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The dynamics of fiscal deficit and current account in 12 SADC countries

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Abstract
Purpose: This study examines the relationship between fiscal deficits and current account deficits in SADC countries.
Methods: A panel analysis using a random-effects model with secondary data from 2009 to 2020 was employed.
Results: Higher fiscal deficits affected current account deficits in the SADC region. Real interest rates and trade openness are critical determinants of both deficits.
Contributions: This study enhances the understanding of macroeconomic imbalances in the SADC region, guiding policymakers in creating tailored policy frameworks for economic stability and sustainable development.
Novelty: The study provides a comprehensive analysis of the relationship between fiscal deficit and current account deficits in Southern African Development Community (SADC) 12-member countries, offering significant insights into the macroeconomic dynamics of the region. A panel analysis using a random effects model with data spanning September 2009 to December 2020 was employed, capturing trends and individual country effects. This study provides a robust examination of common trends and individual country effects, enriching the understanding of how these macroeconomic variables are important within the SADC context. Its emphasis on tailored policy frameworks to address fiscal and external imbalances reflects a forward-looking approach, offering practical guidance for policymakers striving to enhance economic stability and sustainable development within the SADC region. As an area for further study, the same research can be replicated in BRICKS countries and a comparative analysis can be conducted for a broader analysis.
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1. Introduction

A financial and economic crisis is a catalyst that engulfs many emerging economies worldwide (Kim & Kim, 2006). The dynamic of increasing fiscal deficits with rising current account deficits has received much empirical scrutiny in the literature, producing a mix of results for different countries. Coupled with fiscal deficits, debts, and gross spending, consolidation of public finances was inevitable to address economic crises and the debt consequences of emerging economies (Boyd, Caporale, & Smith, 2001; Cavallo, 2005). According to Rubin, Orszag, and Sinai (2004), fiscal consolidation effectively describes a government's policy of reducing deficits and accumulating debts. In fact, exchange rate depreciation plays a significant role in affecting the current account by making imports cheaper and exports more expensive (Laursen & Metzler, 1950). According to Harberger (1950), the concept of the inter-temporal transmission mechanism relies on the fact that a change in government fiscal policy influences domestic demand and interest rates and leads to an appreciation or depreciation of the exchange rate (through capital inflows or outflows in the domestic economy). However, the degree of openness of the financial system and the type of exchange rate regime in place largely determine the impact of fiscal policy on

the external balance. The economic and financial crisis suggest that fiscal consolidation is needed, and it requires better choices regarding the extent of the consolidation to be made, the time period needed to implement it, and the requisite instruments that should be used (Ricciuti, 2003). Emerging economies are expected to find ways to identify fiscal gaps and instruments that enhance the institutional framework for fiscal policy to be credible over time to minimize trade-offs. The twin deficits hypothesis holds if the government's fiscal deficit, through its impact on national savings and consumption, leads to a deterioration of the current account. According to Smith (2019), low- and lower-middle-income countries remain challenged with low value-added and manufacturing exports. Beyond the natural resources they export to the Americas and Europe as major trading partners, they mostly do not trade with each other. There have been few records of intra-trade between these economies. For example, in Africa, neighboring countries rarely trade with each other. The global economy was in dire straits due to the Coronavirus Pandemic. The economic situation around the sphere was greatly affected by the Covid-19 pandemic. Most countries are trying their best to get rid of the pandemic (Nasir & Ahsan, 2023). This study aims to identify the effects of the instruments used through fiscal consolidation on the current account in the Southern African Development Community (SADC). This study investigates whether the twin deficit hypothesis scenario is valid in SADC and analyzes the nature of the relationship between fiscal and current account deficits in the region. A panel of 11 (SADC) member states will be used, including Angola, Botswana, Democratic Republic of Congo (DRC), Eswatini, Lesotho, Madagascar, Mauritius, Mozambique, Namibia, South Africa, Zambia, and Zimbabwe. Many developing countries find their current accounts on persistent deficits due to the fact that their exports revenues fail to cover technology transfers, imports of intermediate and investments goods needed for the development of their economies. Both the fiscal and current account deficits of most African countries, especially in Southern Africa, have been widening over the past decades. This raises the question of whether fiscal deficits are responsible for current account deficits in the region. Figure 1 shows an insight into the trends in both current account and fiscal deficits during the period under review.

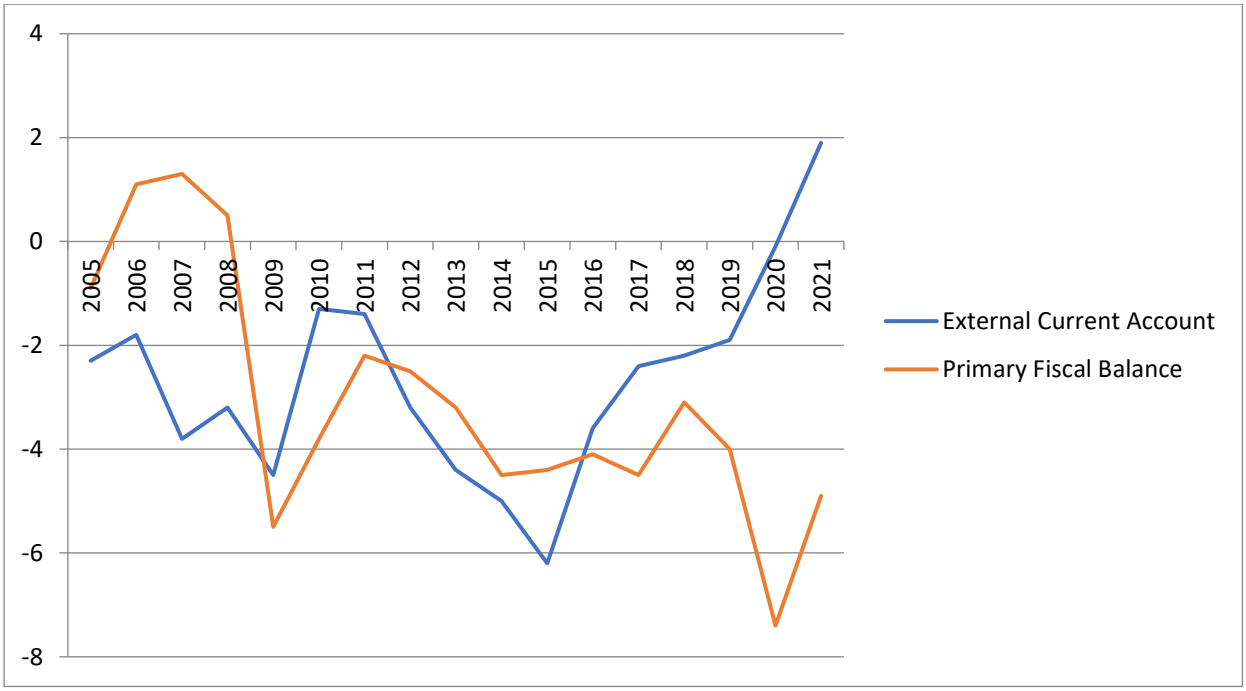

Figure 1. Trend in current account and fiscal balances (% of GDP) in SADC for the period (2005-2021)
Source: International Monetary Fund (2021)

As is clear from Figure 1, SADC rarely recorded a surplus in both the external current account and primary fiscal balance during the period 2005 to 2021. Primary fiscal balances for SADC countries kept deteriorating throughout the period, as shown by the downward trend. However, the external current

account seems promising since an upward trend was noticed from 2016 up to a surplus recorded in 2021. The 2008-2009 global financial crises hit the SADC countries so hard that the region recorded a slump in its primary fiscal balance from a surplus of 0.5% in 2008 to a deficit of -5.5% at the end of 2009. From then on, the region struggled to restore its fiscal balance and kept recording fiscal deficits. The Covid19 pandemic further deteriorated the fiscal balance as governments increased their expenditures to curb the effects of the pandemic. Against this backdrop, the annual average fiscal balance of SADC dropped by 4.3%, from -3.1% in 2008 to an annual average of -7.4% on December 31, 2020. However, SADC fiscal balances firmed during the year 2021, closing at an average of -4.9% at the end of the year. The average external current account balance for SADC was also subdued by the global economic crisis, and its deficit widened from an average of -1.8% in 2006 to -4.5% in 2009. It then firmed in 2010, registering a closing balance of -1.3%. However, from then up to the end of 2015, the external current account experienced a persistent deterioration to an annual average of -6.2%. During the past years, the current account performed very well as it trended upwards and restored a surplus of 1.9% that has not been recorded for a long time. The SADC has experienced deterioration in both its fiscal and current account balances during the past two decades. The twin-deficit hypothesis suggests a positive causal relationship between fiscal and current-account deficits. The existence of twin deficits cripples economies since it leads to the accumulation of external debt to unsustainable levels and discourages savings and investment. Mankiw (2000) postulate that persistent fiscal and current account deficits, if left unattended could extend beyond the own region and lead to global economic crisis. Therefore, the researcher is motivated to carry out a study investigating whether the twin deficit or twin divergence hypothesis applies to Southern Africa.

The purpose of this study is to empirically examine the impact of fiscal consolidation on current account balance and to determine the relationship between fiscal and current account deficits in Southern Africa using a panel of 11 countries. The relationship between fiscal and current account deficits has received much attention over the past few decades in many cases by adopting Granger Causality Tests for example; Kaufmann, Scharler, and Winckler (2002), Baharumshah, Lau, and Khalid (2006), Calderon, Alberto, and Norman (2002) and Udah (2010) among others. Most studies on the relationship between fiscal deficit and current account deficit have been country specific (Iram, Shadid, Mahpara, & Fazli, 2011; Javid, Javid, Arif, & Sabir, 2010). Oladipo, Oseni, and Onakoya (2012) examine the effects of twins' deficits in Nigeria for the period 1970-2008 using secondary time-series data and econometric techniques. Therefore, this study is likely to be the first to investigate the relationship between fiscal and current account deficits using a panel of 11 SADC countries. The outcome of this study will benefit academic institutions, governments, and policymakers of Southern African countries in making decisions on fiscal consolidation measures.

2. Literature review

This section presents a literature review dwelling much on the relationship that exists between fiscal consolidation and the current account, as well as the validity of the twin deficit hypothesis. Specifically, the researchers looked at specified theories that were propounded on prompting fiscal consolidation measures to deal with fiscal deficits and current account deficits. In addition, empirical studies on existing research that have been conducted on this particular topic are reviewed.

2.1 Twin deficit hypothesis

There are two approaches to the transmission mechanism behind the twin deficits hypothesis: the Mundell (1960) model and the Keynesian income expenditure approach. It is interesting to look at budget deficits and current account deficits in light of the Mundell- Fleming model. In an open economy model with high capital mobility, an additional linkage can explain the deterioration in trade balance due to higher budget deficits. An increase in the budget deficit will cause an increase in aggregate demand and domestic real interest rates. High interest rates cause net capital inflow from abroad and result in appreciation of the domestic currency. The strong currency will make imports cheap and domestic exportability less competitive in the global market and adversely affect net exports, deteriorating the current account. Although these mechanisms may differ slightly, this conclusion is

valid under both fixed and flexible exchange rate regimes (Akbostanci & Tunç, 2001). With a fixed exchange rate, an increase in aggregate demand will increase demand for imports, and a trade balance deficit occurs even in the short run. Trade balance may deteriorate in the long run as real appreciation of domestic currency occurs. Aggregate demand increases and the current account deteriorates due to the same interest rates in the world and in the home economies.

While admitting the harmful economic and social consequences of huge budget deficits, critics of the MF approach strongly doubt the sequence of causation implied by these models. For example, Miller and Russek (1989) and Corsetti and Müller (2006b), in presenting the traditional debate on fiscal transmission and twin deficits, stress two distinct transmission mechanisms. One stresses relative price movements, whereas the other stresses intertemporal (borrowing and lending) decisions. One transmission mechanism is central to the Mundell- Fleming model. An expansionary fiscal shock increases disposable income and internal demand. Part of the higher consumption demand leaks abroad in the form of higher import demand, deteriorating the trade balance. Moreover, with flexible exchange rates, a stronger domestic demand also appreciates the exchange rate, crowding out foreign demand. Because of the differences in the multipliers, the impact is stronger for spending hikes than for tax cuts. The increase in the external deficit is somewhat mitigated to the extent that the upsurge in domestic demand raises the domestic interest rate and thus crowds out domestic investment. However, the emphasis is on the static transmission mechanism, which links fiscal deficits to excess demand and relative price movements.

2.2 Keynesian model

From the Keynesian perspective of the income-expenditure approach, an increase in budget deficits will increase domestic absorption (C + I + G) and, therefore, domestic income. The increase in income will induce imports and eventually reduce the surplus or increase the deficit in the trade balance, which is a component of the current account, and thus makes the public sector and external sector deficits act as twins rather than distant cousins. Fiscal expansion also has a crowding-out effect on the domestic market, which raises the interest rate, and the resultant capital flows will lead to currency appreciation. Domestic goods will appear to be expensive in the eyes of foreigners; thus, exports will diminish and the current account worsens. Therefore, budget deficits are viewed as a tool to stimulate aggregate saving and investment, despite the fact that they raise interest rates. Furthermore, Keynesian economic models assume that a shift from tax to debt financing increases private consumption, as private consumption depends on disposable income (income minus taxes). Therefore, fiscal deficits (and lower taxes) increase private consumption and current account deficits.

2.3 Ricardian Equivalence Hypothesis

The third extreme case is the Ricardian Equivalence Hypothesis (REH), which was introduced by Ricardo (1955) and later supported by Barro (1979), who assumes that changes in the budget deficit will be fully offset by changes in savings. The real world is more complex than these two cases, and to identify the circumstances in which the twin deficit hypothesis may hold, one has to look at the channels by which government deficit influences the economy (Cavallo, 2005; Giorgin & Holden, 2003).

The main point is that under a very specific set of assumptions, lump sum changes in taxes would have no effect on consumer spending. A tax cut that increases disposable income would automatically be paid by an identical increase in saving. According to Seater (1993), budget deficits and taxes are equivalent in their effect on consumption. Current consumption can be affected by the expected income of future generations. As the REH states, the time path of taxes does not matter for the households' budget constraint as long as the present value of taxes is not changed. This is because a tax cut does not affect households' lifetime wealth because future taxes will increase to compensate for the current tax decrease. Therefore, current private saving rises when taxes fall, and households save the income received from the tax cut to pay for the future tax increase. Hence, a budget deficit does not cause a twin deficit. In practice, several limits exist for the REH. For example, the public sector may have a longer borrowing horizon than households have, and today's households would regard the current tax cut as a real windfall. Such a tax cut would produce a rise in consumption and a fall in national saving in such a way that private saving would not rise fully to compensate for a fall in government saving;

therefore, the current account would tend to deteriorate (Giorgin & Holden, 2003; Nickel & Vansteenkiste, 2008).

The other reasons for REH limitations in the real world may be barriers to borrowing (Corsetti & Müller, 2006b). Households may be unable to borrow against future income because of imperfections in the financial market, especially if the financial market is underdeveloped. As can be understood from the above, the mechanisms of linkage between budget deficit and current account deficit are complex. We can conclude that government financing decisions may affect private saving, private investment, and current account. The macroeconomic framework and existing institutions framework must be taken into account to identify the exact channels through which budget and current account deficits are connected in the economy (Akbostanci & Tunç, 2001). If a budget deficit is financed by running down foreign reserves or foreign borrowing, the twin deficit relationship has to be stronger.

In general, empirical evidence and studies that were meant to test the relationship between fiscal consolidation and the current account deficit and the validity of the twin deficit hypothesis were covered with many mixed reactions and results. This section reviews these studies and their findings.

Mohammadi (2004) investigated a larger sample of 63 countries (20 advanced, 43 emerging, and developing) by incorporating the distinguishing features of both intra-temporal and intertemporal theories. Irrespective of the choice of samples, his results suggest that an expansionary fiscal policy of government will lead to a worsening of the current account balance. A one percentage point increase in the budget deficit will worsen the current account balance by 0.2 percentage points in industrial countries and by 0.3 percentage points in developing countries. A similar study on the determinants of the current account by Abiad, Leigh, and Mody (2009) found a coefficient of 0.3 percentage points in a panel of 135 countries, which again supported the twin deficits hypothesis. The magnitude of the impact of fiscal shocks on the current account may differ between countries and regions, depending on the degree of openness of their economies to the global system. However, Corsetti and Müller (2006a) pointed out that the impact of fiscal shocks on the current account appears to be greater and more persistent in economies where total trade is a higher share of the GDP than in economies where trade constitutes a smaller share of the total GDP.

Chen, Milesi-Ferretti, and Tressel (2013) discovered that China has displaced exports from the Southern European economies, which combined with an appreciation of the Euro, has contributed to a deterioration of their current account deficits. Schmitz (2014) finds that countries that are close to a financial center, such as London, and also part of a currency union are able to raise external finance more easily; his sample includes Greece, Spain, and Portugal.

Javid et al. (2010) empirically investigates the effects of fiscal policy or government budget deficit shocks on the current account and the other macroeconomic variable: real output, real interest rate and exchange rate for Pakistan over the period 1960-2009. The structural Vector Autoregressive model is employed; the exogenous fiscal policy shocks are identified after controlling the business cycle effects on fiscal balances. The results suggest that an expansionary fiscal policy shock improves the current account and depreciates the exchange rates. The rise in private savings and the fall in investment contribute to the current account improvement, while the exchange rate depreciates. The twin divergence of fiscal deficit and current account deficit is also explained by the output shock, which seems to drive the current account movements and its co-movements with the fiscal balance.

Oladipo et al. (2012) examine the effects of twins' deficits in Nigeria for the period 1970-2008 using secondary time-series data and econometric techniques. The results show a bidirectional causal relationship between budget and trade deficits in Nigeria. The study concludes that appropriate policy measures to reduce budget deficits could play an important role in reducing trade deficits and complement this with budget-cut policies via a coherent package that focuses on policies for export promotion, productivity improvement, and exchange rate, among others.

Neda and Mohammad (2011) theoretically studied the two visions (Keynesian theory and Ricardian equivalence) of twin deficits using macroeconomic variables for 70 countries for 1985 – 2006. This review first classifies the mentioned countries based on World Development Indicators into different income groups of high-, middle-, and low-income countries. Then, the review of required variables based on the evaluation of budget deficit effect on private consumption, economic growth, and current account deficit on all income groups is assessed and estimated by a comparative method. A summary of the acquired results would not affirm the relationship between the budget deficit and current account deficit, consumption, and economic growth in the period of study in high-income countries. This relationship remains in force in middle- and low-income countries; in other words, Ricardian equivalence is rejected in these countries.

Furthermore, Iram et al. (2011) examine the empirical relationship between budget deficit and current account deficit in Pakistan from 1971 to 2008 using an autoregressive distributed lag (ARDL) approach to test the validity of the Keynesian stance, which states that there is a positive and significant relationship between the said variables. The results show that in Pakistan, the long-run coefficients of the control variables (GDP, ER, and INT) appear to be significant, and the most significant variable is budget deficit. Hence, the Keynesian stance is valid in the case of Pakistan. The feedback coefficient is negative and significant, suggesting that about 35% disequilibrium in the previous period is corrected in the current year. They find a stable long-run relationship between budget deficit and trade deficit.

Algieri (2013) examines the Euro area's Mezzogiorno focusing on Greece, Ireland, Italy, Portugal, and Spain (GIIPS group) after employing the traditional Granger causality test (Granger, 1969) and the alternative Toda and Yamamoto (1995) methodology for each individual country. Evidence is found in favor of Ricardian theory, according to which there is no clear relationship between fiscal balances and current account balances. Bitzis, Paleologos, and Papazoglou (2008) apply the Johansen and Juselius (1990) co-integration methodology along with the Error Correction Model and find little evidence that fiscal expansion worsens the Greek current account deficit. On the other hand, Kalou and Paleologou (2012), using a multivariate Vector Error Correction Model (VECM), allowing for endogenous determination of structural breaks, report evidence in favor of the twin deficit hypothesis for Greece. Trachanas and Katrakilidis (2013) provide empirical evidence in favor of the twin deficit hypothesis for Portugal, Ireland, Greece, and Spain after allowing for the presence of structural breaks and asymmetric responses to shocks. Vamvoukas (1999), Katrakilidis and Trachanas (2011) confirm the twin deficit hypothesis for Greece whereas evidence in favor of Ricardian equivalence for European Union member states is found by Papadogonas and Stournaras (2006).

Kosteletou (2013) provides some empirical support for the idea that fiscal policy can be used to eliminate external disequilibrium in southern Eurozone countries after employing a panel data methodology for the period 1991–2011. According to Kosteletou (2013), a deterioration in the government fiscal balance following an expansionary fiscal policy and the opportunity to finance the increased expenditure requirements through six international borrowings increases the supply and stock of domestic bonds and deteriorates the current account.

3. Research Method

This section explains the detailed methodological grounds by providing model specification and justification of the variables under study is going to be provided in order to attain the goal of the study. Procedures that have been implemented in collecting the data are analyzed in this section, as well as reflecting the sources and types of data. Furthermore, the section outlines the diagnostic tests that should be conducted to ensure that the model chosen is fit for estimation.

3.1 Model specification

The twin deficit hypothesis mainly states that government budget deficits will cause trade deficits. However, this is not the only theoretically possible relationship between budgets and trade deficits. The other extreme of the Ricardian equivalence hypothesis holds that it is also possible that the two deficits are not related at all. In light of the above, this study investigated these hypotheses of twin deficits and twin divergence or Ricardian equivalent using a panel analysis of 12 SSA countries. While relying on

different theoretical postulations to inform the variable selection for the model and to understand and interpret the results, there is a need to test the empirical strength of any specific theoretical model. It is important to perform a number of diagnostic tests to identify the best models to meet the underlying Panel Data (Ahmed & Rozario, 2024). The model used in this study was adapted from Mohammadi (2004) in a study that investigated the determinants of the current account using the Random Effect Model (REM) of 97 developing and developed countries over the period 1986–2013. They specify the model as follows:

$$CA_{it}=\alpha_{it}+\beta X_{it}+\mu F_{it}+\theta I_{it}+\varepsilon_{it}$$

where CA is the current account balance, X is a vector of macroeconomic variables, F is a vector of financial indicators, and I is a set of macroeconomic stability or institutional variables. The researchers modified the above equation to suit the current study as follows:

$$CAB_{i,t}=\alpha_{0_{i,t}} + \alpha_1 CAB_{i,t-1} + \alpha_2 FB_{i,t} + \alpha_3 RIR_{i,t} + \alpha_4 TO_{i,t} + \alpha_5 EXD_{i,t} + \alpha_6 RGDP_{i,t} + \alpha_7 INF_{i,t} + \varepsilon_{it}$$

$1, 2, 3, \ldots\ldots, N,\ t = 1, 2, 3, \ldots\ldots, T$ and $\varepsilon_{i,t} = \mu_i + \gamma_t + \omega_{i,t}$

where *i* represents country and *t* represents time. LCA represents the Current Account balance and is treated as a dependent variable. $CAB_{t-1,}$FB, RIR, TO, EXD, RGDP and INFL are explanatory variables which represents Lagged Current Account balance, Fiscal Balance, Real Interest Rates, Trade Openness, External Debt, Real Gross Domestic Product Growth and Inflation respectively. $\alpha_0, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6$ and α_7 represent model parameters were α_0 is the intercept and all other remaining parameters are coefficients. ε_{it} is the stochastic random error term.

3.2 Diagnostics Checks

Before assessing the chosen model, it is important to conduct prognostic tests. This is because regression analysis measures the effects of the predator variables on the citation variables, as discussed by Chika, Oshiogwemoh, and Promise (2022). Brooks (2019) and Ahmad and Dahalan (2020) also contended that prior to assessing the outcomes one ought to do diagnostic test to guarantee the availability of data which satisfy assumptions of the chosen parameter estimation procedure, for example the Gauss Markov assumptions while utilizing OLS. In the case that such assumptions are not satisfied, the researcher needs to settle on other assessment methodologies that do not have extreme preconditions. The statistical test for the measurement of the parameter estimate includes the co-efficient of determination R^2, Durbin-Watson (DW), F-ratio and the t-test, using 5% significance level.

3.3 Data source

To ascertain the goal of the study, the researcher used secondary data and collected all statistical macro panel data from the World Bank. This is because the World Bank is one of the most reputable data sources, and the availability of data in that website permits the researcher to collect all statistical data from the named site. The data observation period is annual, spanning from January 2009 to December 2020. The accessibility of data in this period and the significance of the sample size in accordance with Gujarati (2009) and Hindi and Sundaram (2002) pave the way for the determination of this period.

4. Results and discussions

4.1 Descriptive Statistics

To understand the nature of the collected data, the study makes use of descriptive statistics on all variables under study, as presented in Table 1. Inflation revealed very high volatility with 501 standard deviations and a high mean of 15.48. A positive skewness of 7.69 during the time under study means that inflation was volatile and negatively affected the fiscal balance. A higher-than-normal kurtosis of 62.86 confirms that time series data with inflation as a variable is more leptokurtic in nature.

Trade openness revealed high volatility (sensitivity) to exogenous effects, as shown by 362 standard deviations from the mean. It also indicates a very wide range, with a maximum return of 158% and a minimum return of 48%. A positive skewness of 0.79 indicates that more imports exist within the period

under study. Kurtosis of 2.89 implies an excessive peakedness and leptokurtic nature. Data for the current account balance and other variables were different from trade openness and inflation in terms of skewness and kurtosis. Kurtosis ranges between 2 and 3, indicating a mesokurtic nature, whereas food security and rainfall are leptokurtic in nature. Jarque-Bera suggests that all variables are normally distributed as the p-values are significant at the 5% level of significance.

Table 1. Summary of Descriptive Statistics

	CAB_	EXTD_	INF_	LAGCAB_	RGDPG_	RIR_	TO_	FB_
Mean	-4.7391	46.6222	15.4862	-4.7361	2.9363	9.1097	85.1202	-4.7727
Median	-3.9147	34.6625	5.5062	-4.0335	3.3498	6.8525	79.7661	-4.1000
Maximum	13.4327	170.6992	558.5600	19.5116	19.6753	52.4368	158.9001	8.1000
Minimum	-41.5269	9.4663	-16.7611	-41.5269	-14.8947	-79.8032	48.9933	-17.1000
Std. Dev.	9.8839	35.2342	61.8711	9.7976	4.6919	17.8120	27.1020	4.2318
Skewness	-1.1866	1.3548	7.6856	-1.0894	-0.2957	-1.1848	0.7945	-0.0869
Kurtosis	2.5354	4.3860	62.8642	5.7734	5.7466	1.3384	2.8924	3.4917
Jarque-Bera	0.3328	0.9443	2.9800	4.4139	3.4155	4.2897	3.9493	1.4957
Probability	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0009	0.4734
St. Dev.	127.49	162.6	501.3	125.05	288.838	415.12	362.04	234.942
Observations	132	132	132	132	132	132	132	132

Source: Author's own computation

4.2 Panel Unit Root Test

Shastri, Giri, and Mohapatra (2017) postulates that in order to ascertain reliable results, there is need to conduct stationarity of data, To check for the presence of unit root, Levin, Lin and Chu test, Pesaran and Shin W-test; Augmented Dickey Fuller (ADF) Chi-square and Phillips Peron (PP) Chi-square tests were utilized. This is to ensure that variables are devoid of stationarity weakness that might impede the result of the analysis.

Table 2. Unit Root Test Results

Variable	Levin, Lin & Chu Statistic	Im, Pesaran & Shin W-Statistic	ADF Fisher Chi-square Statistic	PP Fisher Chi-Square Statistic	Order of Integration
CAB	0.0000***		0.0009***	0.0041***	I(0)
FB	0.0000***	0.0000***	0.0000***	0.0000***	I(1)
LAGCAB	0.0000***	0.0030***	0.0063***	0.0176**	I(0)
TO	0.0000***	0.0000***	0.0005***	0.0069***	I(0)
RIR	0.0000***	0.0001***	0.0002***	0.0001***	I(0)
EXTD	0.0000***	0.0000***	0.0005***	0.0000***	I(1)
RGDPG	0.0004***		0.0086***	0.0077***	I(0)

INFL	0.0000***	0.0002***	0.0002***	0.0000***	I(0)

Source: Author's own computation

Gujarati (2009), supported by Brooks (2019), pointed out that variables are said to be stationary whenever the absolute values of ADF and PP statistics are greater than the critical values. From the above Table, the results indicate that FB and EXTD were integrated at I (1) and other variables were integrated at I (0), indicating a mean riveting series. The absence of I (2) variables in the model compelled the researcher to test for long-run relationships between variables.

4.3 Cointergration Test

The long-run relationship between variables was tested using the Pedroni Residual Cointegration Test. The results are presented in Table 3.

Table 3. Pedroni Residual Cointegration Test Results

	Statistic	Prob
Group rho-Statistic	3.011564	0.9987
Group PP-Statistic	-3.821989	0.0001
Group ADF-Statistic	-3.568000	0.0002

Source: Author's own computation

Using a 5% level of significance, the results indicate that there is a long-run relationship between variables, since the Pedroni Residual test shows that the p-values from the group PP-Statistic and group ADF statistics are 0.0001 and 0.0002, respectively, which are less than 0.05.

4.4 Model Selection

To select the appropriate model to be used for regression analysis, the study used the Hausman and Chow tests for the Fixed Effects test. The null hypothesis is to accept the random effects model, while the alternative hypothesis is to accept the fixed effects model. The results for the two Test are presented below

Table 4. Hausman Test Results

Test Summary	Chi Square Statistic	Chi Square d.f	Probability
Cross Section Random	46.870505	7	0.0000

Source: Author's own computation

Table 5. Chow Test Results

Test Summary	Statistic	d.f	Prob
Cross Section F	4.778101	(10,114)	0.0000
Cross Section Chi-square	46.205962	10	0.0000

Source: Author's own computation.

From Table 4, the results indicate that the p-value from the Hausman test is 0.0004, which is less than 0.05. Therefore, this study employs a fixed effects model rather than a random effects model. Furthermore, from Table 5, the results indicate that the probabilities are 0.0000, which is less than 0.5.

Thus, the results indicate that there is sufficient evidence in the model that leads to a structural breakpoint in the data, making the pooled OLS model inappropriate in line with Hausman (1978). Hence, FEM is preferred as the correct model specification to be used. Both tests support the use of FEM.

4.5 Regression Results- Fixed Effects Model Results

The OLS regression technique was used to estimate the relationship between Fiscal Balance and Current Account Balance, including other variables. In the estimation process, the dependent variables were lagged by one year to ensure that the model possessed a high degree of goodness of fit. The coefficient of Adjusted R-squared, F-statistic and Durbin Watson statistic were statistical tools used in making inferences of the regression results.

Table 6. Regression Results -Fixed Effects Model Results

C	6.072137	2.994503	2.027761	0.0449
FB_	0.490189	0.119948	4.086679	0.0001
LAGCAB_	0.580277	0.062366	9.304454	0
RIR_	-0.12792	0.051239	-2.49652	0.014
TO_	-0.087242	0.03419	-2.551682	0.012
EXTD_	0.050756	0.019977	2.540659	0.0124
RGDPG_	0.172452	0.119221	1.446493	0.1508
INF_	-0.000312	0.011652	-0.026734	0.9787
R-squared	0.834024	Mean dependent var		-4.739131
Adjusted R-squared	0.809273	S.D. dependent var		9.883865
S.E. of regression	4.316507	Akaike info criterion		5.888894
Sum squared resid	2124.074	Schwarz criterion		6.282003
Log likelihood	-370.667	Hannan-Quinn criter.		6.048635
F-statistic	33.69689	Durbin-Watson stat		1.891166
Prob(F-statistic)	0.0000	0.0000	0.0000	0.0000

Source: Author's own computation

4.6 Results Interpretation

Except for RGDPG and INF, all other regressors included in the model have proven to have a significant impact on Current Account Balance in a panel of 12 SADC countries. The extent at which the adopted regressors are successful in explaining the variation in current account balances is represented by the R^2value. The R^2 obtained from the regression model is 0.834024 implying that 83.40% of the variations in Current Account Balances are explained within the model while the remaining 16.60% of the variations are explained by factors not included in the model and these are represented by the random error term.

The adjusted R^2 of 0.809 shows that the model still has a good fit even after considering the degrees of freedom. The F-statistic of the model is 33.697, and its probability is significant at the 1% level, indicating that the model is feasible for research. The Durbin-Watson statistic of 1.891 is closer to 2 implying that there is no serial autocorrelation and that the model is correctly specified. However, the serial correlation LM revealed no autocorrelation in the model. In addition, the DW statistic is greater than the R^2 value, indicating that there is no spurious regression.

The results from the regression analysis reveal important insights into the dynamics of the Current Account Balance (CAB) within the studied economies. The positive relationship identified between the current year's CAB and lagged CAB indicates persistence in imbalances over time. Specifically, the finding that a 1% increase in the previous period's current account deficit results in a 0.580% increase in the current year's deficit suggests a momentum effect. This means that if a country experiences a deficit in one period, it is likely to continue experiencing a similar deficit in the following period, reflecting inertia in economic behaviors and adjustments. The statistical significance of this relationship is underscored by a p-value of 0.0000 and a t-statistic of 9.304454, both of which confirm that lagged CAB is a reliable predictor of current imbalances. This result aligns with the findings of Chinn and Prasad (2003) and Iram et al. (2011), who suggest that current account imbalances tend to revert to their mean over time. The concept of mean reversion is critical here; as economies adjust to shifts in trade patterns, exchange rates, and other external factors, they are expected to eventually stabilize around a long-term equilibrium level. This study posits that lagged imbalances create a form of economic momentum, reinforcing similar trends in subsequent periods.

In terms of trade openness, the findings indicate a negative impact on the current account balance. Specifically, the regression results suggest that a 1% improvement in trade openness, perhaps measured by increased exports or imports, will deteriorate the current account balance by 0.087%. This counterintuitive finding suggests that while greater trade openness can enhance economic activity, it may also lead to higher imports relative to exports, negatively affecting CAB. The statistical significance of this variable is confirmed by a p-value of 0.0120 and a t-statistic of -2.551682, indicating that trade openness is a significant determinant of the current account balance. This is consistent with Blecker (2016), who noted that greater trade liberalization can sometimes lead to imbalances if a country does not simultaneously enhance its export capacity.

The regression results affirm a negative relationship between real interest rates and the current account balance, highlighting the complex interplay between interest rates, investment behavior, and trade dynamics. A 1% increase in the real interest rate deteriorates the current account balance by 0.128%. The significance of this variable is reinforced by a p-value of 0.0140 and a t-statistic of -2.497, indicating that real interest rates play a crucial role in influencing the current account balance, consistent with Edwards (2005) arguments. Higher real interest rates increase borrowing costs, attract foreign capital, appreciate currency, and potentially stifle economic growth. The results are consistent with Neda and Mohammad (2011) and Bluedorn and Leigh (2011), who argue that as foreign capital flows into a country with high real interest rates, the demand for that country's currency may increase, leading to currency appreciation. An appreciated currency makes exports more expensive and imports less expensive. This shift can negatively affect trade balance; exporters may struggle to compete in international markets, while consumers may turn to cheaper imported goods. Therefore, the current account balance may deteriorate as exports decline and imports increase.

Contrary to the researcher's expectations, the results show that external debt positively affects the current account balance. Specifically, a 1% increase in external debt improves the current account by 0.050%. The variable is statistically significant with a p-value of 0.012 and a t-statistic of 2.541. This counterintuitive finding suggests that, in certain contexts, borrowing might be used to finance productive investments that enhance economic output, thus positively affecting CAB. This finding contradicts earlier studies by Bitzis et al. (2008), which indicate that external debt typically exerts a negative influence on the current account due to the burden of servicing that debt. Algieri (2013) also highlighted that there is no clear relationship between fiscal balances and current account balances, arguing that the positive impact of external debt on the current account balance can be attributed to its potential to finance productive investments, stimulate economic growth, and enhance trade competitiveness. Traditional views suggest that external debt may lead to negative consequences due to service costs. This finding illustrates that, in certain contexts, strategic borrowing can lead to beneficial outcomes that improve CAB.

5. Conclusion

The regression analysis conducted on the current account balances of the 12 SADC countries reveals significant insights into the dynamics influencing these balances. The results indicate that except for real GDP growth (RGDPG) and inflation (INF), all variables in the model significantly affect the current account balance. The analysis highlights a notable persistence in current account imbalances, as evidenced by the positive relationship between the current year's current account balance and lagged balance. Trade openness is shown to negatively impact the current account balance. The results also affirm the negative relationship between real interest rates and current account balance. Interestingly, the study found that external debt positively impacts the current account balance, contradicting initial expectations. These findings underscore the complex interplay between various economic factors that influence the current account balance in SADC countries, highlighting the need for nuanced policy approaches that consider both immediate and long-term economic implications.

From the findings presented, the scholar suggests policy recommendations that the Ministries of Finance and the Central Banks may pursue to improve the current account and fiscal account. Since SADC countries have shown evidence of twin deficits, policymakers must consider fiscal consolidation (reducing deficits and debt accumulation). Fiscal consolidation includes measures such as efficient spending monitoring, proficient revenue collection apparatus, and restructuring the civil service. Fiscal consolidation has proven to be helpful in many countries where it has been fully implemented. Fiscal strain can be controlled by reducing nonpriority expenditure, strengthening the revenue base, and, where feasible, allowing a flexible exchange rate. As per researchers' knowledge, Low Official Development Assistance (ODA) is a major contributing factor to the large budget deficits of SADC countries. Zimbabwe, being one of the countries, needs to attract aid flows and negotiate for debt relief. ODA is the transfer of real resources to countries. This has to be accompanied by a well-built policy structure to enable successful assimilation. For all SADC countries, there is a need to take up a number of measures such as lowering production costs, raising production of agriculture, removing structural bottlenecks to productivity growth, moving resources from traditional and less productive sectors to more productive sectors, and improving the investment environment so that investors automatically pick up signals and invest in profitable export-oriented areas in order to improve the current account.

In SADC countries, it is sustainable to finance the current account through inflows of portfolios and direct investments since it is an addition of real resources. Drawing down international reserves and external borrowing are not feasible since SADC countries are pressed with a large international debt. In the long run, there is a need for the government to develop new exports and primary product beneficiation (value addition). In Zimbabwe and other SADC countries, the current account can be used to address the budget balance.

5.1 Further studies

As a result of several reasons, such as data unavailability for some nations, the research did not include all SSA countries. A number of countries were excluded from the study, which creates a research gap that might be covered by other future researchers. In addition, other econometric techniques such as GARCH, ARCH, and REM can be used in this same study by other researchers. Future studies can also use the Pre-wise Granger Causality test and ARDL model to investigate the causal relationship between budget deficit and current account deficit.

5.2 Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper

5.3 Authors' Contribution

Talent Kondo originally conceived this paper and designed the graphs and tables. Simba Mutsvangwa contributed in data collection and sorting. All authors contributed to the writing and critical editing of the paper. Talent Kondo was responsible for the final version of the manuscript.

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Data Accessibility
The data used can be accessed upon reasonable request.

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