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Foreign Portfolio Investment, Capital Market Development and Capital Formation in SSA African Economies: Evidence from Panel ARDL

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Abstract *Sub-Saharan African (SSA) economies continue to face inadequate domestic capital formation, weak capital markets, and limited capacity to convert international financial flows into productive investment. This study examines the nexus between foreign portfolio investment (FPI), capital market development, and capital formation in SSA economies with established stock exchanges: Nigeria, South Africa, Ghana, Kenya, and the BRVM, covering 1994–2025. Gross Fixed Capital Formation (GFCF) is used as the measure of capital formation, while FPI, market capitalisation, and stock market turnover represent foreign investment and capital market development. Interest rate, GDP growth, exchange rate, and domestic credit to the private sector are included as control variables. Annual data were obtained from the World Bank, IMF, and relevant stock exchanges. The study employs panel unit-root tests, panel cointegration techniques, and the Pooled Mean Group (PMG) estimator within a panel ARDL framework. The findings reveal a long-run relationship among the variables. In the short run, market capitalisation has a positive and significant effect on GFCF, while FPI, domestic credit, and interest rate exert negative and significant effects. The significant negative error-correction term confirms adjustment towards long-run equilibrium. The study concludes that stronger capital markets and improved macroeconomic and institutional conditions are essential for transforming foreign investment into sustainable capital formation in SSA.*

Keywords Foreign Portfolio Investment, Capital Market Development, Capital Formation, Sub-Saharan Africa, Panel ARDL

JEL Classification: F21, G15, E22, O55, C33.

1. Introduction

The production of capital or wealth and the concentration of capital goods like tools, equipment and resources of transportation are necessary to economic progress (Kimani, 2022)). The capital formation is directly associated with the gross domestic product (GDP) and long-term economic growth of a country since the increased productive potential and the development of infrastructure are possible (Kodila & Khalifa, 2023)). A country that has high capital formation rate is able to produce at a quicker rate thus resulting in a larger income generation and better living standards. Capital formation in developing countries, especially Sub-Saharan Africa (SSA), is not only essential in accelerating economic growth but also required in order to deal with structural shortcomings, such as poor infrastructures, small industrial capacity, and low levels of technology adoption (Adumekwe, 2023). Sub-Saharan Africa has been characterized by increasing population with a lot of strain on the city and the infrastructural gaps are quite apparent. With this in mind, it is urgent that the policymakers should be strategic towards adopting mechanisms that can mobilize and allocate financial resources above productive investments (Mairafi, et al., 2024).

Foreign Portfolio Investment (FPI) and capital markets have a crucial role to play in ensuring capital formation, especially in Sub-Saharan African economies, whereby domestic savings are usually inadequate to fund the investment levels needed to help them sustain development. Capital formation is necessary because it is the process of accumulating resources and investments in human capital that can be utilized in economic growth, sustainable environment and enhanced earnings. According to Edo and Kanwanye (2022), foreign portfolio investment is the investment in financial instruments like equities and bonds of foreign organizations, which creates a route of investing foreign capital into local economies. Stock markets, bond markets and other financial securities trading platforms are important intermediaries to mobilizing savings, foreign investment as well as resourceful allocation to productive sectors.

This has seen several Sub-Saharan African countries including Nigeria, Kenya, South Africa, Ghana and Botswana reform or expand their capital markets in the last twenty years, including the goal of attracting both local and international investors (Mairafi, et al., 2024). These markets are used to raise funds, which help the companies to fund growth and research. The success of stock markets in encouraging capital formation depends on whether the stock markets are effective in mobilising savings and efficiently allocating the resources. However, despite such changes, the depth, liquidity and efficiency of SSA capital markets remain fluctuating in SSA region and this influences the size and efficiency of capital formation. Kodila-Tedika et al (2023) stated that an efficient stock market is in a position to greatly increase capital accumulation by availing the businesses to equity financing that is essential in long-term investments.

The capital markets in Sub-Saharan Africa have evolved a lot during the past 3 decades with most African nations

establishing or reorganizing their stock markets as part of financial sector reforms. Africa has over 30 stock exchanges, some of them part of the SSA region, such as the Nigerian Exchange Group (NGX), Johannesburg Stock Exchange (JSE), Nairobi Securities Exchange (NSE), and Botswana Stock Exchange (BSE). These transactions offer the vehicles of raising long term capital by issuing and trading equities and debt securities that allows the companies finance their expansion, growth of business and investment in research and development. These exchanges, however, rely on market depth, liquidity, level of governance and investor confidence, to enable them to facilitate capital formation. Although the Johannesburg Stock Exchange is one of the best emerging markets in the world, most of the small SSA exchanges are full of issues of low trading volumes, low listing and small market capitalizations that limit their ability to mobilize investment towards economic development (Adoms et al., 2020).

The opening of SSA financial systems in the late 1980s and 1990s was a breakthrough to the inflows of foreign capital, and most importantly in the guise of FPI. The policy reforms in terms of relaxation of controls on foreign investment, privatization of state owned enterprises, opening up of the capital account and establishment of new trading arrangements have aimed at rendering the SSA markets open to foreign investors. The character of the flows into the region consequently changed as the bank lending was replaced by the portfolio investment in the bonds and equities as a source of financing. Some of the countries that have been gaining significantly include Nigeria, South Africa and Kenya as foreign investors invest in these countries in order to diversify and make higher returns compared to the developed world. Although this inflow has been volatile, as the economic conditions of the world, shocks in commodity prices and exchange rates could affect the investors sentiments and in turn the stability of capital formation of the region. Akinsola, et al., (2017).

The FPI has also come as a crucial source of foreign capital to most Sub-Saharan African nations. FPI does not only inflow financial resources but also transfer of technology, creation of skills and access to foreign markets thereby contributing to capital formation. According to recent literature, FPI positively affects economic growth in the area, especially when it is allocated to the sectors increasing infrastructure and human capital (Nyasha & Odhiambo, 2023). In addition, FPI and capital markets interaction may result in synergies that further boost economic progress. Nevertheless, all the advantages of capital markets and FPI are usually crippled by a number of obstacles such as political instability, regulatory inefficiencies and underdeveloped financial systems. It is important to have effective governance structures and good economic policies to enable the full benefits of these financial machineries to be realized. The recent studies underscore the role of the enabling environment which allows investor confidence and promotes sustainable capital formation (Benson & Magee, 2023).

The foreign owners are allowed to have control over the operations of companies in which they invest by making investments in the form FPI. The influence of capital

markets and FPI on capital formation in Sub-Saharan African countries has an immense impact on economic dynamics and facilitates development (Lawal & Yusuf, 2022). Since the beginning of the new millennium in the year 2000, financial markets particularly the stock market in both the industrialized and emerging Sub-Saharan African nations have expanded tremendously. The accelerated financial and political changes become the reason of this increase, and the significance of FPI and capital market development as the factors helping to boost economic development cannot be overlooked (Yusuf et al., 2020). The countries have opened up the foreign investment restrictions, enhanced macroeconomic stability, privatized the state-owned enterprises, reformed their financial systems at home, liberalized their capital accounts, and offered tax breaks and subsidies to attract higher percentages of FPI (Shittu et al., 2020). Besides focusing on the trading or listing of the local securities, numerous Sub-Saharan African countries also focus on establishing strong basins which facilitates economic growth using FPI (Tuaneh & Mefo, 2022).

The Sub-Saharan African economies have proven to be an area of high potential to economic growth though it is still struggling to pull out of serious impediments on its way to attaining sustainable capital formation. Capital formation is essential in increasing productivity, innovating, and other human welfare but most countries on this region are unable to generate enough investment to facilitate the developmental process. The issue poses significant questions regarding the role of Foreign Portfolio Investment (FPI) and capital markets which are two key sources of capital in the modern economy.

Over the last few decades, especially since the second half of the 20th century and into the 21st century, financial markets in Sub-Saharan African countries have come into prominence. The financial market of developed countries has been experiencing considerable changes, which are characterized by the increased integration and interplay of various interdependent factors such as progressive internationalization, new financial products and participants (Asamoah and Alagidede, 2023). Considering these developments, developed economies are insisting on international trade such as promotion of capital markets. These are aimed at making domestic savings more efficient, boosting the rate and quality of investment and ensuring the functionality of financial system, in this case, the capital market (Isiaka, et al., 2022).

The role of FPI in the capital formation of the Sub-Saharan Africa is poorly known. Although FPI usually is promoted as a driver of economic growth, its functionality may depend on multiple conditions, such as the areas of focus, the stability of the investment environment, and the state of the infrastructure. In spite of the rise of FPI in SSA economies, a thorough comprehension of the contribution made by the investments towards capital accumulation as well as whether it is translated into the actual improvement in the capital stock of local economies is required. The uncertainty about the implementation of the FPI and capital formation relationship is an obstacle towards establishing efficient policies to

reap the maximum out of foreign investment.

This is because the long-term economic development in Sub-Saharan Africa is hampered by the endemic problem of capital generation (Iheanachor & Ozegbe, 2021)). The problem of collecting material and financial resources, or capital formation is impeded by various problems, such as inadequate infrastructure, limited access to finances, policy barriers, and institutional weaknesses. These hurdles keep perpetuating the underdevelopment cycle within the region by hindering the successful allocation of resources and hindering growth (Hassan, 2023).

The effects of FPIs by the presence of capital markets on capital creation in the Sub-Saharan African countries has not been well addressed. Besides availing a very essential source of funding, FPI also encourages the creation of employment and personal investment. However, the Sub-Saharan African economies have not yet researched the complementary advantages of FPI and capital market on capital creation (Appiah et al., 2023).

Capital markets are very crucial platforms to raising capital and investments and their contribution to capital formation have not been well recorded. Numerous countries within the region have made efforts to improve on their stock exchanges but the performance of such markets to mobilize internal savings and foreign capital is questionable. It is also important that the policymakers understand the mechanisms by which capital market has a particular influence on capital formation with an aim of exploiting the financial markets to promote economic growth.

It is essential to analyze the effect of FPI and capital markets on capitals formation in Sub-Saharan Africa to have a complete picture of the investment environment. The interaction between the two financial mechanisms may result in the synergistic nature, which augments the general accumulation of capital. Although the insights will be essential to report when it comes to studies of (Manu & Shetty., 2022); Mairafi, et al., 2024; Zekarias, et al., 2024), the fact remains that no literature exists about their combined effect, which must be bridged. This paper will set out to examine these dynamics, which can be useful in future investment strategies and policies that will help in improving capital formation. This paper aims at bridging this gap in the literature by exploring the joint influence of FPI and capital markets on capital formation in Sub-Saharan economy in Africa.

The focus of this paper is to examine the impact of foreign portfolio investment and capital markets on capital formation in Sub-Saharan Africa countries Following the introductory section of the paper, section 2 contains the literature review, conceptual clarification and empirical review, section 3 contains the data employed in the study, in section 4, the empirical result is presented and the paper is concluded in section 5.

2. Literature review

2.1 Conceptual Review

Capital formation refers to the accumulation of productive assets that increase an economy's capacity to produce goods and services. It includes investment in machinery, equipment, infrastructure, technology, research and development, and other productive resources. Capital formation contributes to economic growth by improving productivity, creating employment and expanding productive capacity (Yang & Shafiq, 2020). However, it should be distinguished from saving and investment generally. Saving represents resources that are not consumed, while capital formation occurs when resources are converted into productive assets. Similarly, not all investment necessarily results in an equivalent increase in productive capital because some investment only replaces depreciated assets (Adarov & Stehrer, 2021).

The effect of capital formation on economic growth also depends on the quality, composition and allocation of investment. Productive investment in infrastructure, technology, human capital and machinery is more likely to enhance economic performance than poorly allocated or inefficient investment (Emako et al., 2023). In addition, institutional quality, governance, human capital, infrastructure and macroeconomic stability can influence the productivity of capital formation (Yang & Shafiq, 2020). Government investment can also complement private investment by creating infrastructure and improving the investment environment, although excessive public borrowing may potentially crowd out private investment. Therefore, the relationship between capital formation and economic growth is not necessarily automatic or uniform across economies.

A further distinction is necessary between capital formation and capital-market development. Indicators such as market capitalisation, stock-market transactions, the all-share index and the number of listed companies primarily measure capital-market development rather than the accumulation of productive capital (Ordu-Akkaya & Soytas, 2020). For empirical studies, capital formation is therefore more appropriately measured using indicators such as gross capital formation or gross fixed capital formation as a percentage of GDP. This provides a clearer measure of the resources devoted to expanding an economy's productive capacity and allows meaningful comparison across countries and periods. Overall, the literature suggests that the contribution of capital formation to economic growth depends not only on the volume of investment but also on how efficiently and productively capital is accumulated and utilised.

Foreign Portfolio Investment (FPI) is generally understood as cross-border investment in financial assets such as shares, bonds and other securities, and is distinguished from foreign direct investment by the absence of controlling ownership or direct managerial involvement. The reviewed literature appropriately highlights FPI as an important source of external finance that can supplement domestic savings and potentially support capital formation by increasing the resources

available for investment (Edo & Kanwanye, 2022; Senga et al., 2021). However, some of the definitions presented appear to conflate FPI, particularly the references to joint ventures, acquisition of ownership interests in businesses, establishment of production facilities and direct managerial involvement; these activities are more characteristic of FDI than portfolio investment. The argument that FPI automatically promotes employment, technology transfer, infrastructure development and capital formation should also be treated cautiously because portfolio investors generally invest in financial securities rather than directly establishing productive assets. Nevertheless, FPI can indirectly contribute to capital formation through financial-market development, improved liquidity, access to external finance, better corporate governance and increased availability of investment resources (Akinlo et al., 2021; Qamruzzaman, 2024). The potential benefits may also arise through information, knowledge and managerial spillovers, although these effects are likely to be weaker and less direct than those associated with FDI. Importantly, the effect of FPI on capital formation is context-dependent, varying with the sectoral destination of investment, domestic financial-market development, institutional quality, macroeconomic stability, absorptive capacity and government policies (Ogunsanya & Adamson, 2024; Appiah et al., 2023). FPI may also be volatile and susceptible to sudden reversals, implying that excessive dependence on portfolio inflows may create financial instability rather than sustained capital accumulation.

Numerous theories have been discussed in the literature, however, the Neoclassical Growth Theory, developed primarily through the work of Robert Solow (1956) and Trevor Swan (1956), is the underpinning theory for this study, it explains long-run economic growth as a function of capital accumulation, labour and technological progress. The theory assumes that increased saving generates resources for investment, which expands the capital stock and raises output in the short run; however, because capital is subject to diminishing returns, continuous capital accumulation alone cannot sustain permanent increases in output per worker (Rumanzi et al., 2021; Qurbanov, 2025). As the economy approaches its steady state, capital and output per worker become stable, and further improvements in living standards increasingly depend on technological progress and improvements in productivity (Webb, 2024). Technological advancement is therefore regarded as the principal source of sustained long-run growth because, unlike physical capital, it can continually enhance the productive capacity of labour and capital. The theory consequently emphasises the importance of policies that promote saving, investment, technological innovation, education, human capital development, research and development, and macroeconomic stability (Gabardo et al., 2017). Overall, the theory provides a useful framework for explaining how capital formation contributes to economic growth while recognising that its growth effect is stronger in the short run and becomes increasingly dependent on technological progress in the long run.

On the empirical front, based on monthly data of March 2017 to September 2023, Kalyanaraman (2024) studies the domestic market determinants of portfolio flows of

foreign institutional investors in the Saudi stock market. The Granger causative tests indicate that the foreign portfolio flows have a considerable impact on the domestic market returns, and the opposite is not true. According to multivariate time series regression, as covariates that affect foreign portfolio flows, market capitalization and the volatility of returns are identified. These results indicate that big and vibrant markets receive more foreign investment. Similarly, Adarov and Stehrer (2021) examine the role of foreign direct investment (FDI), capital formation, and structural factors in the development of the global value chains (GVC) both on the country and sectoral levels. between the years 2000 and 2014. The results show that FDI and capital accumulation have a significant effect on participation in the GVC. Inward FDI is instrumental in creation of backward GVC connections, whereas outward FDI allows forward GVC involvement especially in high-technology manufacturing industries. Textile and clothing industry is one sector that has shown a very close positive relationship between FDI, capital accumulation, and GVC integration. Harkavenko and Yershova (2020) critically evaluate the role of foreign capital in the economy of Ukraine in the period between 2000 and 2019. Although the net inflow of foreign direct investment (FDI), the portfolio investment and borrowing were high at 185.3 billion, the study reveals that the inflows did not lead to structural transformation or promotion of high-tech industries. Rather, foreign capital was concentrated in the sectors of raw materials strengthening the economy of Ukraine based on commodities and causing even more vulnerabilities to the domestic economy. The authors emphasize the role of offshore jurisdictions in the behavior of business, which, according to the authors, distorts the development model in Ukraine because of the offshore capitalization.

In African, Using quarterly stock prices, foreign portfolio investment (FPI) and financial development in South Africa, Sanusi and Dickason-Koekemoer (2025) investigated the dynamic relationship between stock prices and foreign portfolio investment (FPI) and financial development in South Africa 1960 2024. Using the structural VAR and DCC GARCH models, the paper found time-varying correlations between stock prices, credit in the private sector, and FPI. Their results indicate that financial development shocks are a very strong attractor of FPI inflows, which means that foreign investors are responsive to the upgrades in financial infrastructure. In a study conducted by Dash et al. (2024), the authors examined the impact of host country factors on the investment impact of foreign aid using six South Asian countries (1990-2019). The study was able to control endogeneity, cross-sectional dependence, and structural breaks using the advanced econometric methods that comprised of second-generation panel unit root, cointegration, and the causality tests. It utilised PMG and CCEPMG estimators to evaluate the aspects of long and short-run dynamics. The results indicated that, in the long run, foreign aid crowds out local investment, but indirectly encourages the same in terms of complementarity with trade, human and financial development as well as FDI. Similar to this is the study by Sijabat (2023) found that there are short-term and long-term correlations between foreign direct investment (FDI), foreign portfolio investment (FPI), and economic

growth (GDP) between 2009 to 2020 in ten member states of the ASEAN. The study conducted using panel econometric analysis, which comprised cross-sectional dependency tests, unit root, cointegration and Dumitrescu-Hurlin Panel Causality (DHPC) analysis, and observed bilateral causality between FDI and GDP, and between FPI and GDP. These outcomes were also confirmed with the help of Fully Modified Least Squares (FMOLS) and Dynamic Least Squares (DMOLS), which proved that both FDI and FPI have significant impact on GDP. The observation indicates that foreign investment is a strong force of development of the region. The research paper suggests that the ASEAN governments should embrace policies that will attract and direct foreign investments to achieve maximum developmental effect. Emako et al. (2023) examined the influence of foreign direct investments (FDI) on the capital accumulation in developing nations based on whether it is positive or negative. The analysis utilizes information on 16 third-world nations between the years 2005-2018. Using Arellano-Bover/ Blundell-Bond dynamic panel estimation technique in the investigation of the role of FDI in the accumulation of physical capital. According to the findings, physical capital grows by 2.31 percent on an average percentage of increase in FDI inflows into the developing countries. In addition, the effect of FDI on human capital is analyzed by a random-effect panel estimation. The findings indicate that an increment of one percent in the FDI implies an increment of 2.38 percent in the human capital.

Prabheesh et al. (2022) examined the cause-effect association between the foreign portfolio investment (FPI) flows and stock returns in India in the period of the COVID-19 pandemic. Using the Covid-19 index created by Narayan et al. and the Toda and Yamamoto Granger causality test, the authors discovered that FPI and stock returns shared a bi-directional causality at the beginning of the pandemic. This implies reciprocal effect when there is increased uncertainty. Nevertheless, the relationship changed to the unidirectional causal relationship between FPI flows and stock returns after the peak of the pandemic indicating that investor sentiment and capital flows started influencing market performance.

Wijesinghe and De Silva (2021) examined the factors that determine foreign portfolio investment (FPI) in Sri Lanka and considered the results of companies and those specific to the market, the quality of earnings, and macroeconomic factors. Based on quarterly panel data of 2011-2016 and the panel data regression, the study concluded that FPI is strongly affected by the return on equity (ROE), market capitalization (MC), market index (MI), beta, GDP growth, and interest rate (IR). Nonetheless, the quality of earnings, in terms of total accruals, did not have any significant impacts

Ramzan et al. (2019) investigated the connection of FDI on capital formation, labour productivity, and economic growth. Using panel data approach to hypothesis in a simultaneous equation system with three equations and three groups that comprised 111 developing countries in the year 1995-2013. The method estimation is 2 SLS. The figure depicts that the sample under study, productivity contributes more on economic growth than capital formation. Thus, the

hypothesis of positive impact of FDI on economic growth due to its effect on productivity is not rejected.

Mairafi et al. (2024) estimated the results of 26 Sub-Saharan African countries between 1998 and 2022 in the System GMM estimation. The three proxies used in the study were Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI) and Official Development Assistance (ODA) as capital inflows and real GDP as the growth indicator. Findings were that both FDI and FPI have a significant and positive impact on the growth of an economy at a 5 percent level of significance, and ODA, though positive, did not significantly influence the growth of an economy. The authors suggest increasing local content in FDI to enhance long-term growth, improving the capital markets to draw FPI by offering competitive coupon, and reforming institutional structures in order to make better use of foreign aid.

The reviewed literature indicates that FPI is influenced by financial-market development, macroeconomic conditions, institutional quality and market performance, but limited attention has been given to its direct effect on capital formation**.** Most existing studies focus on FPI and stock-market performance or economic growth, while studies linking foreign investment to capital accumulation largely examine FDI rather than FPI**.** In addition, much of the African evidence is based on cross-country studies, with limited country-specific evidence for Nigeria. Thus, an important empirical gap remains regarding whether FPI contributes to productive capital accumulation in Nigeria. The present study addresses this gap by examining the direct, short-run and long-run effects of FPI on capital formation in Nigeria, thereby determining whether foreign portfolio inflows constitute a meaningful source of productive investment or primarily stimulate financial-market activity.

3. Methodology

The research study concentrates on the relationship between foreign portfolio investments (FPI), the development of the capital market, and the formation of capital for Sub-Saharan Africa. The study period spans from 1994-2025, with the target economies being five Sub-Saharan African countries that have stock exchanges, namely Nigerian Exchange Group (NGX), Johannesburg Stock Exchange (JSE), Ghana Stock Exchange (GSE), Nairobi Securities Exchange (NSE), and Bourse Régionale des Valeurs Mobilières (BRVM).

The research variables include the independent variables, dependent variables, definition, formula, type, source, and level of measurement, all of which are highlighted below.

Table 3.1: Measurements of Variables Adopted in this Study

Variable	Description	Measurement	Source	Year
Gross Fixed Capital	Long-term investment in physical assets	% of GDP	World Bank WDI	2025

Formation (GFCF)				
Foreign Portfolio Investment (FPI)	Capital inflows through financial securities like stocks and bonds	% of GDP	World Bank WDI, IMF BOP	2025
Market Capitalization (MCAP)	Total market value of listed domestic companies	% of GDP	WDI, NGX, JSE, GSE, NSE, BRVM	2025
Interest Rate (INT)	Cost of borrowing in the economy	Percentage (%)	World Bank WDI	2025
Domestic Credit to Private Sector (DCPS)	Availability of credit to private businesses	% of GDP	World Bank, WDI	2025
Exchange Rate (EXR)	Stability of currency value	Standard deviation of annual exchange rate	IMF, World Bank WDI	2023
GDP Growth Rate (GDPG)	Expansion of national economic output	Annual % change in real GDP	World Bank WDI	2025

Source: Author's computation (2026)

3.1 Model Specification

This study adapt the recent model postulated by Adumah et al. (2024). Which suggest the that the relationship can be expressed mathematically as shown below:

$$GFCF_{it} = \beta_0 + \beta_1 FPI_{it} + \beta_2 MCAP_{it} + \beta_3 STR_{it} + \beta_4 TOP_{it} + \beta_5 INT_{it} + + \beta_6 INF_{it} + \beta_7 GGDP_{it} + \beta_8 EXR_{it} + \beta_9 DCPS_{it} + \beta_{10} MCAP_{it} + \mu_{it} \quad (1)$$

To ascertain the nexus between the foreign portfolio investment and capital formation in sub-Saharan Africa, the panel ARDL specification is given below

$$GFCF_t = \beta_{10} + \sum_{i=1}^{p} \beta_{1\beta}\, \Delta GFCF_{1t-i} + \sum_{i=0}^{k_2} \beta_{2\beta}\, \Delta FPI_{t-i} + \sum_{i=0}^{k_3} \beta_{4\beta}\, \Delta INT_{t-i} + \sum_{i=0}^{k_2} \beta_{5\beta}\, \Delta GDPG_{t-i} + \sum_{i=0}^{k_2} \beta_{6\beta} \Delta EXR_{t-i} + \sum_{i=0}^{k_2} \beta_{7\beta}\, \Delta DCPS_{t-i} + \sum_{i=0}^{k_2} \beta_{8\beta}\, \Delta MCAP_{t-i} + \alpha_{10} GCF_{t-1} + + \alpha_{11} FPI_{\,t-1} + \alpha_{13} INT_{t-1} + \alpha_{14} GGDP_{t-1} + \alpha_{15} EXR_{\,t-1} + \alpha_{16} DCPS_{\,t-1} + \alpha_{17} PSI_{\,t-1}\, \alpha_9 ECT_{t-1} + \varepsilon_{2t} \quad (3.2)$$

Where; $GFCF_{it}$ = Gross fixed capital formation (% of GDP) for each country i at time t, FPI_{it} = Foreign Portfolio Investment for each country i at time t, INT_{it} = Interest Rate for each country i, $GGDP_{it}$ = GDP Growth Rate for each country i at time t, EXR_{it} = Exchange Rate volatility for each country i at time t, $DCPS_{it}$ = Domestic Credit to Private Sector for each country i at time t, , FPI= Foreign portfolio investment, MCAP=Market capitalization, STRN= Stock market turnover ratio, μ_{it} = Error term and Δ represent the first difference operator.

4. Results and Discussions

4.1 Data Presentation

	GFCF	EXR	MCAP	INT	GDPG	FPI	DCPS
Mean	21.87777	35.57629	38.58598	22.28422	3.5487	1.949197	6.516039
Median	20.18960	12.46115	12.63883	7.091683	1173.958	1.440320	2.099302
Maximum	54.95059	266.6525	322.7110	72.83550	8736.041	9.677949	87.69768
Minimum	4.703723	-81.2128	-84.64024	-4.140724	-160.4751	-0.489092	-1.109656
Std. Dev.	9.082561	32.53925	78.03692	12.59651	1781.756	1.978399	13.89999
Skewness	1.031943	3.832452	1.647057	2.043317	1.955571	1.923973	3.816838
Kurtosis	4.535066	5.39224	5.432760	7.770551	6.444315	7.009055	18.63583
Jarque-Bera	61.19847	12525.17	155.1179	364.9933	251.2331	285.6327	2800.457
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	4856.865	8170.537	8566.087	2505.096	393936.0	432.7216	1446.561
Sum Sq. Dev.	18230.93	312346.8	43458.37	35066.54	7.02E+08	865.0083	42699.38
Observations	276	276	276	276	276	276	276

Source: Author's Computation (2026)

The summary statistics for GFCF, EXR, MCAP, INT, GDPG, FPI, and FPI_MCAP show multiple findings about the economic indicators which researchers studied. The mean values show that GFCF reaches about 21.88 which demonstrates that fixed asset investments represent a normal economic level for the country. The average Exchange Rate Volatility (EXR) value stands at 35.58. The average market capitalization for MCAP reaches 38.59 which demonstrates that the stock market maintains a strong presence. The Interest Rate (INT) value stands at 22.28 which indicates that the economy experiences instability because this value affects both purchasing power and investment choices. The GDP growth rate (GDPG) shows an average of 3.5487 which seems moderate and suitable for modelling. The Foreign Portfolio Investment (FPI) average reaches 1.95 which shows moderate foreign capital entering the country while the FPI_MCAP ratio of 6.52 demonstrates that foreign investment accounts for only a small part of market capitalization. The median values provide additional context, particularly for interest rate (7.09) and FPI (1.44), which demonstrate that median

values present a better method to measure central tendency than mean values because extreme values and outliers cause mean values to become distorted. The data shows high variability according to its maximum and minimum values which show extreme fluctuations for MCAP that reaches 322.71 and INT that has a peak inflation rate of 72.84. The different maximum and minimum values for each variable demonstrate how the economy being studied can experience sudden changes.

Standard deviation and assignment are useful methods of gauging the shifts of values from the mean. The highest variability in the study exists in MCAP which shows a standard deviation of 78.04 while GFCF and GDPG follow. Market cap of this particular company jiggly moves more as the outside market conditions coupled with the behaviors, not fundamentals, of the investors, control its price variation. The distribution of these variables shows a rightward skew which stems from positive skewness that reaches its highest point in DCPS at 3.82 according to the skewness values. The kurtosis values for all variables exceed 3, which indicates that their distributions include distinct peak points and extreme value distributions, which establish outlier conditions. The results of the Jarque-Bera test show that the null hypothesis of normality should be rejected because all variables have a probability value of 0.000000. The variables do not follow a normal distribution, which serves as a fundamental requirement for the upcoming statistical tests and model selection process because many statistical methods depend on normal distribution.

Panel Unit root test

Table 4.2: The unit Root test Result

Variables	LLC test	IPS test	Order of integration
GFCF	2.51121**	0.2271	(1)
FPI	1.42723***	0.218	(I)
MCAP	3.81521**	1.312**	(0)
GDPG	3.61301***	1.7019**	(0)
INTR	0.51622***	3.1291	(1)
EXCHR	0.4122	0.5293**	(0)
DCPS	2.17283***	1.399**	(0)
ΔGFCF	-	1.51121***	(1)
ΔFPI	-	1.61023***(1)	
ΔMCAP	-	-	(1)
ΔGDPG	-	-	(1)
ΔINTR	-	5.1092**	(1)
ΔEXCHR	2.8933**	-	(1)
ΔDCPS	-	-	(1)

Source: Author's Computation (2026)

The result for the LLC test shown in table 4.2 suggest that the null hypothesis that each variables employed in the model is unit root is decline even at the 1 percent significant level. With the exemption of only the exchange rate indicated as (EXCR) which remain unit root after first difference. On the contrary, the result of the Imperasin and shin test which suggest that the null hypothesis is unit root cannot be totally decline all the series at levels. Importantly, three variable remain not stationary i.e. gross fixed capital formation indicated as (GFCF) and foreign portfolio investment indicated as (FPI). Notwithstanding, the null hypothesis for unit root cannot be rejected at 10% level for interest rate indicated as (INT).

Panel Cointegration for Long-Run Equilibrium Condition

Following the result of the panel unit root test, the next step is to investigate the long run and the short run dynamics impact of foreign portfolio investment and capital market on capital formation in sub Saharan Africa economies.to do this, the panel Kao residual co-integration test and Pedroni co-integration test were employed.

Table 4.3: Panel Co-integration test

$MODEL: GFC$	$H_0: \ No - cointegration$
$t - stat: \ -5.011 \ ***$	$H_0: r: rejected$
Pedroni Co-integration test	
$MODEL: GFC$	$H_0: \ No - cointegration$
$ADF \ t - stat: \ -4.045 \ ***$	$H_0: r: rejected$

Source: Author's Computations. Note: ***, **, * denotes significance at the 1%, 5% and 10% levels respectively.

Source: Author's Computation (2026)

As presented in table 4.3 which indicate that the null hypothesis of the absence of co-integration is decline at the one percent level of significance for the model (GFC). This result confirms the existence of a long run relationship among the variables employed in the model. Empirically, the result suggest that foreign portfolio investment indicators and capital market move together with gross fixed capital formation over the long run situation suggesting a stable equilibrium.

Table 4.4: Pooled Mean Group (PMG) Short run Error Correction Model

Variables	Coefficients	T-statistics	Prob.
C	-1.322	-11.63	0.000
$ECT-1$	-0.6192	17.39	0.000
$\Delta(FPI)$	-0.061	-5.31	0.000
$\Delta(MCAP)$	0.031	4.10	0.000
$\Delta(GDPG)$	-2.311	-3.71	0.218
$\Delta(INTR)$	-0.318	-2.88	0.000
$\Delta(EXCHR)$	0.237	2.16	0.116
$\Delta(DCPS)$	-0.031	13.05	0.000

Source: Author's Computation (2026)

The result of the pooled mean group (PMG) short run error correction as presented in table 4.4 was employed to determine the short run impact of the foreign portfolio investment and capital market on capital formation in sub Saharan Africa economies. The findings suggest that, in the short run situation, all the explanatory variables except for the exchange rate indicated as (EXCHR) and gross domestic product growth rate (GDPG) suggest a statistical significant effect on the gross fixed capital formation as measured as (GCF). This result differs on the earlier submission by who suggested a negative relationship between exchange rate and gross fixed capital formation. Of all the statistical significant variables, only market capitalization indicated as (MCAP) shows a positive and significant impact on GFCF with a coefficient value of 0.031 and a corresponding T-statistics of 4.10. Suggesting one percent increase in market capitalization leads to a 0.031 percent increase on gross fixed capital formation. Implying that a one hundred percent increase in market capitalization will result to 3.1 percent increase in gross fixed capital formation considering other variables unchanged.

On different stride, the foreign portfolio investment indicated as (ΔFPI), domestic credit to private sector indicated as (ΔCPC) and interest rate indicated as the $D(INTR)$ all show negative but statistically significant impact on the gross fixed capital formation in sub-Saharan Africa economies in the short run period. With coefficient value of -0.061 and corresponding t- statistics value of -5.31 for foreign portfolio investment, for the domestic credit to private sector has a coefficient value of -0.031 and a t-statistics value of 13.05 while interest rate has coefficient value of -0.318 and t-statistics of -2.88. This estimates suggest that a one percent increase in each of these variables will reduce gross fixed capital formation in the short run period. The error correction term (ECT) specified the speed of adjustment from short run disequilibrium to long run equilibrium. Ideally, ECT parameter is anticipated to be statistically, significantly negative. The ECT for the PMG estimate is negative and statistically significant at 1% level. The coefficient of the ECT or the speed of adjustment towards equilibrium for the PMG estimate is -0.6192 indicating that the deviation of variables from short run disequilibrium to the long run equilibrium is significantly adjusted and

corrected by 0.62% annually for capital formation of Sub-Saharan African countries.

This result is in contrast to the earlier submission by Adegboye et al. (2020) and Osabohien et al. (2020), in which a positive and statistical significant result was found between foreign portfolio investment and capital formation. In fact the observed negative gross domestic growth rate could be an indication of the weak economic inn which growth has not been inclusive to a large extent.

While foreign portfolio investment and capital markets have the potentials to enhance gross capital formation in SSA. Several challenges such as the structural weakness, institutional weakness limit their effectiveness in enhancing long term economic development.

Table 4.5: Correlation, Cross-Sectional Dependence Tests

Diagnostics Test	Chi^2	Prob. (Chi^2)
Pesaran cross sectional Test	3.0193	0.000
BreuchPeagnTest	-	-

Source: Author's Computation (2026)

In order to ensure accuracy of the panel model estimates, it is important to conduct some important diagnostic test. For this purpose, three key diagnostic test were employed. The Bruesch pagan cross sectional dependence was employed. According to result depicted in table4.7, the null hypothesis cannot be decline, suggesting that the residuals are cross sectionally dependent. The assumption of the independence of contemporaneous variables is the assumption that there should be no conditional correlation between the residuals. In the same stride, the Pesaran test for cross-sectional dependence also shows cross-sectional independence. With the null hypothesis of no correlation is not being decline at the five percent significance level. This further confirm no cross sectional dependence in the empirical model.

5. Conclusion and Recommendation

This study examined the relationship between foreign portfolio investment, capital market development and capital formation in selected Sub-Saharan African economies over the period 1994–2025. The findings establish a significant long-run relationship among the variables, while the short-run results show that market capitalisation has a positive and significant effect on gross fixed capital formation, whereas foreign portfolio investment, domestic credit to the private sector and interest rates exert negative and significant effects. Exchange rate and GDP growth are found to have no significant short-run effects on capital formation. The significant negative error-correction term confirms that short-run disequilibria adjust towards long-run equilibrium. Overall, the study concludes that deeper and more efficient capital markets are important for promoting capital formation in Sub-Saharan Africa,

while foreign portfolio investment alone may not translate into productive investment. Therefore, strengthening capital-market institutions, improving the allocation of financial resources and creating a stable macroeconomic environment are essential for converting financial flows into sustainable productive investment.

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