Financial Integration and Financial Development: Evidence from Sub-Saharan African (SSA) Countries.

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Abstract

The study examined the effects of financial integration on financial development for 49 Sub-Saharan Africa (SSA) countries for the period 2002 to 2021. Five independent metrics of financial development and two financial integration measures were utilized to ensure robustness of the anticipated results. Using a dynamic panel GMM-SYS estimation technique, it was discovered that the impacts of financial integration on financial development in SSA are highly dependent on the proxies employed to capture these two variables of financial integration. Financial integration has a beneficial influence on private sector credit, domestic credit, liquid liabilities, and finance size, when proxied by the interest rate spread. However, this measure of financial integration limits the volume of financial activity of financial intermediaries as it's negatively correlated. Similarly, when measured using gross private capital flows, financial integration has statistically positive effects on financial development as measured by liquid liabilities but has a negative impact on financial development as measured by finance activity and financial size in Sub-Saharan African nations. The general implication of these findings is that the influence of financial integration on financial development in SSA is complex. However, before reaching a firm conclusion about the relationship between these two variables, several transmission mechanisms by which former influences the latter, as well as their various proxies, must be considered.

Keywords: Financial Development, Gross Private Capital Flows, Dynamic Panel SYS- GMM Analysis

1.0 Introduction

Globally, there is growing interest in regional and global financial integration, which includes sub-Saharan African (SSA) countries. Financial integration[1] means eliminating barriers to international investments, treating both domestic and foreign investors fairly and equally, and harmonizing the laws and regulations governing the institutions and its operations (Ekpo & Chuku, 2017). Economic theory postulates that financial integration promotes economic growth and welfare by facilitating effective and efficient resource allocation, portfolio and risk diversification, consumption smoothening, higher investment profitability and ensuring price convergence through healthy competitions. Financial integration also facilitates domestic financial development, particularly in developing countries (Edison et al., 2002; Gourinchas & Jeanne, 2003; Fetai, 2015; Ahmed, 2016; Indawan, 2020).

Financial market integration is believed to affect the real economy through at least two broad channels. First, the size of the financial sector and the volume of available credits are seen as proxies for how effectively the financial sector manages to collect savings and allocates them to productive investments. This transfer of funds not only raises productive capacity but should also enhance the efficiency of the economy by reallocating funds from the least productive to the most productive investments. A second channel relates to the capacity of the financial sector to absorb shocks. An effective financial sector will raise the possibilities for households and enterprises to hedge against risks and systemic shocks (Bloch & Tang, 2003). However, some schools of thought have challenged the assertion of a strong, positive, and significant relationship between financial integration and economic growth. For instance, Edison, (2002) observes that international financial integration may delay growth in the presence of pre-existing misrepresentations such as a timid financial sector and poor quality of regulatory institutions. The final effect will be capital flight and other macroeconomic fluctuations.

Most SSA countries embraced the concept of financial integration in the 1980s and 1990s with the hope of gaining access to the world financial system, solving their deficit current account problems, growing economies, creating jobs, reducing inequality, and promoting

In this study, the terms "financial integration," "international financial flows"", "Capital account liberalization," financial openness", "liberalization of financial systems" are used interchangeably

poverty alleviation programs. These countries liberalized their financial sectors by moving away from regimes of financial repression that impeded international financial transactions and foreign direct investment (FDI). They also dismantled economic restrictions and deregulated their domestic financial markets. However, SSA countries are yet to benefit from global and regional financial integration. Their financial systems still have less depth than in other regions of the world, and financial services reach fewer people than elsewhere (Prasad et al., 2007; Lane & Milesi-Ferratti, 2007; Soumaré et al., 2021).

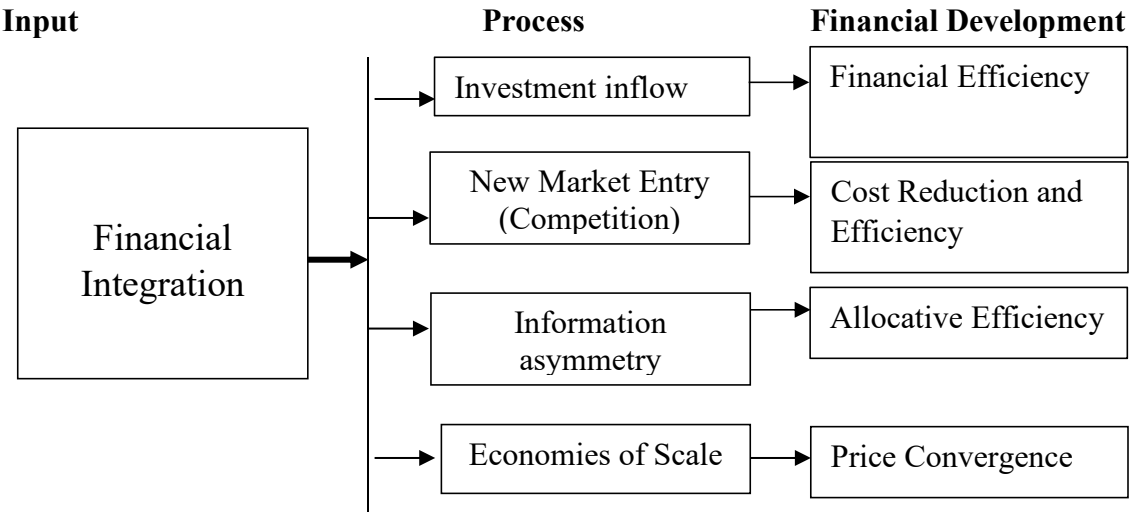
The dismal condition of the financial system in developing countries such as SSA countries after financial globalization has also received great attention since the last quarter of the 20th century. Some authors have argued that financial integration has remained a misfortune for developing countries since it is a major cause of financial crises. Bhagwati, (1998) stated that the disadvantages of global financial integration for emerging nations exceed their advantages. The claims of significant benefits from free capital mobility, according to Bhagwati, (1998), are unpersuasive, and the substantial gains (from capital account liberalization) have only been claimed, not shown. According to Eatwell, (1997), unfettered international capital flows have been linked to a decline in economic efficiency (as measured by growth and unemployment) since the 1960s. Prasad et al., (2003) state that there is little indication that financial integration has assisted them in improving the stability of swings in consumption growth, despite the theoretically substantial benefits that would accrue to developing nations if such stabilization were accomplished. Similarly, Iheanacho et al., (2023) argue that financial integration may result in a loss of macroeconomic stability and relevant risk brought about by a high level of foreign financial institution penetration.

To our knowledge, there is a paucity of studies on the effect of financial market integration on financial development in SSA. Most of the studies in this area focus on the importance of financial market development. Also, local studies that treated this topic used a limited number of proxies to capture financial development and financial integration. This study, therefore, fills this gap by empirically providing evidence of the effect of financial integration on financial development in SSA countries between 2002 and 2021. This study has both practical and theoretical significance.

2.0 Relationship between Financial Integration and Financial Development

The Inter-American Development Bank (2015) defines financial integration as "the process through which a country`s financial markets become more closely linked with those of other countries' and with those of the rest of the world. Financial integration is an aspect of advanced financial systems (Taghizadeh-Hesary et al. 2019). In theory, the liberalization of financial systems facilitates financial development by ensuring more transparency and competition in the financial sector (Obstfeld, 2008), allowing capital and resources to be efficiently allocated (Kose et al. 2009a) and encouraging the formation of best practices of regulation (Kose et al., 2009a). Thus, the liberalization of the financial market contributes to increasing stock market liquidity, improving the efficiency of the banking system (Levine, 2001), and reducing the cost of capital (Stultz, 1999). However, there is a growing concerns that too much integration could be harmful to the development of financial systems. Higher financial openness could lead to excessive risk-taking (Kose et al., 2009a), capital flight, vulnerability to self-fulfilling crises (David et al., 2015), and higher contamination risk among interlinked economies (Kose et al., 2009a), eventually imposing detrimental impacts on long-term financial development (Kose et al., 2009a). Hence, there is possibly an association between the development of financial systems and integration, which may vary based on the integration levels.

Figure 1: Connection between financial integration and financial development.



Source: Author's compilation 2023

The conceptual framework for this study shows that financial integration leads to financial development through four channels. First, financial integration may lead to increased investment inflows as domestic firms gain greater access to foreign financial markets and foreign firms invest in domestic financial markets, thus leading to an increase in the size of domestic financial markets (AfDB, 2010; Ravenhill, 2004; Giannetti et al., 2002).

Secondly, financial integration removes barriers to entry into domestic markets for foreign firms, and this contributes to increased competition in the domestic market, leading to improved productive efficiency effects through intermediaries achieving unit cost reduction (AfDB, 2010; ADB 2013; Martin, 2010; Wakemann-Linn & Wagh, 2008).Thirdly, financial integration allows for extensive sharing of information, reduces information asymmetry and allows for more efficient allocation of resources (Farid, 2013; Garcia-Herrero & Wooldridge, 2007; World Bank, 2007). Lastly, financial integration concentrates financial intermediation within a SSA region and because of that the regional markets may enjoy economies of scale whilst being protected from global competition (Demartino & Grabel, 2003; Frey & Volz, 2011). Such protection may attract investment into the integrated region from non-regional countries. SSA countries have adopted financial integration with the aim of enhancing economic growth and stimulating financial development in addition to other perceived benefits of financial integration. However, the perceived benefits of financial integration have not been conclusively proved empirically. Volz & Frey (2011) note "These assumed benefits are predominantly based on theoretical arguments that are habitually made both in the debate on financial globalization and financial integration". In addition, most literature on financial integration tends to focus more on the benefits, whilst ignoring the negative effects it can have on individual countries (Mougani, 2012).

Empirical evidence about the nexus between financial integration and development has never reached a consensus. On the one hand, the first strand of research (Levine, 2001, Klein & Olivei ,2008; Baltagi et al., 2009; Ozkok, 2015) documented a positive linkage between the openness of financial sector and its development. For instance, Baltagi et al., (2009), using a broad sample of countries, provided evidence regarding financial integration being an important catalyst for banking sector development. Similarly, Klein & Olivei, (2008) found that financial liberalization is linked to greater financial sector depth, regardless of economic settings. Levine, (2001) proves
that liberalizing restrictions on international portfolio flows could improve stock market liquidity

and that the efficiency of a banking system could be enhanced by a stronger presence of foreign banks in the domestic market.

On the other hand, another strand of literature revealed weak or no direct links between financial openness and development. Both Menya et al., (2014) and David et al., (2015) showed that financial integration had no developmental effects on most African countries in their sample.

Furthermore, Hauner et al., (2013) and Ashraf, (2018), while emphasizing the role of trade openness for financial development, found no evidence of a financial integration effect. Instead, they found that financial account liberalization could force credit providers to increase risk-taking owing to intense credit-market competition.

3.0 Methodology

The study employs the descriptive and causal research design for validating the impact of financial integration on financial development in SSA countries. It also focuses on numeric data which is used to construct statistical models applied in explaining the relationships between variables. The study made use of panel data to ascertain the relationship between financial integration and financial development. The population of the study consists of all 49 countries of SSA countries for the period 2002 – 2021. The panel series are unbalanced because of unavailability of the data for all the 49 countries. This time period is chosen to accommodate pre- and -post financial crises of 2007-2008 in the USA.

Model Specification

Examination of financial integration-development relationship was carried out using a dynamic panel approach with system generalised method of moments (GMM).

The following is baseline regression model;

$$FD_{i,t} - FD_{i,t-1} = (\alpha-1)FD_{i,t-1} + \beta_1 FIN_{i,t} + \varphi X_{i,t} + \eta_i + \varepsilon_{i,t} \quad (1)$$

Where $FD_{i,t}$ is financial development index, $FIN_{i,t}$ is a measure of financial integration, X is a vector of weakly exogenous and predetermined variables, $\boldsymbol{\varepsilon_{i,t}}$ is the error term, η_i, is a time invariant country specific effect.

Equation (1) can be simplified in terms of the $FD_{i,t}$ variable, so that

$$FD_{i,t} = \alpha FD_{i,t-1} + \beta_1 FIN_{i,t} + \varphi X_{i,t} + \eta_i + \varepsilon_{i,t} \quad (2)$$

To eliminate the country specific effect η_i, we take a first difference transformation of equation (2), thus:

$$(FD_{i,t} - FD_{i,t-1}) = \alpha(FD_{i,t-1} - FD_{i,t-2}) + \beta_1(FIN_{i,t} - FIN_{i,t-1}) + \varphi(X_{i,t} - X_{i,t-1}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \quad (3)$$

So that by applying the difference operator, Δ, our estimation equation becomes

$$\Delta FD_{i,t} = \alpha\Delta FD_{i,t-1} + \beta_1\Delta FIN_{i,t} + \varphi\Delta X_{i,t} + \Delta\varepsilon_{i,t} \quad (4)$$

The use of instruments is required to deal with the problem of endogeneity of the explanatory variables and the fact that, by construction, the error term in equation (4) will correlate with the lagged dependent variable, which compromises the consistency of standard estimators. We, therefore, introduce instrumental variables (IV) in the GMM framework (Arellano & Bond, 1991; Edison et al., 2002). The moment conditions for the GMM estimation are as follows.

$$E[FD_{i,t-s}, \Delta\varepsilon_{i,t}] = 0 \qquad s \geq 2,\ t = 3 \ldots T, \quad (5)$$

$$E[X_{i,t-s}, \Delta\varepsilon_{i,t}] = 0 \qquad s \geq 2,\ t = 3 \ldots .T,$$

where X stands for all the predetermined and weakly exogenous variables. The set of moment conditions in equation (5) defines a "difference-GMM" estimator in which the lags of the levels of the variables are used as instruments, and the country specific effects are differenced away. This instrumentation approach is however problematic; as Blundell & Bond (1998) have shown, this kind of instrumentation is weak, and will compromise the asymptotic and small sample properties of the estimator through larger variances that leave the coefficients biased. They show that the way to correct this problem is to include the level equation in the system, and instrument the predetermined and endogenous variables in levels with their own lagged differences. The improvement in the asymptotic and small sample properties of this "system-GMM" estimator is then achieved through the inclusion of additional moment conditions on the country-specific effects. That is;

$$E[(FD_{i,s} - FD_{i,s-1}).(\eta_i + \varepsilon_{i,t})] = 0 \text{ , for all values of } s \geq 1$$

$$E[(X_{i,s} - X_{i,s-1}).(\eta_i + \varepsilon_{i,t})] = 0, \text{ for all values of } s \geq 1$$

$$E[FD_{i,t+q}.\eta_i] = E[FD_{i,t+p}.\eta_i] = E[X_{i,t+q}.\eta_i] = E[X_{i,t+p}.\eta_i] = 0$$

$$\text{for all values of } (p \neq q) \geq 1 \ \} \quad (6)$$

These moment conditions simply imply that there are no correlations between the differences of these variables and the country specific effects, and between the future values in levels of these variables

and the country specific effects. Because the dynamic panel data approach is an instrument-based technique, it is important to evaluate the validity of the instruments used in the model. The estimated coefficients are judged to be efficient and consistent if the moment conditions are satisfied, and the instruments are valid. Instrument validity will hold if the residuals from equation (4) are not second-order serially correlated. Therefore, to validate the estimates of the model, hence the use of Sargan-Hansen test of over identifying restrictions, this is also a test of second-order serial correlation in the residuals, and report the test statistic along with the associated probability values. This will be carried out after the system GMM have been run and robustness of the validity of the estimates is confirmed.

The choice of the GMM is motivated by the conclusions of Baltagi et al., (2007) and Demetriades & Law (2006) who aver that dynamic system panel data models are more appropriate estimation technique for relationship among variables. Despite the fact that the technique is an improvement on pooled panel instrumental variable (IV) regression approach, it is more appropriate in following ways; the system GMM approach affords all researchers to exploit both the cross-section and times series attributes of the data set. It controls for country-specific effects and not included in the error term. It controls for potential bias associated with the purely cross-sectional estimations. The approach captures the partial adjustment property and account for the Nickell bias that occurs when the lagged dependent variable is correlated with the disturbance term and still obtains consistency in estimations. The system dynamic panel approach also controls for potential endogeneity problems in the regressors. In particular, the fact that financial integration and financial development could have lagged or contemporaneous dual causation implies a potential violation of the endogeneity condition for standard regression analysis though the system GMM technique was developed by Holtz-Eakin et al., (1988), it was improved in several dimensions by Arellano & Bond, (1991), Arellano & Bover, (1995) and Blundell & Bond, (1998). It has been applied in related studies such as Edison et al., (2002), Bonfiglioli, (2008), and Schularick & Steger, (2010).

Source of Data

Data used in this study consists of secondary data spanning 2002 to 2021. This dataset was sourced from several outlets such as the World Bank Development indicator and IMF's International Financial Statistics (IMF's IFS). The study dataset consists of all indicators of financial integration, financial development and control variables. Data of interest are domestic credit, private sector credit, liquid liabilities; financial size, financial activity, interest rate spread, capital flows, and other control

variables such as inflation rate, exchange rate, human capital development, population density, among others. The full description and measurement of these variables are discussed in next sub section.

Description and Measurement of variables

Variables used in this study are described below alongside their measurement. These variables are categorised as dependent, independent and control variables.

Table 1: Descriptions of variables

Variables	denotation	Measurement	Source
Dependent Variables Financial Devt (FD) • domestic credit • private sector credit • liquid liabilities • finance-activity • financial-size	 FDDC FDPSC FDLL FDFA FDFS	 Domestic Credit (% of GDP) Private Sector Credit (% of GDP) Liquid Liabilities (% of GDP) The private sector credit ratio times the value of total shares traded on the stock market exchange ratio (% of GDP). The total value traded ratio times the stock market capitalization ratio (% of GDP)	World Bank (2022)
Independent variable Financial Integration • interest rate spread • foreign capital flow	 FII FIGPC	 Interest rate differentials/spread Gross Private Capital Flows (% of GDP)	World Bank (2022)
Control Variables • Inflation • Investment • Exchange rate	 INF DINV	consumer price index,	

• Lending rate • Population density • Human capital • Human capital • Land area • Trade openness	EXCH LR POPD HC1 HC2 LA TOTR	Naira exchange rate to US Dollar ……. ratio of the sum of exports and imports to GDP	

4.0 Presentation and Discussion of Results

Variables used in equation (1) are described before estimation of the equation. Several descriptive analyses of the variables employed were used in this study. The descriptive statistics employed are mean, standard deviation, maximum and minimum together with sum. The result of the descriptive statistics is presented in table 2 below.

Results from Table 2 below, indicate that all variables are consistent since their average values fall within the range of their minimum and maximum values. Also, the value of standard deviation of each variable is low, indicating that there is low variations among these variables. In addition, the average number of observation is over 900. The difference in the number of observation is due to missing figures.

Table 2: Descriptive Statistics of variables

S/N	Variables	count	mean	Sd	min	max	sum
1	FDDC	979	18.623	16.088	0.00	104.849	18232.17
2	FDPSC	979	18.799	16.106	0.00	104.894	18404.23
3	FDLL	979	2.25 trill	4.89 trill	48.3 mill	38.9 trill	2,200 trill
4	FDFS	950	4.88 trill	2.62 trill	5.89 trill	6.79 trill	91.92 trill
5	FDFA	951	827 bill	4.66 trill	514996.8	52.0 trill	7,870 trill

6	FII	977	78.920	249.043	0.002	3781.903	77104.5
7	FIGPC	979	904 mill	2.23 bill	-7.40 bill	17.0 bill	885 bill
8	TOTR	980	73.322	43.070	0.757	347.997	71855.35
9	PCI	980	2097.007	2744.734	255.100	16992.03	2.055 mill
10	INF	980	9.416	28.321	-8.975	557.202	9228.124
11	DINV	980	21.695	8.7531	2.000	81.021	21260.94
12	EXCH	980	44.6 mill	454 mill	0.055	6.72 bill	43.7 bill
13	LR	977	15.796	10.273	4.737	97.336	15433.04
14	POPD	979	94.314	120.784	2.294	623.517	92333.71
15	HC1	980	99.155	23.172	9.062	156.445	97172.09
16	HC2	963	43.793	21.318	5.508	114.715	42172.98
17	LA	979	496209.7	539120.2	460	2376000	4.86 mill

*** implies that p<0.01 and significant at 1%, ** implies that p<0.05 and significant at 5%, * implies that p<0.1and significant at 10%

Source: Author's computation using data from World Bank (2022)

Tables 3a and 3b presented below show the pairwise correlation coefficients among the variables used in this study. This is used to analyse the presence of multicollinearity among the explanatory variables. It is important that models do not have perfect multicollinearity amongst the explanatory variables for robustness and easy estimation. From the result presented in table 3a and 3b, we can see that the highest degree of relationship amongst the explanatory variables is 0.724 and this is between the first measure of integration and lending rate while the least degree of relationship is 0.001 and this is between exchange rate and trade openness. Thus, with this establishment, we can say that there is no perfect multicollinearity possibly associated with the regression results.

Table 3a: Pairwise correlations results

Variables	**FDDC**	**FDPSC**	**FDLL**	**FDFS**	**FDFA**	**FII**	**FIGPC**	**TOTR**
FDDC	1.000							

FDPSC	1.000***	1.000						
FDLL	-0.102***	-0.103***	1.000					
FDFS	0.217***	0.216***	-0.022	1.000				
FDFA	0.381***	0.379***	0.016	0.836***	1.000			
FII	-0.125***	-0.126***	0.041	-0.047	-0.039	1.000		
FIGPC	0.223***	0.221***	0.121***	0.635***	0.610***	-0.008	1.000	
TOTR	0.216***	0.214***	-0.179***	-0.083**	-0.053*	-0.025	-0.079**	1.000
PCI	0.410***	0.407***	-0.098***	0.145***	0.192***	-0.099***	0.129***	0.464***
INF	-0.109***	-0.110***	-0.017	0.158***	-0.012	0.119***	0.040	-0.082**
DINV	0.040	0.040	0.067**	-0.130***	-0.105***	0.006	-0.041	0.259***
EXCH	-0.027	-0.026	-0.045	-0.054*	0.012	-0.013	-0.026	0.001
LR	-0.227***	-0.227***	0.119***	-0.094***	-0.090***	0.724***	-0.003	-0.011
POPD	0.350**	0.351**	0.013	-	-0.079**	-0.072**	-0.018	-0.068**

	*	*		0.117***				
HC1	0.037	0.039	-0.028	-0.092***	-0.030	0.136***	-0.023	-0.058*
HC2	0.547***	0.549***	-0.127***	0.200***	0.331***	-0.105***	0.218***	0.222***
LA	-0.090***	-0.094***	0.095***	0.284***	0.213***	0.123***	0.250***	-0.251***

*** implies that p<0.01 and significant at 1%, ** implies that p<0.05 and significant at 5%, * implies that p<0.1and significant at 10%

Source: Author's computation using data from World Bank (2022)

Table 3b: Pairwise correlations results (contd.)

Variables	**PCI**	**INF**	**DINV**	**EXCH**	**LR**	**POPD**	**HC1**	**HC2**	**LA**
FDDC									
FDPSC									
FDLL									
FDFS									
FDFA									
FII									
FIGPC									
TOTR									

PCI	1.000							
INF	-0.045	1.000						
DINV	0.184***	-0.090***	1.000					
EXCH	-0.032	-0.010	-0.125***	1.000				
LR	-0.119***	0.155***	0.071**	-0.052*	1.000			
POPD	0.167***	-0.047	-0.105***	-0.049	0.006	1.000		
HC1	0.045	-0.049	0.074**	0.039	0.203***	0.265***	1.000	
HC2	0.501***	-0.098***	0.092***	0.020	-0.087***	0.312***	0.313***	1.000
LA	-0.135***	0.095***	0.150***	-0.020	0.107***	-0.416***	-0.271***	-0.226***

*** implies that p<0.01 and significant at 1%, ** implies that p<0.05 and significant at 5%, * implies that p<0.1and significant at 10%

Source: Author's computation using data from World Bank (2022)

Panel Unit Root Test

Prior to the estimation of the regression model, it is necessary that we examine the stationarity of the variables. A variable is said to be stationary if it has constant mean and variance overtime and is thus considered relatively stable and can be used for prediction. In order to test for the stationary, the Levin et al., (2002); and Lm et al., (2003) panel unit root methods were employed and the result is presented in table 4 below. As shown in Table 4, all variables,

except gross capital flows (LNFIGPC) and inflation (INF), are stationary only at first difference. This means that they are integrated of order 1. The probability values of their Z[t-bar] are less than 5%. The result also shows that we reject the null hypothesis for gross capital flows and inflation rate as their probability values are level are less than 5% and we thus conclude that gross capital flows and inflation rate are stationary at level.

Table 4: Panel unit root test result

S/N	Variable	Obs.	Z[t-bar]	p-value	Obs.	Z[t-bar]	p-value	Conclusion
1	FDDC	881	1.354	0.912	832	-4.759***	0.000	I(1)
2	FDPSC	881	0.974	0.835	832	-4.794***	0.000	I(1)
3	LNFDLL	881	9.424	1.000	881	-4.419***	0.000	I(1)
4	LNFDFS	854	6.875	1.000	854	-4.329***	0.000	I(1)
5	LNFDFA	855	1.500	0.933	855	-9.332***	0.000	I(1)
6	FII	879	6.566	1.000	830	-8.830***	0.000	I(1)
7	LNFIGPC	793	-3.390***	0.000	-	-	-	I(0)
8	TOTR	882	0.788	0.785	833	-1.916**	0.028	I(1)
9	LNPCI	882	0.353	0.638	833	-2.877***	0.002	I(1)
10	INF	931	-4.450***	0.000	-	-	-	I(0)
11	DINV	931	0.312	0.622	882	-9.984***	0.000	I(1)
12	LNEXCH	882	2.320	0.990	833	-5.210***	0.000	I(1)
13	LR	879	6.408	1.000	830	-4.220***	0.000	I(1)
14	POPD	881	6.340	1.000	832	-6.202***	0.000	I(1)
15	HC1	882	1.303	0.904	882	-4.958***	0.000	I(1)
16	HC2	865	0.136	0.554	865	-6.918***	0.000	I(1)
17	LA	881	4.870	1.000	881	-3.326***	0.000	I(1)
18	INST	882	0.435	0.668	882	-20.394***	0.000	I(1)

*** implies that p<0.01 and significant at 1%, ** implies that p<0.05 and significant at 5%, * implies that p<0.1and significant at 10%

Source: Author's computation using data from World Bank (2022)

Cointegration Test

With the varying order of stationarity as established in table 4, it is important to examine if the models exhibit a long run relationship amongst the variable relations as this is important for prediction and robustness of the regression result. The Dickey-Fuller and Augmented Dickey-Fuller cointegration test technique is employed in this study with result presented in table 5 below. The result of the Kao cointegration test from table 5 shows that using the modified Dickey-Fuller t statistics, Dickey-Fuller t statistics and Augmented Dickey-Fuller t statistics, the null hypothesis of no cointegration for the entire five variant

equations are rejected and thus, we accept the alternative and conclude that the entire five variant models are cointegrated. Thus, there is cointegration in the models to be estimated.

Table 5: Kao cointegration test results

	Eqn one		**Eqn two**		**Eqn three**		**Eqn four**		**Eqn five**	
Parameter	**Statistics**	**p-value**	**Statistics**	**p-value**	**Statistics**	**p-value**	**Statistics**	**p-value**	**Statistics**	**P-value**
No. of panels	49		49		49		48		48	
Avg. no. of periods	15.857		15.857		15.857		15.917		15.938	
Modified Dickey-Fuller t statistics	3.69***	0.000	3.65***	0.000	3.46***	0.001	1.92**	0.027	1.88**	0.030
Dickey-fuller t statistics	3.30***	0.001	3.21***	0.001	3.19***	0.001	3.18***	0.001	2.86***	0.002
Augmented Dickey-fuller t	2.11**	0.010	4.26***	0.000	3.42**	0.001	3.34***	0.000	3.31***	0.001

statistics

Using the Newey-West lags selection *** implies that p<0.01 and significant at 1%, ** implies that p<0.05 and significant at 5%, * implies that p<0.1and significant at 10%

Source: Author's computation using data from World Bank (2022).

Presented in Table 6 shows the SYS-GMM results of the effects of financial integration (proxied by interest rate spread (FII), and foreign capital flows (LnFIGPC) on financial development in SSA. There are five models since financial development is represented by five indicators – domestic credit (FDDC), private sector credit (FDPSC), liquid liabilities (FDFS), finance activity and financial size. The use of these different measures of financial development ensures robustness and takes account of possible sensitivity of variables used.

Based on Table 6, it can be seen that the p-value of the ANOVA (F-statistic) of each of the five models is less than 0.05. This indicates that these models are robust and that all included explanatory variables in each of these models are jointly significant in influencing the measures of financial development. Also, among the five models, the one with most robust is the model in which financial activity was used as proxy for financial development, followed by the one with financial activity and liquid liabilities.

In table 6, financial integration, captured by interest rate spread, has a positive effect on all measures of financial development used in this study, except finance activity (FDFA). It's impact on financial activity (a measure of financial development) is negative and statistically significant. The implication of this result is that high spread encourages banks and other financial institutions to give loans and advances, which culminates into more domestic and private credit, liquid liabilities and increases financial size (Okon, et al., 2020). However, high interest spread could limit financial activities from the demand side perspective. These results conform to the findings of Baltagi et al (2009), Garcia (2012), Taghizadeh-Hesary et al. (2019) and Indawan (2020). These studies found that financial integration facilitates financial development by ensuring more transparency and competition in the financial sector.

Similarly, when proxied by capital flows, financial integration has statistical positive effects on financial development, measured as liquid liabilities. However, capital flows have a negative effect on financial development measured as finance-activity and financial size. This implies that foreign capital flows promotes liquid liabilities but reduce the level of financial activity, and

finance-size in sub Saharan African countries. A reason for could be the negative capital inflows into the region. Lack of inflow of capital limits amount of money in the system and could therefore reduce financial intermediation.

Table 6: SYS-GMM results of the Impact of Financial Integration on Financial Development

	Eqn 1	**Eqn 2**	**Eqn 3**	**Eqn 4**	**Eqn 5**
Variables	**FDDC**	**FDPSC**	**FDLL**	**FDFS**	**FDFA**
L.FDDC	0.8235**				
	(0.016)				
L.FDPSC		0.8385**			
		(0.018)			
L.FDLL			0.9178***		
			(0.007)		
L.FDFS				0.9486***	
				(0.008)	
L.FDFA					0.9387***
					-0.009
FII	0.0010***	0.0007***	0.0003***	0.0002***	-0.0004***
	(0.001)	(0.001)	(0.00006)	(0.00005)	(0.00006)
LNFIGPC	-0.0143	0.0466*	0.0851***	-0.0081***	-0.0140**
	(0.106)	(0.099)	(0.008)	(0.004)	(0.01)
TOTR	0.0077***	0.0133***	0.0015**	-0.0014***	-0.0012***
	(0.009)	(0.009)	(0.001)	(0.001)	(0.0003)
LNPCI	-0.0834	-0.7601	0.1260***	0.0104**	-0.1905***
	(0.536)	(0.441)	(0.033)	(0.026)	(0.026)
INF	0.0013***	0.0025***	0.0013***	0.0008***	0.0005**
	(0.002)	(0.002)	(0.0001)	(0.0002)	(0.0002)
DINV	0.1733***	0.1740***	0.0043***	-0.0026***	0.0002***
	(0.02)	(0.021)	(0.001)	(0.001)	(0.002)

LNEXCH	0.0860**	0.0519**	0.0244***	-0.0850***	-0.0650***
	(0.04)	(0.038)	(0.005)	(0.012)	(0.012)
LR	-0.0223**	-0.0087**	-0.0072***	0.0072***	0.0072***
	(0.029)	(0.023)	(0.002)	(0.002)	(0.002)
POPD	-0.0085**	-0.0140***	0.0011***	-0.00003***	-0.0016***
	(0.004)	(0.003)	(0.000)	(0.0003)	(0.0003)
HC1	-0.0079**	-0.0067**	0.0007***	-0.0009***	-0.0032***
	(0.012)	(0.013)	(0.001)	(0.001)	(0.001)
HC2	0.0239**	0.0326**	0.0001***	-0.0050***	0.0028***
	(0.021)	(0.019)	(0.002)	(0.001)	(0.001)
LNLA	-1.5489	-1.6422	0.0763**	0.0200**	-0.1043***
	(0.28)	(0.287)	(0.033)	(0.018)	(0.018)
Constant	18.899	23.1643	1.922	2.4622	4.9045***
	(5.608)	(5.308)	(0.471)	(0.608)	(0.337)
Observations	855	855	855	840	841
No. of cou.	49	49	49	49	49
F-stat prob.	0.000	0.000	0.000	0.000	0.000
AR(1) Prob.	0.001	0.001	0.087	0.043	0.011
AR(2) Prob.	0.853	0.906	0.638	0.061	0.296
Sargan Prob.	0.000	0.000	0.000	0.000	0.000
Hansen Prob.	0.675	0.673	0.427	0.793	0.515

*** implies that p<0.01 and significant at 1%, ** implies that p<0.05 and significant at 5%, * implies that p<0.1and significant at 10%.

Conclusion

Financial integration is one of the major concepts that has attracted attention. While it is generally believed that the financial development of developed countries is promoted by financial integration, the case for developing countries, especially in SSA, is debatable. This

paper therefore investigates the effects of financial integration on financial development in SSA. In order to ensure the robustness of the estimated results, five different measures of financial development and two financial integration measures were used. Employing the system GMM, it was found that the effects of financial integration on financial development in SSA depend strongly on the kinds of proxies used in capturing these two variables. Financial integration, when proxied by the interest rate spread, has a positive effect on private sector credit, domestic credit, liquid liabilities, and finance size. However, this measure of financial integration limits the level of financial activity. Similarly, when proxied by capital flows, financial integration has statistically positive effects on financial development measured as liquid liabilities but negatively influences the level of financial development measured as finance activity and financial size in sub-Saharan African countries. The overall implication of these findings is that the impact of financial integration on financial development in SSA is not straightforward. However, before drawing a definite conclusion on the connection between these two variables, several transmission channels through which financial integration impacts financial development, as well as their different proxies, need to be put into consideration.

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