREPT(-1)	-0.156193						
	(0.05397)						
	[-2.89397]						
LOGRECE(-1)	-0.316657						
	(0.05459)						
	[-5.80028]						
TOP(-1)	-0.044580						
	(0.00697)						
	[-6.39315]						
LOGODA(-1)	-0.203467						
	(0.07741)						
	[-2.62860]						
C	1.778821						
Second Part: Short Run Model							

Error Correction:	D(LOGASI)	D(LOGFDI)	D(LOGFPI)	D(LOGREPT)	D(LOGRECE)	D(TOP)	D(LOGODA)
CointEq1	-0.298051	-0.255206	-0.150431	-0.968953	0.467492	-2.760176	-0.270234
	(0.09383)	(0.18260)	(0.37511)	(0.29520)	(0.47321)	(3.54198)	(0.26631)
	[-3.17649]	[-1.39761]	[-0.40103]	[-3.28241]	[0.98792]	[-0.77928]	[-1.01472]
D(LOGASI(-1))	0.246296	0.513585	-0.721462	-0.006615	0.294059	6.666055	0.033521
	(0.17489)	(0.34036)	(0.69918)	(0.55023)	(0.88203)	(6.60205)	(0.49640)
	[1.40825]	[1.50895]	[-1.03186]	[-0.01202]	[0.33339]	[1.00969]	[0.06753]
D(LOGFDI(-1))	0.170578	0.271180	0.179186	0.308299	-0.743491	-3.823425	0.009283
	(0.16871)	(0.32832)	(0.67446)	(0.53077)	(0.85084)	(6.36856)	(0.47884)
	[1.01108]	[0.82596]	[0.26567]	[0.58085]	[-0.87383]	[-0.60036]	[0.01939]
D(LOGFPI(-1))	0.060922	0.006164	-0.021019	-0.114487	-0.626682	0.140035	-0.124410
	(0.09168)	(0.17843)	(0.36653)	(0.28845)	(0.46239)	(3.46098)	(0.26022)
	[0.66448]	[0.03454]	[-0.05735]	[-0.39691]	[-1.35532]	[0.04046]	[-0.47809]
D(LOGREPT(-1))	-0.116763	-0.116409	-0.127903	-0.584110	-0.011254	-2.793201	-0.259071
	(0.07023)	(0.13668)	(0.28078)	(0.22096)	(0.35421)	(2.65127)	(0.19934)
	[-1.66248]	[-0.85168]	[-0.45553]	[-2.64349]	[-0.03177]	[-1.05354]	[-1.29962]
D(LOGRECE(-1))	-0.024482	0.093486	-0.032998	0.018651	-0.130284	0.771542	0.074358
	(0.03840)	(0.07472)	(0.15350)	(0.12080)	(0.19364)	(1.44940)	(0.10898)
	[-0.63762]	[1.25112]	[-0.21497]	[0.15440]	[-0.67282]	[0.53232]	[0.68232]
D(TOP(-1))	-0.012831	-0.014577	0.004437	-0.035337	-0.020385	-0.472115	-0.010045

	(0.00563)	(0.01096)	(0.02251)	(0.01771)	(0.02839)	(0.21252)	(0.01598)
	[-2.27918]	[-1.33051]	[0.19713]	[-1.99512]	[-0.71798]	[-2.22153]	[-0.62864]
D(LOGODA(-1))	0.036393	-0.142835	-0.260906	-0.256017	-0.182369	2.231410	0.081631
	(0.09090)	(0.17690)	(0.36340)	(0.28598)	(0.45844)	(3.43143)	(0.25800)
	[0.40036]	[-0.80743]	[-0.71795]	[-0.89522]	[-0.39781]	[0.65029]	[0.31640]
C	0.117433	0.172908	0.275908	0.643803	0.408727	0.793405	0.342911
	(0.07769)	(0.15119)	(0.31058)	(0.24441)	(0.39180)	(2.93261)	(0.22050)
	[1.51161]	[1.14368]	[0.88837]	[2.63411]	[1.04321]	[0.27055]	[1.55517]
Number of coefficients		70					

Source: Author's Computation (2023)

4.5 Interpretation and Discussion of Results of LOGASI Model

The VEC estimation output consists of two parts as it in the first model. The error correction terms are denoted CointEq1, CointEq2, and so on in the output.

Analysis, Interpretation and Discussion of Short-run Result

ECM Model for ASI given Eq (7): Estimated ECM Model for ASI

$$\begin{aligned}\Delta\log\mathrm{ASI}_t = &-0.2984ECT_{t-1} + 0.246\Delta\log\mathrm{ASI}_{t-1} + 0.171\Delta\log FDI_{t-1} + 0.061\Delta\log FPI_{t-1} \\ &-0.117\Delta\log REPT_{t-1} - 0.024\Delta\log RECE_{t-1} - 0.013\Delta TOP_{t-1} + 0.036\Delta\log ODA_{t-1} + 0.117\end{aligned} \quad (9)$$

The result in Eq (9) shows that 1% change in the lag of ASI is associated with 0.246% increase in the current ASI, on average ceteris paribus in the short run, while 1% change in the lags of FDI, FPI and ODA are associated with a 0.171%, 0.061% and 0.036% increases respectively in ASI on average ceteris paribus in the short run. Also, 1% change in the lags of REPT, RECE and TOP are associated with 0.117%, 0.024% and 0.013% decreases respectively in ASI on average ceteris paribus in the short run.

The ECT result shows that the previous period's deviation from long run equilibrium is corrected into current period at an adjustment speed of 29.84%. Or the coefficient of -0.2984, suggests 29.84% movement back towards equilibrium following a shock to the model, one period later. The error correction term has a t-statistic of -3.17649, which is highly significant supporting the cointegration result. The coefficient on the error correction term is negative, so the model is stable.

Probability Values and DW statistic of the ASI-VECM Output

To see each equation the probability values and Durbin-Watson statistic of the VECM model, estimate the VECM model using the Ordinary Least Squares Method (OLS) method.

Table 5: VECM Ordinary Least Squares Method for LOGASI Model:

Estimation Method: Least Squares				
Date: 24/09/22 Time: 07:38				
Sample: 1987 2021				
Included observations: 35				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.298051	0.093830	-3.176487	0.0018
C(2)	0.246296	0.174895	1.408254	0.1608
C(3)	0.170578	0.168709	1.011077	0.3133
C(4)	0.060922	0.091685	0.664477	0.5072
C(5)	-0.116763	0.070235	-1.662479	0.0981
C(6)	-0.024482	0.038396	-0.637625	0.5245
C(7)	-0.012831	0.005630	-2.279176	0.0238
C(8)	0.036393	0.090902	0.400356	0.6894
C(9)	0.117433	0.077688	1.511609	0.1324
Determinant residual covariance		0.001161		
Equation: D(LOGASI) = C(1)*(LOGASI(-1) + 0.229494650494*LOGFDI(-1) - 0.261533763703*LOGFPI(-1) - 0.156192983765*LOGREPT(-1) - 0.31665691623*LOGRECE(-1) - 0.0445802729696*TOP(-1) - 0.203467135341*LOGODA(-1) + 1.77882081135) + C(2)*D(LOGASI(-1)) + C(3)*D(LOGFDI(-1)) + C(4)*D(LOGFPI(-1)) + C(5)*D(LOGREPT(-1)) + C(6)*D(LOGRECE(-1)) + C(7)*D(TOP(-1)) + C(8)*D(LOGODA(-1)) + C(9)				
R-squared	0.664332	Mean dependent var		0.159704
Adjusted R-squared	0.599511	S.D. dependent var		0.291745
S.E. of regression	0.244176	Sum squared resid		1.550172
Durbin-Watson stat	2.105653			

Source: Author's Computation (2023)

Using the probability values of the variables, using 5% level of significance to either reject or accept the hypothesis. From Table 5, the adjustment coefficient (λ) for the target variable (LOGASI) equation is C (1) = -0.2984 with a probability value of 0.0018. The target variable equation is significant at 0.0018(1%) level. The short run results show that the explanatory variables little or no effects or impact on ASI in the short run. VECM pays more attention to

the long run effects than the short run effects. Furthermore, use this VECM OLS results for LOGASI Model to check for short, long and strong causal effects.

Analysis and interpretation of Long-run Results

Long-run Cointegrating Equation for ASI Model is given in Eq.(8). Estimated Cointegrating Equation for ASI Model is given in Table 4 as

$$ECT_{t-1} = 1.000\log ASI_{t-1} + 0.229\log FDI_{t-1} - 0.261\log FPI_{t-1} - 0.156\log REPT_{t-1} - 0.317\log RECE_{t-1} - 0.045\log TOP_{t-1} - 0.203\log ODA_{t-1} + 1.779 \quad (10)$$

This is cointegrating or Johansen long run cointegrating equation (long run model). The cointegration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments. In this simple model, the only left-hand side variable is the error correction term. In long run equilibrium, this term is zero. Hence,

$$LOGASI_t = -1.779 - 0.229\log FDI_{t-1} + 0.261\log FPI_{t-1} + 0.156\log REPT_{t-1} + 0.317\log RECE_{t-1} + 0.045\log TOP_{t-1} + 0.203\log ODA_{t-1}$$

(10)

Here all the signs have been '**reversed'.** Now need to check whether the long run coefficient sign (negative or positive) matches with the reality or not. Variables here are all long run variables.

Using the **Normalized Cointegrating Coefficients** in the Johansen cointegration test result in Table 3), have the same equation as

$$LOGASI = -1.779 - 0.229\log FDI + 0.261\log FPI + 0.156\log REPT + 0.317\log RECE + 0.045\log TOP + 0.203\log ODA \quad (11)$$

Normalized cointegrating coefficients (standard error in parentheses)

In the Normalized cointegrating coefficients (standard error in parentheses, in the long run the signs of the coefficients are revised in the long run. Theoretically, the result showed that are consistence with the model a priori expectation.

The result shows that FPI, REPT, RECE, TOP and ODA will have positive effects on ASI in the long run. 1% change in the FPI, REPT, RECE, TOP and ODA will associate with 0.261%, 0.156%, and 0.317%, 0.045% and 0.203% increase in ASI respectively, on average ceteris paribus in the long run. The results also show that FDI will has negative effects on ASI in the long run. 1% change in FDI will associate with 0.291% decrease in the ASI in the long run. These results are partially in line with our apriori expectations of the long run effects of extent external financial flows on the Nigerian all share index.

v) Short Run, Long and Strong Causal Linkage Between the External Financial Flows and the Nigerian All Share Index.

4.6 Regressors' and ECT t-statistics Approach

The study use regressors' and ECT t-statistics of the VECM Causality to check for the regressors' and ECT t-statistics approach to check for the short run, long run and strong causal effects among the variables. If regressors' and ECT t-statistics are statistically significant, the short run, long run and strong causal effects are inferred. The estimated system equation of VEC OLS model of ASI model in Table 5 explain probability value of the VECM.

The probability values are extracted to know how significant the regressors are in explained the outcome variable. It is probability values that give significant relevance to the t statistic. If regressors' and ECT t-statistics are statistically significant, the short run, long run and strong causal effects are inferred. In this interpretation, the study use 5% level of significance to either reject or accept the hypothesis, the independents variables in our ASI model are not statistically significant in determining the long run growth of the ASI in the Nigerian capital market.

D (LOGASI) Estimated Equations: Substituted Coefficients

D(LOGASI) = - 0.298ECT(-1) + 0.229LOGFDI(-1) - 0.264LOGFPI(-1) - 0.156LOGREPT(-1) - 0.317LOGRECE(-1) - 0.045TOP(-1) - 0.203LOGODA(-1) + 1.779) + 0.246D(LOGASI(-1)) + 0.171D(LOGFDI(-1)) + 0.061D(LOGFPI(-1)) - 0.117D(LOGREPT(-1)) - 0.024D(LOGRECE(-1)) - 0.013D(TOP(-1)) + 0.036D(LOGODA(-1)) + 0.117 (12)

Note: the variables without the difference ('Ds') signs explain the long run effects, while the variable with the difference ('Ds') signs explain the short run effects.

From Table 5 and Eq (12) in LOGASI equation, C (1) is adjustment coefficient (λ) of ECT and it is negative (-0.2981) and its t-statistic is statistically significant (-3.176487), with a probability value of 0.0018 less than 5%. This shows there is convergence and long run causal relationship in the ASI model. Also, in the LOGASI equation only D (TOP (-1)) probability value is (0.0238) is less than 5% level of significant. Thus, only this variable TOP has causal effects on ASI in the short run and also in long run (see the VECM analysis Table 4).

The fact that results the t-statistics of the D (TOP) in the short run is statistically significant and the t-statistics of the ECT is also statistically significant in the long run, these joint statistically significance between the variables in the short and long run implies a strong causal relationship in between the variables. The ECM estimated result shows that the previous period's deviation from long run equilibrium is corrected into current period at an adjustment speed of 49.94% for the annual market capitalization model and 29.84% for the all-share index model.

5. CONCLUSION AND POLICY RECOMMENDATIONS

5.1 Conclusion

The findings from this study tend to conform to the a priori expectations on the impacts of external financial flows on capital market performance proxied as All-Share Index. The result showed that the independent consistency with the models a priori expectations in the long run and partially in the short run. The outcome of this study shows that external financial flows play an important role in capital market performance. The study found that official development assistance, foreign direct investment, remittance from the compensation of employees, foreign portfolio investment, and remittance from personal transfers have strong and significant positive effects on ASI in the long run and partially in the short run, while trade openness has little impact on total annual capital market performance in the long run.

Therefore, the study has shown that the behavior of the external financial flows are strong variables influencing all-share index in the capital market in Nigeria, especially in the long run. The stock indices movement is respective to the change in external financial flows basic.

5.2 Policy Recommendations and Implication

The suggestion from the study points to the fact that foreign direct investment, foreign portfolio investment, remittance from personal transfers, remittance from the compensation of employees, trade openness, and official development assistance are significant components of external financial flows that will cause an improvement in the level of the all-share index in the Nigeria's capital market in the long run and partially in the short run. As a consequence, thus, it is imperative to consider a package of recommendations directed at perfecting their goods in short and long-run interest in Nigeria. In the light of the above findings, the ensuing recommendations were suggested.

i. There is thus a strong suggestion that a veritable difference exists between short-run and long=run effects of foreign capital inflows to Nigeria on the capital market. The study suggested that the policy measures aimed at directing long-run capital inflows should not be the same as those aimed at changing the short-run patterns of flow.
ii. The study revealed that foreign portfolio investment exerts a positive significant effect on all-share index in Nigeria, the study recommended that capital market regulators should apply all necessary tools and continue to encourage the listing of private companies on the floor of stock exchange market.
iii. Also, there is the need for capital market regulatory authorities to implement effective and efficient policies that ensure free flow of market information related to all share index and stock market returns that exist within the floor of the capital market to prevent information asymmetries which could create volatility clustering in foreign portfolio investment in the country. Likewise, in order to boost the value of transactions in the Nigerian capital market, there is a need for the availability of more investment instruments similar to derivatives, convertibles, future, swaps, and options as accessible in the developed countries.
iv. The empirical result from the two equations shows that official development assistance in form of aid has a significant positive impact on the level of the all-share index in the short and long run. On the other hand, volatility of official development assistance by creating uncertainty in the flow of aid has a negative influence on domestic capital formation activity. Foreign aid is effective in enhancing growth. This paper therefore recommends that Nigeria should grossly avoid accepting aid from developed nations as it depreciates the economy and exposes the country's economy to external control, manipulation, and imposition of unpalatable economic policies that cannot augur well with internal revenue generation and economic sustainability.

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