

Possibility of SADC Monetary Union: Testing for Coordination of Fiscal and Monetary Policies

Balisa Mhambi* and Syden Mishi*

Department of Economics, Faculty of Business and Economic Sciences, Nelson Mandela University, South Africa

Abstract: There is consensus that fiscal and monetary policies should be coordinated into a broader macroeconomic framework for sustainable monetary union. The Brexit scenario, and the debt problems of some European Union members has vindicated re-consideration of premises on which monetary unions are set-up. Southern African Development Community (SADC) had mooted the idea of a monetary union, despite the Rand Common Currency Area not being successful. However, there has been little literature on coordination of fiscal and monetary policies within and across SADC countries. The aim of this study is to examine whether the key macroeconomic policies are coordinated in order to create a spring-board for a sustainable monetary union. The study employed panel data analysis techniques on 14 SADC countries. The Pooled Mean Group (PGM) method was applied to constrain the long-run coefficients to be identical, but allow the short-run coefficients and error variance to differ across groups. The application of PGM technique allows the study to control for heterogeneity across countries and the time dependence that exist on most macroeconomic series. The empirical results show that there is fiscal and monetary policies coordination amongst some SADC countries. However, cross-country differences on key macroeconomic fundamentals such as debts, fiscal balances and money supply may hinder the formation of a monetary union and obstruct the economic survival initiatives for trade amongst member states. The paper concludes monetary union may naturally become necessary to facilitate cooperation and trade amongst countries once there exists shared goals.

Keywords: Macroeconomic policy, policy coordination, International Finance, Economic Development, Monetary Union.

1. INTRODUCTION

Monetary union formation and sustainability is a topical issue on economic policy coordination and political arena (Dixit & Lambertin, 2003; Foresti, 2018). Accordingly, Hanif and Arby (2003) indicates that the two major policy instruments for non –inflationary and stable growth include the monetary and fiscal policies. More so, a monetary union occurs when two or more countries use a single currency or different currencies with a fixed exchange rate monitored by one central bank. According to Foresti (2018), the central bank with its single monetary policy instrument cannot control the multiple inefficiencies that characterise the economy as these inefficiencies require multiple policymakers with numerous ideas and strategies. In so doing, Foresti (2018) commends that policymakers should focus on optimal policy mix and on the monetary and fiscal policy coordination to reduce the likelihood of failure for all designed policies and institutions. These debates on monetary and fiscal policy coordination to ensure success of an economy for a particular country and sound monetary union have been prompted in part by the experience of the European Monetary Union (EMU), which is widely perceived as having been both

successful and beneficial to member countries (Jefferis, 2007) - until the Brexit¹.

These member countries based their agreement on the coordination of merely monetary policy, one central bank and independent fiscal policy to retain sovereignty. However, Milow (2014), pointed that the EMU experienced numerous challenges, where the Euro Crisis, with unexpected Euro devaluation and public debt problems of several member countries and severe liquidity shortage of the banking sector, followed moderate GDP growth rates. Furthermore, the Brexit scenario and the debt problems of some European Union member states like Greece, have vindicated re-consideration of premises on which monetary unions are established. Agbeyegbe (2008) argued that the attraction of monetary union is supported by claims that coordination on macroeconomic policies across countries carries benefits such as lower transaction costs associated with trading goods and services in between countries. Likewise, Jefferis (2007) suggests that, there is variety of implicit and explicit advantages and benefits of policy coordination within an economy, including political and economic factors. Policy coordination is therefore beneficial when done within an economy (fiscal and monetary policy coordination)

*Address correspondence to these authors at the Department of Economics, Faculty of Business and Economic Sciences, Nelson Mandela University, South Africa; Tel: +27 41 504 4607; E-mail: balisamhambi@gmail.com, balisam@compcom.co.za, syden.mishi@mandela.ac.za

¹The withdrawal of the United Kingdom from the European Union which was ignited by the Euro crisis.

and across countries (fiscal and/ or monetary policies coordination among group of countries). Sampawende, Sembene, Vigninou, and Issifou, (2019) posits that several integration arrangements in Africa, (WAEMU, CEMAC, ECOWAS, COMESA, EAC, and SADC)² have adopted coordination mechanisms to promote the convergence of fiscal positions with expectation that, this will facilitate the synchronisation of economic cycles.

This study sought to examine the possibility of SADC monetary union (pursing a mutual monetary policy) through the coordination of both the fiscal and monetary policies across countries. Are the macroeconomic policies within the group of countries coordinated? The Southern African Development Community (SADC) is made up of 16 member states from Southern Africa. The member states include Angola, Botswana, Comoros, Democratic Republic of Congo, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zambia and Zimbabwe, but 14 were used in this study due to data availability. These countries share mutual sustainable development goals such as reducing high level of unemployment, alleviating poverty and inequality, and achieve peace and security and economic growth (SADC, 2012). Furthermore, these countries face similar development, trade, education, health, security and defence challenges to the extent that policies to address these can be related. However, these challenges, though threatened by fragmented and poorly implemented policies at present, are the underlining factors for coordination of policies for development. Moreover, according to Khamfula and Huizinga (2004), these states are characterised by a high degree of economic disintegration and political instabilities. Economic disintegrations is a constraint for development as it creates an environment with trade barriers, high level of unemployment, political instabilities and constrained cross boarder capital flows. If macroeconomic policies are found to be coordinated across countries within this group, this vindicates the establishment of monetary union. To establish whether coordination exist the paper test for co-integration of the monetary and fiscal policy variables among the group of countries. It is

possible that creating a monetary zone arrangement fosters the synchronisation of economic shocks among countries, therefore synchronisation may be considered endogenous in that regard (Sampawende, *et al.*, 2019).

It is imperative here to acknowledge the presents of common currency usage within this region, which however does not amount to monetary union as no common central bank exists. A Common Monetary Area (CMA), is a currency agreement in which the South African Rand is a denominator currency in South Africa, Namibia, Lesotho, and Eswatini. Within this CMA, each country maintains the sovereignty to issue its own national currency and thus receive seigniorage; however, that currency is legal tender only in that country. It is only the South African Rand, which is legal tender throughout the CMA, thus *de facto*, all member countries follow South Africa's monetary policy. The agreement is acknowledged to lack a framework for macroeconomic policy coordination (Sampawende, *et al.*, 2019). Macroeconomic policy coordination is critical to create a spring-board for a sustainable monetary union in the SADC region.

Following this introduction and background the rest of the paper is structured as follows: section two reviews literature; section three is methodology, section four presents estimation results and discussion, while section five provides a conclusion and recommendations.

2. LITERATURE REVIEW

Literature suggest that with respect to fiscal stabilisation and commitment there is an insignificant gain due to conflict of interest between the regulation of public debt and the rate of inflation (Beetsma & Jensen, 2005). Dixit and Lambertini (2001, 2003) and Eichengreen and Ghoro, (2002) explained that fiscal cooperation in a monetary union is possible when all players agree on their goals. In addition, Dixit and Lambertini (2003) suggests that a country's fiscal policy has spill over effects on other countries and the monetary policy has its time inconsistency challenge. However, the Barro-Gordon type model in Dixit and Lambertini, (2003) indicates that the ideal output and inflation across the European countries are achievable through fiscal and monetary policy coordination. This is despite that the fiscal externalities and monetary policy time inconsistency problem impose externalities on other state countries, and the common monetary policy has its own inconsistency problems. Menguy (2011) indicates that in a monetary union, optimal inflation

²West African Economic and Monetary Union (UEMOA/WAEMU)
Economic and Monetary Community of Central Africa (CEMAC)
Economic Community of West African States (ECOWAS)
Common Market for Eastern and Southern Africa (COMESA)
East African Community (EAC)
Southern African Development Community (SADC)

increases reduce the impact of the common central bank in minimising price instability. As a result, more countries in the union will become highly indebted. The European crisis is a great testament to this hypothesis.

However, other studies on fiscal policy coordination are in consensus that policy convergence is good for economic stabilisation. Thus, Niemann and von Hagen (2008) show that policy coordination is desirable even though the gains achievable from the said coordination are negligible. Likewise, Lei, Han and Qiang (2018) show that the Chinese fiscal policy has a negative and significant relationship with stock market performance whilst the monetary policy effect on stock markets varies depending on the fiscal policy. Accordingly, other studies from developing and emerging countries seem to conclude that fiscal and monetary policy coordination is not feasible (see for example Khamfula & Huizinga, 2004; Asongu, 2014). This suggests that there is little need for coordinating monetary and fiscal policies in the long run as price stability can be achieved without interfering with fiscal policy. However, in the short run, there is a potential conflict between monetary and fiscal policies. For example, Tirelli, Muscatelli and Trecroci (2004) prompts that the nature of the interaction between the two policy instruments should depend on the nature of the shocks hitting the system.

Khamfula and Huizinga (2004) indicate that, SADC countries are likely to incur large costs relative to the benefits on policy coordination hence would not be desirable. Masson and Pattillo, (2005) and Asongu (2014) suggests that the ideal output and inflation may not be achievable through monetary and fiscal policy in a monetary union. The authors express doubts about a full African monetary union due to economic and institutional characteristics disparities and poor linkages (for example, low trade volume among the SADC countries) across countries. However, Masson and Pattillo (2005) view a selective expansion of existing monetary unions as a more promising strategy. Furthermore, Herzog (2006) proposes that the spillover effects are not sufficient for deepening coordination. Agbeyegbe (2008), argues, chance of the SADC countries sustaining some form of a Maastricht-type criteria is quite low. This implies that coordination of monetary and fiscal policy is greater to non-cooperative Nash behaviour. Indeed, Asongu (2014) commends that the African member states in a monetary union should consider harmonising cross country differences and institutional characteristics that obstruct effectiveness of monetary and fiscal policy synchronisation in a

monetary union. In addition, Sampawende, *et al.*, (2019) asserts that fiscal convergence is a necessary condition for the success of a monetary union, which constitutes the highest degree of integration.

In addition to that, other works are in consent that coordination of the monetary and fiscal policy was ineffective as the two policies acted in different directions. For example, the dynamic panel generalised methods of moments in da Silvia and Vieira (2014) indicates that monetary policy behave in a countercyclical way whilst fiscal policy seems to be procyclical for 113 advanced and developing countries between 2001 and 2012. Although both policies are more effective in the advent of the financial crisis, the study however commends the fiscal policy as the most effective policy. Accordingly, Dumitrescu (2015) analysed the fiscal and monetary policy coordination effect on the Romanian business cycle from 2004 to 2014. The survey indicated a lack of coordination of the two policies. Thus, the fiscal policy was positively correlated with overall business cycle as it amplifies business cycles and stimulating the economy. On the other hand, the monetary policy acted countercyclically in order to achieve price stability.

Overall, a number of studies argue that there is need for fiscal and monetary convergence in developing countries particularly in Africa and SADC. For example, Baldini and Ribeiro (2008) in their analysis of fiscal and monetary anchors of price stability in Sub Saharan Africa indicate that fiscal outcomes could be a direct source of inflation variability to different shocks in Sub Saharan countries from 1980-2005. More so, Obinyeluaku and Viegi (2009) suggest that, fiscal policy can affect monetary policy through monetisation or direct effect on price dynamics. The relationship between fiscal balance and monetary stability and the analysis of inflation response to different shocks for 10 SADC countries indicate that fiscal outcomes have a direct impact on inflation variances from 1980-2006. Zehirun, Breitenbach and Kemegue (2015) analysed the effect of monetary union from the viewpoint of the generalised purchasing power parity hypothesis and optimum currency area in SADC. The Johansen multivariate cointegration technique indicates that the monetary union is feasible in the region with the exception of Angola and Mauritius. However, the study also indicates that the real exchange rates of the SADC countries might attenuate policy stabilisation in the wake of external shocks. In

addition if countries maintain different exchange rate policies, that would result in less opportunities for coordination. Moreover, Mshiyeni (2016) revealed that fiscal cooperation may be disadvantageous of monetary cooperation and lacks credibility with the private sector but is welfare-improving when central banks adhere to a rule.

3. METHODOLOGY

This paper employs panel data which is desirable in the sense that it allows controlling for country specific and time-specific factors (Sampawende, *et al.*, 2019; Knust, 2010; Balgati, 2008). The analysis take explicit account for individual heterogeneity, which is essential to reveal results unobserved characteristics that do not change over time (Park, 2010). The panel data gives more informative variables, more variability, less collinearity among the variables, more degrees of freedom and more efficiency and captures dynamic changes (Baltagi, 2008). The main analytical technique applied was the Pooled Mean Group (PMG) method, which constrain the long-run coefficients to be identical, but allows the short-run coefficients and error variance to differ across groups (Bangake & Eggoh, 2012; Goswan & Hossain, 2016).

3.1. Data Sources

The study covers a sample of 14 Southern African countries to examine whether the key macroeconomic policies are coordinated to the extent of creating a spring-board for setting up a sustainable monetary union. Coordination is determined by examining if the macroeconomic indicators series are co-integrated (move together over time). Two member countries namely Madagascar and Comoros are not included in this study due to data unavailability. All data are taken from World Bank and International Monetary fund (IMF) over the period 2000-2016.

3.2. Empirical Model Specification

Based on literature (see for example Bangake & Eggoh, 2012; Goswan & Hossain, 2016; Sampawende, *et al.*, 2019), this paper employed unbalanced panel data estimation techniques to estimate possibility of policy coordination among SADC countries. To measure coordination of policies across the countries in the group, the following approaches have been followed:

1. Estimating a regression equation where the leading economy's monetary policy (MP)

indicator's correlation coefficient with each of the i^{th} SADC member is dependent variable. South Africa represents 61% of regional GDP and is first of the top performing countries (SADC, 2019), and therefore is used as a benchmark economy. A higher score, implies the South African monetary policy indicator is strongly associated with the monetary policy of the other respective country. The explanatory variables are the macroeconomic indicators measured as differentials between South African fiscal policy indicator and that of the i^{th} member country. Resultantly, the estimation equation is specified as follows.

$$MP_{SA-i} = \alpha + \beta_1 FBD_{SA-i} + \beta_2 GDPg_{SA-i} + \beta_3 EDD_{SA-i} + \varepsilon_i \quad (1)$$

Where:

MP is the correlation of SA monetary policy and the i^{th} SADC member; FBD is the fiscal balance difference between SA and the i^{th} SADC member; GDPg is the GDP growth differential between SA and the i^{th} country; while EDD is the external debt differential. For robustness, MP is measured in three ways, as broad money growth (bmg); monetary base ratio (new money) (mbr) and as real interest rate (rir) given that the countries in this group uses different monetary policy frameworks.

Regarding, monetary policy coordination among SADC members, literature posit that a positive and statistically significant Pearson Correlation coefficient between monetary policy measures –implies coordination. This is considered superior computation to one in Sampawende, *et al.*, (2019) where divergence was computed as the absolute difference between the levels of the variable in two countries. On the other hand, possible determinants of monetary policy coordination are identified as including fiscal policy indicators (Sampawende, *et al.*, 2019).

From this model the study is able to determine whether fiscal policy (FBD and EDD) explain monetary policies association, through establishing statistically significant correlation coefficient between monetary policy indicators. If a coefficient on a fiscal indicator is statistically significant, then that means fiscal and monetary indicators are associated; a negative sign would imply presence of coordination. This is so as lower fiscal policy indicator differential means aligned fiscal policy variables between South Africa and i^{th} . Negative effect on the correlations (association)

between the monetary variables, then it implies lower differentials (fiscal policy alignment, or better known convergent) is good for stronger correlation (monetary policy alignment). Thus, the region will be considered ready for monetary union. On the other hand, tax smoothing models developed by Barro (1979) and Lucas and Stokey (1983) posit that the similarity of economic growth rates (towards zero growth differentials) between countries may explain convergence in macroeconomic policies. On the other hand, more divergent growth levels may lead to divergent macroeconomic policies, therefore a negative relationship is expected, a priori (Sampawende, *et al.*, 2019).

2. Pooled mean group estimation- this is to determine co-integration in panel framework, isolating long run and short run effects. Monetary policy differential is the dependent variable, explained by fiscal policy indicators as in equation 2 below:

$$MP_{SA-i,t} = \alpha + \beta_1 FBD_{SA-i,t} + \beta_2 GDPg_{SA-i,t} + \beta_3 EDD_{SA-i,t} + \varepsilon_{i,t} \quad (2)$$

To implement this technique we conduct unit root test, Pedroni panel cointegration test and Kao residual cointegration test. The results of these tests are shown below. The panel is more towards time series panel

(T (17)> N (14)), therefore unit root tests can be applied. The results of unit root test were computed with the assumption of intercept and no trend.

4. ESTIMATION OF RESULTS AND DISCUSSIONS

This section presents empirical results and their discussion. Table 1 presents correlation coefficient results.

Table 1 show that, South Africa's monetary policy (interest rate measure) is statistically correlated to the ones of: Botswana, Malawi, Mozambique, Namibia, Eswatini and Tanzania while the fiscal policy (balance and external date) is statistically coordinated to those of: Botswana, Democratic Republic of Congo, Lesotho, Mauritius, Namibia, Tanzania and Zambia. More so, the empirical results indicate that there is more association on broad money growth between South Africa and other SADC countries such as Angola Botswana Democratic Republic of Congo Lesotho Mozambique Namibia Seychelles, Eswatini, Tanzania and Zimbabwe. Broad money growth convergence has been explained by the positive coefficients of SADC countries on (bmg). However, Madagascar Malawi Mauritius and Zambia have negative coefficients. A negative coefficient implies less coordination of broad money growth between countries with negative

Table 1: Correlation Coefficient- Are Macroeconomic Policies Coordinated

Benchmark: South Africa Country	Monetary Policy			Fiscal Policy	
	bmg	bmr	rir	FB	ED
Angola	0.142005	0.422082	-0.03478	-0.43363	-0.07734
Botswana	0.589691**	-0.48863*	0.303425*	0.783068**	0.727713***
Democratic Republic of Congo	0.392091	-0.00951	-0.18773	-0.36434	-0.58766**
Lesotho	0.355438	-0.44628*	0.606902**	0.746547*	-0.18949
Madagascar	-0.14628	0.056491	-0.41323	0.21365	-0.15811
Malawi	-0.09227	-0.45882*	0.521119**	-0.19613	-0.24651
Mauritius	-0.26237	0.106306	0.475139*	0.134879	0.696996***
Mozambique	0.272993	-0.71995***	0.149595	0.339183	-0.24013
Namibia	0.29623*	0.416465	0.616314**	0.564877	0.758509***
Seychelles	0.425682	0.682791	-0.19935	0.491999	-0.33862
Eswatini	0.388377	-0.21232	0.312795*	-0.25608	-0.06813
Tanzania	0.423801**	-0.8382***	-0.02362	0.749433**	-0.29426
Zambia	-0.29113	0.249881	0.443352*	0.632361*	-0.29005
Zimbabwe	0.619263	-0.14056	-0.33616	-0.03079	-0.07284

Source: Authors' Computations.

***, **, * denote significance at 1, 5 and 10 percent respectively.

coefficients and South Africa. In addition to that, Mauritius, Tanzania, Zambia, Seychelles, Namibia, Mozambique and Angola have positive coefficients on monetary base ratio. The scenario in Table 1 implies that there is more coordination on broad money rate of South Africa and of the countries with positive coefficients on (bmr). However, there is less coordination of broad money growth between South Africa and Botswana, Lesotho, Eswatini, Malawi, Zimbabwe, Mozambique, Tanzania and Democratic Republic of Congo since these countries have negative coefficients.

There is less association between the real interest rate of South Africa and that of Angola, Democratic Republic of Congo, Madagascar, Seychelles, Tanzania and Zimbabwe. Less convergence (divergence) of real interest rate has been explained by negative coefficients on (rir) as shown in Table 1. However, Lesotho, Malawi, Mozambique, Eswatini, Zambia, Namibia, Botswana and Mauritius have positive coefficients. The scenario implies that there is more association (by implication, coordination) of macro-economic policies concerned about stabilisation of real interest rate between South Africa and all countries with positive coefficient on real interest rate (rir). The mixed results reflect lack of consensus in literature, for example Khamfula and Huizinga, (2004) and Asongu, (2014) found no support for full convergence.

Negative coefficients of Angola, DRC, Zimbabwe, Malawi and Eswatini in Table 1 shows that fiscal

balances of these countries are not correlated to that of South Africa. Lesotho, Madagascar, Mozambique, Seychelles, Eswatini, Tanzania, Zambia and Namibia, Botswana and Mauritius have positive coefficient. Positive coefficient explains the greater convergence of fiscal balances. Accordingly, Angola, Democratic Republic of Congo, Lesotho, Madagascar Malawi, Mozambique, Seychelles, Eswatini, Tanzania, Zambia and Zimbabwe have a negative coefficients on external debt. Therefore, there is no convergence of external debt between South Africa and countries with negative coefficients on external debt. External debt on South Africa and Namibia, Botswana and Mauritius is highly correlated since the countries do have positive coefficients. Imposing limits on fiscal deficits and debt ratios prevents volatile and unstable public finances in one country from negatively affecting other members of the monetary zone.

Table 2 presents regression analysis results with MP (interest rate has been chosen as it is the most popular monetary policy indicator in the region) correlation as dependent variable and differentials of key macroeconomic indicators as explanatory variables. Analysis is done per country in relation to South Africa, the benchmark country.

FBD on Botswana, Lesotho, Namibia, Tanzania, have negative and statistically significant coefficients. The negative FBD beta implies that as the difference in fiscal policies increase (divergence), there is low monetary policy coordination. An inclusive policy

Table 2: Effect of Macroeconomic Indicator Differential on Policy Convergence

Dep. Var: $MP_{SA,t}$	Explanatory variables			Sample statistics	
	Country	FBD beta	GDPg	ED	Obs.
Angola	-0.0883	0.0314	0.0310	11	0.240
Botswana	-0.0125*	-0.188*	-0.190**	14	0.473
DR Congo	-0.874	0.144	-0.0345*	11	0.442
Lesotho	-0.0671**	0.279**	0.119	8	0.435
Madagascar	-0.00238	-0.299*	0.0243	11	0.544
Malawi	-0.251	-0.332*	0.0109	9	0.339
Mauritius	-0.326	0.384	-0.0893	13	0.332
Mozambique	-0.0927	-0.0603	-0.0361*	14	0.297
Namibia	-0.275*	-0.109	0.00245**	7	0.826
Seychelles	0.146	-0.133	0.0412	13	0.455
Eswatini	0.105	0.114	0.0755	12	0.156
Tanzania	-0.381*	-0.0144**	0.00987*	14	0.437
Zambia	-0.0801	0.550	-0.0286*	13	0.383
Zimbabwe	-0.187	-0.0615	0.116	10	0.479

Table 3: Panel Unit Root Test Result

Variables	LLC		Conclusion	IPS		Conclusion
	Levels	Δ		Levels	Δ	
bmg	0.3981	-5.4473***	I(1)	2.2384	-8.6321***	I(1)
rir	-0.5088	-8.0831***	I(1)	-2.6011**	-	I(0)
bmr	-0.1549	-9.6837**	I(1)	0.9514	-11.3387***	I(1)
FBD	-1.2743	-10.1311***	I(1)	2.0035	-12.7660***	I(1)
GDPg	0.2759	-8.4982***	I(1)	3.9016	-9.6732***	I(1)
EDD	-6.0918***	-	I(0)	0.4485	-3.1951***	I(1)

Source: Authors' computation.

Notes: Values reported are t-statistics value.

*, **, ***, statistical significance at 10, 5 and 1 percent respectively.

implementation on fiscal balances amongst all SADC countries will create conducive environment for monetary policy union.

Taking into account that convergence can be endogenous to common macroeconomic policies, the Rand monetary area countries show that as economic growth rates differ between countries, monetary policy convergence is low- this is shown by the positive coefficients. However, only Lesotho beta is statistically significant. The negative coefficient explains that convergence in growth rates (lower differential) results in higher monetary policy convergence of South Africa and that of SADC countries. However, the economic growth of South Africa and the economic growth of Zimbabwe, Tanzania, Seychelles, Namibia, Mozambique, Malawi, Madagascar and Botswana are less coordinated. External debt beta coefficient on Namibia and Tanzania is positive and statistically significant implying that larger differentials in this variable, results in converging monetary policy. Botswana, DR Congo, Mozambique and Zambia have negative coefficients, implying greater convergence and coordinated macroeconomic policies.

To conclude on coordination, the paper test whether the macroeconomic indicators are cointegrated- that is whether they move together over time, rather than just been correlated. For panel cointegration test, we first

present unit root tests -see Table 3 (Levine, Lin & Chu, 2002- LLC; Im, Pesaran & Shin 2003- IPS), and other preliminary tests, and then lastly, we present the results from panel cointegration test.

All variables are integrated of order one [I(0)], except for rir and EDD which have different orders of integration between the two tests applied, which is a good ground for implementing panel cointegration test. Next, we apply the Pedroni panel cointegration test to the data, assuming individual intercept and results are presented in Table 4 below. The existence of a long run relationship cannot supported based on v-statistic and rho-statistic in both the within – and between-dimension. However, Phillips-Peron and Augmented Dickey Fuller tests confirm the existence of long run relationship as shown by the statistically significant test statistics.

In addition, the study conducted Kao test to augment the Pedroni test in confirming existence of long run relationship. The Kao residual cointegration test has null hypothesis of 'No cointegration'. The computed ADF t-statistic of -3.1281 was statistically significant at 5 percent; therefore, we reject the null and conclude on the existence of cointegration. Table 5 presents the PMG estimation results isolating short run and long run coefficients.

Table 4: Pedroni Panel Cointegration Test Result (Null Hypothesis: No cointegration)

	Within-Dimension (Panel)	Between-Dimension (Group)
v-Statistic	0.2194930 (0.4131)	-
rho-Statistic	-0.002708 (0.4989)	2.826425 (0.9976)
PP-Statistic	-4.554372***	-1.408150*
ADF-Statistic	-5.149881***	-3.589618***

Source: Authors' Computations.

***, **, * denote significance at 1, 5 and 10 percent respectively.

The speed of adjustment (ec) coefficient is negative as expected and statistically significant, with a value of 0.659, implying that it takes approximately 8 months (two quarters) for a deviation from equilibrium to be corrected.

Fiscal balance and economic growth have long run effects on monetary policy, while external debt is the only one with short run effect. If fiscal balance differential increases (fiscal divergence), so does monetary policy between the two countries, the same can be said for economic growth also in the long-run. This is in line with studies such as (Niemann & von Hagen, 2008). In the short run as external debt levels between two countries increases, so does their monetary policies. The results indicate the significance of synchronising macroeconomic policies in the region before implementing monetary union. The macroeconomic variables are cointegrated and therefore macroeconomic frameworks need to be synchronised. Different levels of development imply different macroeconomic policies, and thus more difficulty to coordinate policies across countries. Open trade among countries and mobility of factors of production can be a great precursor to coordination of policies as such mobility improves alignment of levels of development across countries (Barro, 1979; Lucas & Stokey, 1983).

Table 5: PMG Estimates

VARIABLES	Long-run	Short-run
	PMG	PMG
ec		-0.652*** (0.413)
D.FBD		0.0394 (0.127)
D.GDP		-0.151 (0.3092)
D.ED		0.0472* (0.1301)
FBD	0.183*** (0.0123)	
GDP	0.901*** (0.0197)	
ED	-0.0957 (0.0192)	
Constant		0.502 (0.372)
Observations	174	174

Standard errors in parenthesis.
 *** p<0.01, ** p<0.05, * p<0.1.
 Source: Authors' Computations.

5. CONCLUSIONS

There is potential coordination on the fiscal and monetary policies amongst SADC countries. Large differences concerning macro-economic policies are existing amongst SADC member states. However, member states are sustainably managing their debts, fiscal balances and defining broad money as well as the growth rate of broad money, which influences level of real interest rate, is still different. These differentials act as obstacles to the formation of the monetary union by SADC member states. The differentials do not only act as obstacles to the formation of a monetary union but also hinders prospects of economic survival initiatives for trade amongst member states. However, differential on fiscal balances might not hinder the formation of the monetary union if members agree on certain goals such as economic growth, broad money growth and inflation rate, although some empirical evidence highlight the need for coordination and small differentials prior monetary union formation. It is imperative to take not of the possibility of convergence being endogenous to synchronisation of macroeconomic policies.

Despite the large differentials and less coordination on macroeconomic policy design and implementation which hinders the formation of a monetary union, SADC member states can still benefit from trade amongst themselves and monetary union will become a necessary element to facilitate co-operation. It is imperative to note that if common shocks exists and account for large variance in key macroeconomic indicators such as inflation, growth rates, among others, adopting a common policy is not costly. The differentials may well be explained by existence of several regional groupings within SADC, such as, Southern African Customs Union (SACU), Common Market for Eastern and Southern Africa (COMESA) and the East African Community (EAC), among others. This membership overlay imply different goals and thus diverging macroeconomic indicators making convergence not easy.

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