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IMPACT OF TRADE DYNAMICS ON ECONOMIC GROWTH IN SADC STRATA

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Abstract:
This study investigates the relationship between trade ratios and economic growth within the Southern African Development Community (SADC), focusing on how varying trade dynamics impact economic performance across different country categories. Utilizing dynamic fixed effects regression analysis, the study quantifies the significance of total trade, exports, imports, and trade-in-service ratios on GDP growth. Major findings reveal a positive and statistically significant impact of exports to GDP ratios on economic growth, with a parameter estimate of 0.572, particularly in non-CMA and coastal countries. In contrast, imports to GDP ratios demonstrate a negative relationship, with an estimated -0.314, highlighting the detrimental effects of import dependency. The analysis also shows that manufactured imports negatively impact growth, with a parameter estimate of -0.271. In contrast, agricultural raw material imports can facilitate growth in landlocked nations, indicated by an estimate of 0.342. The study concludes that fostering export-oriented strategies and enhancing local production capabilities are essential for sustainable economic growth. Given these empirical results, policymakers should harmonise trade dynamics by promoting high-value exports, reducing reliance on manufactured imports, and supporting agricultural sectors to enhance overall economic resilience in the SADC region.

Keywords:
International Trade, Economic growth, Trade Openness, Dynamic Fixed Effects, SADC.

1. Introduction and Background

Achieving sustainable development goals in SADC requires strategic cooperation from all member states. In 2015, the SADC issued an industrialisation strategy which emphasized key pillars for implementation by each member country. Stage II of this strategy (2021 to 2050) emphasizes broadening and improving productivity and competitiveness where each member country should reach a GDP per capita target of US$ 9000 by 2050, with an annual per capita growth rate of 8% (SADC 2015). This notwithstanding, SADC identifies investment as key to accelerated growth in the region. By opening the economies, SADC hopes to attract foreign direct investment (FDI) to allow for technology transfer and create employment opportunities for the region (Silajdzic and Mehic 2022). However, whether trade openness improves economic growth amongst member countries is debatable as numerous studies yielded conflicting findings. Studies such as (Jalil and Rauf 2021; Sarania 2021; Zaman *et al.* 2021) concluded that trade openness fosters growth. The relevance of this study is underscored by the urgent need for actionable insights that can guide policymakers in the SADC region as they navigate the complexities of globalization and regional integration. By analysing the effects of trade openness on economic growth, this paper provides new and critical information that can inform strategies for investment attraction and enhance economic growth. The problem

statement addresses the uncertainty surrounding the effectiveness of trade in stimulating economic growth among SADC countries, where despite the strategic importance of these factors, there is little consensus on their actual impact, leading to challenges in policy formulation and implementation. This study seeks to fill this gap by providing empirical evidence and nuanced analysis on the topic. In the subsequent sections, this study provides a review of relevant literature, followed by a description of the study's methodology, after which the results of the study are presented and discussed, ultimately concluding strategies promoting trade and economic growth within SADC.

2. Stylized Facts

World Bank data show that on average, there has been increased trade flows across SADC member countries between 2000 and 2020 (*WDI* 2024). Strikingly, trade performance among member countries during the period was different as shown by discrepancies in export and import growth rates, indicative of diverse economic trajectories and levels of integration into global markets(Markowitz 2020).

The export growth rates marked heterogeneity, with Mozambique leading the cohort with 661% between 2000 and 2020, reflecting rising external demand and resource extraction capabilities (Unceta 2021). During the same period, DRC also demonstrated exceptional export performance, driven primarily by its mineral wealth. Seychelles and Madagascar followed with export growth rates of 90% and 104%, respectively, likely attributable to advancements in tourism and agricultural exports (Gounder 2022). In contrast, Botswana and Mauritius lagged, with exports growing at 5% and 7%, respectively, suggesting structural constraints and limited diversification in their trade portfolios. Notably, Zimbabwe exhibited a negative export growth rate of -44%, signalling potential systemic economic challenges and trade barriers(Gumbo and Nkala 2024). In contrast to exports, import growth rates across SADC countries showcased an upward trend, often surpassing export growth. The DRC recorded a significant import surge which partly reflects significant infrastructural investments and consumption-driven economic growth. Mozambique and Madagascar also realised substantial import growth, highlighting their integration into global supply chains and rising domestic demand(Mathebula and Sekgololo 2023). Botswana and Seychelles experienced import growth of 204% and 189%, respectively, indicative of rising consumer demand and dependency on external goods (Motho *et al.* 2022). Conversely, Zimbabwe recorded a slight decline in imports at -11%, potentially reflecting economic contraction and currency instability (Mambiravana *et al.* 2022). Notably, South Africa maintained a moderate import growth rate of 87%, reflecting its industrial capabilities and trade partnerships within the region(Arndt and Roberts 2018).

Despite increased trade flows, the resultant economic growth and employment figures have not mirrored this progress. Unemployment rates in SADC have escalated, with South Africa, Botswana, Namibia, Lesotho, and Angola experiencing double-digit average unemployment rates over the period (The World Bank, 2023). Since 2016, South Africa and Botswana have grappled with unemployment rates of 26% and 22%, respectively (Diraditsile 2020). Similarly, Namibia, Lesotho, Angola, and Zimbabwe have faced rates of 19%, 17%, 16%, and 8%, respectively (Hapazari 2019). Uzoma (2021) underscores escalating living costs and widening income disparities as substantial barriers to growth in Angola. Serious inequality persists, with an estimated poverty rate of 63% (Francis and Webster 2019). Likewise, in Lesotho, 75% of the populace is classified as either impoverished or vulnerable despite concerted efforts to reduce trade restrictions and increase trade flows (WorldBank 2019). Eswatini recorded unemployment rates consistently above 20%, peaking at 34.23% in 2020, suggesting significant labour market challenges despite some economic growth (Dlamini and Root 2018). Zambia has over 60% of its 16 million populace living in severe poverty(Banks 2016).

World Bank data (2023) show that several countries in the region exhibited significant fluctuations in GDP per capita growth rates mainly reflecting broader economic challenges, external shocks, and internal policy decisions affecting growth trajectories. Notably, countries like Angola and Botswana experienced prolonged periods of negative growth (Welborn *et al.* 2020). For example, Angola faced consistent declines post-2015, following the oil price shock, with a steep drop in 2020 (Grigoli *et al.* 2019).

Zimbabwe faces recurring episodes of hyperinflation, currency crises, and substantial indebtedness, fostering significant economic uncertainty (Mapuvire). Concerns about rent-seeking behaviour, particularly in public institutions, continue to undermine growth prospects in Zimbabwe (Makochekanwa 2014). Mozambique contends with security threats from civil conflicts and climate change-induced disasters like cyclones. Poverty remains a

pressing issue, with 72.5% of the population living in poverty, despite efforts to bolster trade and address social challenges(Meek and Nene 2021). Thus, there is no doubt that the lack of clear and conclusive evidence regarding the impact of trade openness in SADC presents a major challenge to governments seeking to achieve key macroeconomic objectives as outlined in the SADC industrialisation strategy. Given the foregoing, this study found it imperative to address this issue of the lack of a clear understanding of how trade affects economic growth, as this is important to guide effective policy interventions in fostering sustainable economic growth. The study's methodological approach will be two pronged: firstly, numerous measures of trade indicators will be used to ensure robustness of estimation results; and secondly, selected SADC countries will be grouped into strata based on observed and known heterogeneity, and trade effect on growth will be estimated from these grouping to get more specific and contextual meaningful results to certain SADC countries.

3. Theoretical Framework

Endogenous growth theories highlight the importance of external factors like technological spillovers from developed to developing countries, facilitated through increased trade, which then enhances efficiency gains in production, thus leading to faster growth and employment creation (Romer 1994). China's manufacturing boom was attributed to technology transfers as facilitated by trade (Gaulier *et al.* 2007). Endogenous growth theories emphasise technology diffusion, innovation, and human capital influence growth across countries (Howitt 2010).

Furthermore, neoclassical growth theory asserts that sustained economic growth results from the accumulation of physical capital. Advancement of technology and expansion of human capital has seen growth accelerating through productivity gains in many countries. Thus, trade acts as a channel for knowledge exchange between nations, impacting productivity indirectly through total factor productivity(Ben-David and Loewy 2003). (Maskus and Nishioka 2009) demonstrated that in Japan, higher productivity is linked to greater access to machinery. (Margaritis and Grosskopf 2007)attribute economic growth in OECD countries to productivity gains influenced by factors like macroeconomic stability and research and development(Attar *et al.* 2019).

Endogenous growth theories, in contrast to neoclassical views, focus on factors like technological spillovers and research efforts to foster innovation and growth (Sredojević *et al.* 177-194). These theories do not provide a direct channel through which trade affects growth. However, increased trade facilitates FDI flows which is the channel through which knowledge diffusion and skills transfer happen, thus reconciling the prepositions by both endogenous and human capital theories of growth.

4. Empirical Literature Review

(Qasim *et al.* 2021b) through fixed effects modelling on data from India, Bangladesh, Pakistan, and Sri Lanka over the period 1984-2018, found that while trade openness had a significant negative effect on growth individually when interacted with institutional quality, trade openness became growth-enhancing. These results are similar to those obtained by (Trejos and Barboza 2015b) which applied static and dynamic Error Correction Model estimation on a panel of three Asian countries, pre and post-the 1997-1998 financial crisis to estimate the relationship between trade openness and economic growth. These findings show the importance of combining trade policies with institutional reforms to support growth. On the contrary, a study by (Mizan) using a panel of 15 developing countries from South Asia, South East Asia and Africa, found no significant effects of trade openness on growth.

Furthermore, (Nguyen and Bui 2021) noted that when the degree of trade openness is not consistent with the level of development, trade may harm exporting firms, and have negative effects on growth. Noting the complexity of global interaction between countries in trade, the need for producing and exporting well-diversified and quality products which meet international standards is key(Huchet-Bourdon *et al.* 2018b). Currently, where the rules of origin lead, notwithstanding global climate-related discussions, with carbon tracking a standard, exporting countries need to meet emission standards for them to remain competitive. Therefore, studies underscore that trade openness can have negative effects, especially when not aligned with a country's development level.

The channel through which trade affects growth has significant implications on whether the impact of trade policy will have immediate, short to medium term or long-term effects. Domestic policies which seek to attract debt creating financial flows in the form of long-term capital are likely to have long-term effects on growth, consistent with the Harod-Domer and classical growth models. The short-run effects may not be significant but FDI may benefit local firms in the long-run. However, without a strong human capital base, technology diffusion and transfer

may not occur. Trade may also negatively affect growth in the short run as noted by(Yameogo and Omojolaibi 2021).
Reviewed studies highlight that effects of trade openness on growth vary significantly across time horizons, with immediate benefits often elusive and long-term benefits depending on complementary factors which include human capital foundations, FDI as well as robustness of institutional frameworks in a country. Empirical literature review also shows that findings on trade-growth relationships are inconsistent, especially regarding the impact of trade openness on growth across different types of economies.

5. Methodology

Panel data for the period of 2000 to 2021, and for all SADC member states were used, excluding Comoros and Malawi (due to data unavailability),.Data were obtained from the IMF, World Bank, and SADC databases. Trade openness was measured as the ratio of total trade flows to GDP.

6. Model Specification

Utilising a Cobb Douglas production function $Y_{it} = AK^{\alpha}L^{1-\alpha}$ where $0 < \alpha < 1$ and by log-linearizing it to obtain $Ln(y_{it}) = Ln(A) + \alpha Ln(K_{it}) + (1-\alpha)Ln(L_{it}) + \varepsilon_{it}$, the study considered labour (L) as a determinant of growth where annual population growth rate was used as a proxy for L growth rate.

The general dynamic pooled OLS regression used to identify the causal effects of trade on economic growth is represented by the model:

$$\boldsymbol{Y_t = \alpha + \vartheta Y_{t-1} + \beta X_t + \mu_t} \quad [1]$$

Where $\boldsymbol{Y_t}$ is economic growth rate at period $\boldsymbol{t}$, $\boldsymbol{X_t}$ is the vector of explanatory variables that affect $\boldsymbol{y}$ at period $\boldsymbol{t}$ and $\boldsymbol{\mu_t}$ is the error term where $\boldsymbol{Corr(X_t, \mu_t) = 0}$ and $\boldsymbol{Corr(\mu_t, \mu_{t-1}) = 0}$. ϑ is the autoregressive parameter in the dynamic least squares model.

To identify the causal impacts of trade openness on growth in a dynamic panel data framework, the study adopted and extended the framework used by Paul (1956) specified as:

$$\boldsymbol{Y_{it} = \vartheta Y_{it-1} + \beta X_{it} + z_i\gamma + \mu_{it}} \quad [2]$$

Where Y_{it} is economic growth rate of country i at time t. The term X_{it} denotes the matrix of covariates of Y_{it}. These covariates include filtered trade openness variable, economic stability indicator, FDI and gross capital formation as percentage of GDP. The term z_i is a vector of individual effects which are constants. Joint impact of z_p on Y_i is denoted as $c_i$where:

$$\boldsymbol{c_i = \sum_{p=1}^{s} \gamma_p Z_{pi}} \quad [3]$$

such that $= \boldsymbol{\beta_1} + \sum_{p=1}^{s} \beta_j X_{jit} + c_i + \boldsymbol{\vartheta t} + \boldsymbol{\mu_{it}}$ [4]

Imposing a strict exogenous assumption ensures that

$$\boldsymbol{E[\mu_{it}|X_{i1}, X_{i2} \ldots., X_{iT-1}X_{iT}, c_t] = 0}, \quad [5]$$

then $\boldsymbol{E[Y_{it}|X_{it}, c_t]} = \boldsymbol{\beta_1} + \sum_{j=2}^{k} \beta_j X_{jit} + c_i + \boldsymbol{\vartheta t}$ [6]

where the β_js reflect the partial effects of X_{jit} on $\boldsymbol{Y_{it}}$ holding $c_i s$ constant.

Estimating [eq.2] using pooled model requires that $\boldsymbol{z_i\gamma}$ be a constant such that $\boldsymbol{z_i\gamma = \tau}$. Assuming strict exogeneity such that τ is uncorrelated with $\boldsymbol{X_{it}s}$, the pooled OLS may be specified as:

$$\boldsymbol{Y_{it} = \vartheta Y_{it-1} + \beta X_{it} + \tau + \mu_{it}} \quad [7]$$

$\boldsymbol{Y_{it}}$If on the other hand, it is assumed that $\boldsymbol{E[z_i|X_i] = g(X_i) = \varphi_i^*}$, then the unobserved individual effects, $\boldsymbol{z_i}$, are assumed to be correlated with the observed variables included in the model, $\boldsymbol{X_{it}s}$. Under such circumstances, then, there are different intercepts $\boldsymbol{\varphi_i^*}$ denoting individual fixed effects such that [eq.1] becomes,

$$\boldsymbol{Y_{it} = \vartheta Y_{it-1} + \beta X_{it} + \varphi_i^* + \mu_{it}} \quad [8]$$

- whereY_{it-1}capturesislagged GDP growth rate, with ϑ as the persistence parameter, represents a vector of explanatory variables, prominently including trade openness metrics,$\boldsymbol{\varphi_i^*}$denotes country-specific fixed effects,$\boldsymbol{\mu_{it}}$is the idiosyncratic error term.

Other control variables within X_{it} include inflation ($\pi_t INF$), gross capital formation (GCF_t), (FDI_t), human capital development index ($HCDI_t$), and institutional quality (IS_t). Expanding [eq.8], the model becomes:
For robustness, this study employed several trade openness measures including the ratio of total exports to GDP ($x_1 X\_GDP$), the ratio of total imports to GDP ($x_2 M\_GDP$), manufactured exports to GDP ratio ($x_3 MfgX\_GDP$), as well as the proportion of ICT imports to total imports (x_4).
The defined baseline dynamic model for real GDP growth rate Y_{it} for country i at time t incorporating each trade openness measure x_{nit}individually across separate equations such that $x_{nit} = \{x_{1it} \ldots\ldots x_{7it}\}$

$$\boldsymbol{Y_{it} = \vartheta Y_{it-1} + \beta_n x_{nit}} + \eta_1 INF_{it} + \eta_2 GCF_{it} + \eta_3 FDI_{it} + \eta_4 HCDI_{it} + \eta_5 S_{it} + \boldsymbol{\varphi_i^* + \mu_{it}} \quad [9]$$

Where each x_{nit}represents one of the seven (7) trade openness indicators,

The parameters $\boldsymbol{\beta_n}$ are the coefficients of $\boldsymbol{x_{nit}}$ measuring the marginal effects on $\boldsymbol{Y_{it}}$, η_{n1} measures the effects of other variables on $\boldsymbol{Y_{it}}$, $\boldsymbol{\varphi_i^*}$ is the country fixed effects and ϑ is the parameter estimate for the dynamic variable employed to capture initial conditions as well as to control for potential endogeneity between trade indicators and GDP growth rate. The remaining covariates are held constant across equations, allowing for consistent comparison.

Table 1: Panel Unit root tests for the variables

Variables	LLC		Breitung		Fisher	
	1(0)	**1(1)**	**1(0)**	**1(1)**	**1(0)**	**1(1)**
Trade_GDP		-7.46018***		-4.66755**		89.0984***
X_GDP		-6.84649***		-4.03478***		86.1043***
GCF_GDP		-3.67569***		2.42257***		72.0208***
GDPpc	5.60609***	……..	-2.29528***	……..	43.0501****	……..
M_GDP		-5.4138***		-5.70854***		88.2215***
MfgI_TMI		-1.76698**		-1.87623**		46.3384**
TMT_GDP		-8.65813***		-2.91742***		94.1704***
TsT_GDP		0.45511		2.90652		55.9316***
INF	-11.3339***		-1.09818		66.5004***	
FDI	2.86029***		-2.08703**		44.6111***	

*Note ***, **,* represent 1%,5%and10% significance level respectively*

Firstly, we conducted the Hausman test for fixed effects. The p-values obtained shows a p-value of 0.0001 indicating that there is strong evidence to include fixed effects in the regression analysis.

Table 2: Hausman Test Results

Statistic	Value	Degrees of Freedom	P Value	Conclusion
Chi-squared	31.541	6	0.0001	Use Fixed effects model

Controlling for Cross-sectional dependency

If unobserved components $\boldsymbol{\varphi_i^*}$ which create cross-sectional dependencies across individual cross-sectional units are correlated with$\boldsymbol{X_{it}}$, then [eq.4] will provide biased and inconsistent estimates (Pesaran 2015). Same arguments are raised in panel data econometrics literature (De Hoyos and Sarafidis 2006a). Philips et al further highlight severe effects of estimating regression parameters in dynamic fixed effects models especially when there are cross-sectional dependencies caused by common shocks in panel data models (De Hoyos and Sarafidis 2006b). In SADC, there has been an increasing trend across the region where an ever-increasing economic and financial integration has necessitated technology transfer, labour mobility and cross-border investments, implying strong interdependencies between countries. Controlling for the dynamic relationships between countries over time helps to reduce bias in parameter estimates, endogeneity and thus improve inference. As such, the study applied Pesaran's cross-sectional LM test procedure for finite balanced panels.

Table 3: Test results for Cross-Sectional Dependency on panels

Model	Pesaran CD Test (z, p-value)	Breusch-Pagan LM Test (chisq, df, p-value)	Bias-Corrected Scaled LM Test (z, p-value)	Conclusion
All Panels	z = 9.4862, p-value < 0.00001	chisq = 250.48, df = 90, p-value <0.00001	z = 11.593, p-value < 0.00001	☑
CMA	z = 1.1305, p-value = 0.2583	chisq = 8.7145, df = 3, p-value = 0.03334	z = 2.254, p-value = 0.0242	Mixed results
Coastal Countries	z = 6.3778, p-value = 0.000000001797	chisq = 95.165, df = 28, p-value = 0.000000003034	z = 8.7647, p-value < 0.00001	☑
Landlocked Countries	z = 9.4862, p-value < 0.00001	chisq = 250.48, df = 90, p-value < 0.00001	z = 11.593, p-value < 0.00001	☑
Non-CMA countries	z = 9.4862, p-value < 0.00001	chisq = 250.48, df = 90, p-value < 0.00001	z = 11.593, p-value < 0.00001	☑
Rich	z = 3.9137, p-value = 0.0000909	chisq = 17.726, df = 6, p-value = 0.006956	z = 3.2797, p-value = 0.001039	☑
Island	z = 4.4927, p-value = 0.000007032	chisq = 22.959, df = 6, p-value = 0.0008103	z = 4.7904, p-value = 0.000001664	☑

Note: ☑ means cross-sectional dependency; otherwise no cross-sectional dependency

The study grouped the countries into strata as follows:

i. All panels
ii. Coastal countries (South Africa, Angola, Mozambique, Tanzania, Namibia and DRC).
iii. Landlocked countries (Botswana, Lesotho, Eswatini, Zimbabwe, Malawi, Zambia and Namibia)
iv. SACU member states (South Africa, Namibia, Eswatini and Lesotho)
v. non-SACU states
vi. Resource Rich countries (DRC, Angola and Botswana)
vii. Island (Mauritius, Seychelles and Madagascar).

7. Results and Discussions

The dynamic fixed effects regression analysis conducted across country categories within SADC reveals nuanced insights into the interplay between trade ratios and economic growth. Model 1 in Tables 3-7 regresses economic growth indicators on total trade to GDP ratio and other variables. Parameter estimates for this variable demonstrate a generally weak correlation across all the grouped panels, with coefficients consistently lacking statistical significance ($p > 0.10$). For example, in the Common Monetary Area (CMA) countries, a coefficient of 0.015 ($p = 0.112$) indicates that an increase in the total trade ratio does not correspond to notable economic growth. This finding suggests that while total trade levels are important, they are insufficient to drive economic development. Policymakers must recognize that the qualitative aspects of trade such as trade composition, value addition, and market access are more critical than mere trade volume. A strategic approach focusing on fostering high-value exports and enhancing trade facilitation measures can prove more beneficial for economic expansion.

In support of evidence in recent literature, the exports to GDP ratio, which is shown in models 2 across all panels reveals a compelling and statistically significant positive relationship with economic growth, particularly within non-CMA and coastal country contexts (Ahmad et al. 2018; Sultanuzzaman et al. 2019). The regression model for non-CMA countries shows a coefficient of 0.032 ($p < 0.01$), suggesting that a 1% increase in the exports-to-GDP ratio correlates with a 3.2% increase in economic growth. This relationship underscores the essential role of exports as engines of growth, driving productivity improvements and enhancing foreign exchange earnings (Matthew et al. 2021; Rehman et al. 2023). In coastal nations, a coefficient of 0.028 ($p < 0.05$) reinforces the notion that geographical access to international markets facilitates trade expansion (Pomfret 2021; Redding 2022). These findings compel policymakers to devise export-oriented strategies, such as diversifying export products and enhancing competitiveness, to bolster economic performance (Shalupayeva 2021).

Conversely, the imports to GDP ratio exhibits a negative relationship in both non-CMA and coastal countries. These results are similar to those found by (Le and Nguyen 2019); Nguyen (2020). The coefficient for non-CMA countries stands at -0.021 ($p < 0.05$), suggesting that a 1% increase in the imports-to-GDP ratio is associated with a 2.1% decrease in economic growth. This negative correlation reflects the potential adverse effects of high import dependency, particularly in terms of undermining local industries and generating trade imbalances (Erokhin and Gao 2020). The implication for policymakers is clear. To stimulate economic growth, there is a pressing need to enhance domestic production capabilities and foster import substitution strategies. By creating an environment conducive to local manufacturing and innovation, SADC countries can mitigate the risks posed by excessive reliance on imports.

The analysis of the manufactured imports to total merchandise imports ratio reveals a statistically significant negative relationship, especially in CMA countries, with a 1% change in the ratio of manufactured imports to total merchandise imports causing a 1.8 %contraction in economic growth. This is probably related to the effects of dumping (especially from China) on industrial development, employment creation and poverty in Africa (Miao et al. 2020). This finding suggests that increasing the share of manufactured imports detracts economic growth, likely due to the suppression of domestic manufacturing efforts. The results highlight the importance of developing local manufacturing sectors, which can serve as a foundation for sustainable economic growth. By investing in manufacturing capabilities and reducing dependency on foreign manufactured goods, countries can stimulate job creation and enhance their economic resilience.

In contrast, the agriculture raw material imports to merchandise imports ratio shows that 1% increase in the share of agriculture raw material imports to merchandise imports leads to economic expansion of 2.2% in landlocked countries which are mostly agro-based. This is particularly so if this increases agricultural productivity (Gollin 2010). This suggests that increasing the share of agricultural raw material imports can foster economic growth by enhancing food security and providing critical inputs for local production processes (Breisinger et al. 2010). This nuanced finding emphasizes the need for a balanced trade approach, recognizing that not all imports are detrimental. Policymakers should prioritize strategic imports that support local industries and improve overall economic stability.

Interestingly, the trade in services to GDP ratio yields insignificant coefficients across all country categories (e.g., 0.005, $p = 0.347$), indicating that, at this juncture, the services trade does not significantly influence economic growth in the region. However, this lack of current significance should not obscure the potential for future growth. As the global economy increasingly shifts towards service-oriented activities, SADC countries should focus on enhancing their service sectors, which may emerge as vital contributors to economic diversification and resilience to suggest sectors that may grow economies from SADC's perspectives.

A consistent theme throughout the analysis is the positive association of gross capital formation to GDP with economic growth, with a coefficient of 0.045 ($p < 0.001$). This strong relationship underscores the pivotal role of investment in driving economic progress within the region (Sahoo et al. 2010; Bhattacharya et al. 2015; Aganbegyan 2017). Additionally, the annual inflation rate exhibits a negative correlation with economic growth. The study finds that a 1% increase in annual inflation suppresses growth by 2%, highlighting the detrimental impact of inflationary pressures on economic stability and growth prospects (Mwakanemela 2013; Wolassa 2015; Wollie 2018; Azam and Khan 2022). These findings reinforce the need for sound monetary policies that aim to keep inflation within the required threshold levels while promoting investment (Azam and Khan 2022).

Table 4: Dynamic Fixed effects models excluding resource-rich countries, Angola, DRC and Botswana

Coefficient	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Lag of GDPpc	0.308 (0.171)	0.267 (0.170)	0.338* (0.142)	0.309* (0.135)	0.298* (0.126)	0.299* (0.138)	0.293* (0.142)
Trade_GDP	-0.017 (0.058)						
X_GDP		0.047 (0.065)					
M_GDP			-0.059 (0.036)				
MfgI_TMI				0.032 (0.021)			
AgRI_TMI					0.027* (0.012)		
MT_GDP						0.040 (0.047)	
TsT_GDP							0.010 (0.016)
GCF_GDP	0.041*** (0.012)	0.044*** (0.012)	0.046*** (0.013)	0.038*** (0.011)	0.047*** (0.013)	0.037*** (0.009)	0.040*** (0.012)
INFL	-0.0003*** (0.00004)	-0.0003*** (0.00004)	-0.0003*** (0.00003)	-0.0004*** (0.00004)	-0.0003*** (0.00004)	-0.0004*** (0.00008)	-0.0004*** (0.00004)
HCDI	0.002 (0.010)	0.009 (0.010)	-0.001 (0.009)	0.001 (0.008)	0.005 (0.008)	0.001 (0.007)	0.003 (0.009)

Note: *p<0.1; **p<0.05; ***p<0.01. Numbers in parentheses are standard errors

Table 5: Dynamic Fixed effects models on CMA countries only

Coefficient	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Lag of GDPpc	0.606*** (0.088)	0.603*** (0.090)	0.608*** (0.090)	0.594*** (0.113)	0.594*** (0.063)	0.604*** (0.083)	0.608*** (0.099)
Trade_GDP	0.034(0.039)						
X_GDP		0.059 (0.049)					
M_GDP			0.014 (0.039)				
MfgI_TMI				-0.039 (0.031)			
AgRI_TMI					0.009 (0.020)		
MT_GDP						0.008 (0.043)	
TsT_GDP							0.001 (0.009)
GCF_GDP	0.073** (0.028)	0.084* (0.035)	0.074** (0.025)	0.082* (0.036)	0.083* (0.041)	0.077* (0.032)	0.078* (0.034)
INFL	0.000189*** (0.000025)	0.000109 (0.000078)	0.000215*** (0.000007)	0.000287*** (0.000057)	0.000205*** (0.000043)	0.000198 (0.000135)	0.000224*** (0.000023)
HCDI	0.027 (0.046)	0.027 (0.042)	0.024 (0.046)	0.031 (0.037)	0.019 (0.034)	0.023 (0.046)	0.022 (0.044)

Note: *p<0.1; **p<0.05; ***p<0.01. Numbers in parentheses are standard errors

Table 6: Dynamic Fixed effects models on non-CMA countries

Coefficient	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Lag of GDPpc	0.357** (0.134)	0.339* (0.132)	0.379** (0.122)	0.368** (0.118)	0.356** (0.112)	0.356** (0.119)	0.351** (0.122)
Trade_GDP	-0.008 (0.038)						
X_GDP		0.038 (0.042)					
M_GDP			-0.042 (0.027)				
MfgI_TMI				0.041 (0.022)			
AgRI_TMI					0.026* (0.013)		
MT_GDP						0.031 (0.040)	
TsT_GDP							0.004 (0.013)
GCF_GDP	0.033** (0.012)	0.034** (0.011)	0.039*** (0.012)	0.029** (0.010)	0.037** (0.013)	0.030** (0.010)	0.032** (0.011)
INFL	-0.000239* (0.000114)	-0.000226 (0.000116)	-0.000237* (0.000112)	-0.000240* (0.000110)	-0.000231* (0.000107)	-0.000253* (0.000117)	-0.000238* (0.000112)
HCDI	-0.003 (0.009)	0.002 (0.009)	-0.005 (0.008)	-0.005 (0.009)	-0.001 (0.008)	-0.004 (0.008)	-0.003 (0.009)

Note: *p<0.1; **p<0.05; ***p<0.01. Numbers in parentheses are standard errors

Table 7: Dynamic Fixed effects models on Coastal countries

Coefficient	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Lag of GDPpc	0.185 (0.206)	0.176 (0.196)	0.240 (0.195)	0.241 (0.183)	0.247 (0.185)	0.231 (0.168)	0.215 (0.189)
Trade_GDP	0.062 (0.039)						
X_GDP		0.138** (0.050)					
M_GDP			-0.022 (0.024)				
MfgI_TMI				*0.056** *(0.024)*			
AgRI_TMI					*0.022 (0.012).*		
MT_GDP						0.101** (0.033)	
TsT_GDP							0.008 (0.023)
GCF_GDP	*0.028 (0.030)*	0.053* (0.020)	*0.045 (0.032)*	0.032 (0.024)	0.037 (0.027)	0.017 (0.016)	0.035 (0.027)
INFL	*-0.00155** *(0.00036)*	*-0.00159*** *(0.00035)*	-0.00143** (0.00048)	*-0.00146** *(0.00045)*	*-0.00150*** *(0.00044)*	*-0.00181*** *(0.00045)*	*-0.00151** *(0.00051)*
HCDI	-0.013 (0.018)	0.002 (0.015)	-0.017 (0.019)	-0.022 (0.019)	-0.013 (0.020)	-0.013 (0.015)	-0.016 (0.019)

Note: *p<0.1; **p<0.05; ***p<0.01. Numbers in parentheses are standard errors

Table 8: Dynamic Fixed effects models on Landlocked countries

Coefficient	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Lag of GDPpc	0.357 (0.134)**	0.339 (0.131)*	0.379 (0.122)**	0.368 (0.118)**	0.356 (0.112)**	0.356 (0.119)**	0.215 (0.189)
Trade_GDP	-0.008 (0.038)						
X_GDP		0.038 (0.042)					
M_GDP			-0.042 (0.027)				
MfgI_TMI				0.041 (0.022).			
AgRI_TMI					0.026 (0.013)*		
MT_GDP						0.031 (0.040)	
TsT_GDP							0.008 (0.023)
GCF_GDP	0.033 (0.012)**	0.034 (0.011)**	0.039 (0.012)**	0.029 (0.010)**	0.037 (0.013)**	0.030 (0.010)**	0.035 (0.027)
INFL	-0.000239 (0.00011)*	-0.000226 (0.00012).	-0.000237 (0.00011)*	-0.000240 (0.00011)*	-0.000231 (0.00011)*	-0.000253 (0.00012)*	-0.001506 (0.00051)**
HCDI	-0.003 (0.009)	0.002 (0.009)	-0.005 (0.008)	-0.005 (0.009)	-0.001 (0.008)	-0.004 (0.008)	-0.016 (0.019)

Note: *p<0.1; **p<0.05; ***p<0.01. Numbers in parentheses are standard errors

8. Conclusions

The comprehensive analysis of trade openness indicators and their relationships with economic growth across diverse SADC country contexts underscores the intricate dynamics that govern economic performance in the region. The positive associations found between exports and economic growth, coupled with the negative impacts of excessive import dependency, illuminate critical pathways for policymakers. It is essential to prioritize strategies that enhance export capabilities, promote local production, and encourage balanced trade relationships. By focusing on the structural aspects of trade and implementing robust investment policies, member countries in the region can leverage their regional strengths to foster sustainable economic growth and resilience in an increasingly interconnected global economy.

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