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Transitory and Permanent Effects of Capital Market Development on Capital Formation in Sub-Saharan Africa

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ABSTRACT: Recent research on the relationship between capital market development and capital formation is inconsistent.This study investigates the effect of capital market development on capital formation, and theempiricalmethodutilisedinthisstudy, the Mundlak method,decomposestheeffectsofcapitalmarket development on capital formation into transitory and permanent effects. This decomposition is important in order to ascertain whether capital market development is beneficial to short-run or long-run capital formation, which is a key determinant of a country's growth level.The study investigates the capital market development-capital formation nexus byapplyingaggregate dataset from seven countries within the Sub-Saharan African regionnamelyGhana,Kenya,IvoryCoast,Mauritius,Nigeria,SouthAfrica,and Zimbabwe over the period from 1980 to 2021. The results indicatethat capital market development has a transitory negative impact on capital formation,but has a permanent positive impact on capital formation. More importantly, the permanent effect seems more robust and stronger than the transitory effect. The findings conform to conventional wisdom that Sub-Saharan African countries with well-developed capital markets experience long-run benefits of increased capital formation and improved economic development. Based on the research findings, we recommend that capital market authorities of Sub-Saharan African countries should prioritise policies that will boost productivity, liquidity, and resilience. The study further recommends that Sub-Saharan African countries must improve their capital markets' infrastructures, and eliminate the tax, legal and regulatory hurdles that impede the development of their domestic capital markets.

KEYWORDS:*Capitalmarketdevelopment,capitalformation,Sub-Saharan Africa, Mundlak Methodology, Panel data.*
JEL Classification:*E22, E44, G15, N27, O1*

I. INTRODUCTION

One of the primeval policy measures that marked the commencement of financial liberalisation was the removal of interest rate restrictions. Around the 1960s to 1970s, interest rates were controlled by the government of most developing countries in a bid to fund government budget deficits. However, by the early 1970s, proponents of the financial liberalisation hypothesis (McKinnon 1973; Shaw 1973) criticised these so-called government interventions and urged governments and financial authorities to liberalise their financial systems. Following on from Mackinnon (1973) and Shaw (1973) critique of financially repressive interest rate policies that restrain growth of developing economies, there has been a perspective shift in the literature, with a focus on debt and equity market liberalisation and its corresponding effect on capital market development, capital formation and growth.

By way of definition, capital markets are a segment of a country's financial system designed to channel surplus funds towards investors that require capital, by means of financial instruments such as bonds, debentures, mutual funds, and money market securities. Capital markets comprise a primary market where financial instruments and securities are sold to investors, and a secondary market where previously issued securities are traded among investors via public or private listings (World Bank, 2020).

According to the World Bank (2020), the preconditions for capital market development include macroeconomic stability of the domestic economy, a relatively developed financial system and a solid legal and institutional environment; and a well-developed capital market is essential to growth of the domestic economy in several ways. Capital markets assemble surplus funds in the economy and increase the amount of capital available to businesses and firms, which may lead to the creation of additional jobs and real wage growth. Capital markets also provide funds to finance riskier investments for firms that may not be able to access banking

sector credit; and may present more lucrative investment options than bank deposits, albeit higher risk. Furthermore, to minimise inflation, foreign exchange risks, and maturity mismatches, economic agents can acquire long-term local currency financing through domestic capital markets, thus, enhancing financial stability (World Bank, 2020; Afolabi *et al*, 2021; Udo *et al*, 2021).

In the capital market development literature, there are two divergent views relating to the efficacy of the policy. Advocates in favour of capital market development (for instance, Bencivenga*et al*, 1995; Greenwood and Smith, 1997; Obstfeld, 1998; and Henry, 2000) argue that developed capital markets promote effective and efficient financial resource allocation, reduce cost of equity capital as a result of a fall in interest rates arising from an increase in foreign participation in the domestic capital market;improvethesizeand liquidityofthedomesticcapitalmarket;increaseavailabilityoffinancial resources for capital formation and consequently improve economic development and growth. Importantlythisistheprevailingviewofthe World Bank and theInternationalMonetaryFund(IMF).

Contrarily, some advocates argue that countries with less-developed capital markets may experience a decline in their real macroeconomic indices, and their argument is based on the premise that capital market activities are largely portfolio flows, which are short term and may have very limited impact on growth. For instance, Stiglitz (2000) asserts that liquidity in domestic capital markets may not encourage information acquisition or corporate governance. In addition, Devereux and Smith (1994) maintains that risk sharing is greater in developed capital markets and may have negative consequences on savings and capital formation. In line with this assertion, Stiglitz (2000) maintained that from historical experience, the so-called predictions of the capital market development advocates may be precise, but unrealistic.Whereas some studies have researched the effects of financial liberalisation and development in Sub-Saharan African countries (seeforinstanceFowowe,2008; MisatiandNyamongo,2012;GhazanchyanandStotsky,2013; Ahmed, 2013; Menyah*et al*,2014; Abbas *et al*, 2016; Ariwa (2017); and Onisanwa and Adaji (2020), investigations on the efficacy of capital market development and its effect on capital formation in the region has received very limited attention.

Thus, the main objective of this paper is to investigate the impact of capital market development on capital formation. The empirical method employed decomposes the effect of capital market development on capital formation into transitory and permanent effects. This decomposition is important as it shows whether the effect on capital formation is a mere "short run" shock, or a permanent "long run" effect that is a key determinant of a country's growth level. Using a random effects model with a Mundlak fixed effects estimator ensures that the economically correct fixed effects structure is preserved, thus preventing correlation between unobserved country specific effects and the explanatory variables. Hence, the purpose of this paper is to synthesize and analyse available data from seven Sub-Saharan African countries inorder to provide empirical evidenceinacomparativeframeworkontheefficacyofcapitalmarketdevelopment, thus aspiring to contribute to the theoretical, empirical and policydiscourse. Apart from the introduction, this paper is structured into four Sections. Section 2 presents a review of the theoretical and empirical literature on capital market development and capital formation. In Section 3, we present an overview of the data, the theoretical framework, specify the empirical models and discuss the estimation procedures. Section 4 discusses the empirical results, while Section 5 concludes with policy recommendations.

II. LITERATURE REVIEW

This section reviews the theoretical and empirical literature on the efficacy of capital market development and the corresponding effects on capital formation.

2.1 Theoretical Literature

The literature on capital market development is highly controversial as existing theory does not seem to precisely validate the claim that countries with liberalised and well-developedcapital markets experienceincreased output via increased savings mobilisation and capital formation.

A strand of the literature argue that capital market liberalisation induces capital market development, which is in turn, beneficial to the economy in several ways. This school of thought postulates that countries with liberalised capital markets have well-developed capital markets owing to greater foreign investor participation and better range of financial instruments; and experience a surge in financial inflows that will boost capital formation and consequently raise living standards of the domestic populace via increase in the level of economic activity, thereby promoting long term economic growth. Some researchers in this school of thought include Greenwood and Smith (1997) who develop a theoretical model to explain how capital market development through liberalisation increases savings mobilisation and promotes capital formation; and Obstfeld (1998) who argues by way of a theoretical framework, that internationally integrated capital markets help to promote risk sharing which feeds into economic growth.

Contrarily, some theoretical studies argue against the efficacy of well-developed capital markets, citing

that although advanced countries may benefit from well-developed and liberalised capital markets, developing countries may become worse off as they may neither have a relatively developed financial system nor a robust legal and institutional environment. Proponents of this school of thought such as Stiglitz (2000) argues that capital markets behave differently from product markets due to their inherent characteristics such as asymmetric information, moral hazard, and adverse selection; hence, developing countries with developed capital markets may experience a surge in foreign portfolio flows which are highly volatile and have limited connection to real economic activities. Furthermore, Devereux and Smith (1994) also utilize a standard representative-agent and overlapping-generations theoretical model to show that developed capital markets may encourage greater risk sharing. In their view, greater risk sharing may bring about reduced savings rates, which is detrimental to capital formation and economic growth.

2.2 Empirical Literature

There is a wealth of empirical research on the efficacy of capital market development in boosting capital formation and growth, however, there exists a controversy over this connection that is vigorously deliberated upon. The study by Levine and Zervos (1998) was one of the first studies found to challenge the efficacy of capital market development for boosting capital formation. The authors carried out a broad empirical study in a cross section of 16 emerging market economies from 1986 to 1993, investigating whether capital market development has a permanent positive effect on capital formation in countries with more integrated capital markets. The authors find no evidence that increased capital market development and integration leads to increased capital formation in the long run. This finding is rather unexpected, owing to ample evidence that capital market development through liberalisation impacts on the cost of equity capital. However, a possible explanation for Levine and Zervos (1998) finding is that capital market development may cause a transitory increase in the growth rate of capital formation, not a permanent change.

On another note, Henry (2000) carries out an empirical investigation to ascertain whether capital market development causes investment booms in Argentina, Brazil, Chile, Columbia, India, Korea, Malaysia, Mexico, the Philippines, Thailand, and Venezuela. The author applies event study techniques to test whether the data from the 11 developing countries are consistent with theoretical predictions. The empirical results indicate that 9 out of the 11 countries experienced a significant improvement in capital formation levels in the first year following liberalisation of the capital market; 10 out of the 11 countries experienced a surge in capital formation levels in the second year following capital market liberalisation; and 8 out of the 11 countries experienced an increase in capital formation in the third year following liberalisation.

Furthermore, employing a panel of 27 countries that liberalised their capital markets between 1980 and 1985, Fuchs-Schundeln and Funke (2003) investigate the capital market development-capital formation nexus by analysing how open capital markets impact on the financial sector and macroeconomic development. Their results confirm that capital formation increased by 6 percentage points in the second year, and by 14 percentage points in the fourth year following capital market liberalisation. In addition, their results indicate that when institutions are strengthened prior to liberalisation, the effect on capital formation and growth tends to be much higher. Thus, the authors conclude that capital market liberalisation stimulates economic growth via its impact on capital market development and capital formation.

Osinubi and Amaghionyeodiwe (2003) investigate the effects of capital market development on investment and long run growth in Nigeria using time series data for the period 1980 to 2000. In their study, capital market development is measured by two indicators- market capitalisation of listed companies to GDP ratio and value of stocks traded to GDP ratio; investment is measured by gross fixed capital formation to GDP ratio; and economic growth is measured by real GDP per capital growth. The indicators employed by Osinubi and Amaghionyeodiwe (2003) for capital market development, investment and economic growth are quite similar to the indicators used in this paper.Usingtimeseriesempiricaltechniqueswithina VARframework,theirresults suggest that although the capital market development indicators are positively associated with investment, the relationship is not statistically significant. Their results also indicate the absence of a significant positiverelationshipbetweenthecapitalmarketdevelopment indicatorsandeconomicgrowthboth in the short run and in the long run inNigeria.

Sarkar (2007) employed data from 21 non-OECD countries and 16 OECD countries to investigate the capital market development-capital formation nexus, from 1976 to 2002, using the ARDL approach. The empirical results indicate that capital market development boosts capital formation in 10 (4 OECD and 6 non-OECD) countries out of the 37 under investigation. The author concludes that there is typically no linkage between capital formation and capital market development that is favorable, for both developed and less

developed countries in the series; and notes that the strategy of promoting capital market development is only marginally effective for accomplishing the development objectives of LDCs.

With specific reference to MENA countries, Naceur*et al* (2008) explored the relationship between capital market liberalisation, capital formation, capital market development and economic growth in 11 countries from 1979 to 2005. The results from their panel studies indicate that there is no linkage between capital market liberalisation and capital formation in the short run and long run; but capital market liberalisation has a permanent positive effect on capital market development. The authors also maintain that when the institutional structure of the capital market is developed prior to liberalisation, the effects on capital market development and growth is strengthened and this finding is in line with Fuchs-Schundeln and Funke (2003).

On another note, Adelegan (2009) investigated the extent to which capital market development and financial integration boosts efficiency of allocation of investment funds, using annual firm level data for 85 manufacturing companies from 1984 to 2000 by means of event study methods. Their results indicate a positive relationship between capital market development and investment efficiency, which is beneficial to GDP growth. Similarly, Adewuyi and Olowokere (2010) found that capital market plays a significant role in the growth of the Nigerian economy by fostering an environment that is favourable for investment diversification.

Ajao (2011) carries a two-fold investigation to ascertain the relevance of the Nigerian Stock Exchange in promoting capital formation and growth of the Nigerian economy. The author employs the ordinary least squares procedure, using annual time series data from 1981 to 2009. The empirical results indicate an inverse relationship between capital market development and capital formation, but capital formation has a positive effect on economic growth. Hence, the author concludes that during the course of its many years of operation, the Nigerian Stock Exchange made a negligible contribution to long-term capital formation in Nigeria. The findings are similar to Abbas *et al* (2016) who conclude that Dar es Salaam Stock Exchange has no significant influence on capital formation in Tanzania from 2000 to 2011.

Interestingly, Ariwa*et al.* (2017) found that capital market efficiency positively impacts on manufacturing sector expansion, while capital market liquidity does not have a significant impact on the sector while investigating the impact of capital market development on Nigeria's manufacturing sector. Furthermore, Afolabi *et al.* (2017) showed that Nigeria's economic growth has a significant and favorable association with capital flows, stock turnover ratio, and market capitalisation, indicating that capital market development enhances businesses' capacity to raise capital, boost capital formation, and support economic expansion.

Very recently, Onisanwa and Adaji (2020) carried out an empirical investigation on the relationship between capital market development and investment growth in Nigeria from 1981 to 2018 using the Auto-regressive Distributed Lag method. The authors adopted three measures for capital market development namely market capitalisation ratio, turnover ratio, and value traded ratio; while investment growth was measured by gross capital formation to GDP ratio. Their results indicate that only value traded ratio had a favourable impact on capital formation. Both market capitalisation and turnover ratio were found to have a negative impact on capital formation both in the short run and long run.

A survey of the existing empirical literature suggests inconsistent results. These differences may be as a result of varying countries and time periods, distinct data types and empirical techniques adopted by various researchers. However, Gerdtham and Ruhm (2006) suggestthat empirical investigations on policy impact assessment may change if researchers were to distinguish between transitory and permanent effects. This paper therefore revisits this issue by investigating the relationship between capital market development and capital formation in seven Sub-Saharan African countries during the period 1980 to 2020. A novel contribution of this paper consists of decomposing the effect of capital market development on capital formation into transitory and permanent effects, in an attempt to reconcile the different findings in the empirical literature.

III. DATA AND METHOD OF ANALYSIS

In order to ascertain whether capital market development provides beneficial effects, this research paper examines the effects of capital market development on capital formation. The data employed in this study covers seven Sub- SaharanAfricancountriesnamelyGhana,Kenya,IvoryCoast,Mauritius,Nigeria,SouthAfrica,and Zimbabwe over the period 1980 to2021. The choice of the period under investigation and the number of countries in the sample is driven by the availability of data for the country variables included in the empirical models.

3.1 Data

The panel empirical analysis is limited to seven Sub-Saharan African countries due to availability of data for the period under investigation. The countries includeGhana,Kenya,IvoryCoast,Mauritius,Nigeria,SouthAfrica,and Zimbabwe over the period 1980 to2021. Thedataforcapitalmarketdevelopmentandmacroeconomicindicators for the seven countries under investigation areobtainedfromtheWorld Development Indicator database of the World Bank for the period 1980 to 2021.

3.2 Model Specification.

The main model employed in this research to ascertain the effects of capital market development on capital formation is presented below:

$$CF_t=\alpha_i+b_1SMC_{it}+b_2STOCK_{it}+b_3lnGDPCAP_{it}+b_4FDEV_{it}+b_5INFL_{it}+T_i+\varepsilon_{it} \quad (1)$$

where i represents the Sub-Saharan African countries of interest namely Ghana, Kenya,Ivory Coast, Mauritius, Nigeria, South Africa, and Zimbabwe, i.e., the cross-sectionelement; and t is the year (1980 to 2021), the time-series element; αi is the country-specific fixed effects intercept; and b (b1 to b5) are the partial slopes for each of theexplanatory variables.

Thekey variables of interest are the capital formation and capital market development indicators. Gross Capital Formation to GDP ratio, denoted as *CF* is the capital formation measure and is the dependent variable, in line with Kraay (1998); Misati and Nyamongo (2012); Vanni (2018); and Onisanwa and Adaji (2020). Market capitalisation to GDP ratio, denoted by *SMC*captures capital market size in line with Levine and Zervos (1998); Edison*etal.* (2002); Ariwa*et al.* (2017); and Onisanwa and Adaji (2020).Totalvalueofstockstraded to GDP ratio, denoted by *STOCK* is the indicator for capital market liquidity in line with Levine and Zervos (1998); Achy (2003); and Ariwa*et al*. (2017). Both the *SMC* and *STOCK* variables are the measures for capital market development, and are expected to have positive coefficients.

A few additional explanatory variables which are known to be important to capitalformation based on the literature are included in the regression model. For instance, theneoclassical investment theory suggests that the level of economic performance affectscapital formation to a large extent as countries with higher income levels will generallyhave larger domestic savings which will be used to finance investments hence, realGDP per capita in current US$, denoted by GDPCAP is used to account for wealtheffects on capital formation in line with Naceur et al. (2008). Furthermore, inflation,denoted by INFL is included in the model to control for macroeconomic stability in theregression model as in Boyd et al. (2001) because it is expected that the higher thevolatility of the macro economy, the less likely investors would invest their funds inthe capital market. Domestic credit to the private sector to GDP ratio, denoted FDEV, isalso included in the regression model to control for the effects of financial sectordevelopment as in Levine and Zervos (1998) and Ariwa et al. (2017).

3.3 Estimation Procedure

The empirical analysis begins with carrying out a panel unit root test for the variables of interest in the model in order to ensure stationarity. The series (gross capital formation, market capitalisation to GDP, total value of stocks traded, GDP per capita, domestic credit to the private sector and inflation) are tested for stationarity using Levin-Lin-Chu (2002) test. The null hypothesis is that all the panels contain a unit root, while the alternative hypothesis is that the panels are stationary.

Thereafter, we estimate a fixed effects model that includes year and country dummies, in line with Fowowe (2008). Following on from the fixed effects estimation, we estimate a random effects model with Mundlak (1978) decomposition, to disintegrate the effects of capital market development on capital formation into transitory and permanent effects (as in Bender and Theodossiou, 2015).

I. Panel Data Fixed Effects Estimations

The starting point of this research paper is the estimation of the fixed effects model specified in Equation (1)[1].

$$CF_t=\alpha_i+b_1SMC_{it}+b_2STOCK_{it}+b_3lnGDPCAP_{it}+b_4FDEV_{it}+b_5INFL_{it}+T_i+\varepsilon_{it} \quad (1)$$

*CF denotes gross capital formation (% of GDP); SMC denotes market capitalization to GDP ratio; STOCK denotes*value of stocks traded to GDP ratio; *lnGDPCAP* denotes log of real GDP per capita (in current US$);

[1] Equation 1 is the empirical model employed in this research and is drawn from several works in the financial development literature. For instance, see Kraay (1998); Misati and Nyamongo (2012); Vanni(2018), amongst others.

FDEV denotes domestic credit to the private sector (% of GDP); and *INFL* denotes the rate of inflation as measured by the consumer price index(CPI).

Equation (1) is referred to as the fixed effects model. In the fixed effects modelling technique, it is assumed that the time-invariant factors are unique to each country and should not be correlated with other country characteristics. Each country is different therefore, its error term and the constant, α_i that captures the individual country characteristics should not be correlated with the others.

II. Estimating the Transitory and Permanent Effects of Capital Market Liberalisation on Capital Formation

The framework of the Mundlak (1978) methodology is presented below.

Assuming that there exists a basic model:

$$\underline{Y} = X\underline{\beta} + \underline{\varepsilon} \quad (2)$$

where $\underline{Y}$ and $\underline{\varepsilon}$ are *n*-vectors, *X* is a *n* * *k* matrix of full rank and $\underline{\beta}$ is a *k* vector of parameters to be estimated. The error term is decomposed into:

$$\varepsilon_{it} = m_i + s_t + u_{it} \quad (3)$$

where m_i and s_t are systematic effects associated with the *i*th country and the *t*th year. $i = 1,\ldots..,N$; $t = 1,\ldots\ldots,T$; and $n = NT$. Hence, it is common knowledge that $X\underline{\beta}$ does not explain all the variation in $\underline{Y}$.

The basic model is re-written thus:

$$\underline{Y} = X\underline{\beta} + Z\underline{\alpha} + \underline{u} \quad (4)$$

assuming that

$$\underline{u} = (\underline{0}, \sigma^2 I_n), \qquad E(\underline{u}'X) = E(\underline{u}'Z\underline{\alpha}) = 0 \quad (5)$$

where $\underline{Z}$ is a matrix of dummy variables and $\underline{\alpha}$ is a vector of effects. Assuming that there is no time effect, *Z* can be re-written thus: $Z = I_N \otimes \underline{e}_T$ where $\underline{e}_T$ is a *T*-vector on ones. The Mundlak method also assumes that the *X*'s are deviations from their sample means. The properties of the various estimators being considered is dependent on the existence and extent of the relationships between the *X*'s and the effects. The regression below is introduced to account for such relationships:

$$\alpha_i = \underline{X}_{it}\underline{\pi} + w_{it} \quad (6)$$

Averaging over *t* for a given *i*:

$$\alpha_i = \underline{X}_{i.}\underline{\pi} + w_i$$

There is also the assumption that

$$w_{i.} \sim (0, \omega^2_1) \quad (7)$$

Apparently, it is evident that $\underline{\pi} = \underline{0}$ if and only if the explanatory variables are uncorrelated with the effects. Assuming that the projection matrix on the column space of *Z* is denoted by $K(Z) = Z(Z'Z)^{-1}Z'$ and its orthogonal complement by $M(Z) = 1\text{-}K(Z)$, Equation (7) can be expressed as an *NT* - vector below:

$$Z\underline{\alpha} = K(X\underline{\pi} + \underline{W}) \quad (8)$$

where $\underline{W}$ is the *NT*-vector of w_{it}.

Merging Equations (4) and (8) yields the following expression:

$$\underline{Y} = X\underline{\beta} + K(X\underline{\pi} + \underline{W}) + \underline{U} \quad (9)$$

$$\underline{\varepsilon} = \underline{U} + K\underline{W} \sim (\underline{0}, \sigma^2 I_{NT} + T\omega^2_1 K) \quad (10)$$

Given the above equations, under the random effects, there is a concern with the expectation of *Y* conditional on *X* and the grouping to be denoted by *Z*:

$$E(Y \mid .) = X(\beta + K\pi) \quad (11)$$

where $E(Y \mid .) \equiv E(Y \mid X, Z)$.

Similarly, the fixed effects model calls for the expectation of the *Y* conditional on *X* and the effects to be denoted by $Z\underline{\alpha}$:

$$E(Y \mid ..) = X\beta + Z\underline{\alpha} \quad (12)$$

where $E(Y \mid ..) = E(Y \mid X, Z\underline{\alpha})$

When the linearised form of Equation (1) is estimated using the fixed effectsmethod, it is assumed that any time-invariant factors are part of the country's fixedeffect. The empirical model in Equation (1) is referred to as a fixed effects modelbecause although, the intercept αi varies across the different countries underinvestigation, for each country, it is time-invariant. This is precisely why it isspecified as just αi without the time subscript. Bender and Theodossiou (2015)maintain that although the fixed effects modelling controls for country specificcharacteristics, it suffers from some crucial limitations. For instance, fixed effectmodels assume that country specific effects remain the same over time butrealistically, the effects vary over time due to policy variations. Another limitationof the fixed effect model is that it combines the effects of invariant factors into asingle fixed effect.

The long-term effect of capital market development on capital formation andeconomic development is ambiguous. If the effect of capital market development oncapital formation is not spontaneous, then one may argue that the effects of a changein the capital market indicators due to liberalisation may take a considerable lengthof time to manifest itself. This is the main reason why this paper incorporates the Mundlak(1978) estimation procedure, in order to decompose the effects of capital marketdevelopment on capital formation into transitory and permanent effects, thus,mitigating the shortcomings of the traditional fixed effects method. The Mundlak(1978) decomposition is important as it shows whether the effect on capitalformation is a mere "short run" shock, or a permanent "long run" effect that is a keydeterminant of a country's growth level. The Mundlak methodology has beenapplied both in health related research (for instance, Van Praag et al, 2003; Benderet al, 2013;) and non-health related research (for instance, Afonso et al, 2011). UsingMonte Carlo simulations, Egger and Pfaffermayr (2005) prove that Mundlak (1978)methodology provides an approximation of the transitory and permanent effects ofthe covariates in dynamic empirical models[2].

Following Egger and Pfaffermayr (2005), the panel Equation (1) used in this paper to investigate the effects of capital market development on capital formation can be expressed in Mundlak terms as follows:

$$CF = f(SMC, \overline{SMC}, STOCK, \overline{STOCK}, ln GDPCAP, FDEV, INFL) \quad (13)$$

The 'bar' over the variable denotes the mean value of that variable over a period. When the linearised form of the model is estimated using the random effects procedure, the coefficient on the level values of the variables (*SMC* and *STOCK*) denotes the difference of the mean from the actual variable and represents the transitory effects of capital market development on capital formation, while the coefficients on the average values of the variables ($\overline{SMC}$ and $\overline{STOCK}$) represent the permanent effect of capital market development on capital formation. By including the average values of the explanatory factors that are fixed for each country, Bender *et al*. (2013) and Bender and Theodossiou (2015) contend that the economically correct fixed effects structure is preserved, thus, preventing correlations between unobserved country specific effects and the explanatory variables[2].

IV. RESULTS AND DISCUSSION

I. The Unit Root Test Results

The Levin-Lin-Chu (2002) unit root test is applied to ascertain whether the variables of interest are stationary or non-stationary. The results indicate that all the variables are non-stationary at level, save for value of stocks traded to GDP ratio (*STOCK*). The results are presented in Table 1 below.

Table 1: Summary of Unit Root Test Results.

Variable	Level	1st Difference	Order of Integration
CF	-3.38**		I(0)
SMC	-2.72*		I(0)
STOCK	-2.46	-5.99*	I(1)
GDPCAP	-3.95*		I(0)

[2] Only the capital market development measures are decomposed into temporary effects and permanent effects. The Mundlak terms are not included for the other explanatory variables in the panel model as the main variables of interest in this paper are capital formation and the capital market development measures.

FDEV	-2.60*		I(0)
INFL	-4.28**		I(0)

Note: We employ the Levin-Lin-Chu (2002) unit root test. I(0) denotes stationary; I(1) denotes non- stationary. ***, ** and * denote rejection of the null hypothesis at 1%, 5% and 10% significance level respectively. *GDPCAP* is in log form.

II. The Fixed Effects Estimation Results

The results from the fixed effects estimation of the capital market development-capital formation equation are presented in Table 2. The dependent variable is gross capital formation to GDP ratio, while the explanatory variables include market capitalisation, value of stocks traded, real GDP per capita, domestic credit to the private sector and inflation. Thep- value of the *F* test is 0.000, suggesting that the model has some explanatory power in terms of the variation in the dependent variable, i.e., the model is statistically significant. Also, the R^2 value is 0.70, indicating that 70% of the variation in capital formation is explained by the model.

Table 2: Fixed Effects estimation of the effect of capital market development on Capital Formation

Explanatory Variables	Coefficients	Standard Errors	t-statistics
SMC	-0.068	0.07	-0.97
STOCK	-0.117**	0.05	-2.34
LnGDPCAP	0.241***	0.08	3.01
FDEV	0.283***	0.09	3.14
INFL	-0.017***	0.01	-1.7
Constant	0.873	0.49	1.78

Notes: The dependent variable is log of capital formation to GDP ratio. The regression equation includes country fixed effects and year dummy variables.
*, ** and **indicate statistical significance at 10%, 5% and 1% respectively. The period of estimation is from 1980 to 2021. prob>F=0.000; R^2=0.70.

The coefficients on the market capitalisation (SMC, which denotes capital marketsize) and value of stocks traded (STOCK, which denotes capital market liquidity)variables are negative; however, only the STOCK variable is statistically significantat 5%. This indicates that at 95 percent confidence level, a 1 percent increase incapital market liquidity led to a 12 percent fall in capital formation in Sub-SaharanAfrica. This finding suggests that the capital market is inefficient in boosting capitalformation, and is in line with the findings of Ajao (2011) and Abbas et al (2016).Interestingly, the results further indicate that real GDP per capita (lnGDPCAP) anddomestic credit to the private sector (FDEV) have a positive and significant effecton capital formation as indicated by the positive and statistically significantcoefficients, in line with theory. Specifically, the results indicate that a one percentincrease in real GDP per capita is associated with a 24 percent rise in capitalformation, and that a one percent increase in domestic credit to the private sector isassociated with approximately 28 percent growth in capital formation.

Furthermore, inflation rate (INFL) has a negative and statistically significantcoefficient, suggesting that high and unstable inflation rate impacts negatively oncapital formation in line with theoretical prediction.

III. Results of the Transitory and Permanent Effects Estimations

Table 3 reports the results of the estimations when the transitory and permanent effectsof capital market development on capital formation are examined using the randomeffects model with a Mundlak fixed effects estimator. The dependent variable is grosscapital formation to GDP ratio, while the explanatory variables include marketcapitalisation, value of traded stocks, real GDP per capita, domestic credit to privatesector, inflation rate, average market capitalisation, and average value of tradedstocks.

Table 3: Transitory and Permanent effects of Capital Market Development on Capital Formation

Explanatory Variables	Capital Market Development	
	Transitory effect	Permanent effec
SMC	-0.068 (0.07)	0.147** (0.21)
STOCK	-0.117** (0.05)	0.125* (0.19)

GDPCAP	0.241*** (0.08)	0.193***(0.04)	
FDEV	0.283*** (0.09)	0.372*** (0.09)	
INFL	-0.017*** (0.01)		-0.011*** (0.00
Constant	0.873 (0.49)	0.936*** (0.36)	

Note: The dependent variable is log of capital formation to GDP ratio. Numbers in parenthesis are standard errors. The regression equation includes differenced and mean values of market capitalisation to GDP ratio and value of stocks traded to GDP ratio, country dummy variables and year dummy variables. *, ** and **indicate statistical significance at 10%, 5% and 1% respectively. The period of estimation is from 1980 to 2021.; prob>F=0.000; R2=0.57. This is the random effects estimation with a Mundlak fixed effects estimator.

From the results of the investigation of the transitory effects of capital marketdevelopment on capital formation depicted in column 1 of Table 3, both thecoefficients on the capital market development indicators (SMC and STOCK) arenegative. However, the coefficient on STOCK which measures capital marketliquidity is statistically significant, suggesting a negative transitory effect of capitalmarket liberalisation on capital formation. The results from the transitory effects aresimilar to the standard fixed effects estimation results reported in Table 2 withidentical coefficient signs and magnitudes. On the other hand, column 2 depicts the
permanent effects of capital market development on capital formation.Interestingly, the coefficients on both the capital market development indicators,SMC and STOCK are positive and statistically significant at 5 percent and 10percent level respectively, indicating that capital market development is beneficialto long run capital formation. Specifically, the results indicate that a one percentincrease in capital market size leads to a 14.7 percent increase in capital formation,and a one percent rise in capital market liquidity leads to a 12.5 percent increase incapital formation. This finding is an indication that capital market development hasa long lasting effect in increasing capital formation and is in line with Fuchs-Schundeln and Funke (2003); and Onisanwa and Adaji (2020). Furthermore, theresults suggest that real GDP per capita (lnGDPCAP) which measures economic
growth and domestic credit to the private sector (FDEV) which measures financialsector development have a significant positive association with capital formation.Also, the rate of inflation was found to have a significant negative relationship withcapital formation in line with theoretical prediction.

V. CONCLUSION AND POLICY RECOMMENDATIONS

In recent years, there has been an unending controversy on the efficacy of capital market development. Although, a lot of support has been found that capital market development stimulates capital formation, the findings of the empirical results are mixed. Some empirical studies on the subject matter have shown that the relationship between capital market development is positive (Levine and Zervos, 1998; Fuchs-Schulden and Funke, 2003; Onisanwa and Adaji, 2020) while others have found that the relationship is negative (Naceur*etal*, 2008; Ajao, 2011; and Abbas *et al*, 2016).

This research paper investigates the capital market development-capital formation nexus in seven Sub-Saharan African countries by applying the Mundlak (1978) methodology to decompose the effects of capital market development on capital formation into transitory and permanent effects. The results suggest that capital market development has a negative transitory effect on capital formation; but has a positive permanenteffect on capital formation in the Sub-Saharan African countries under investigation.Theempiricalresults provide an indication that capital market development has a significant positive effect on capital formation in the long term and this may consequently boost economic growth levels within the Sub-Saharan African region. Based on the empirical results, the following policy recommendations are proffered:

I. Sub-Saharan African countries must simplify the listing requirements for both their primary and secondary capital markets as this would encourage more unquoted companies' participation in the capital markets, thus improving the depth of the domestic capital markets.
II. Sub-Saharan African countries should improve their capital market infrastructures and eliminate the tax, legal and regulatory hurdles that impede the development of the capital market. Infrastructural deficiencies constitute a significant barrier to the expansion of the capital market.
III. The capital market authorities of Sub-Saharan African countries should prioritise policies that will boost productivity, liquidity, and resilience of the capital market. One way to achieve this is to introduce additional instruments such as climate bonds, inflation-linked bonds, hedging instruments and blockchain bonds into their domestic capital markets.
IV. It is also crucial that the macroeconomic fundamentals of Sub-Saharan African countries are strengthened as this would further encourage capital formation and consequently boost economic growth in the region.

REFERENCES

[1]. Abbas, A. O., Pei, Y. X., & Rui, Z. (2016). Impact of stock market on economic growth evidence: Dar-es-Salaam stock exchange–Tanzania. *Journal of Finance and Accounting, 4(6),* 321-327.

[2]. Achy, L. (2005). Financial Liberalisation, Saving, Investment and Growth in MENA Countries. *Middle East Economics, 6,* 67-94.

[3]. Adelegan, O. (2009). Capital market development and investment efficiency in Nigeria. *Savings and Development, 33(2),* 113-132.

[4]. Adewuyi, I. D., &Olowookere, J. K. (2011). The contributions of capital market to economic development in Nigeria. *International Journal of Economic Development Research and Investment, 2(1),* 36-46.

[5]. Afolabi, B., Olanike, A.B., Olusegun, A.O., &Ibimilua, S.T. (2017). Interconnection between capital market indices and economic growth: Nigeria's perspective (1989-2015). *Advances in Social Sciences Research Journal, 4(18),* 160-173.

[6]. Afonso, A., Gomes, P., & Rother, P. (2011). Short- and long-run determinants of sovereign debt credit ratings. *International Journal of Financial Economics, 16(1),* 1–15.

[7]. Ahmed, A.D. (2013). Effects of financial liberalisation on financial market development and economic performance of the Sub-Saharan African region: An empirical assessment. *Economic Modelling 30(2013),* 261-273.

[8]. Ajao, M.G. (2011). Stock market development, capital formation and growth in Nigeria. *International Journal of Current Research, 3(6),* 382-388.

[10]. Ariwa, F. O., Ani, O. I., Onyele, K. O., &Ekeleme, I. J. (2017). Impact of stock market liquidity and efficiency on performance of the manufacturing sector in Nigeria. *International Journal of Economics and Financial Management, 2(1),* 71-82.

[11]. Bencivenga, V.R., Smith, D.B., & Starr, R.M. (1995). Transaction costs, technological choice and endogenous growth. *Journal of Economic Theory, 67(1),* 53-77.

[12]. Bender, K.A., & Theodossiou, I. (2015). A reappraisal of the unemployment-mortality relationship:Transitoryandpermanenteffects.*JournalofPublicHealthPolicy.36(1),*81- 94.

[13]. Bender, K.A., Economou, A., & Theodossiou, I. (2013). The temporary and permanent effects of unemployment on mortality in Europe. *International Labour Review, 152(2),* 275-286.

[14]. Devereux, M.B., &Smith, G.W. (1994). International risk sharing and economic growth. *International Economic Review, 35 (4),* 535-550.

[15]. Edison, H.J., Klein, M.W., Ricci, L., &Sloek, T. (2002). *Capital account liberalisation and economic performance: Survey and synthesis.* NBER Working Paper No. 9100, Cambridge, MA: National Bureau of Economic Research.

[16]. Egger, P., & Pfaffermayr, M. (2005). Long run and short run effects in static panel models.*Econometric Review, 23(3),* 199-214.

[17]. Fowowe,B.(2008).Financialliberalisationpoliciesandeconomicgrowth:Paneldataevidencefrom Sub-Sahara Africa. *African Development Review, 20 (3),* 549-574.

[18]. Fuchs-Schundeln, N., and Funke, N. (2003). Stock market liberalisations: Financial and macroeconomic implications. *Review of World Economics, 139(4),* 730-761.

[19]. Gerdtham, Ulf-G., &Ruhm, C.J. (2006). Deaths rise in good economic times: Evidence from the OECD. *Economics and Human Biology, 4(3),* 298-316

[20]. Ghazanchyan,M., &Stotsky,J.G.(2013).*Driversofgrowth:EvidencefromSub-SaharanAfrican countries.*IMF Working PaperNo.WP/13/236.

[21]. Greenwood, J., & Smith, B.D. (1997). Financial markets in development and the development of financial markets. *Journal of Economic Dynamics and Control, 2(1),* 145-181.

[22]. Henry, P.B. (2000). Do stock market liberalisations cause investment booms? *Journal of Financial Economics, 58(1-2),* 301-334.

[23]. Henry, P.B. (2006). *Capital account liberalisation: Theory, evidence, and speculation*. NBER Working Paper Series No. 12698.

[24]. Kraay, A.C. (1998). In Search of the Macroeconomic Effects of Capital Account Liberalisation. World Bank, mimeo.

[25]. Levine, R. (2005). Finance and growth: Theory and evidence. *Working Paper 10766*. NBER.

[26]. McKinnon, R.I. (1973). *Money and capital in economic development*. Washington DC: Brookings Institution.

[27]. Menyah, K.,Nazlioglu, S.,&Wolde-Rufael, Y. (2014). Financialdevelopment,tradeopennessand economicgrowthinAfricancountries: New insightsfromapaneldatacausalityapproach.*Economic Modelling, 37,* 386-394.

[28]. Misati,R, N.,&Nyamongo,E.M.(2012).Financialliberalisation,financialfragilityandeconomic growth in Sub-Saharan Africa. *Journal of Financial Stability, 8 (3),* 150-160.

[29]. Mundlak, Y. (1978). On the pooling of time series and cross section data. *Econometrica, 46(1),* 69-85.

[30]. Naceur, S.B., Ghazouani, S., &Omran, M. (2008). Does stock market liberalisation spur financial and economic development in the MENA region? *Journal of Comparative Economics, 36 (4),* 673-693.

[31]. Obstfeld, M. (1998). The global capital market: Benefactor or menace? *Journal of Economic Perspectives,*

12(4), 9-30.

[32]. Onisanwa, I.D., & Adaji, M.O. (2020). Stock market development and investment growth in Nigeria. *Journal of Economics and Management. 42(4)*, 99-117.

[33]. Osinubi, T.S., & Amaghionyeodiwe, L.A. (2003). Stock market development and long run growth in Nigeria. *Journal of African Business*, *4(3),* 103-129.

[34]. Sarkar, P. (2007). *Stock Market development and capital accumulation: What the time series evidence shows.* Munich Personal RePEc Archive (MPRA) Research Paper No. 5054.

[35]. Shaw, E. S. (1973). *Financial deepening in economic development*. New York: Oxford University Press.

[36]. Stiglitz, J.E. (2000). Capital market liberalisation, economic growth, and instability. *World Development*, *28 (6),*1075-1086.

[37]. Udo, G.C., Nwezeaku, N.C., & Kanu, S.I. (2021). Effects of capital market development on the economic growth of Nigeria. *International Journal of Innovation and Economic Development, 7(2),* 30-46.

[38]. Van Pragg, M.M.S., Frijters, P., & Ferrer-i-Carbonell, A. (2003). The anatomy of subjective well- being. *Journal of Economic Behaviour and Organization*, *51(1),* 29-49.

[39]. Vanni, E.M. (2018). *An analysis of the effects of financial liberalisation on capital formation and economic growth in Sub-Saharan Africa*. (Publication No. 752670) [Doctoral Dissertation, University of Aberdeen]. British Library EThOS.

[40]. World Bank Group (2020). Capital markets development: A primer for policy makers. https://openknowledge.worldbank.org/handle/10986/36058