




SHORT AND LONG RUN DYNAMIC COMMON CORRELATION EFFECTS OF EXTERNAL CAPITAL INFLOW ON ECONOMIC GROWTH IN SSA COUNTRIES



 **Gildas Dohba Dinga¹⁺**


¹Ph.D Candidate, Faculty of Economics and Management Sciences, The University of Bamenda, Cameroon.

Email: gildoh1995@gmail.com Tel: (+237)650696174

 **Dobdinga Cletus Fonchamnyo²**

²Associate Professor, Vice Dean in Charge of Teaching and Programming, The University of Bamenda, Cameroon.

Email: dfonchamnyo@gmail.com Tel: (+237)677381419

 **Giyoh Gideon Nginyu³**

³Ph.D Candidate, Faculty of Economics and Management Sciences, The University of Bamenda, Cameroon.

Email: g2nginyu@gmail.com Tel: (+237)670069956

 **Chuo Joshua Njuh⁴**

⁴Ph.D Candidate, Faculty of Economics and Management Sciences, The University of Bamenda, Cameroon.

Email: remiben11@gmail.com Tel: (+237)670829933



(+ Corresponding author)

ABSTRACT

Article History

Received: 26 May 2020

Revised: 29 June 2020

Accepted: 31 July 2020

Published: 19 August 2020

Keywords

FDI

External debt

Official development Aid

Economic growth

Short and long run dynamics

Dynamic common correlation effects approach.

JEL Classification:

C23; E22; F35; H63; O41.

The socio-economic effects of shock in one country produce a spillover effect on other economies given the global village nature of the world today. Current economic analyses have tended to adopt methodologies that treat cross sectional dependence in analysing macroeconomic phenomena. We employ the novel dynamic common correlation effect technique of Chudik and Pesaran (2015) that accounts for cross sectional dependence to examine the short and long run effects of different sources of external capital (foreign direct investment (FDI), official development aid (ODA) and external debt) on economic growth within 36 Sub Saharan African countries between 1995-2018. The result indicates a negative effect of external debt and ODA on economic growth in both the short and long run but it's only statistically significant in the short run. FDI is positive but only statistically significant in the short run. Disparity is noticed in the results especially in the long run when the panel is sub divided into lower and middle income countries. ODA and FDI exert positive long run effect in low income countries but negative in middle income countries. Meanwhile debt is negative for both income groupings.

Contribution/ Originality: This study uses the new estimation DCCE technique to examine capital inflow on economic growth in the presence of cross sectional dependence in SSA.

1. INTRODUCTION

The undeniable lack of required domestic capital in Africa and sub Saharan Africa in particular have consistently made policy makers in this continent to look outward and seek external finance in order to meet up with their financial obligation and development goals. Bird and Choi (2020) noted that the sustainable development goals have focused attention on ways of providing external finance to support development efforts of economies. While sources of external finance like external debt and official development aids seems to indicate greater trends as per inflow comparatively with other sub regions, foreign direct investment on its part has consistently shown

low trends in the SSA sub region. Moreover, Calderón, Chuban-Pole, and Kubota (2019) noted that the trend of gross capital flow in SSA follow a different path to that of global capital flows, and capital flow within the sub region have been recently reshaped by three external shocks that is 2008-2009 global financial crisis, 2011-2012 European sovereign debt crisis and the 2014 plunge in oil prices. FDI investment have continuously showed low trend and this trend is expected to exacerbate significantly in 2020 amid the dual shock of low commodity prices and the corona virus pandemic (UNCTD, 2020). Meanwhile external debt and official development aid have continually showed increasing trends from 2012 to 2017 (Africa's Pulse, 2018).

Face with low domestic capital, SSA economies has tended to seek more external capital in order to meet up with their domestic financial obligations. The major question wanting is that are these different types of external capital inflow fostering or retarding growth within SSA countries? With the global village nature of the world today, where shock in one country affect other countries, economic analyses have tend to adopt more robust methodologies that account for cross country dependence. Most existing studies in this domain have mainly used conventional estimation techniques like FE, RE and GMM (Bird & Choi, 2020; Karagoz & Caglar, 2016), Pooled mean group (PMG) and panel VAR (Guei, 2019; Juselius, Møller, & Tarp, 2014; Musibau, Yusuf, & Gold, 2019) which does not account for cross sectional dependence. Ali, Yusop, Kaliappan, and Chin (2020) noted that these conventional technique produce biased estimate in the presence of cross sectional dependence. In this light, this current study sought to examine the short and long run effect of different sources of external capital (external debt, foreign direct investment (FDI) and official development aid) on economic growth within SSA economies. To attain this objective, this study adopts the novel dynamic common correlation effects technique developed by Chudik and Pesaran (2015). This technique differs from conventional techniques since it accounts for cross sectional dependence across cross sectional units. The result indicates that external debt and official development aid exert a negative effect while FDI exert a positive effect on economic growth in the short run. A similar result is obtained in the long run but statistically insignificant. But when the sample is sub divided into two income groups, a significant long run positive effect of FDI and aid and negative effect of debt is observed in lower income countries while middle income countries show negative and insignificant effect for each source of external capital on economic growth. The rest of this paper is organised as follow, section 2 will examine the literature review, section 3 will look at the methodology, section 4 will examine the results and finally section 5 will be conclusion and recommendation.

2. LITERATURE REVIEW

Economic theory posits a mixed outcome on the effect of external debt on economic growth. The neoclassical growth theory (Solow, 1956) posits a positive direct effect of external debt on economic growth. This is based on the fact that if the debt is optimally used it is anticipated to increase investment. The debts overhang theory (Myers, 1977) state that a certain level of external debt will have a positive effect but at a certain level, additional debt will have a negative effect. A handful of empirical research has been carried out to ascertain the effects of debt on economic growth with many inconclusive outcomes. Karagoz and Caglar (2016) using FE, RE and dynamic models examine the effect of external debt on economic growth for 17 OECD countries and concluded on a positive effect of external debt on economic growth. (Chudik, Mohaddes, Pesaran, & Rai, 2013) while applying cross sectional augmented distributive lag investigated the long run effect of debt on growth from 1965 to 2010 in 40 countries. Their result indicated significant negative long run effect of debt on economic growth. Guei (2019) investigate the debt-growth nexus using a panel ARDL model for 13 emerging economies from 1990-2016. The outcome indicated no robust relationship in the long run while a short run negative effect of external debt on economic growth is observed. Equally, Senadza, Fiagbe, and Quartey (2018) employ the GMM technique to examine external debt effect on economic growth in 39 SSA from 1990-2013. Their result indicates a negative effect of debt on economic growth. While applying the ARDL technique to examine the external debt and economic growth nexus in Nigeria from 1984-2018, Ohiomu (2020) concluded that debt overhang and crowding out variables

aversely effect growth. On their part, [Fincke and Greiner \(2015\)](#) examine the debt-growth nexus for 8 emerging economies and concluded on a positive effect of debt on growth.

Foreign aid is another sources of external capital that has been examine with a great deal of inconclusive result. Most Aid growth models have been developed with the assumption that aid fills the resource gap necessary to launch developing countries into a takeoff to self-sustain growth ([Chenery & Strout, 1966](#)). Studies have equally noted that aid can be Fungible if they are not use for the purpose that it was intended for [McGillivray and Morrissey \(2001\)](#). Empirically, [Juselius et al. \(2014\)](#) employ a panel VAR model and examine the impact of aid on key macroeconomic variables from mid-1960 to 2007 within 36 SSA countries. Their result indicated broad support for a positive long run impact of aid on the economy. [Musibau et al. \(2019\)](#) using a PMG model examine the relationship between foreign capital inflow human capital development and economic growth in ECOWAS countries. Their results indicated that official development aid is negative in the short run and positive in the long run, FDI exert a positive effect while external debt is negative in both the short and long run. [Bird and Choi \(2020\)](#) employ the Dynamic GMM and FE technique to investigate effects of FDI, aid and remittances on economic growth and concluded FDI showed a positive effect while foreign aid is ambiguous and usually insignificant.

The literature of FDI and economic growth is extensive with many conflicting results. These studies differ in design, sample and methodology. The conflicting results noticed have been shown to be negative or positive. [Driffield and Jones \(2013\)](#) investigated the effect of external finances on economic growth using a three stage least square technique and concluded on a positive effect of FDI on economic growth while official development aid showed a negative effect. [Yeboua \(2020\)](#) using a panel smoothing transitional regression on 27 African economies over the period 1990-2017 examines the FDI and economic growth nexus in Africa. His result indicates that FDI promote growth in countries with good institutions above a certain threshold and retard growth or have no effect in those below the threshold. [Adams and Klobodu \(2017\)](#) examine the different effects of capital flow on economic growth from 1970 to 2014 in five SSA countries using the ARDL techniques. Their findings indicated that capital inflow (FDI and aid) have different long run effects on economic growth within different countries.

The theoretical and empirical review of external finance on economic growth generally indicate mixed outcome for each of the sources of external finance considered. A vital issue that accounts for the disparity among existing results stem from methodology and the scope of the study considered. In this study, we examine the effect of three sources of external capital (debt, FDI and ODA) on economic growth from 1995 to 2018. The study period is chosen based on data availability and given that it ties with the recovery faces of the early 1990 global crisis. The novel methodology proposed by [Chudik and Pesaran \(2015\)](#) that accounts for cross sectional dependence is adopted given that it have not been employ in this domain and given it numerous advantages.

3. METHODOLOGY AND DATA

3.1. Data and Model

The sample under consideration covers a total of 36¹ sub Saharan African countries with the time dimension spanning from 1995 to 2018. All the data of the different variables are collected from the [World Development Indicators \(2019\)](#) data catalogue of the World Bank. The dependent variable is gross domestic product per capita growth rate annual percentage. Three sources of external finance are used in this study that is external debt measured as total external debt as a percentage of gross national product, foreign direct investment measure as foreign direct investment net inflows as a percentage of gross domestic product and finally development Aid measure as net official development aid receive as a percentage of gross national product.

¹ Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo. Dem. Rep, Congo. Rep, Cote D'Ivoire, Eswatini, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Sudan, Tanzania, Togo, Uganda, Zimbabwe.

To examine the effect of external capital inflow on economic growth within sub-Saharan African economies, we estimate the following model inspired from the work of Chudik et al. (2013).

$$\text{GDPC}_{it} = \alpha_i + \rho \text{GDPC}_{it-1} + \lambda_1 \text{XDEBT}_{it} + \lambda_2 \text{FDI}_{it} + \lambda_3 \text{ODA}_{it} + \gamma_i f_t + \xi_{it} \quad (1)$$

From Equation 1, $i = 1, \dots, N$ and $t = 1, \dots, T$ and GDPC_i is GDP per capital for unit i at time t , α_i is an unobserved individual effect, XDEBT, FDI and ODA are the different sources of external finance that is external debt stock, foreign direct investment inflow and official development aid, f_t is an unobserved common factors with heterogeneous factor loadings γ_i and ξ_{it} is an idiosyncratic error term. Meanwhile, ρ , λ_1 , λ_2 and λ_3 are the parameters of the model which are homogenous over cross-sectional units i and bounded by a finite constant. The data is analyzed using STATA 14.

3.2. Estimation Technique

As noted by Vos and Everaert (2019) Dynamic models are common in practice since many economic variables tend to react slowly to changes in their determinants and hence display considerable persistence over time. In this regard, we employ four novel estimation techniques to examine the short and long run effects of the diverse sources of external finance on economic growth within SSA countries. Firstly, we employ the PMG of Pesaran, Shin, and Smith (1999) which involve the averaging and pooling of the coefficients over the cross sectional units. The short run effects are allowed to be individual unit's specifics across panels while the long run effects are constraints to be equal across the panels. In order to account for cross sectional dependence and given the multifactor error model considered, we estimate the model using the dynamic common correlation techniques. As explain by Ditzen (2016) we first estimate the model wherein the long run coefficients are recalculated to match the pooled mean group naming convention (model 2). The model is re-estimated such that the long run coefficients are not divided by the error correction speed of adjustment vector (model 3). Since the lag dependent variables in the previous two dynamic common correlation models are not strictly exogenous Ditzen (2016) noted that the estimator will become biased. In this light we estimate the model using the novel technique proposed by Chudik and Pesaran (2015) whereby the estimators tend to gain consistency with the addition of cross sectional mean. The DCCE technique is very important for several reasons; firstly it allows for mean group, pooled and pooled mean group estimations. Secondly, the biasedness of small sample time series is corrected, thirdly it provide a new routine to estimate a heterogeneous panel model using dynamic common correlated effect and it equally test for cross sectional dependence within the estimated model among others. Before proceeding to estimate the model, we first perform the Pesaran (2003) second generation unit root test and the Westerlund (2007) second generation cointegration test that all account for cross sectional dependence. We equally employ the Pesaran (2004) and Pesaran (2015) cross sectional dependence test to check for cross sectional dependence within our panel. Chudik. et al. (2013) explain that cross sectional dependence occurs due to the interactions among the countries at same economic and social network, and other unobserved factors. Failure to address problem of cross sectional dependence (CD) produce biased and inconsistent results. Hence this study adopts the DCCE technique which account for cross sectional dependence, and since this will go a long way to bridge the methodology gap between conventional technique and new techniques.

4. EMPIRICAL RESULTS

4.1. Preliminary Test Results

Before proceeding to estimate our model, we first perform some key pretest on the variables of interest. The Pesaran. (2003) second generation test for unit root is employed to examine the stationarity of the variables. The result in Table 1 indicates that the null hypothesis of panels containing unit roots is rejected for all the variables. This implies that all the variables are stationary at level and hence follow an I(0) process. Equally, in order to ascertain long run relation between the dependent variable and the independent variables in the panel, we employ

the Westerlund (2007) second generation test that accounts for cross sectional dependence. The results from the four test statistics (Ga, Gt, Pt, Pa) of the Westerlund (2007) second generation cointegration test reject the null hypothesis of no cointegration between each variable and the dependent variable. This validates cointegration between the variables and hence confirms the existence of a long run relation. Due to the vitality of cross sectional dependence on the dynamics of macroeconomic variables, we perform the Pesaran (2004) and the novel (Pesaran, 2015) cross sectional dependence test. The results from the two tests statistics indicate that the null hypothesis of cross section independence is rejected for each variable in both tests thereby confirming cross sectional dependence.

Table-1. Panel unit root/cointegration /cross sectional dependence test.

Unit root test								
	GDPG		EXDBT		FDI		ODA	
	Statistics	p-value	Statistics	p-value	Statistics	p-value	Statistics	p-value
Pescadf(1)	-7.832	0.000	-2.61	0.009	-1.946	0.026	-1.572	0.057
Cointegration test								
Gt			-14.979	0.000	-14.919	0.000	-13.596	0.000
Ga			-9.666	0.000	-9.975	0.000	-9.879	0.000
Pt			-13.072	0.000	-14.259	0.000	-13.621	0.000
Pa			-10.823	0.000	-13.185	0.000	-12.924	0.000
Cross sectional dependence								
Pesaran (2004) CD-test	3.34	0.001	61.72	0.000	13.30	0.000	20.65	0.00
Pesaran, (2015) CD-test	24.564	0.000	106.396	0.000	69.404	0.000	87.622	0.000

4.2. Short and Long Run Dynamics

With the confirmation of a strong long run relation from the cointegration between the variables, we now estimate the model for short and long run effects using the four procedures described above. In Table 2, we present the estimated long and short run affect using the different four econometric techniques explained above. Meanwhile in Table 3, we sub divide the sample into two that is low income countries and middle income countries to capture and account for income level disparity.

Table-2. Estimated results.

	(1) pmg-mg	(2) dcce-mg	(3) dcce-mg-nodivid	(4) dcce-cce
Short run effects				
D(XDEBT)	-0.0745*** (0.025)	-0.0772*** (0.026)	-0.0772*** (0.026)	-0.0779*** (0.0239)
D(FDI)	0.140 (0.103)	0.195* (0.106)	0.195* (0.106)	0.236** (0.110)
D(ODA)	-0.0699 (0.0453)	-0.0772* (0.0415)	-0.0772* (0.0415)	-0.0494** (0.0224)
cons	1.127*** (0.231)			
EC	-0.818*** (0.0520)	-0.845*** (0.0831)	-0.845*** (0.0730)	-0.806*** (0.118)
Long run effects				
XDEBT	-0.0101*** (0.003)	-0.0150** (0.007)	-0.0126*** (0.004)	-0.0138 (0.0262)
FDI	0.175*** (0.037)	0.0733 (0.094)	0.0619 (0.090)	0.0689 (0.130)
ODA	0.00153 (0.002)	0.000156 (0.014)	0.000132 (0.007)	-0.00257 (0.0767)
N	805	805	805	805
CD(p-value)		2.323 (0.0202)	2.323(0.0202)	1.890(0.0587)
F-stat(p-value)		7.38 (0.00)	7.38 (0.00)	3.01 (0.00)

Note: ***, ** and * are the respective significant levels at 1%, 5% and 10%. () are standard errors.

From the results in Table 4, the short run coefficients indicate that external debt is negative and statistically significant at 1% significant level for all the four techniques applied. This implies that increase debt is associated with decrease in economic growth within SSA countries that is for model 4, a 1% increase in external debt will lead to 0.078% fall in economic growth. This result confirms the findings of Guei (2019) and Senadza et al. (2018). Official development aid is equally negative and statistically significant in all applied techniques and shows that increase in development aid is associated with a fall in economic growth in the short run. This negative effect can be due to the fungible nature of most official development aid flowing into the sub region. This outcome confirms the findings of Musibau et al. (2019) and contradicts Juselius et al. (2014). On the other hand and in line with the findings of Bird and Choi (2020) FDI is positive and statistically significant at 5% for all the four models employed. This implies an increase in the inflow of FDI leads to an increase in economic growth in the short run.

The long run coefficients equally confirms a negative relationship for external debts on economic growth, but this result is only significant for the first three models, but insignificant in the fourth model. This results disparity can be explain based on the fact that the non-consideration of cross sectional mean in the other model produces significant results that are biased for inference. The outcome confirms (Guei, 2019) who concluded on no robust long run relationship. FDI exhibit a long run positive effect on economic growth, but these results is insignificant. Meanwhile official development aid is positive in the long run when cross sectional averages are not assume in the model but exhibit a negative relationship when cross sectional averages are accounted for. This outcome is in line with Bird and Choi (2020). The error correction term is negative as expected and statistically significant for the four models. This indicates that there is an average 82.85% adjustment from short run disequilibrium to long run equilibrium.

Table-3. DCCE income level estimates.

Variables	LIC (dcce-cce)	MIC (dcce-cce)
Short Run		
D(XDEBT)	-0.112 (0.052)**	-0.067 (0.347)*
D(FDI)	0.177(0.143)	0.236 (0.139)*
D(ODA)	-0.024 (0.011)**	-0.070 (1.09)
EC	-1.007(0.112)***	-0.608 (0.216)***
Long Run		
XDEBT	-0.049(0.01)***	-0.012(0.018)
FDI	0.218 (0.081)***	-0.042(0.262)
ODA	0.0027(0.0013)**	-0.004(0.059)
N	399	368
CD (p-value)	-1.56 (0.1184)	-0.66 (0.51)
F-stat(p-value)	2.19 (0.00)	1.71 (0.00)

Note: ***,** are the respective significant levels at 1%, 5% and 10%. () are standard errors.

The F-statistic of model 2, 3 and 4 in Table 2 as well as the CD test statistics are all significant thereby confirming goodness of fit in the estimated model. To equally ensure results robustness and ensure it's good for inference, we perform a second generation unit root test on all the four residuals. The residual unit root test presented in Table 4, indicate that the null hypothesis of residual containing unit root is rejected at the 1% significant level for all the four models, this therefore validate our model.

In order to account for income level effects of external capital inflow on economic growth in SSA countries and for comparative purposes, we sub divide the sample into two income groups that is 19 lower income countries (LIC) and 17 middle income countries (MIC). After confirming good fit from the significant value of the F statistics and the stability of the two models residuals Table 4, the result presented in Table 3 shows that comparatively, there is a short run negative and significant effect of external debt on economic growth in both sub panels but the effect is higher in LIC than in MIC. Still in the short run, foreign direct investments is positive for the two sub panels, but

only exert a significant effect in MIC. Equally, the short run effect of official development aid is negative for both sub panels but only exert a significant effect on LIC.

Table-4. Residual unit root test.

Models	Residual 1		Residual 2		Residual 3		Residual 4		Residual LIC		Residual MIC	
	z-stic	p-v	z-stic	p-v	z-stic	p-v	z-stic	p-v	z-stic	p-v	z-stic	p-v
pescadf	-2.14	0.02	-7.09	0.00	-7.17	0.00	-7.34	0.00	-4.78	0.00	-4.70	0.00

Note: z-stic is Z statistics coefficient, p-v is the p-value.

The error correction term in both models is negative and statistically significant as expected. This implies that deviation from long-run equilibrium of real GDP growth of the previous period is corrected by 60.8% within MIC and 100.7% within LIC in the current period to restore equilibrium. Comparatively, there is fast convergence from short run disequilibrium to long run equilibrium in LIC than in MIC. The long run outcome reveals that, increase external debt will lead to a fall in economic growth in both LIC and MIC within SSA. But the debt effect is only significant with LIC. The result of FDI and official development aid reveals great disparity between countries at different income level. The outcome shows that increase in the inflow of FDI and official development aid are significantly associated increase in economic growth within LIC. On the other hand, increase in the inflow FDI and official development aid is negative for MIC but not statistically significant.

5. CONCLUSION AND POLICY RECOMMENDATION

In this study, we examine the short and long run effect of different sources of external finance (external debt, FDI inflow and official development aid) on economic growth within 36 sub Saharan African countries from 1995 to 2018. We employ the novel dynamic common correlation effect technique developed by Chudik and Pesaran (2015). Pesaran (2003) unit root, Westerlund (2007) cointegration and Pesaran (2004); Pesaran (2015) cross sectional dependence test are employed. The results indicate a short run negative effect of external debt and official development aid on economic growth while foreign direct investment reveals a positive effect. In long run, a similar and insignificant result is confirmed in the long run for foreign direct investment, external debt and official development aid. Reexamining this relationship at different income level (LIC, MIC), the short run results of the two sub samples indicate a similar outcome. Whereas in the long, a positive and significant effect of FID and ODA is found for LIC while a negative link is found for MIC. The long run effect of external debt is negative for both income level but only significant for LIC.

Based on the results, the study recommends that policy makers in SSA countries should put in place policies that will foster accountability and transparency in the usage of external debt and foreign aid in order to ensure that aids are used for development purposes especially MIC. External debt and official development aid should be channeled into productive sectors like infrastructural development, education and health. Improvement should be made at the level of business climate and institutional sector so as to attract more FDI investment.

Funding: This study received no specific financial support.

Competing Interests: The authors declare that they have no competing interests.

Acknowledgement: Authors acknowledge the loadable assistance on methodology receive from the BRAIN TRUST ECONOMIC and ECONOMETRIC CONSORTIUM (BTEEC). c/o bteec2020@yahoo.com.

REFERENCES

- Adams, S., & Klobodu, E. K. M. (2017). Capital flows and economic growth revisited: Evidence from five Sub-Saharan African countries. *International Review of Applied Economics*, 32(5), 620-640. Available at: <https://doi.org/10.1080/02692171.2017.1355357>.
- Africa's Pulse, S. (2018). *Analysis of issues shaping africa's economic future (April)*. Washington, DC: World Bank.

- Ali, S., Yusop, Z., Kaliappan, S. R., & Chin, L. (2020). Dynamic common correlated effects of trade openness, FDI, and institutional performance on environmental quality: evidence from OIC countries. *Environmental Science and Pollution Research*, 27, 11671–11682. Available at: <https://doi.org/10.1007/s11356-020-07768-7>
- Bird, G., & Choi, Y. (2020). The effects of remittances, foreign direct investment, and foreign aid on economic growth: An empirical analysis. *Review of Development Economics*, 24(1), 1-30. Available at: <https://doi.org/10.1111/rode.12630>.
- Calderón, C., Chuban-Pole, P., & Kubota, M. (2019). Drivers of gross capital inflows: which factors are more important for Sub-Saharan Africa. Policy Research Working Paper 877, World Bank Group.
- Chenery, H. B., & Strout, A. M. (1966). Foreign assistance and economic development. *The American Economic Review*, 56(4), 679-733.
- Chudik, A., & Pesaran, M. H. (2015). Common correlated effects estimation of heterogeneous dynamic panel data models with weakly exogenous regressors. *Journal of Econometrics*, 188(2), 393-420.
- Chudik, A., Mohaddes, K., Pesaran, M. H., & Rai, M. (2013). Debt, inflation and growth: Robust estimation of long-run effects in dynamic panel data model. Working Paper No. 162.
- Ditzen, J. (2016). Xtdcce: estimating dynamic common correlation effects in Stata. In United Kingdom Stata Users Group meetings 2016(NO. 08). Stata Users.
- Driffield, N., & Jones, C. (2013). Impact of FDI, ODA and migrant remittances on economic growth in developing countries: A systems approach. *The European Journal of Development Research*, 25(2), 173-196. Available at: <https://doi.org/10.1057/ejdr.2013.1>.
- Fincke, B., & Greiner, A. (2015). Public debt and economic growth in emerging market economies. *South African Journal of Economics*, 83(3), 357-370. Available at: <https://doi.org/10.1111/saje.12079>.
- Guei, K. (2019). External debt and growth in emerging economies. *International Economic Journal*, 33(2), 236-251. Available at: <https://doi.org/10.1080/10168737.2019.1590727>.
- Juselius, K., Møller, N. F., & Tarp, F. (2014). The long-run impact of foreign aid in 36 African countries: Insights from multivariate time series analysis. *Oxford Bulletin of Economics and Statistics*, 76(2), 153-184. Available at: <https://doi.org/10.1080/10168737.2019.1590727>.
- Karagoz, M., & Caglar, M. (2016). Does debt really crack the whip? Evidence from a panel of selected OECD countries. *Procedia Economics and Finance*, 38, 430-437. Available at: [https://doi.org/10.1016/s2212-5671\(16\)30214-3](https://doi.org/10.1016/s2212-5671(16)30214-3).
- McGillivray, M., & Morrissey, O. (2001). A review of evidence on the fiscal effects of Aid. (No.01/13). CREDIT Research Paper.
- Musibau, H. O., Yusuf, A. H., & Gold, K. L. (2019). Endogenous specification of foreign capital inflows, human capital development and economic growth. *International Journal of Social Economics*, 46(3), 454-472. Available at: <https://doi.org/10.1108/ijse-04-2018-0168>.
- Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, 5(2), 147-175. Available at: [https://doi.org/10.1016/0304-405x\(77\)90015-0](https://doi.org/10.1016/0304-405x(77)90015-0).
- Ohiomu, S. (2020). External debt and economic growth nexus: Empirical evidence from Nigeria. *The American Economist*, 65(2), 1-14. Available at: <https://doi.org/10.1177/056943450914862>.
- Pesaran, M. H. (2015). Testing weak cross-sectional dependence in large panels. *Econometric Reviews*, 34(6-10), 1089-1117. Available at: <https://doi.org/10.1080/07474938.2014.956623>.
- Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association*, 94(446), 621-634.
- Pesaran, H. A. (2003). Simple panel unit root test in the presence of cross section dependence. University of Cambridge, Faculty of Economics (DAE). Cambridge Working Papers in Economics 0346.
- Pesaran, M. H. (2004). General diagnostic tests for cross section dependence in panel. CESifo Working Papers No. 1233.
- Senadza, B., Fiagbe, A. K., & Quartey, P. (2018). The effect of external debt on economic growth in Sub-Saharan Africa. *International Journal of Business and Economic Sciences Applied Research*, 11(1), 61-69.
- Solow, R. M. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economic*, 43(4), 759-778.

- UNCTD. (2020). International production beyond the pandemic. United nation. World Investment Report.
- Vos, D. I., & Everaert, G. (2019). Bias-corrected common correlated effects pooled estimation in dynamic panels. *Journal of Business & Economic Statistics*, 1-13. Available at: <https://doi.org/10.1080/07350015.2019.1654879>.
- Westerlund, J. (2007). Testing for error correction in panel data. *Oxford Bulletin of Economics and Statistics*, 69(6), 709-748. Available at: <https://doi.org/10.1111/j.1468-0084.2007.00477.x>.
- World Development Indicators. (2019). *World bank*. Washington D.C: The World Bank.
- Yeboua, K. (2020). Foreign direct investment and economic growth in Africa: New empirical approach on the role of institutional development. *Journal of African Business*, 1-18. Available at: <https://doi.org/10.1080/15228916.2020.1770040>.

Views and opinions expressed in this article are the views and opinions of the author(s), Asian Journal of Economic Modelling shall not be responsible or answerable for any loss, damage or liability etc. caused in relation to/arising out of the use of the content.