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Export diversification and economic growth: evidence from the Southern African Development Community (SADC) states

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Abstract
This study employs a panel data regression growth model to empirically investigate the relationship between export diversification and economic growth in the Southern African Development Community (SADC) region for the period 1995 to 2020. We employ two measures of diversification namely, the diversification index and the concentration index. The control variables that are thought to influence economic growth include; capital, trade openness, direct investment and population growth. The study results found strong evidence in support of the export diversification-led growth hypothesis for the SADC region. The results imply that exports can play key role in the SADC region's economic growth strategy. The study recommends that SADC countries should put in place policies that should diversify exports in the SADC region. Export diversification will allow SADC countries which are traditionally commodity exporters to hedge against volatile international commodity prices. It will also allow SADC states to stabilize their export revenues. Diversification of exports is critical in achieving stable GDP growth, job creation and stable export earnings in the SADC region.

Keywords: *Economic growth, export diversification, primary products, Southern African Development Community and valued-added products.*

1. Introduction

SADC is a regional grouping comprising of 15 states. Its main objective is to foster member countries development, peace, security and growth in order to alleviate poverty among its people. Its objective of achieving sustainable growth has largely remained elusive as the region continues to face low and volatile gross domestic product (GDP). This is attributed to many factors including weak domestic conditions and volatile international prices. UNECA (2012) notes that African economies are less diversified and remain dominated by few primary products. Hence, at the 2012 African Union Summit, Africa adopted a policy shift of moving away from relying on raw primary exports to higher value-added exports (UNECA, 2012). Reliance on primary exports is associated with weak terms of trade (TOT) and macroeconomic variables. Thus, through export diversification, Africa intends to build strong economies that are capable of absorbing adverse external shocks. The SADC states which specialize in primary exports from agriculture, mining, oil, among others quickly embraced the export diversification as a growth strategy.

According to Samen (2010), countries achieve export diversification by spreading production and exports over many sectors. This is done through changing a country's export composition and structure. The benefits of export diversification include stable export earnings, job creation and

skills transfer and infrastructure development (Al-Marhubi, 2000). Iizuka and Gebreeyesus (2017) notes that exporting diversified products allows a country to generate foreign exchange revenues, boost productivity and employment as well as promoting gdp growth. The benefits of export diversification appeal to the SADC states that face challenges of low growth, shortages of foreign currency, low productivity and high levels of unemployment. Figure 1 shows the SADC's GDP growth rate trend and export diversification index for the period 1995 to 2020. As indicated in Figure 1, the average region's growth has been volatile.

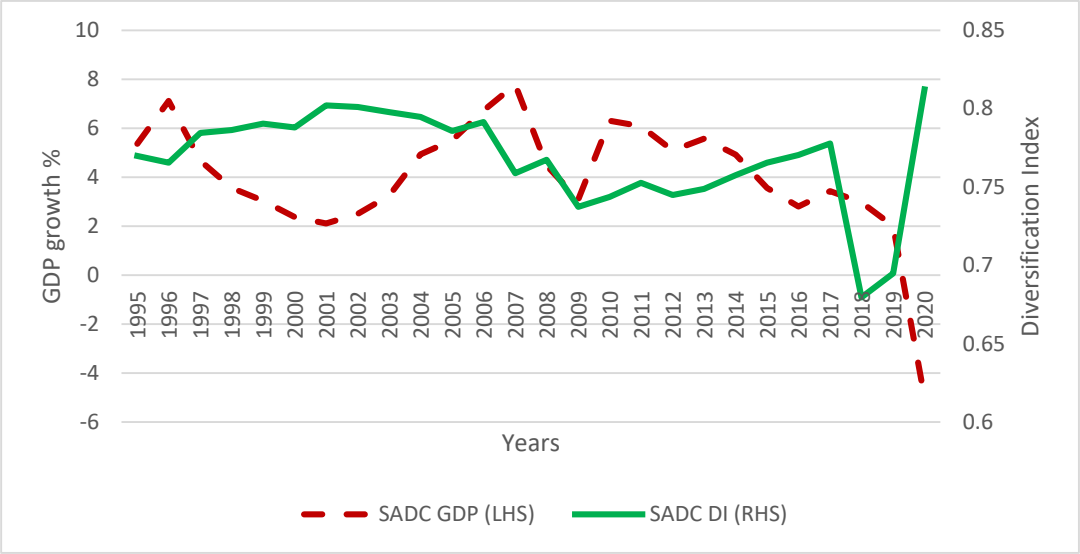

Figure 1. SADC GDP growth and diversification index (1995-2020)

Source: World Bank, 2021

The global financial crisis during the period 2007-2009, and the negative effects of covid-19 containment measures weighed down the region's GDP growth. The SADC's exports appear to be less diversified meaning they are concentrated on a narrow export basket of goods. There are however signs of increasing diversification. The SADC's average export diversification index has been on a downward trend (improving) between 2005 and 2009. It increased between 2009 and 2017 indicating a reversal of diversification. It declined between 2017 and 2018 before increasing again between 2018 and 2020. South Africa is leading its regional peers in the export diversification process (Naude and Rossouw, 2008). Other countries that have shown some level of export diversification include; Eswatini, Lesotho, Madagascar, Mauritius, Mozambique, Seychelles and Tanzania. Those still dominated by primary exports include; Angola (crude oil), Zambia (copper), Botswana (diamonds), Malawi (tobacco) and Zimbabwe (tobacco and gold).

Figure 1 indicates that the SADC states are experiencing low and volatile gdp growth. There is growing empirical evidence in support of the export diversification-led growth hypothesis. The implication of this hypothesis is that policymakers can pursue the root of export diversification to drive economic growth in the SADC region. However, empirical evidence on diversification-led gdp growth hypothesis for the SADC region is scanty. In general, the available empirical studies have produced mixed evidence. This creates an opportunity for further investigating in this area. Hence, the overall objective of this study is to investigate the relationship between export

diversification and gdp growth for the SADC region. This adds to existing empirical studies in this area. The study uses the latest available data to generate useful trade and growth policy recommendations that are important to the SADC region's policymakers and other stakeholders.

This paper has five sections, Section 2 provide a review of the theoretical and empirical literature on export diversification and economic growth. Section 3 covers the methodology. It focuses on model specification, data sources and estimation technique. Section 4 presents and Section 5 discusses the empirical results and conclusion of the paper with policy recommendations, respectively.

2. Literature review

Theoretically, the view that trade promotes development emanates from the classical economists. The classical economists argued that trade and specialization provide opportunities for countries to access large markets. Adam Smith's theory of absolute advantage argues that a country should trade and specialize in the production and export of a good in which it has absolute advantage. On the other hand, David Ricardo's theory of comparative advantage states that a country should specialize in the production and export of a good in which it has lower production costs than in autarky. Classical economists were of the view that specialization efficiently allocates resources and is beneficial for growth (Matthee and Naude, 2008). This implies that the SADC states should achieve growth by promoting the production and export primary goods.

The view that specialization drives efficiency depends largely on assumption that there is no uncertainty in production and export as stated by Osakwe (2007). New trade theories argue that under conditions of uncertainty specialization is less effective to growth (Osakwe, 2007). Dependency on export of primary goods leads to deteriorating terms of trade and low growth (Hesse, 2008). Developing nations face international price volatility which is a major source of export earnings and growth instability. Hence, they need to find ways of reducing the negative impact of international price volatility on their economies. Chenery (1979) argued that developing nations need to diversify from primary to manufactured exports to achieve long run growth. This ensures export earnings stability and reduces the effects of declining terms of trade. Thus, Hausmann and Klinger (2007) argued that a country needs to export "rich country" exports to become rich.

Yokohama and Alemu (2009), argue that a country can broaden its comparative advantage through export diversification. Three arguments underpin this view. Firstly, the traditional argument argues that developing nations depend on primary exports which are vulnerable to international demand. Such countries can spread their export earnings and ensure income stability by export diversification. This prevents foreign exchange as well as balance of payments mismatch which lead to instability (Osakwe, 2007). This instability creates macroeconomic uncertainty and discourages investment, thus negatively impacting on gdp growth. Secondly, endogenous growth theories argue that diversifying exports results in the creation of new industries through backward and forward linkages. A country can then have the benefit of stable export earnings by widening its production structure resulting in the production of high value products. Finally, structural models of economic growth advocate for export diversification policies. Such policies can create new industries through backward and forward linkages as well as expand existing ones which is important for economic growth (Chenery, 1979). Diversifying exports results in the production of

high value products, prevent declining terms of trade and volatile export earnings and realize increased growth (Herzer and Nowak-Lehnmann, 2006).

Empirical studies on the link between export diversification and growth regress either GDP growth or GDP per capita growth against export diversification and some control variables. Control variables include among others; population growth, trade openness, gross fixed capital formation, rule of law, share of manufactures in exports, real exchange rate. Generally, studies have confirmed that export diversification promotes growth. Al-Marhubi (2000) using a cross-country sample with 91 countries, employed different measures of export concentration to a growth equation and found that export diversification contributes to growth. De Fettanti, Perry, Lederman and Maloney, (2002)'s findings supported the export diversification-led growth hypothesis. Agosin (2007) used cross-sectional data for the period 1980 to 2003 for a sample of ASEAN and Latin American countries to examine the link between export diversification and growth. He found that export diversification influences growth. Balaguer and Cantavella-Jorda (2004) found a positive link between export diversification and per capita income in Spain. Hertzer and Nowak-Lehnmann (2006) noted that export diversification promoted gdp growth in Chile. Matadeen (2011) and Sannassee, Seetanah, and Lamport (2014) found the same result to gdp growth in Mauritius.

Generally, regional studies confirm that export diversification promotes growth. A study by Gutierrez de Pineres and Ferrantino (2000) found that export diversification promotes growth in Latin America. Feenstra and Kee (2004) observed that a 10% boost in export diversification in industries leads to a 1.3%-point increase in productivity gdp growth, using a sample of 34 countries. Lederman and Maloney (2007)'s study supported the diversification-led growth hypothesis. Yokoyama and Alemu, (2009) concluded that export diversification contributes to gdp growth in East Asia. They also found that Sub-Saharan African (SSA) countries' weak export diversification led to an insignificant contribution to growth. Hodey, Oduro and Senadza (2015) concluded that diversified exports promote growth using data from 42 SSA countries. Amoro (2020) also concluded that export diversification contributes to gdp growth in the Economic Community of West African States. McIntyre, Xin Li, Wang, and Yun (2018)'s study on 34 small states concluded export diversification has a more significant impact on reducing output volatility than improving long run growth in small states.

Some studies have found no evidence to support the export diversification led growth hypothesis. Michaely (1977) noted that a positive link between export diversification and growth only existed among the more-developed countries but not for the least-developed economies. In Latin America, Gutierrez de Pineres and Ferrantino (2000) noted that export diversification led to higher per capita income growth when using panel data but no evidence to support of diversification-induced growth in Columbia and Chile on the basis of time series data. In Nigeria, Doki and Tyokohol (2019) and Nwosa, Tosin and Ikechukwu (2019) found export diversification having a positive but insignificant influence on gdp growth. The mixed findings create an opportunity for further work. Hence, we explore the relationship between export diversification and gdp growth in the SADC region.

3. Methodology

3.1 Model specification

This study seeks to examine the relationship between export diversification and gdp growth for the SADC states for the period 1995-2020. It employs an empirical strategy that has been used in many similar studies (Agosin, 2007; Matadeen, 2011, Sannassee, Seetanah and Lamport, 2014; Gutierrez and Ferrantino, (2000); Hodey, Oduro, and Senadza (2015); Yuni, Urama, Ugwuegbe and Agbanike (2020). Following the theoretical established relationships and other empirical studies, we specify a dynamic panel data growth model as:

$$y_{it} = x_{it}\beta + \varepsilon_{it} \quad (1)$$

In equation (1) y_{it} is the real gdp (GDP) growth rate, x_{it} is a parameter of explanatory variables that includes export diversification and ε_{it} is the error term and is $\varepsilon_{it} \sim IID\left(0, \delta_{\varepsilon}^{2}\right)$. The error component ε_{it} can be decomposed into two components, $\varepsilon_{it} = \mu_i + v_{it}$ where, the first component, μ_i measures the unobserved country-specific effects and the second, v_{it} is the idiosyncratic error term. Hence, the dynamic panel growth equation (1) can be rewritten as:

$$y_{it} = x_{it}\beta + \mu_i + v_{it} \quad (2)$$

In the panel data growth equation (2), μ_i denotes unobserved country-specific time-invariant effect and v_{it} is the idiosyncratic error term. The v_{it} error term varies across both countries and years and is assumed to be uncorrelated over time. After inserting all variables represented by matrix, x_{it}, the cross-country gross regression model from equation (2) becomes:

$$RGDP_{it} = \alpha_0 + \alpha_1 DVI_{it} + \alpha_2 CI_{it} + \alpha_3 RGDP_{it-1} + \alpha_4 CAP_{it} + \alpha_5 DI + \alpha_6 OPEN_{it} + \alpha_7 POP_{it} + \mu_i + v_{it} \quad (3)$$

Where i index the 15 SADC states and t denotes the years. Hence, our two variables of interest, DVI_{it} represents export diversity in SADC country i at time t while CI_{it} represents export concentration in SADC country i also at time t. These variables are expected to have a positive and negative impact on economic growth of the SADC states, respectively. The control variables are lagged real gross domestic product ($RGDP_{it-1}$), capital stock (CAP_{it}), direct investment (DI_{it}), trade openness ($OPEN_{it}$) and population growth (POP_{it}).

4. Data description and sources

The study uses annual data for the period 1995-2020 for all 15 SADC states. The data was obtained from the World Bank and UNCTAD databases. The variables of interest that is, export diversification and concentration indexes were obtained from World Integrated Trade Solution (WITS) software. The data for other variables were sourced from the World Bank development indicators. In the panel data regression model (3), the dependent variable ($RGDP_{it}$) is the annual real gdp growth rate for each SADC state.

Capital stock (CAP_{it}) is proxied by the gross fixed capital formation. It pertains to government and private sector acquisition of new capital goods, new plant and equipment used in production. Direct investment (DI_{it}) is net direct investment inflows into the SADC states. Both CAP_{it} and DI_{it} are expected to have positive impact on gdp growth given adoption of new as well as improved

technologies. Population (POP_{it}) is the annual population growth. Trade openness ($OPEN_{it}$) is the ratio of exports plus imports divided by the country's gdp. It indicates the extent of each country's exposure to the global economy through trade. We expect POP_{it} to have a positive relationship with gdp growth in SADC. The relationship between $OPEN_{it}$ and growth is ambiguous. Keho (2017) argues that the little research on Sub-Saharan Africa indicates that the effects of trade openness on growth has mixed and inconclusive results. Haussmann and Klinger (2007) concluded that trade openness may impact gdp negatively in countries that specialise in the production of primary products, which are vulnerable to international commodity prices.

We employ the Hirschman index (HI) to measure the degree of export diversification. Other export diversification measures include; Herfindal, Ogive, Entropy and Aggregate Specialization Index. Samen (2010),notes that the HI is popular and commonly used. The HI is calculated as:

$$HI = \sqrt{\sum_{i=1}^{N}\left(\frac{x_i}{X}\right)^2} \qquad (4)$$

Where x_i is the nominal export value of a specific product from a country i, X denotes the country's nominal total exports value and N is the number of export products. This index ranges between 0 (less diversified exports) and 1 (more diversified exports). A positive sign is expected for this variable.

The concentration index (CI_{it}) variable measures the degree to which a country's exports are focused on a limited number of products and markets (UNDP, 2010). This index is calculated as:

$$CI = \sum_{i=1}^{n}\left(\frac{x_{ij}}{X_j}\right)^2 - \sqrt{1/n}\Big/\left(1-\sqrt{\frac{1}{n}}\right) \qquad (5)$$

Where x_{ij} is the value of exports for country j and product i, X_j is the total exports from country j and n is the number of products at standard international trade classification (SITC) 3 group level. The index ranges from 0 to 1. The concentration index values close to zero (0) indicate that exports are less concentrated while those closer to one (1) indicate highly concentrated exports. A negative sign is expected for this index.

Table 1 presents the descriptive statistics for the 15 SADC states variables. The mean and standard deviation values for the dependent variable, *RGDP* are 4.01 and 4.90, respectively. Real GDP growth for the SADC states for the period 1995 to 2020 range from -17.67 to 26.85. The mean values for CI_{it} and DVI_{it} for the SADC states are 0.43 and 0.77, respectively. These values indicate that on average, the SADC states exports are moderately concentrated. However, there are wide disparities in terms of export concentration among the SADC states as indicated by the CI_{it} and DVI_{it} minimum and maximum values. CI_{it} ranges of between 0.11 and 0.96 while DVI_{it} ranges between 0.29 and 0.93. Standard deviations values indicate that DVI_{it} (0.11) and CI_{it} (0.23) are the least volatile variables.

Table 1: Descriptive statistics

Variables	Mean	Stand. dev.	Minimum	Maximum
RGDP	4.01	4.90	-17.67	26.85
CAP	26.15	15.65	-15.73	86.96
DVI	0.77	0.11	0.29	0.93
CI	0.43	0.23	0.11	0.96
DI	4.99	6.97	-6.37	57.88
OPEN	73.03	33.40	7.81	188.58
POP	2.12	0.97	-2.63	3.58

5. Estimation procedure

We employ the panel least squares technique in estimating the coefficients of the panel data regression equation (3). Before estimations, the data was subjected to diagnostic tests to make sure that there was no multi-collinearity among the variables, hence avoid the misleading characteristics of the time series variables as well as select the appropriate model. The multi-collinearity test results that are presented in Table 2 indicate that multi-collinearity is not a problem as all the values in the matrix are below 0.8.

Table 2. Correlation matrix

	RGDP	CAP	DVI	CI	DI	OPEN	POP
RGDP	1.0000						
CAP	0.1281	1.0000					
DVI	0.0417	0.2151	1.0000				
CI	0.1335	-0.1391	0.1405	1.0000			
DI	0.0751	0.2879	0.1768	-0.0077	1.0000		
OPEN	-0.0418	0.0946	0.1247	0.0797	0.2497	1.0000	
POP	0.2477	0.0208	0.0852	0.3356	0.0336	-0.4604	1.0000

In order to obtain robust results, we conducted stationarity tests on the variables used in the model (both dependent and the explanatory variables). The panel unit root tests were conducted using a combination of the ADF-Fisher, Levin-Lin-Chu, PP-Fisher and the Peasaran-Shin tests. Table 3 shows the Augmented Dicky-Fuller (ADF) test results. The variables *CAP*, *DVI*, *DI*, and *POP* are stationary at levels. The other variables were stationary after first differencing.

Table 3: Unit root test results

Variables	Level	1st Difference	Status
RGDP	0.2285	14.4669	I(1)

CAP	-3.93586	-	I(0)
DVI	-4.87700	-	I(0)
CI	-1.64057	-18.2626	I(1)
DI	-5.7604	-	I(0)
OPEN	-1.78061	-16.8812	I(1)
POP	-3.54023	-	I(0)

Panel data permits the use of the; pooled effects (PEM), fixed effects (FEM) and random effects (REM) models. Estimating the panel data growth model (3) using the PEM may produce a pooled OLS estimator that is biased and inconsistent due to its assumption of strict homogeneity of the parameters. This leads to the loss of vital insight offered by the panel data. The F-test was used to select the appropriate model between the PEM and FEM. The null hypothesis is that the PEM estimator is an efficient (consistent) estimator of the true parameters. The F-test produced an F-statistic value of 4.5357 and a p-value of 0.0000. This shows that there is heterogeneity in the data. Hence, the data cannot be pooled. The appropriate model becomes the FEM. We then used the LM test to select the appropriate model between the PEM and the REM. The null hypothesis is the PEM estimator is an efficient (consistent) estimator of the true parameters. The LM results produced the Breusch-Pagan Chi-square statistic of 30.5711 and a p-value of 0.0000. Hence, the null hypothesis is rejected and the appropriate model is the REM.

Both the F-test and LM test refute the pooling of the SADC states panel data during estimation. This suggests that the panel data growth model (3) can be estimated using either the FEM or the REM. To determine the appropriate model between the two, we employed the Hausman specification test. The null hypothesis is that the REM estimator is an efficient estimator of the true parameters. The test results reported a Chi-square statistic of 16.0633 and a p-value of 0.0000. The results reject the null hypothesis hence; the panel data regression growth model (3) for the SADC states was estimated using the FEM.

6. Discussion of empirical results

The panel data regression growth model (3) was estimated using the FEM model. Estimations were done using the e-views software. Estimations were done in levels. All SADC states were included in the analysis and the results are presented in Table 4. The F-statistic value of 7.5256 is significant at 1% level. This confirms the fitness of the model and that the relationship between the dependent variable and the explanatory variables is statistically reliable. The results in Table 4 indicate that lagged real GDP has a positive impact on gdp growth and is significant at the 1% level. This implies that previous values of GDP impact positively on the current GDP of the SADC states.

Table 4: Panel Least Squares Estimates

Dependent variable: RGDP				
Variable	**Coefficient**	**Std Error**	**t-Statistic**	**Prob**
C	-5.1514	3.4592	1.4892	0.1374
$RGDP_{it-1}$	0.3894***	0.0567	6.8671	0.0000
CAP	-0.0409	0.0250	-1.6369	0.1026
DVI	13.6953***	4.4495	3.0780	0.0023
CI	-6.3720***	2.3348	-2.7292	0.0067
DI	0.0723*	0.0389	1.8582	0.0640
OPEN	-0.0338**	0.0148	-2.2908	0.0226
POP	1.2635**	0.5248	2.4077	0.0166
R-squared	**0.3285**		**Adjusted R-Squared**	**0.2849**
F-statistic	**7.5256**		**Prob(F-statistic)**	**0.0000**

*Note: *indicate significant at 10%, **, significant at 5% and ***, significant at 1% level*

The control variables, trade openness (*OPEN*) and population growth (*POP*) are both significant at 5% level. The variable *OPEN* negatively influences economic growth while *POP* positively influences economic growth in the SADC states. Our findings on the variable *POP* are in line with Al-Marhubi (2000) who found that population growth has a positive effect on GDP growth. The results imply that increasing employment in the SADC region will spur economic activity as more labour is absorbed in the various export and domestic linked sectors. This result is also in line with the findings by Arip, Yee, and Karim (2010) who concluded that increasing employment had a positive effect on growth in Malaysia. The results of the *OPEN* variable largely reflect the mismatch between imports of high value finished products and services against low value added and less diversified exports of the same from the SADC region. Direct investment (DI) positively influences gdp growth and is significant at 10% level. Empirical literature has mixed and inconclusive evidence on this variable.

Finally, our two variables of interest, export diversification (*DVI*) and export concentration (*CI*) have the expected signs and are significant at 1% level. As expected, *DVI* and *CI* positively and negatively influence GDP growth in the SADC states, respectively. There is evidence in support of the export diversification-led growth hypothesis for the SADC states. These findings are supported by Hesse (2008), Hodey, Oduro, and Senadza, (2015) and Murphy-Braynem (2019), who concluded that countries that followed export diversification strategies achieved GDP growth. The relationship between *CI* and *RGDP* is in line with expectations that concentrated exports are detrimental to growth. This confirms similar studies by Lederman and Maloney (2007) and Hesse (2008). Export concentration exposes a country to price shocks and therefore retards long term growth. We therefore conclude that an increase in diversified exports in both the number of export products and export markets will lead to long term economic growth and minimize volatility from external shocks in the SADC region.

7. Conclusions and policy recommendations

This study's main objective was to examine the link between export diversification and gdp growth in the SADC states for the period 1995-2020. This is achieved by estimating a panel data regression model for all the SADC's15 states using the FEM. Two measures of export diversification are used

in the analysis. The control variables are capital stock, direct investment, and trade openness and population growth. The results show that export diversification promotes economic growth in the SADC states. Other variables found to influence economic growth in the SADC states are trade openness, population growth and direct investment.

The above results have important implications for SADC states. Since the SADC states are price takers on the international market, export diversification gives them a platform to benefit from trading with the rest of the world. The SADC states exports are dominated by primary products with volatile prices, a factor which contributes to revenue volatility and hence unstable GDP growth. Export diversification ensures that the SADC states move away from dependence on primary exports. This helps the SADC states to minimize the negative impact of price volatility in international markets which leads to growth and export revenue volatility.

This study's findings imply that the SADC states need to diversify their domestic production structures away from the predominant primary production such as agriculture, energy (fuel), mining, and tourism into manufacturing and services exports. The SADC states should increase investment in infrastructure, and industrial sectors to ensure that their export concentration is minimized. They should put in place policies that support direct investment and trade openness. This ensures increased export revenues for the SADC states. This is important for ameliorating the foreign currency shortages faced by many SADC states. All this will enhance the growth performance of the SADC states which is currently the main concern of its policymakers. Increased growth performance is important for job creation and poverty reduction. The role of DI in knowledge and technology transfer from developed countries to the SADC states is paramount. This is in line with the SADC Industrial Strategy Road Map's main objective of fostering modernization and economic transformation of the SADC states.

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