International Journal of Applied Research 2017; 3(10): 122-128

ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2017; 3(10): 122-128
www.allresearchjournal.com
Received: 20-08-2017
Accepted: 21-09-2017

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Macroeconomic convergence in the SADC: Evidence on beta and sigma convergence

Maximilian Mainza

Abstract
This paper examined the prospects for the SADC regional integration by assessing the convergence of real per capita GDP given structural differences across the countries (Conditional beta convergence), and the possibility of reductions in income dispersions across the SADC member states (Sigma convergence). The study also analyzed the real GDP growth. The study finds convergence in the level and growth of real per capita GDP and GDP, based on fixed effects, maximum likelihood estimations, and Cointegration analysis.

Keywords: Beta Convergence, Sigma Convergence, Regional Integration

1. Introduction
Previous studies by Rossouw (2006) [13], Zyuulu (2009) [21], and the United Nations Economic commission for Africa (UNECA) (2011) [18], have shown that macroeconomic convergence in the Southern African Development community (SADC) is a vital requirement, for deep integration to be achieved. To achieve deep integration in the SADC, member states agreed on a set of primary and secondary MEC indicators to be satisfied over the period of ten years from 2008 to 2018 at three point in time (2008, 2012 and 2018).
The SADC RISDP stipulates primary indicators[1] and secondary indicators[2] as targets towards achieving the deep integration in region. Because SADC member states are very diverse economically, policies may differ and diverge from the set targets, especially in an event of negative economic shocks. However, little is known about the convergence hypothesis application to the SADC region. This study investigated whether the real per capita GDP of the poorer SADC member states caught up with that of their richer counterparts, and whether the dispersions in per capita GDP reduced across SADC member states for the period 1992-2014 (i.e. whether conditional beta convergence, and sigma convergence existed in the SADC, respectively); and also whether real GDP growth was converging to the regional average.
This paper contributes to the literature by testing SADC conditional beta convergence using the Fixed Effects together with the Generalized Least Squares (GLS), and Maximum likelihood estimators, while taking into account short run dynamics, effects of physical and human capital accumulation, and population growth over the period 1992 to 2014. The study also tested the convergence of real GDP growth towards a common stochastic trend across the SADC member states, that has not been, extensively been studied. The study found evidence of conditional beta convergence in the level and growth of real per capita GDP, but at a slow speed of convergence. The panel unit root tests for the SADC real GDP growth found the existence of convergence towards the regional average.

[1] Primary SADC MEC indicators included: Inflation rate single digit by 2008, 5% by 2012, and 3% by 2018; ratio of budget deficit to GDP not exceeding 5% by 2008, and 3% by 2012, and maintained at the 2012 level up to 2018, public debt of less than 60% of GDP by 2008, and this be maintained up to 2018.
[2] secondary targets) included: external reserves/import cover of at least 3 months by 2008 and more than 6 months by 2012; Economic growth (Real GDP growth) of ≥ 7.0%; Central Bank credit to government less than 10% of previous year's tax revenue by 2008; less than 5% by 2015; increase the level of savings to at least 25% of GDP by 2008 and to 30% by 2012; increase domestic investment levels to at least 30% of GDP by 2008.

The rest of the paper is organized as follows. Section 2 reviews the macroeconomic convergence hypothesis and its empirical exploration. Whereas Section 3 illustrates the methodology and model specifications. Section 4 presents estimates of conditional beta and sigma convergence in the SADC, and Cointegration analysis of the SADC real GDP growth. Section 5 concludes

2. Macroeconomic Convergence and its Empirical Exploration

The basic paradigm of the macroeconomic convergence debate centers on the Solow-Swan neoclassical exogenous growth model, which was famously advocated by Ramsey (1928) [11], Solow (1956) [16], Cass (1965) [3], and Koopmans (1965), which is famously referred to as the Ramsey-Cass-Koopmans (RCK) model, and on the other hand, the endogenous growth theory, advocated famously, by Romer (1986) [12], and Mankiw, *et al*. (1992) [8]. The neoclassical growth theory, assumes that with diminishing marginal returns to capital, an economy with lower capital-labor ratio exhibits a higher marginal product of capital and thus, grows faster compared to a similar economy with a higher capital-labor ratio, where the differences across countries will tend to fade out over time, with per capita income and its growth rate gradually converging until reaching an identical long-run equilibrium level for both countries, respectively. In other words, if countries have similar preferences and technology, then with time, they will have the same steady state level of income and the same steady state growth rate provided that all countries can access the same technology. This is widely known as absolute or unconditional beta convergence, since the differences in the steady state across countries was not controlled for.

Proponents of endogenous growth theory (or Conditional convergence) such as Romer, (1986) [12], Mankiw, *et al*. (1992) [8], Islam (2003) [5], and Varblane and Vahter (2005) [19], argued that the endogenous growth theory considered technology as endogenous growth factor that is subject to decision making process at individual firm level, implying that each country have a different level of per capita income towards which it is converging. Therefore, endogenous growth theory argues that convergence is only possible if the differences in the steady states across countries is controlled for factors such as capital accumulation, accumulation of human capital, social capability, infrastructure and institutional environment. Thus, the notion of Conditional beta convergence.

However, other empirical studies by Maurer (1995) [9], and Kumo (2011) [7], for instance, failed to find any significant correlation between the initial level of GDP per capita and GDP growth rates among a number of countries. Divergences in real GDP growth rates across countries was attributed to differences in technological progress by Varblane and Vahter, (2005) [19], who argued that 'the unsuccessful attempts to obtain unconditional convergence among economies stems from the most important assumption of the neoclassical growth model that the long term growth is solely determined by the rate of technological change, which is considered to be exogenous', and that countries are similar in all other respects except their per capita physical and human capital. Islam 2003 [5] argued that the failure to find convergence across a club of countries is influenced by data availability, choice of the sample, and the choice of estimation techniques, of cross-section or panel data analysis.

Other Advocates of economic convergence based on regional economic integration, particularly, in the SADC such as Rossouw (2006) [13], Zyuulu (2009) [21], and the UNECA (2011) [18], argued that coordination of economic policies through macroeconomic convergence criteria is essential for regional integration. Zyuulu (2009) [21] argued that, 'it often made sense for countries to coordinate their economic policies to generate benefits that were not possible otherwise'. He gave an example of how cooperation in international trade by setting zero tariffs between member states in a regional economic community was likely to be beneficial relative to the case when countries attempted to secure short term advantages by setting optimal tariffs. Further, the UNECA, echoed Kumo (2011) [18] who argued that macroeconomic convergence is not necessary to establish a free trade area but is necessary to sustain it and achieve deeper integration. Rossouw (2006) [13], while drawing experience from the European Union's monetary union and a single currency, argued that the SADC MEC criteria are goals which member countries in a region should aim to achieve, even after monetary unification.

Regarding the appropriate methodology for estimation of macroeconomic convergence, different methodologies have been used in literature to test the convergence hypothesis. For instance, Islam (2003) [5] used panel data to test the convergence hypothesis, by comparing with cross-sectional regressions of Mankiw *et al*. (1992) [8], and argued that only panel data can overcome the problem of unobserved or unmeasurable factors such as preferences and technology differences across countries that can act as control variables, of which the cross section framework is unable to account for. Others such as Busetti *et al* (2006) [2], and Arnold *et al*. (2011) [1], conducted either time series unit root tests or panel unit root tests to investigate the convergence hypothesis. Recently, Kumo (2011) [7], used a combination of generalized least squares (GLS) and unit root tests to test the convergence hypothesis to the SADC club of countries, and failed to find evidence that support the hypothesis of conditional β- club convergence in SADC during the period 1992 to 2009.

3. Estimation and Data Issues

3.1 Model

The study utilized a growth model similar to Varblane and Vahter (2005) [19], Islam (2003) [5] and Jalloh (2014), who derived their estimated convergence models from the original Solow model and/or human-capital-augmented Solow model with a standard Cobb-Douglas functions, given by equations (1) and (2), respectively:

$$Y(t) = K(t)^{\alpha}(A(t)L(t))^{1-\alpha} \quad (1)$$

$$Y(t) = K(t)^{\alpha}H(t)^{\beta}(A(t)L(t))^{1-\alpha-\beta} \quad (2)$$

Where, K and H are physical and human capital respectively, L is labor, A captures the level of technology and α and β are the partial elasticities of output with respect to physical and human capital.

To test the neoclassical growth models' hypothesis of conditional β-convergence in SADC, the study estimated a growth model similar to Mankiw *et al* (1992) [8] and Islam (1995), which argued that a vector of control variables to the

unconditional beta specification[3] should be included because countries exhibit different steady-state positions. The conventional growth equation, derived from equation (2), which uses panel data is given as:

$$\ln(y_{i,t}) = \beta \ln(y_{i,t-1}) + \sum_{j=1}^{k} \theta \ln(x_{i,t}^{j}) + \eta_{i,t} + \varepsilon_{i,t} \quad (3)$$

Where, $\ln(y_{i,t})$ is the natural log of country i's real GDP per capita at time t; $\ln(y_{i,t-1})$ is the natural log of country i's real GDP per capita at time t – 1; $\beta = e^{\lambda\tau}$, where, $e^{\lambda\tau}$ is the rate of adjustment, τ is (t – (t-1)); $\ln(x_{i,t}^{j})$ are control variables, j = 1, 2, …, k for country i at time t, which in this study include of physical and human capital accumulation, population growth rate, and the short run unobservable changes or shocks; $\eta_{i,t}$ is the country specific effect for country i at time t; $\varepsilon_{i,t}$ is an error term for country i at time t. A group of countries is said to have attained conditional β-convergence if and only if the condition, $0 < \beta < 1$, is satisfied. Implying that conditional β-convergence to be achieved, the coefficient of $\log(y_{i,t-1})$ in equation (4) must lie between zero and unity. Additionally, to account for short run dynamics, equation (4) is extended in line with Arnold *et al*. (2011) [1] as follows:

$$\Delta\ln(y_{i,t}) = \beta \ln(y_{i,t-1}) + \sum_{j=1}^{k} \theta \ln(x_{i,t}^{j}) + \sum_{j=1}^{k} \varphi \Delta\ln(x_{i,t}^{j}) + \eta_{i,t} + \varepsilon_{i,t} \quad (4)$$

Where, the rest are as defined in equation (4), while, $\Delta\ln(y_{i,t})$, $\Delta\ln(x_{i,t}^{j})$, is the first difference of change of $\ln(y_{i,t})$, and change of $\ln(x_{i,t}^{j})$, respectively.

Sigma convergence, tests the view that the dispersion of real per capita income across a group of economies tends to fall over time. In the strict sense of sigma convergence, a group of economies are said to converge if the standard deviation of their real per capita income distribution declines over time. In other words, for countries in a regional integration setting, convergence is said occur in a sigma (σ), or standard deviation sense if, $\sigma_t < \sigma_{t-1}$, where σ_{t-1} is the time t-1 standard deviation of $\ln(y_{i,t-1})$ across i. Although β-convergence is a necessary condition for the existence of σ-convergence, since sigma depends on β-convergence, or $\ln(y_{i,t-1})$, it is not a sufficient condition. Empirically, a formal test for sigma convergence is done by regressing σ_t with the time trend (T). In this formulation, convergence in per capita income holds if the coefficient of time is significantly negative. Specifically, if we define the standard deviation of $\ln(y_{i,t-1})$ across SADC countries at time t as σ_t, then one way to assess convergence is to see whether σ_t decreases over time. A formal test involves estimating the following regression:

$$\sigma_t = \alpha + \gamma T + \varepsilon_t \quad (5)$$

[3]Unconditional beta convergence specification is $\ln(Ry_{i,t}) = \alpha - \beta \ln(y_{i,t-1}) + u_{i,t}$, where, $\log(Ry_{i,t})$ is the natural log of country i's real GDP growth rate between time t; $\log(y_{i,t-1})$ is the natural log of country i's real GDP per capita at time t – 1; α is a constant and $u_{i,t}$ is an error term for country i at time t. β is the convergence coefficient.

Where T is a time trend, ε is a disturbance, while α and γ are the parameters to be estimated. Convergence requires the estimated γ to be significantly negative.

This study, also, investigated the extent of convergence in SADC real GDP growth which is one of the SADC MEC indicators. To test the SADC real GDP growth convergence, this study examined time series unit root and panel unit root tests for stationarity or test for Cointegration of SADC GDP growth across the SADC economies, similar to Kumo (2011) [7]. The implementation of the econometric tests associated with this notion of convergence is based on the following equation:

$$(lnX_{i,t} - ln\bar{X}_t) = \theta(lnX_{i,t-1} - ln\bar{X}_{t-1}) + \varepsilon_t \quad (6)$$

Where, $ln\bar{X}_t$ denotes the benchmark SADC real GDP growth target, which is measured by the log of the regional average at a given point in time of study; $lnX_{i,t}$ real GDP growth of country i at time period t, while $lnX_{i,t-1}$ and $ln\bar{X}_{t-1}$) are the lags of the left hand side of the equation.; and ε_t is a covariance stationary random error term. If we let $(x_t = (lnX_{i,t} - ln\bar{X}_t)$, then equation (7) can be expressed as an autoregressive (AR) (p), process, $x_t = \theta x_{t-1} + \varepsilon_t$ where p = 1 and the convergence test amounts to a unit root test on, x_{t-1}, i.e. (θ = 0).

In order to determine implications of convergence dynamics in the SADC real GDP growth, knowledge of the speed of convergence in an event of a shock is vital. This study estimated the speed of adjustment of real GDP growth to the SADC club steady state, in line with Mbao (2011):

$$\Delta lnx_t = \alpha - \theta lnx_{t-1} + \varepsilon_t \quad (7)$$

Where: $\Delta\ln x_t$ is the first differences of the SADC real GDP growth; α is the constant term representing autonomous growth in real GDP; θ is the speed of adjustment to the SADC club-real GDP growth to its long run average; ε is the error term; and t is time in years. This is basically, the expression for the conditional beta convergence. The speed of adjustment is supposed to be negative if convergence occurs and that if its absolute figure is close to one, the greater the speed of adjustment.

Following Hausman tests for the appropriate estimation techniques, equation (5 and 7) was estimated using Ordinary Least Squares (OLS), while equations (3) and (4) were estimated using fixed effects model side by side with the Generalized Least Squares (GLS), and a Maximum Likelihood estimation (ML). To test equation (6) for SADC club convergence, and individual SADC member states' convergence to the regional average, respectively, this study performed both panel and time series unit root tests, using Levin-Lin-Chu unit root tests and Philips-Perron unit root tests, respectively.

3.2 Data

The data on real per capita GDP, real GDP at current prices, and population growth rate, was obtained from the World Bank key Development Indicators database, August 2016 update. Data on gross capital formation to GDP ratio, came from the IMF World Economic Outlook (WEO) database, April 2016 update. And data for the mean years of schooling (ages 25 years+), came from the 2015 UNDP Human development reports. The estimations of unconditional and conditional β- convergence, and σ-convergence covers all

15 SADC member states. Physical and human capital accumulation, which were used as control variables for conditional β- convergence, are approximated by gross capital formation expressed as a percentage of GDP and mean years of schooling for the population aged between 25 and 64 years, respectively. The estimation of SADC real GDP growth covered only SADC member states with reliable and available data, for the study period.

4. Empirical Analysis

The section presents estimation results for conditional β-convergence, σ-convergence, and the convergence of SADC real GDP growth.

4.1 Estimation Results of Conditional β-Convergence in the SADC

In order to test the presence of conditional β-convergence in the SADC, natural log of per capita GDP (lnY), was regressed on: the natural log of lagged per capita GDP (lnY_1), accumulation of human capital (lnH) [4]; accumulation of physical capital (lnSk)[5], Population growth rate (lnN), and their short run dynamics (ΔlnY, ΔlnH, ΔlnSk, and ΔlnN). Table 1 below present estimations of long-run (L-R) and short-run (S-R) conditional β-convergence of panel and cross section data for the SADC member states based on fixed effects, generalized least squares (GLS), and Maximum likelihood (ML) techniques. The estimated models were robust. And that after the Hausman test, the fixed effects model was preferred, thus, this study discusses results for the fixed effects regressions only if results are similar, and otherwise, if the results between the models are different.

From the estimation result as presented below, it could be noted that the value of the coefficient of log per capita GDP (β), 0.905 for fixed effects model, is significant, thus, satisfied the conditional β-convergence requirement of $0<\beta<1$.This result implyies that conditional β-convergence exists amongst SADC member states, thus, SADC member states were to the regional lon run average per capita income. This result contradicts the findings by Kumo (2011) [7], who used SADC data for 1992 to 2009, with different control variables. However, these findings are similar to Jalloh (2014) tests for conditional convergence among the economic community for West African Countries (ECOWAS). Therefore, the speed of adjustment to the steady state for the SADC club of countries, given that $\beta = e^{\lambda\tau}$, τ= 1 in our case, then $\lambda\tau$ = 0.0998 for the fixed effects estimator. This implys that the speed of adjustment of log of per capita income to the long run steaty state for the SADC region is approximately 10 percent per annum implying that, it would take approximately 10 years for SADC economies to come back to their long-run per capita income level after short-run shock, that triggers disequilibrium. This is a relatively very low rate of adjustment to the steady state level, that could be desirable in an event of a boom but damaging to the SADC economies when negative economic shocks are in play.

[4] Mean years of schooling was used as a proxy for Human capital investment.

[5] Gross capital formation as a percentage of GDP was used as a proxy for physical capital investments.

Table 1: Estimation Results of Conditional Convergence in the SADC, 1992-2014: Dependent Variable is Per Capita GDP.

Variables	Fixed Effects (L-R)	(S-R)	GLS (L-R)	(S-R)	ML (L-R)	(S-R)
lnY_1	0.905***	0.918***	0.978***	0.979***	0.976***	0.982***
	(0.0254)	(0.0256)	(0.00931)	(0.00912)	(0.0124)	(0.0123)
lnH	0.319***	0.237***	0.0562*	0.0274	0.0731*	0.0408
	(0.0835)	(0.0896)	(0.0311)	(0.0284)	(0.0384)	(0.0387)
lnSk	0.0167	0.0125	0.0212	0.0176	0.0204	0.0135
	(0.0238)	(0.0251)	(0.0158)	(0.0165)	(0.0186)	(0.0192)
lnN	-0.0575	-0.149	-0.0716*	-0.122**	-0.0211	-0.0516
	(0.0971)	(0.116)	(0.0414)	(0.0493)	(0.0695)	(0.0758)
dlnH		0.140**		0.204***		0.185***
		(0.0661)		(0.0448)		(0.0613)
dlnSk		0.0438		0.0200		0.0479
		(0.0316)		(0.0227)		(0.0308)
dlnN		0.110		0.0731*		0.0670
		(0.0948)		(0.0427)		(0.0862)
Constant	0.0974	0.202*	0.0744	0.140**	0.0271	0.0693
	(0.106)	(0.120)	(0.0490)	(0.0570)	(0.0753)	(0.0813)
Observations	345	344	345	344	345	344
R-squared	0.862	0.867				
Number of state	15	15	15	15	15	15
Standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$						

In the short run, the positive and significant coefficient of log of per capita GDP of 0.918, implies that SADC club-conditional β-convergence still holds. The speed of adjustment to the steady state for the SADC club, of 8.8% per annum, is not very different from the 10% long run speed of adjustment. In both the short run and long run, accumulation of human capital proxied by the mean years of schooling for the population aged between 25 and 64 years old, had a correct sign and significantly determined the growth and level of per capita GDP in the SADC. This is in line with the proponents of endogenous growth theory who argue that research and development (R&D) and human capital creation are the most important engines of growth. However, in both the short run and long run, accumulation of physical capital proxied by gross capital formation expressed as a percentage of GDP, despite showing a correct sign, did not significantly determine the growth and level of per capita GDP in the SADC.

Population growth in the fixed effects and ML models, though with a correct sign, does not have a significant effect on the level of per capita GDP in the SADC in the long-run, while the GLS model indicates that it slightly, reduses the level of Per capita GDP. Given that the significancy of population growth rate is weak under the GLS, and shows the correct negative sign under the fixed effects and ML models, this study argue that population growth does not significantly affect the level of income.In the short run, however, population growth rate had an opposite sign for all models but insignificant for the fixed effects and ML models, but slightly significant for the GLS model. Therefore, this study accepts that in the short run population growth ate had no significant effect on the growth of per capitra GDP. This study rejects the null hypotheses that the level and growth of per capita GDP across the SADC member states did not converges to the regional average long-run level as determined by the structural characteristics of each country during the 1992 to 2014, Therefore, this study accepts the alternative hypothesis of the presence of conditional β-convergence in the SADC.

4.2 Estimation Results of Sigma Convergence in the SADC.

Table 2 below presents the OLS regression results of sigma (σ_t)-convergence, in which the stansdard deviation of per capita income (σ_t) across SADC coutries, was regressed against the time trend (years). The significant negative coefficient of the time trend variable, imply the existence of sigma convergence, or the reduction in per capita income dispersion across SADC member countries.

Table 2: Estimation Results of σ-convergence in the SADC, 1992-2015.

Variables	Sigma(σ)
Time in years	-0.00111***
	(0.000351)
Constant	3.493***
	(0.703)
Observations	345
R-squared	0.028
Standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$	

This study condradicts the previous finding by Kumo (2011) [7] who failed to find sigma-convergence in the SADC, and also Jalloh (2014) who found conditional β-convergence among ECOWAS countries but failed to find the existance of sigma convergence. Figure 1 below graphs the standard deviation (SDy) of per capita income across SADC countries. It is clear that the stardard deviation of per capita GDP across the SADC club has been reducing since the 1990s, thus validating the regression result that σ-convergence exists across the SADC.

Although the concept of β-convergence is a necessary not sufficient condition for σ-convergence, in this study the conditional β-convergence was sufficient for σ-convergence. Both measures of convergence show that there was per capita income level and growth convergence in SADC club during the study period, 1992 to 2015 (23 years). Therefore, the hypothesis that income dispersions across the SADC member states did not reduce during the 1992 to 2014, is rejected, thus, the study accepted alternative hypothesis that σ-convergence of per capita GDP existed in the SADC.

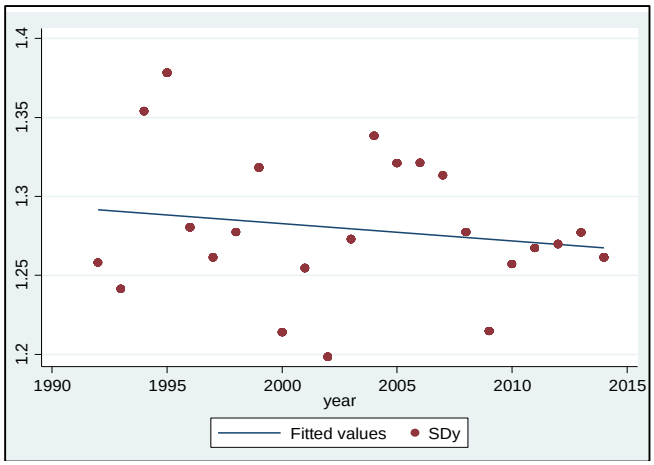

Fig 1: Standard Deviation of Log of Per Capita GDP in the SADC, 1992-2015

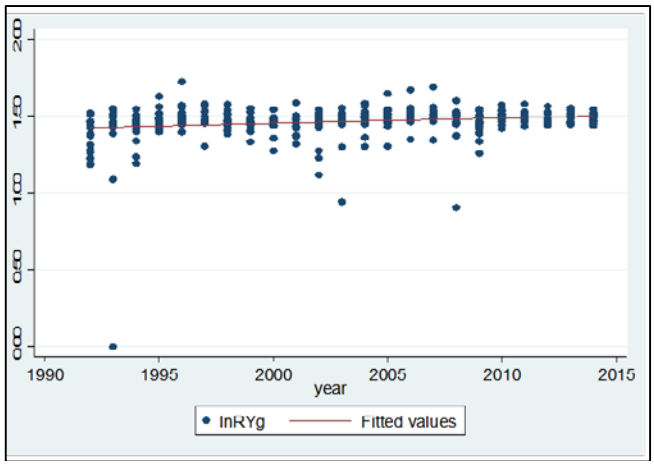

Fig 2: SADC Real GDP Growth Rates (lnRYg), 1995-2015

4.3 Convergence Tests for the SADC MEC Indicators

Because macroeconomic convergence is a necessary condition for deep integration, this sub section examined the extent of convergence of SADC Real GDP growth across member states using panel and time series unit root tests. Speed of adjustment to the SADC Real GDP growth club steady state was also estimated, to determine the dynamics of convergence.

4.3.1 Real GDP growth convergence in the SADC

The unit root tests for the period 1995 to 2015, were conducted on the log of real GDP growth rate deviation from the regional average series for a club of all SADC member states, and for each individual member state. Table 3 in the Appendix, show results of the club convergence of the log of real GDP, which is further illustrated in Figure 2 below.

Using Levin-Lin-Chu panel unit root test, the study found the existence of a club convergence of the real GDP growth across SADC member states, especially after 2010. Additionally, the long-run steady state SADC club real GDP growth rate of 4.4%, is below the SADC club target of 7%. Further, the speed of adjustment of the SADC club real GDP growth rate to its long-run average of 72%[6], is a relatively very fast adjustment rate of approximately one year 4 months, implying that the SADC club real GDP quickly adjusts to the long-run rate of 4.4%, after a shock, thus, the target of 7% is unrealistic and very unlikely to be fulfilled by most SADC member states. Further, Table 3 in the Appendix shows that most individual SADC member states' real GDP growth rates were converging to the regional average. Although some countries' convergence in real GDP was insignificant, the size of the z-staistic, z(t), implies that they were not very far from convergence to the regional long-run average.

5. Conclusion

This study examined Macroeconomic convergence in the SADC by investigating convergence of real per capita GDP, or 'conditional β-convergence', and the possibility of reductions in income dispersions across the SADC member states, or 'σ-convergence', and also tested the convergence of SADC real GDP growth. This was achieved by using the Fixed Effects together with the Generalized Least Squares (GLS), and Maximum likelihood estimators, and cointegration analysis.

Overall, the study demonstrated both estimations of conditional β-convergence and σ-convergence found convergence in the level and growth of real per capita GDP in the SADC. The panel unit root tests for the SADC real GDP found the existence of convergence towards the regional average.

The presence of conditional beta convergence in the SADC implies that the level and growth of per capita GDP in each of the SADC member states converged to each member state's long-run level as determined by the level of human capital accumulation in the long run, and other structural characteristics of each member state during the 1992 to 2014. Additionally, the presence of sigma convergence in the SADC as illustrated by the negative slope of the standard deviation of real per capita GDP during the study period, 1992 to 2014, implied a reduction in income dispersions across member states.

Based on the long run averages for the SADC real GDP growth, achieving deeper integration will require further improvements in economic policy management across the member states. Additionally, the diversity in terms of levels of development, across member states, will require reviewing, for the deep integration targets to be implemented.

The study recommends future research to test convergence of other MEC indicators as well as variables such as interest rates, and exchange rates, to examine the prospects of deep integration.

[6] See Table 4 in the Appendix

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