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Testing the Triple Deficit Hypothesis for Sub-Saharan Africa: Implications for the African Continental Free Trade Area[1]

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Samson N. Okafor
Research Department, Central Bank of Nigeria, Abuja
E-mail: samsonokafor4@gmail.com

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Chukwunonso Ekesiobi
Department of Economics, Chukwuemeka Odumegwu Ojukwu University, Nigeria
E-mail: cs.ekesiobi@coou.edu.ng

Ogonna Ifebi
Department of Economics, ChukwuemekaOdumegwu Ojukwu University, Nigeria
E-mail: eo.ifebi@coou.edu.ng

Stephen K. Dimnwobi
Department of Economics, Nnamdi Azikiwe University, Awka, Nigeria
Corresponding Author:
E-mail: stephenkcdim@gmail.com

Simplice A. Asongu
School of Economics, University of Johannesburg, South Africa
E-mails: asongus@afridev.org, asongusimplice@yahoo.com, asimplice@uj.ac.za

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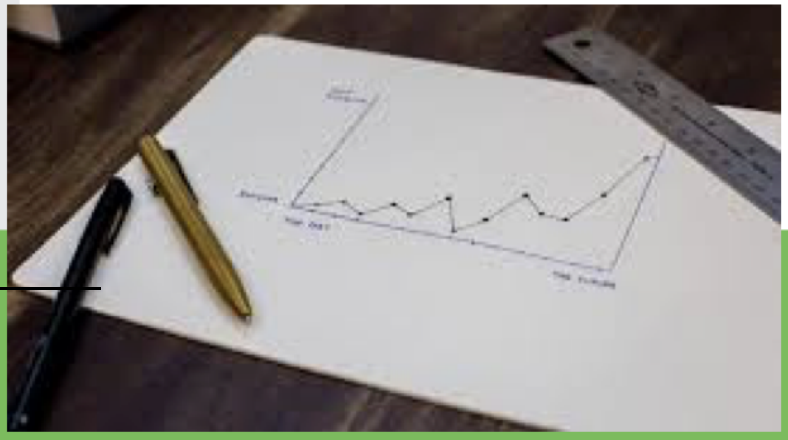

Abstract

Aware of the nature of deficits in the current account, fiscal account, and the financial account balances of the countries in the Sub-Saharan Africa (SSA) region, this inquiry assessed the relationship between these deficits and the implication of such relationship for the African Continental Free Trade Area (AfCFTA). To do this, the study adopted panel data analysis techniques using the Pooled Mean Group-Autoregressive Distributed Lag (PMG-ARDL) specifications to test for the Triple Deficit Hypothesis (TDH) in the region. The findings of the study revealed the presence of the TDH in SSA where bidirectional causality exists between current account balance and budget balance, and between saving gap and current account balance, with a unidirectional causality running from budget balance to saving gap. The adoption of sound fiscal, monetary, and trade interventions in the region constitutes the major policy recommendations.

Keywords: Triple Deficit Hypothesis; Sub-Saharan Africa; African Continental Free Trade Area

1. Introduction

The advent of globalization has engendered greater interconnectedness of nations, culminating in varying degrees of global, continental, and regional trade agreements aimed at fostering economic integration and shared prosperity (Inançli & Addi, 2019; Umulisa, 2020). The African Continental Free Trade Area (AfCFTA) represents the latest regional trade pacts among 54 of the 55 African Union (AU) nations, withEritrea as the lone member of the continent yet to endorse the deal. Being the largest free-trade area with regards to the number of participating nations since the World Trade Organization (WTO) establishment, the agreement aims to eliminate tariffs from 90% of goods, establish a single market, and strengthen the continent's economic integration (Ekobena et al, 2021; Magoti et al., 2020). However, some trade agreements bear economic benefits to participating nations than others, with challenges consequent upon the inherent characteristics of participating countries (Ebaidalla & Yahia, 2014; Sakyi et al, 2017; Yiheyis, 2013). These difficulties have ranged from domestic trade issues (Akinci & Yilmaz, 2012), fiscal policies to savings and investment (financial account) policies (Chowdhury& Saleh, 2007) of the member countries, amongst others. A combined deficit in these policy options (referred to as *the triple deficits*) according to Kuijs (2006) and Shastri et al (2017), are most

likely to affect the expected development outcomes in an economy and within trade agreements between nations.

In recent decades, the SSA region has experienced considerable fiscal deficits, current account deficits as well as financial account imbalances (Ahmad & Aworinde, 2014; Workneh, 2021), and given these concerns, this paper adds several insights to the TDH literature. First, it focuses attention on SSA which has been mostly ignored in this area of research. This is perilous for a region struggling with a rising debt load (regional debt-to-GDP rose to 59% in 2019 from 37% in 2012 – World Bank, 2020a), a record population of the global poor (72% of people in SSA survive on below US$ 2 a day - World Bank, 2020a), the largest youth concentration and rate of population expansion in t he globe, projected to increase by two folds come 2050 to 2 billion people (Dimnwobi et al ., 2021) among other worrisome development outcomes. What is more, on the heels of the COVID-19 outbreak, the macroeconomic fragility of SSA countries has been uncovered with looming economic, political, and social implications. The World Bank (2020a) projects the pandemic to depressingly affect most SSA countries through diverse channels among which includes, a trade decline, decreases in investment, fall in international remittances, waning foreign aid, increased fiscal deficits, and financial sector squeeze. The internal and external macroeconomic disequilibria resulting from the slump may persevere into the foreseeable future and negatively alter the SSA region's chances to catchup with other regions and meet the Sustainable Development Goals (SDGs) by 2030.

Second, since the introduction of the AfCFTA, this study represents the first effort at examining the validity of the TDH in SSA and its implication for the take-off of the AfCFTA. As SSA nations strive toward achieving the goals of the AfCFTA, it becomes expedient to examine the economic performances and dynamics of the savings gap, fiscal and current account balances of the countries in the region. Comprehending the probable causal linkages between these variables becomes a prerequisite for developing and implementing sound macroeconomic policies in the SSA region and provides an assured platform for the AfCFTA to thrive. Also, large and persistent internal and foreign deficits are commonly acknowledged to endanger macroeconomic stability and growth. As some SSA countries have demonstrated in the past, huge and incessant budget deficits cause severe issues for future generations bequeathed with a financial burden. The existence of internal and external deficits also causes problems for governments, particularly when their currency reserves deplete, creating an excessive debt quandary or paving the way for an economic catastrophe. Third, unlike mainstream TDH literature, we utilized a second-

generation panel unit root test namely cross-sectionally augmented Im, Pesaran, and Shin (CIPS) panel unit root test of Pesaran (2007) which explicitly accounts for the potential existence of cross-section dependency in panel unit root tests as well as the Dumitrescu-Hurlin (D-H) causality test used for panel Granger causality relationship. Furthermore, this study adopts the Pooled Mean Group-Autoregressive Distributed Lag (PMG-ARDL). This is premised on its ability to account for unobserved heterogeneity specific to countries under study and the consistency of estimates for panel data involving variables of diverse orders of integration. It also permits for heterogeneity of the short-run coefficients across nations, ensures the homogeneity of long-run coefficients and it is appropriate even in the face of a relatively small sample size (Chudik et al.,2015).

The rest of the paper is sectioned as follows, section two is for literature review, the methodology is contained in the third section, and the fourth section presents results and discussions, while section five offers some concluding remarks.

2. Brief Literature Review

A survey of related research shows that several studies have been conducted to estimate the TDH. For example, studies by Ackinci and Yilmaz (2012) and Raji (2019) among others provide some insights for single-country studies on the TDH. However, our study's empirical review focuses on multi-country research works most related to our study objectives and scope. Beginning with Gruber and Kamin (2007), the study applied panel data analysis in a sample of 61 nations to appraise the determinants of the trade account between 1982 and 2003. The outcome of the study showed that growth in savings adversely influences nations that encounter a savings gap, giving way to an increase in trade deficits. Hence, the savings-investment gap contributes to the trade deficit, a view that supports the TDH.

For 23 European economies, Bolat et al (2014) employed the panel Granger causality technique and reported the existence of the TDH in the European economies studied. For a group of transition nations, Çoban and Balıkçıoğlu (2016) employed a dynamic panel econometric approach over the period 2002 to 2013 and found no connection between the savings gap and current deficit. Likewise, for G7 nations, Akbas and Lebe (2016) applied the bootstrap panel cointegration approach between 1994 and 2011. The study established two bilateral causality connections between the current account deficit and saving gap and between the saving gap and budget deficit. The study confirms the

validity of the TDH for the G7 nations. For selected South Asian nations from 1985 to 2015, Shastri et al (2017) found a long-term connection between the savings gap, budget balance, and current account balance thereby confirming the existence of the TDH.

Ozdemir et al (2014) assessed the validity of the TDH in 17 transition economies between 2003 and 2011 and the study provided evidence supporting the Ricardian Equivalence Hypothesis and invalidates the TDH. Similarly, Sen and Kaya (2018) conclude that the TDH is not valid for six post-communist nations over the period 1994 to 2012. In a group of 15 developing nations from 2000 to 2015, Bayramoğlu and Öztürk (2018) found a significant connection between current account and domestic savings whereas causal linkages between current account balance and fixed capital investments cannot be established, hence the study concluded that TDH is partially valid for the selected developing economies studied. Raouf (2020) examined the validity of TDH for a group of 14 Middle Eastern and Northern African (MENA) nations from 1999 to 2018. Employing the non-linear autoregressive distributed lag (NARDL) model, the author discovered that the TDH is valid for the selected MENA nations. For similar studies in Africa, Magoti et al, (2020) examined the relevance of the TDH for East African nations between 2004 and 2018. The study concludes that the TDH does not hold for East African nations. In a recent study, Workneh (2021) relied on the dynamic common correlated effect mean group model and Dumitrescu-Hurlin panel granger causality and concludes that TDH holds for SSA.

3. Methodology

3.1. Theoretical Framework

The theoretical framework of this study is anchored on the TDH. The core logic of the triple deficit is exemplified in the national income identity through the income-output approach as established by Mundell and Fleming during the 1960s. To present the triple deficit, it is instructive to note that this deficit implies that three important variables are in disequilibrium. Thus, the national income identity is utilized to explicate the triple deficit as follows:

$$Y = C + I + G + (X-M) \quad (1)$$

where Y = national output, consisting of domestic (C + I + G) and external (X-M) components; C = consumption expenditure; I = investment expenditure; X = export of goods and services; M = import of goods and services, and X-M = net export (export minus

import). The sum of consumption, investment, and government expenditures is recognized as the aggregate domestic expenditure (ADE). Thus,

$$ADE = C + I + G \quad (2)$$

Substituting the left side of Equation (2) in Equation (1), we arrive at Equation (3) as follows:

$$Y = ADE + X\text{-}M \quad (3)$$

Rearranging Equation (3), we arrive at Equation (4) as follows:

$$Y - ADE = X - M \quad (4)$$

In Equation (4), if the aggregate domestic expenditure (ADE) is more than the national output (Y), the left side of Equation (4) becomes negative, thus a domestic deficit occurs in the economy. As a result, the right-hand side of Equation (4) will also have a negative value for equilibrium to occur, hence external deficit also arises. The external deficit may arise due to the deficit in the public and/or private sectors. For instance, the idea of leakages and injections in an open economy implies that savings (S), taxes (T), and import (M) lower domestic goods demand (leakages), while investment (I), government expenditure (G), and exports (X) enhance domestic goods demands (injections) (Magoti et al., 2020). Thus, the aggregate expenditure (domestic and export component) on goods supplied in the economy is represented in Equation (5) and the utilization of revenue from this supply is given in Equation (6).

$$AE = C + I + G + X \quad (5)$$

where AE = ADE + X, and

$$Y = C + S + T + M \quad (6)$$

Aggregate expenditure (AE) is expected to be equal to the national output (Y), and leakages (S + T + M) equal to injections (I + G + X) for the economy to be at equilibrium. Hence, Equation (5) and Equation (6) are equated to each other as follows:

$$C + S + T + M = C + I + G + X \quad (7)$$

By rearranging Equation (7), we draw a clear line between leakages and injections in the economy and how equilibrium is reached by the equality of leakages and injections.

$$S + T + M = I + G + X \quad (8)$$

To characterise the sources of an external deficit, we rearrange Equation (8) accordingly as shown in Equation (9).

$$(S\text{-}I) + (T\text{-}G) = (X\text{-}M) \quad (9)$$

Equation (9) shows the internal and external balances of the economy. The (S-I) is the saving-investment balance, which is denoted with SAG in this study, while (T-G) shows the budget balance, which according to this study, is represented as BUD, and (X-M) indicates the current account balance or external balance including unilateral transfers that are embedded in X and M, and in this study, the current account balance is denoted with (CAB). Accordingly, Equation (9) shows that an external deficit (CAB) arises from a saving-investment deficit (SAG) and/or the budget deficit (BUD). Therefore, if the external deficit is caused by a budget deficit, the economy is said to have the Twin Deficit. The saving-investment deficit, which is the result of inadequate domestic savings relative to domestic investment, is usually provoked by the Twin Deficit problem, thus creating the Triple Deficit (Magoti et al.,2020). In defining the triple deficit as the "balance of imbalance", Bayramoğlu and Öztürk (2018) explain it as a condition in which two equilibria that represent the domestic economic equilibrium have a deficit and as a situation whereby external deficit balances this deficit.

3.2 Model Specification

According to Raji (2019), the triple deficit can be established if the three variables – saving gap (SAG), budget balance (BUD), and current account balance (CAB) are cointegrated with CAB as the response variable. Thus, we employ the bound cointegration approach developed by Pesaran et al (2001). The bounds testing approach to cointegration was performed within the framework of the autoregressive distributed lag (ARDL) to establish the long-run connection between the variables under examination. Therefore, in line with the theoretical framework, we adopt, with modifications, the model specified by Magoti et al (2020), which is hinged on the pooled mean group (PMG)-ARDL specifications to examine the triple deficit in SSA. The choice of the PMG-ARDL model is premised on its ability to account for unobserved heterogeneity specific to countries under study (Pesaran, 2015). Other advantages of the PMG-ARDL model include – consistency of estimates for panel data involving variables of diverse orders of integration; it permits for heterogeneity of the short-run coefficients across nations; ensures the homogeneity of long-run coefficients and it is appropriate even in the face of relatively small sample size (Chudik et al, 2015). Unlike other alternative model frameworks (e.g., fixed effects, random effects, etc.), the PMG-ARDL helps to generate both the long-run and short-run parameter estimates, as well as performs better in the panel structure of the current study whereby *T* is

large (i.e., T = 30 & above), and relatively larger than N. Therefore, the general form of PMG-ARDL model of this study is specified as follows:

$$CAB_{it} = \alpha_i + \sum_{j=1}^{p_1} \beta_{ij} CAB_{it-j} + \sum_{j=0}^{p} \Omega_{ij} BUD_{it-j} + \sum_{j=0}^{p} \theta_{ij} SAG_{it-j} + \sum_{j=0}^{p} \phi_{ij} INF_{it-j} + \sum_{j=0}^{p} \lambda_{ij} EXR_{it-j} + \sum_{j=0}^{p} \delta_{ij} INT_{it-j} + \varepsilon_{it} \quad (10)$$

such that, $\varepsilon_{it} = a_i Q_t + v_{it}$ (11)

where CAB_{it} = current account balance of country i at time t (measured in terms of the difference between the sum of all visible and invisible exports, and that of all visible and invisible imports having adjusted for the unilateral transfers over a period of time); BUD_{it} = budget balance of country i at time t (measured in terms of the difference between the total government revenues and total government expenditures over a period of time); SAG_{it} = savings gap of country i at time t (measured in terms of the balance between the total private domestic savings and total private domestic investment over a period of time); INF_{it} = inflation rate of country i at time t (usually the annual percentage change in the consumer price index); EXR_{it} = exchange rate of country i at time t (weighted annual average of the official per dollar exchange rate of countries usually in terms of the domestic currency); INT_{it} = interest rate of country i at time t (the prime lending rate in weighted annual average); a_0 is the intercept term; β_i, Ω_i, θ_i, Φ_i, λ_i, and δ_i are the parameters of interest; ε_{it} = serially uncorrelated random error term for all i's, and Q_t = vector of unobserved factors.

3.3. Data and Estimation Procedure

This investigation is premised on panel data analysis, covering 28 SSA countries (Benin, Botswana, Burkina Faso, Cameroon, Central African Republic, Cote d'Ivoire, Equatorial Guinea, Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Togo, Uganda, Zimbabwe) over 30 years from 1990 to 2019. The choice of the selected countries is contingent on data availability given that most of the countries in SSA have limited data on the core variables utilized in this study. Data relating to the relevant variables are annualized secondary time series, sourced, and obtained from the databases of the African Development Bank ([AfDB], 2020); United Nations Conference on Trade and Development ([UNCTAD], 2020), and World Bank (2020b). Specifically, data on budget balance and saving gap were obtained from the AfDB database, while data on the

current account balance and exchange rate were obtained from the UNCTAD (2020), and inflation rate and interest rate data were from the World Bank (2020b).

The estimation begins with determining the existence of residual cross-section dependence which is particularly important for choosing the appropriate structure for the panel Granger causality test. Other important pre-tests include the unit root test aimed at determining the order of integration of variables and the panel cointegration test for establishing the long-run relationship among the variables. For the cross-section dependency, the correlation between the residuals in panel cross-sections is examined. The null hypothesis underlying this test is that there is cross-section independence, while the alternative is that there is cross-section dependence. We reject the null hypothesis if the Breusch-Pagan statistic has a probability value that is less than 0.05.

In testing for unit root, we employed the second-generation panel unit root tests. When cross-section dependency dominates, the second-generation panel unit root tests are deemed suitable (Aluko & Obalade, 2020; Dimnwobi et al., 2021). As a result, this paper uses the Pesaran (2007) CIPS panel unit root test, which explicitly accounts for the potential existence of cross-section dependency in panel unit root tests.

Following the unit root test, a cointegration test is performed to determine if a long-run association exists among the relevant variables. This test follows the approach developed by Pesaran et al, (2001) within the framework of the PMG-ARDL model and complemented by the Johansen Fisher-Combined test. Apart from addressing any issue related to the mixed order of integration of variables, the use of the PMG-ARDL model framework is underscored by its ability to generate both the short run and long-run parameter estimates. The PMG-ARDL model is based on the following specification:

$$\Delta CAB_{it} = \alpha_i + \sum_{j=1}^{p_1} \beta_{ij} \Delta CAB_{it-j} + \sum_{j=0}^{p} \Omega_{ij} \Delta BUD_{it-j} + \sum_{j=0}^{p} \theta_{ij} \Delta SAG_{it-j} + \sum_{j=0}^{p} \phi_{ij} \Delta INF_{it-j} + \sum_{j=0}^{p} \lambda_{ij} \Delta EXR_{it-j} + \sum_{j=0}^{p} \delta_{ij} \Delta INT_{it-j} + \varphi_1 CAB_{it-1} + \varphi_2 BUD_{it-1} + \varphi_3 SAG_{it-1} + \varphi_4 INF_{it-1} + \varphi_5 EXR_{it-1} + \varphi_6 INT_{it-1} + \omega_{it} \quad (12)$$

The long-run association of variables is determined by estimating Equation (12) and obtaining the F-statistic for the joint significance of the parameters of the one-period lagged level variables, as well as observing the sign and significance of the error term. We reject the null hypothesis of no cointegration if the F-statistic is greater than the upper bound critical value at the 5% level and accept if otherwise as provided by Pesaran et al

(2001). Also, in estimating Equation 12, the optimal lag length is automatically chosen by Akaike Information Criterion (AIC).

In establishing the direction of causality among the variables of interest, we employed the Dumitrescu-Hurlin (2012) panel Granger causality procedure over the traditional Granger causality test. The choice of the DH procedure is because it addresses the problem of cross-section dependencies. More so, the DH approach is also preferred when dealing with the balanced and heterogeneous panels, alongside panels with T > N or N > T structure (Bölükbaş et al., 2018). Therefore, the triple deficit hypothesis is validated if a unidirectional causality runs from budget balance to current account and from saving gap to the current account and/or vice versa.

4. Results and Policy Discussions

This section begins with the presentation of the result of the pre-tests – panel cross-section dependence test; panel unit root test and panel cointegration test. Given that the time series in our panel is greater than the number of cross-sections (i.e., T=30 > N=28), we employed the Breusch-Pagan LM test statistic for the reliability and validity of the result. These results are reported in Table 1, according to which, the Breusch-Pagan LM test statistic is 4905.693 with a probability value of 0.0000. The probability of the Breusch-Pagan LM test statistic is less than 0.05, thus we reject the null hypothesis of cross-section independence and conclude that our panel has cross-section dependencies.

Table 1. Residual cross-section dependence test

Test	Statistic	Df	Prob.
Breusch-Pagan LM	4905.693	558	0.0000
Pesaran Scaled LM	164.6706		0.0000
Pesaran CD	65.73845		0.0000

Source: Authors' estimation

The CIPS panel unit root test by Pesaran (2007) was chosen because it performs the unit root test in the presence of cross-section dependency. Table 2 shows the results of the CIPS panel unit root testing. According to the results, all the variables are stationary at level except CAB and EXR which are stationary at first difference. In other words, budget balance (BUD), saving gap (SAG), inflation rate (INF), and interest rate (INT) are I(0) variables, while current account balance (CAB) and exchange rate (EXR) are I(1) variables. This justifies the use of the PMG-ARDL bound cointegration procedure.

Table 2. CIPS panel unit root test

Variable	Method	Level	First Diff.	I(d)
	CIPS	Stat. (Prob.)	Stat. (Prob.)	
BUD		-3.67319** (0.0004)		I(0)
SAG		-5.22714** (0.0000)		I(0)
INF		-3.92185** (0.0002)		I(0)
INT		-4.81205** (0.0000)		I(0)
CAB		-0.73452 (0.8312)	-7.01354**(0.0000)	I(1)
EXR		-1.93276 (0.6732)	-4.27014** (0.0000)	I(1)

**(*) denotes significance at the 1%(5%) level.
Source: Authors' estimation

The results of the panel unit root test in Table 2 validate the use of the panel ARDL approach given that the variables are a combination of I(0) and I(1), with an I(1) dependent variable. The bounds test result is reported in Table 3. According to the result, the F-statistic for the joint significance of the parameters of the one-period lag of the level variables is 8.655622 which is greater than the upper bound critical values at both 1% and 5% levels (i.e., 8.655622 > 1% = 6.36 and 5% = 4.85). This is also validated by the significant negative coefficient of the error term (see Table 6). This implies that a consistent estimate of both long-run and short-run coefficients is evident. This is equally an indication of the validity of the TDH in SSA.

Table 3. Panel ARDL bound cointegration test

F-statistic	K	5% Critical Value		1% Critical Value	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound
8.655622**	5	I(0)	I(0)	I(0)	I(0)
		3.79	4.85	5.15	6.36

** denotes rejection of the null hypothesis at the 1% level.
Source: Authors' estimation

Another supporting test of panel cointegration includes the Johansen-Fisher combined test which is reported in Table 4. The results of the Johansen-Fisher combined test support the bound test result on the cointegration of variables. Both trace test and the max-eigen test of the Johansen-Fisher combined test indicate 6 cointegrating equations at the 5% level. Thus, in the absence of cointegration, the null hypothesis is rejected, and we conclude that a long-run relationship exists among the relevant variables.

Table 4. Johansen-Fisher combined panel cointegration test

Hypothesized No of CEs	Fisher Stat. (Trace Test)	Prob.	Fisher Stat. (Max-Eigen Test)	Prob.
r = 0	1421.07**	0.0000	693.482**	0.0000
r ≤ 1	855.622**	0.0000	516.951**	0.0000
r ≤ 2	455.358**	0.0000	283.584**	0.0000
r ≤ 3	228.335**	0.0000	162.137**	0.0000
r ≤ 4	119.727**	0.0000	109.101**	0.0000
r ≤ 5	79.3493*	0.0218	79.349*	0.0218

**(*) denotes rejection of the null hypothesis at the 1%(5%) level
Source: Authors' estimation

The result of the estimated long-run coefficients of the panel PMG-ARDL model is reported in Table 5. This result follows an automatic normalization process within the framework of the panel PMG-ARDL model involving both long-run and short-run components. First, we conducted a Hausman test to select the appropriate model between PMG and MG. The null hypothesis underlying this test is that there is a long-run homogeneity restriction in the PMG model. The Hausman statistic, 2.48, has a p-value of 0.165 which is greater than 0.05, meaning that the panel is homogenous in the longrun. Also note that, in the longrun, the PMG estimators produce better and more significant results than the MG estimators. Thus, our concern rests on the PMG results as recommended by the Hausman test.

The result shows that budget balance has a significant positive influence on the current account balance in SSA. This is indicated by the coefficient of 0.046 with a probability value of 0.0246 (which is less than 0.05). This implies that the twin deficit exists in SSA, meaning that the budget deficit will result in the current account deficit. The channel through which budget deficit can result in current account deficit is via an increase in capital inflows arising from excessive foreign borrowing to finance the deficit, and through an increase in import-led consumption expenditure occasioned by an increase in aggregate expenditure. It is paramount for SSA to leverage the AfCFTA to bridge the reliance on consumption imports through strengthening intra-regional trade and economic relations to fortify the macroeconomic stance of the region. The result also reveals that the saving gap significantly and positively influences the current account balance with a coefficient of 0.1668 and a probability value of 0.0020, meaning that a percentage increase in the saving gap will bring about a 0.17% rise in the balance on the current account. This is an indication that the saving-investment deficit arising from inadequate domestic saving relative to the private domestic investment results in the current account deficit through an increase in

interest rate. Hence, the presence of robust financial sector policy coordination is critical for the attainment of AfCFTA.

Other significant determinants of changes in current account balance include inflation rate and exchange rate. The inflation rate has a significant negative impact on the current account balance such that a percentage increase in the inflation rate will reduce the current account balance by 0.02%. This is so because an increase in domestic prices will result in the substitution of domestic goods with foreign goods, with imports growing more than exports, leading to a decline in the current account balance and a worrying consequence for AfCFTA. Also, the exchange rate has a significant positive influence on the current account balance such that a percentage increase in the exchange rate will bring about a 0.07% increase in the current account balance. This is theoretically meaningful given that exchange rate depreciation will bring about an expansion in exports and a fall in imports, leading to an increase in the current account balance expected to result in favourable outcomes for countries in the region through AfCFTA. The role of regional monetary policy synchronisation under AfCFTA is, therefore, a prerequisite for the successful execution of the trade reform in SSA.

Table 5. Estimated longrun coefficients based on panel ARDL model

Dependent Variable: CAB		
	PMG	**MG**
BUD	0.045738*	0.028231
	(0.0246)	(0.4129)
SAG	0.16682**	0.113811*
	(0.0020)	(0.0203)
INF	-0.02033*	0.019327*
	(0.0340)	(0.0380)
EXR	0.071188**	0.049420**
	(0.0000)	(0.0015)
INT	0.027626	0.059731
	(0.1194)	(0.2130)
Hausman Test (PMG or MG)	2.48 (Prob. > Ch.sq. = 0.165)	

**(*) denotes rejection of the null hypothesis at the 1%(5%) level.
N.B: CAB: Current account balance, BUD: Budget balance, SAG: Saving gap, INF: Inflation rate, EXR: Exchange rate, INT: Interest rate; p-values in ().
Source: Authors' estimation

The result of the panel PMG-ARDL short-run model which examines the convergence process towards the long-run equilibrium after a short-run shock is reported in Table 6. It shows that the error correction term of the cointegrating equation (cointeq01) has a

significant negative coefficient in line with theoretical expectation. This means that the variables converge to long-run equilibrium at an annual speed of 1.05% after a short-run shock. Even though the speed of adjustment is small for each period, the process of adjustment remains effective under a significant coefficient of adjustment.

Table 6. Panel ARDL short-run model

Dependent Variable: D(CAB)		
	PMG	**MG**
Cointeq01	-0.010538*	-0.009476*
	(0.0470)	(0.0491)
D(BUD)	0.001818*	0.000712
	(0.0147)	(0.3912)
D(SAG)	0.013871*	0.032931*
	(0.0105)	(0.0339)
D(INF)	-0.000139	-0.000089
	(0.7192)	(0.8284)
D(EXR)	0.016157*	0.023186*
	(0.0107)	(0.0218)
D(INT)	0.001505	0.003011
	(0.2280)	(0.3218)
C	0.027644**	0.018453**
	(0.0000)	(0.0002)
Hausman Test (PMG or MG)	2.48 (Prob. > Ch.sq. = 0.165)	

* denotes rejection of the null hypothesis at the 5% level.
N.B: cointeq01: Cointegrating equation, D is the difference operator; p-values in ().
Source: Authors' estimation

Table 7 shows the result of the panel Granger causality test based on the Dumitrescu-Hurlin approach. According to the results, the null hypothesis that a budget balance does not homogeneously cause a current account balance and vice versa is rejected at both 1% and 5% levels given that the probability values of the W-stat/Zbar-stat are less than 0.01. This implies that bidirectional causality exists between current account balance and budget balance. This supports the earlier finding that the twin deficit exists in SSA.

Also, a similar conclusion can be drawn from the causality result between the saving gap and current account balance as the null hypothesis of no homogeneous causality is rejected at the 5% level. Thus, we conclude that bidirectional causality runs between the current account balance and the saving gap in SSA. Interestingly, a unidirectional causality was found running from budget balance to the savings gap. This completes the validity of the TDH in SSA. A budget deficit arising from excessive government expenditure over revenue may cause a current account deficit through excess foreign borrowing to finance

the deficit which comes with inflows of foreign capital, leading to a revaluation of the domestic currency, and through an increase in import-led consumption expenditure occasioned by the increase in aggregate demand. A deficit budget can also crowdout private domestic investment, leading to an increase in the domestic interest rate, which equally results in the attraction of more international capital, triggering an appreciation of the domestic currency. Also, it is noteworthy that the feedback causality between the current account balance and the budget balance, and between saving gap and current account balance implies that, in SSA, a situation where the two equilibria that constitute the domestic economic equilibrium have deficits (that is budget balance and saving gap), the deficits are expected to be offset by the external deficit (current account deficit). This is the position of Bayramoğlu and Öztürk (2018) in characterizing the triple deficit as the "balance of imbalance".

Table 7. Panel granger causality test

Null Hypothesis	W-stat.	Zbar-stat.	Prob.	Remark
BUD does not homogeneously cause CAB	4.55634	4.26068	0.0002	Rejected
CAB does not homogeneously cause BUD	4.85623	4.83546	0.0001	Rejected
SAG does not homogeneously cause CAB	4.24466	3.74667	0.0081	Rejected
CAB does not homogeneously cause SAG	3.42156	2.08573	0.0370	Rejected
SAG does not homogeneously cause BUD	2.59534	0.50216	0.6156	Accepted
BUD does not homogeneously cause SAG	3.45263	2.14527	0.0319	Rejected

N.B: BUD: Budget balance, CAB: Current account balance, SAG: Saving gap
Source: Authors' estimation

The results obtained above confirm the existence of the TDH in SSA given the identified directions of causality. Findings in this study were also in harmony with the findings of Bolat et al (2014), Akbas and Lebe (2016), Shastri et al (2017) amongst others but were contrary to the studies of Çoban and Balikçioğlu (2016), Sen and Kaya (2018) and Magoti et al (2020). This means that a budget deficit arising from excessive government expenditure over revenue may cause a current account deficit through excess foreign borrowing to finance the deficit which comes with external capital inflows, leading to a revaluation of the domestic currency, and through an increase in import-led consumption expenditure occasioned by the increase in aggregate demand.

Based on our results under the objectives and prospects of the AfCFTA, several policy implications and prescriptions are offered as follows; on the fiscal side, the pursuance of harmonious coordination between regional and country-specific fiscal policies should be paramount, notably in the wake of reoccurring unanticipated exogenous shocks. With unpredictable external demand, authorities in the region are enjoined to be more creative with the operation of existing fiscal space to sustain macroeconomic stability. Furthermore, when countries in the region are faced with little or no savings, the aptitude to raise fiscal stimulus and finance fiscal deficits beckons on policymakers to pay attention to expenditure choices and how they impact stability and prosperity. This would help mitigate a possible crowding-out of private investment owing to an increase in fiscal deficits.

Secondly, economic diversification and industrialisation efforts in the region should be aggressively followed to properly leverage the AfCFTA. Following this, export promotion policies are expected to bear more fruit to minimise continuous primary commodity export and decrease import-led consumption in SSA. As a result, the export base of the region's economy will flourish to boost global competitiveness, thereby reducing imports, dumping, and the current account deficit. Moreover, as more nations opt in favour of protectionist trade policies to mitigate the wave of anti-globalist movements and the effect of the coronavirus shock; this portends wider implications for global trade and international economic relations. In the interim, the switch to restrictive trade policies appears to be an enticing measure being adopted by countries to ensure a favourable trade balance. However, it would be detrimental for SSA countries to follow that path given the long-term costs occasioned by a likely protracted international economic recovery. This situation provides ample opportunity for SSA to deepen intra-regional trade and take advantage of the potential economic gains of AfCFTA.

Thirdly, the financial account deficit in the region is traceable to insufficient investment funding due to a weak level of savings, establishing the existence of a saving-investment gap. Consequently, policymakers in the region have to change the direction of policies that increase domestic savings and investment. To bridge the saving-investment gap in SSA, effective exchange rate and interest rate targeting policies are encouraged, as well as per capita income growth and financial inclusion strategies. This will aid the maintenance of a balance between prices of domestic and foreign financial assets in the region, thereby mitigating the financial account deficit, and enhancing the proposed benefits of the AfCFTA in the region. Lastly, monetary and exchange policies should be thoughtfully coordinated to circumvent a likely devaluation-inflation spiral.

5. Conclusion

The existence and sustainability of macroeconomic equilibrium in an economy are largely dependent on the triple balance of the current account, fiscal account, and financial account. A combined imbalance in these sectors creates an economic flux that can cause significant problems overtime. With this in mind, this study set out to investigate the validity of the TDH in the SSA region in readiness for the take-off of the AfCFTA. The findings from the PMG-ARDL and panel Granger causality test (based on the Dumitrescu-Hurlin approach) confirm the presence of the twin and the TDH in SSA, where bidirectional causality exists between current account balance and budget balance, and between saving gap and current account balance, with a unidirectional causality running from budget balance to saving gap. The study is therefore optimistic that the AfCFTA has the potential to set in place long-lasting, sustainable economic growth in Africa and position the continent in more attractive stead in the global market. Finally, collaboration among countries in the region and the general support of stakeholders in the financial, monetary, trade, and fiscal sectors are paramount to ensure that optimal benefits are reaped from the AfCFTA.

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