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Ncube, Prince and Cheteni, Priviledge

University of Fort Hare, University of Fort Hare

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The Impact of the BRICS alliance on South Africa economic growth - a VECM approach

P.Z Ncube[a]

P Cheteni[b]

[a,b]University of Fort Hare, PBX1314, Alice, 5700, South Africa

ABSTRACT

This paper examines the impact of the BRICS alliance on South Africa's economy and the impact that trade openness in the alliance has on South Africa's economy. The study uses series data from 1980 to 2012 and employs up to date econometric methodologies- unit root and vector error correction model estimates to achieve its aims. The empirical result reveals that international trade has contributed a lot to the high economic growth rates experienced by the BRICS economies during the recent decades. However, it is also found that international trade is not the only contributing factor. Human Capital formation, Gross Domestic Capital Formation and Real Effective Exchange Rate appreciation are equally important contributors. Results of the study however reveal that South Africa's trade openness in the alliance has detrimental long run effects for the economy. The study also reveals that despite the growth experienced overall in the alliance, South Africa's economic participation is limited due to unfair trade practices amongst the members of the alliance. The findings provide an insight of the policies to be adopted to achieve higher growth rates in South Africa within BRICS alliance.

Keywords: Trade openness, Growth, BRICS, Unit Root, Vector Error Correction Model.

JEL Codes: F3, F4, F63, O47

1.0 INTRODUCTION

BRICS is the title of an association of emerging national economies namely: Brazil, Russia, India, China and South Africa. These economies represent about 43 percent of the world population, with a combined nominal GDP of over US$14.9 trillion, which is about 25 percent of the world's GDP (WTO, 2013). While BRICS membership presents economic opportunities for South Africa, these are not automatic. Access for SA investment into their markets is often difficult. Magroaty (2013) points out that manufacturers complain that the government has not fought very hard on their behalf, and as a result, imports from member countries to South Africa rose 25 percent annually over the past two years (2011 and 2012), while South Africa's exports to them rose just 13 percent. Jenkins (2012) argues that this is unpalatable considering that South Africa has higher trade openness than any of the other BRICS nations, yet, they make access to their markets difficult by either imposing trade unfriendly restrictions on South African products and investments or by granting preference among countries in a given region such as Asia for China and India, South America for Brazil. Jenkins (2012) argues that Chinese competition can affect industrial employment in South Africa through the displacement of domestic production which opts to reduce jobs directly through layoffs and plant closures. Also, indirect impacts where firms facing increased Chinese competition respond by introducing more capital-intensive technologies, or move out of labour-intensive product lines in each industry.

Therefore, this paper seeks to answer the following questions: Does the BRICS alliance have a positive impact on South Africa economic growth? Beyond political advantages how does this alliance help South Africa to achieve growth? Does trade openness help South Africa?

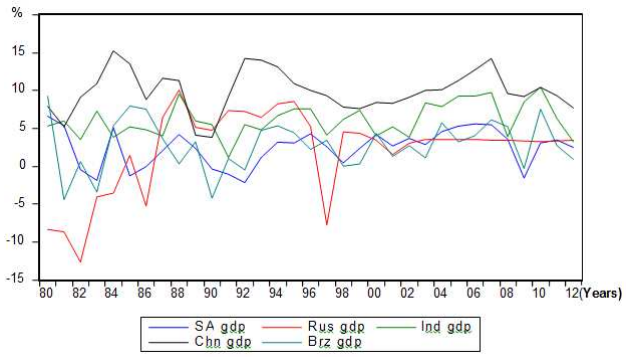
The paper is structure as follows: Section 2 gives an oversight of the BRICS trade, Section 3 model specification, and section 4 concludes the paper.

2.0 SITUATIONAL ANALYSIS OF BRICS TRADE

Polodoo (2010) points out that notwithstanding the adverse economic and financial shocks that the world faced between 2008 and 2011, China experienced double digit growth rates. The average growth rates were 10.66 percent for China and 6.86 percent for India whilst Brazil,

Russia and South Africa experience average growth rates of 2.89 percent, 0.49 percent and 2.66 percent respectively for the period 1980-2012. Growth rate trends are provided in figure 2.1.

Figure 2.1 (GDP trends amongst the BRICS alliance)



Source: Drawn using E-views, using data from knoema (2013)

Jenkins (2012) points out that Brazil is deemed to be one of the fastest growing economies with a large and emergent agriculture, mining, manufacturing and service sectors. It is considered to be the best South American country in terms of economic performance and presently holds a strong status in the world economy. Polodoo (2012) is of the view that as far as Russia is concerned, it is a commodity-driven economy where most foreign currency is earned through fuel and energy, whilst India is a diversified economy consisting of farming, agriculture, industries and a plethora of services. It is also pointed out that service are considered to be the engine of growth in India, representing more than 50 percent of the country's GDP and employing roughly 30 percent of the labour force (Polodoo,2012). STATSA (2013) point out that in terms of the balance of trade, South Africa has run a trade surplus with Russia in the last two years, after running trade deficits in 2008 and 2009, whilst, South Africa runs a trade rising deficit of nearly US$1 billion with Brazil. The country's biggest trade deficit is with China, a figure that reached a high US$4 billion in the year 2012 (StatSA, 2013).

However, in terms of trade openness all the economics have improved. Jenkins (2012) and Polodoo (2012), agree that the economies have opened up more during the recent decades. These ratios increased for all BRICS economies during the period under review. Polodoo (2012) argues that BRICS economies are mainly export oriented economies. Brazil for example, exports

transport equipment, iron ore, industrial raw materials, soybeans, footwear, coffee, autos, automotive parts, machinery and imports machinery, electrical and transport equipment, chemical products, automotive part and electronics. Its main trading partners are USA, the EU and Argentina. Jenkins (2012) argues that although in total, Chinese imports only account for around 6 percent of aggregate consumption of manufactured products in South Africa in 2011, this average masked considerable difference between industries. The share of Chinese products is over 40 percent in footwear and knitted fabrics, and over 30 percent in Television sets, radios and other electronic equipment and in electric lamps and lighting equipment. It is believed that many of the ten industries with the highest level of Chinese import penetration are traditional labor intensive sectors such as textiles and clothing, footwear, leather products and furniture. Chinese competition in these industries is likely to have a particularly severe impact on employment especially of unskilled workers in South Africa.

2.1 LITERATURE REVIEW

Various schools of thought have attempted to analyse and establish the relationship between trade and economic growth. However, some schools of thought investigated the relationship between openness to trade rates and expected economic growth.

2.1.2 Export-led growth hypothesis (ELGH)

According to the export-led growth hypothesis (ELGH), pioneered by Feder (1982), one of the main causes of economic growth is increases in exports. The theory points out that not only increasing the amounts of labor and capital generates growth but also by increasing exports and thus exports are likened to be' backbone' of output.

The export-led growth hypothesis postulates that exports are the main determinant of overall economic growth. One of the main arguments by Feder (1982) in support of the hypothesis is that export growth may affect total factor productivity through dynamic spillover effects on the rest of the economy.

Feder (1982) points out that, there are several ways in which exports can potentially cause an increase in productivity. It is further argued that exports may promote specialization in the production of export products, which in turn may boost productivity levels and may cause the general level of skills to rise in the export sector (ibid,1982). This is believed to lead to a reallocation of resources from the (relatively) inefficient non-trade sector to the higher productive export sector. According to Feder (1982), this productivity change leads to output growth.

Therefore, export expansion helps to concentrate investment in these sectors, which in turn increase the overall total productivity of the economy. These arguments have been reinforced by the endogenous growth literature. The new endogenous growth models have made major modifications to the neoclassical growth theory‘s approach to handling trade effects.

The support for the ELGH is, however, not universal. Moon (1998) argues that nations characterized as following outward-oriented policies do not manifest levels of trade notably higher, or expand their trade at rates higher, than those regarded as inward-oriented. In addition, he notes that it is not apparent that export expansion is the principal source of superior macro-economic performance of outward-oriented nations. Critics point out that the experiences in the East and Southeast Asian countries are unique in many ways and not necessarily replicable in other countries (Buffy, 1992). Moreover, the production and composition of exports was not left to the market but resulted as much from carefully planned intervention by their governments. Jaffee (1985) also questions whether a reliance on exports to lead the economy will result in sustained long-term economic growth in lesser developed countries (LDCs), due to the volatility and unpredictability in the world market.

With regards to empirical investigation, empirical studies regarding the link between trade and economic growth in the BRICS economies are scant. However, there have been some studies conducted to investigate the contribution of international trade to growth individually in these economies. Significant though, is the study by Polodoo (2008), who examined the degree to which international trade has contributed to the economic growth enjoyed by the BRICS economies. The study used panel data from 1990 to 2010 and employs econometric methodologies such as unit root testing and the Vector Auto regression (VAR) model. The

empirical results reveal that international trade has contributed a lot to the high economic growth rates culminated during the recent decades. However, it also found that international trade is not the only contributing factor. Human Capital formation (HC), Gross Domestic Capital Formation (GDFCF) and exchange rate appreciation are equally important contributors.

Fan et al (2005) investigated the link between exports and growth in China using data from 1952 to 2003 and conclude that export growth leads to economic growth. In the case of Brazil, Chow (1987) examines the export led growth hypothesis for Brazil among industrialized countries using data for the period 1960-1987 and finds a bidirectional link between exports and growth in Brazil. Domal and Ozyurt (2010) examine causes of economic growth for 26 Brazilian states for the period 1989-2002. The authors conclude that trade openness as well as human capital formation contributed significantly to growth during the period considered. Ledyava and Linden (2008) provide evidence for Russia. They examine the attributes determining growth in 74 Russian states for the period 1996-2005 using both panel and cross sectional data analysis and find that apart from investments, economic development, exports is significant in explaining growth in Russia. Studies on India were conducted by Dutt and Ghosh (1996), Anwer and Sampath (2001), Nidugala (2001), Bhattacharya and Bhattacharya (2011) among others. Bhattacharya and Bhattacharya (2011) employed data for the period 1996-97:Q1 to 2008-09:Q3 and find a unidirectional causality from exports to economic growth.

As far as South Africa is concerned, empirical studies are provided by Loots (2002) and Kowalski *et al* (2009). Loots (2002) employed quarterly data for the period 1990-2000 to investigate the impact of trade liberalization among others and find that only 50 percent explains growth and that growth in South Africa emanates from growth in Latin America and other emerging countries. Kowalski *et al*, (2009) examined among others the impact of trade liberalization on economic growth in South Africa for the period 1988-2003 and found a positive impact of trade liberalization on growth.

3.0 MODEL SPECIFICATION

Following Mankiw *et al*, (1992) and Polodoo (2008) an augmented Solow growth model as follows is produced:

$EG_{it} = \alpha_0 + \beta EG_{i,t-1} + \lambda Z_{i,t} + e_{i,t}$ ……..1

The variable EG is economic growth rate measured by growth in real GDP of country i at time t. $EG_{i,t-1}$ represents growth in the previous year, included to capture convergence effect; Z is a vector of factors influencing growth; $e_{i,t}$ is the regression residual which is allowed to vary overtime.

This study estimates the regression model:

$GDP_{SA} = \beta_0 + \beta_1 \theta TO + \beta_2 \theta EXCH + \beta_3 \theta NFDI + \beta_4 \theta HC + \beta_5 \theta GDCF + \beta_6 \theta GDP_{BRICS} + e$ ……2

3.1 DEFINITION OF VARIABLES

(GDP_{SA})

The variable GDP (South Africa) is economic growth rate for South Africa measured by growth in real GDP of South Africa at time *t* (Polodoo,2008). It is the dependent variable.

Trade Openness *(TO)*

TO be the trade openness defined as the sum of exports and imports volume as a percentage of GDP, expressed as an average of the BRICS economy (excluding South Africa)(Knoema,2013).

Gross Domestic Fixed Capital Formation (GDFCF)

GDCF is the gross domestic fixed capital formation from both the government and the private sector of country and is invested into each BRICS economy; here it is expressed as an average of the total in BRICS (excluding South Africa) and is in US $ terms.(Knoema,2013).

Real Exchange rate (EXCH)

EXCH is an index that describes the relative strength of a currency relative to a basket of other currencies. The benchmark currency basket is a GDP-weighted basket of the major fully convertible currencies of the world, in this study it would be amongst common regional and international trade partners of the individual BRICS members (Appleyard and Field, 2005).

Net foreign Direct Investment (NFDI)

NFDI is the level of net foreign direct investment. The higher the level of FDI, the higher is the growth rate (Smith, 1876).Here it is an average of the total NFDI in BRICS (excluding South Africa) and is in US $ terms.

Human Capital (HC)

HC is human capital formation proxy by the human development index. Endogenous growth theory postulates that countries which invest heavily in human capital formation enjoy higher growth.

3.2 DATA SOURCES

The study will employ BRICS annual data for the period 1980 – 2012. The data was obtained from the Department of Trade and Industry download facility, Statistics South Africa (Stats SA), the Central Intelligence Agency (CIA) countries database, the SARB online download facility, World Bank online download facility and Knoema.

3.3 THE EXPECTED A PRIORI

The table appended below the expected signs and measurement of explanatory variables to be used in the model:

Variables	**Measured by**	**Expected Sign**
TO	(Exports + Imports) Volume as a percentage of GDP	+
GDFCF	GDFCF by government and private sector as a percentage of GDP	+
EXCH	US dollar	+
NFDI	Net Inward and Outward FDI as a percentage of GDP	+
HC	Proxy by the Human development index	+

3.4 ESTIMATION TECHNIQUES

3.4.1 Johansen technique based on VAR

The Johansen (1995) test for co-integration is applied in this study. This is because the maximum likelihood framework involved is known to offer better properties than the traditional Engle and Granger approach which is residual based. The following steps are involved when implementing the Johansen technique:

Assuming a set of variables as used in the model such as [GDP (sa); EXCH; TO; GDCF; HCF;GDP(brics) and NFDI] that are in I (1) are thought to be co-integrated. A VAR with k lags containing these variables could be set up as:

$yt = \beta yt\text{-}1 + \beta 2yt\text{-}2 + \ldots\ldots\ldots + \beta kyt\text{-}k + ut$ 3

In order to use the Johansen test, the VAR needs to be turned into a vector error correction model (VECM) yt of the form:

$\Delta yt = \Gamma 1 \Delta yt\text{-}1 + \ldots\ldots\ldots + \Gamma k\text{-}1 \Delta yt\text{-}k+1\ \Pi\ yt\text{-}k + \Psi Dt + \mu + \varepsilon t,\ t = 1 \ldots T\ldots\ldots\ldots$ 4

Where Dt are deterministic variables such as dummies and μ is vector of constants. The hypothesis of reduced rank, r, of the long-term impact matrix $\Pi = \alpha\beta'$ is then used to formulate the hypothesis of co-integration. The next step is to establish how many co-integrating vectors exist for each of the relationships. According to Brooks (2002), two test statistic are employed, the λ max statistic and the λ trace statistic.

3.4.2 The Vector Error Correction Model (VECM)

It is appropriate to estimate an error correction model if the relevant variables are co-integrated. In a vector error-correction model, the short-term dynamics of the variables in the system are influenced by the deviation from equilibrium:

$$\Delta yt = \beta 1 \Delta xt + \beta 2\ (yt\text{-}1 - \gamma xt\text{-}1) + \upsilon t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 5$$

The error correction term is given by The implied coefficient on xt-1 of one in this term suggests a proportional long run relationship between y and x.

Table 3.1: Stationarity results of the Augmented Dickey-Fuller test

Variable	Intercept	Trend& intercept	None	Order
SA(GDP)	-4.146315**	-4.545182**	-2.838216**	I(0)
θGDP(BRICS)	-5.645933**	-5.804345**	-5.694442**	I(1)

	-4.170041	-3.952658	-0.973889	
θTO	-6.087178** -0.462544	-5.975016** -2.118554	-5.202513** 1.944863	I(1)
θEXCH	-3.904532** -0.655304	-4.085166* -2.332057	-3.943928** 0.226220	I(1)
θNFDI	-6.912249** 0.471906	-6.976561** -3.582124	-7.990710** 2.676967	I(1)
θHCF	-5.918750** 0.042209	-5.922417** -2.839494	-5.120832** 2.263354	1(1)
θGDCF	-4.119674** -0.827663	-5.722595** -2.974457	-4.142770** 0.866019	1(1)

*Values marked with *represent a stationary variable at 5percent significance level and ** represent a stationary variable at 1 percent significance level.*

3.4.3 Tests for Co integration

The Johansen co integration based on the trace test is shown in table 4.2(a). The trace test shows the null hypothesis that the number of co integrating equations is greater than the number of variables involved.

Table 3.2 (a) Co integration Rank Test (Trace)

Hypothesized No. Of CE(s)	Eigen value	Trace statistic	0.05 Critical Value	Prob.**
None*	0.822240	164.7584	125.6154	0.0000
Atmost 1*	0.759075	111.2114	95.75366	0.0028

Trace test indicates 2 co-integrating eigen(s) at the 0.05.*denotes rejection of the hypothesis at the 0.05 level. **Mackinnon-Haugh and Michellis (1999) p-values

Table 3.2 (b) Co integration rank Test (Maximum Eigen value)

Hypothesised No of CE(s)	Eigen value	Max-Eigen statistic	0.05 Critical value	Prob **
None *	0.822240	53.54700	46.23142	0.0070
Atmost 1*	0.759075	44.12141	40.07757	0.0166

Max-eigen value test indicates 2 co-integrating equations at the 0.05 level.*denotes rejection of the hypothesis at the 0.05 level.

The trace test which is the much stricter test reflected that at least two co integrating equations exist at 5percent significance level. The null hypothesis of no co integrating vectors is rejected since the trace (test) statistic of 164.7584 is greater than the 5percent critical value of approximately 125.6154. Using the same explanation, the null hypothesis that there is at most 1 co integrating vector can be rejected since the test statistic of approximately 111.2114 is greater than the 5percent critical value of about 95.75366. Therefore, the trace statistics specified 2 co integrating relationship at 5 percent significance level. The maximum eigenvalue test revealed

that there are at least two co integrating equations at 5 percent significance level. Using the maximum eigenvalue test, the null hypothesis that there is no co integration at 5percent significance level is rejected this is because the eigen value (test) statistic of 53.45700 is greater than the 5percent critical value of 46.23142.Also the null hypothesis that there is at most 1 co integrating vector can be rejected since the test statistic of 44.12141 is greater than 40.07757. Therefore, it can be concluded that there are two significant long run relationships between the given variables (using the trace test).

3.5 Diagnostic checks

The fitness of the model was tested in three main ways. Firstly, serial correlation shall be tested using the langrage multiplier (LM) test, followed by the White (Ch-sq) test for heteroskedesticity and finally the Jarque-Bera for normality test. Diagnostic checks results are shown in Table 3.3:

Table 3.3 Diagnostic Checks

Test	Null Hypothesis	Statistic:value	Probability value
White(Ch-sq)	No Conditional heteroskedesticity	459.4495	0.3440
Jarque-Bera	There is a normal distribution	0.717586	0.6985
Langranger Multiplier(LM	No serial correlation	39.41931	0.8341

Table 3.3 shows that the test for serial correlation produced an LM statistic of 39.41931 with a probability of 0.834. The LM results suggest that we cannot reject the null hypothesis of no serial correlation. The test for heteroskedesticity using White test with no cross terms produced a CH-sq of 459.4495 at a probability of 0.3440. The null hypothesis of no heteroskedesticity or no misspecification will thus not be rejected. Therefore, the model is robust. The null hypothesis for the Jarque-Bera test states that there is a normal distribution.

The Johansen technique requires an indication of the lag order and the deterministic trend assumption of the VAR.

Table 3.4: Lag order selection criteria

Lag	Log L	LR	FPE	AIC	SC	HQ
0	-414.3706	NA	1510.536	27.18520	27.50901	27.29075
1	-265.7520	220.5309*	2.655476*	20.75819	23.34862*	21.60261*
2	-211.9311	55.55707	3.320794	20.44717*	25.30422	22.03045

*indicates lag order selected by the criterion

LR:sequential modified LR test statistic(each test at 5percent level)
FPE: Final prediction error
AIC: Akaike information criterion
SC:Schwarz information criterion
HQ:Hanna-Quinn information criterion

Table 3.4 shows that overall, criteria selected 1 lag. Therefore a conclusion to adopt 1 lag can be made. Subsequently, the Johansen cointegration test is conducted using 1 lag for the VAR.

3.6 Vector Error Correction Model (VECM)

The discovery of a co integration equation in the previous section implies that a VECM can be used. This allows us to distinguish between the long and short run impacts of variables so as to establish the extent of influence that changes in independent variables in the BRICS alliance has on South African GDP. Using the outcomes from the co integration test the VECM shall be specified. The VECM results are presented in table 3.5.

Table 3.5 (a): Results of the long run co integration equation

Variable	Coeffecient	Standard error	t stat
Constant	0.264770	-	-
SA_GDP(-1)	1.000000	-	-
θTO(-1)	-0.514321	0.06822	-7.53877
θNFDI(-1)	0.206023	0.14215	1.44936
θHCF(-1)	70.49986	10.0962	6.98282
θGDP(brics)(-1)	0.249736	0.11845	2.10842
θGDCF(-1)	-1.393295	0.20914	-6.66203
θEXCH(-1)	0.049185	0.01068	4.60698

	Coefficient	Std Error	t-Statistic	Prob
C(1)	-0.781125	0.234336	-3.333354	0.0030
C(2)	0.111900	0.194866	0.574243	0.5716
C(3)	0.005056	0.261502	0.019333	0.9847
C(4)	0.555269	0.227028	2.445822	0.0229
C(5)	-12.43897	26.22441	-0.474328	0.6399
C(6)	-0.336512	0.496294	-0.678049	0.5048
C(7)	0.067817	0.040585	1.671001	0.1089
C(8)	0.212938	0.244389	0.871306	0.3930
C(9)	-0.3144897	0.504522	-0.624148	0.5389

Table 3.5 Shows the long run relationships between GDP (sa) and the dependent variables in the model. The lower panel shows that GDP(sa) is explained by system coefficients C(1) to C(9).However coefficient C(1) of the system is more significant(0.003) in explaining the longrun relations between GDP(sa) and the dependant variables.

The long run impact of key independent variables on the countries' economic growth as shown by table 3.5 is illustrated using equation 9:

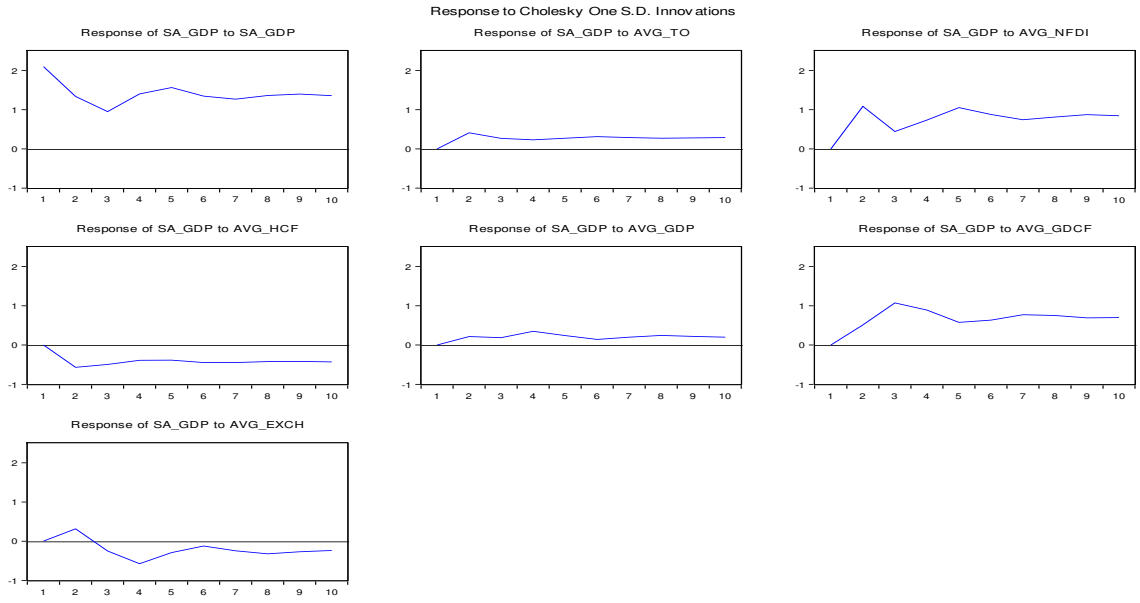
GDPSA=0.26+0.05EXCH-1.39GDCF+70.5HCF+0.21NFDI-0.51TO+0.25GDP (BRICS)...6

Equation 6 suggests that a percentage increase in θ GDP (BRICS) increases GDP of South Africa by approximately 0.25 (ceteris paribus),possibly as a result of "spill-over effects" that come with globalization. Furthermore, the results suggest that a percentage increase in θ *TO* in BRICS alliance decreases GDP of South by approximately 0.51(ceteris paribus), this long run effect implies that goods and technology from the BRICS alliance flood domestic markets in South Africa, thus possibly having lower prices than domestically produced goods as a result of lower production costs and other economies of scale and scope in the other BRICS economies. Measures such as tariff and embargoes on South African products by other BRICS members could also be the cause of this .A percentage increase in θ NFDI in the alliance increases South African GDP by at least 0.21 which could be a derived benefit from the foreign investments made by the rest of the world in other BRICS economies. A percentage increase in θ HCF increases South African GDP by 70.5, which is the largest impact. This could be as a result of the realization of return on investments in education, health and standards of living in the other BRICS members, thus increasing their economic active population and productivity which in turn benefits South Africa in the long run. Yet a percentage increase in the θ EXCH in the alliance leads to a 0.26 increase of the South African GDP. This could be as a result of the appreciation value gained by the alliance currencies against the US dollar, which then benefits South Africa in the long run.

3.7 Impulse response analysis

Impulse response analysis traces out the responsiveness of the dependent variable in the VAR to shocks to each of the other variables. It shows the sign, magnitude and persistence of real and nominal shocks to economic growth (in this context). Figure 3.1 shows the impulse responses.

Figure 3.1 Impulse responses



Response of:

SA GDP to *SA GDP*

There is a positive relationship between GDP South Africa in response to its self into the ten years. However a one standard deviation positive shock of South Africa GDP will cause its self to decrease slightly three years in to the future.

SA GDP to *θ TO*

A standard deviation positive shock on the average trade openness in BRICS alliance causes a positive increase in South African GDP by about half a unit at least three years into the future. However, South Africa's GDP is kept constant into the next seven years.

SA GDP to *θNFDI*

One positive standard deviation shock to the average net foreign direct investment within the BRICS alliance causes a sharp increase in South African GDP within the first year as well as a sharp decline after three years. The one unit shock on θ net foreign direct investment will eventual cause an increase in South African GDP after which it shall be slightly varying into the next seven years.

SA GDP to *θ HCF*

A positive standard deviation shock on the average human capital formation will cause the South African GDP to decrease below the optimal point (0) after the first two years after which it shall be a negative constant variation for the next 8 years. This shows a negative relationship between the average human capital formations in the BRICS alliance with South Africa's economic growth.

SA GDP to θGDP (BRICS)

One standard deviation shock on the average BRICS alliance GDP will cause an insignificant effect on the South Africa GDP. This is shown by the slight positive fluctuations from the optimal point (0) over the entire ten years. This shows that the BRICS alliance is not stimulating South Africa's economic potential for growth; this could be grounds for policy review.

SA GDP to *θ GDCF*

On the other hand , a standard deviation shock on the θ gross domestic capital formation in the BRICS alliance ,would cause South Africa GDP to increase gradually within the first three years, after which it decreases gradually between three and five years. Between five and ten years, the shock causes the South Africa GDP to be constant.

SA GDP to *θEXCH*

A standard deviation on the θ real effective exchange rates within BRICS alliance causes an initial increase from 0 in two years, however, this cause the South African GDP to fall sharply within three years. Eventually the shocks on the real effective exchange rates cause the South Africa GDP to fluctuate between slightly above 0 over the next ten years. This shows that increases in θ real effective exchanges rates against the US dollar within BRICS alliance positively impact South African economic growth.

4.0 CONCLUSIONS AND POLICY RECOMMENDATIONS

The long run results suggested that South Africa's trade openness in the alliance has a negative impact on South Africa's economy. This means the BRICS Alliance contribution to SA

economic growth is a two sided coin. Overall, the alliance does seem to lift SA growth although the HCF is affected in the process. Beyond political gains SA is benefiting from the trade in BRICS, although they are costs attached to it. Theory is not in agreement as to the weather trade liberalization or trade protectionism promotes or limits economic growth. Therefore, to improve the South African economy, trade openness in the alliance should be lowered. However, this remedy is only applicable if all the domestic industry is stimulated and the domestic prices are competitive and the infant industries are given optimal terms protecting them against foreign multinationals who already benefit from low production costs, economies of scale and economies of scope. Hence, to increase commercial cooperation, other BRICS members should be lobbied to facilitate market access by effectively addressing hurdles standing in the way of trade development, such as bureaucratic procedures, regulations and standards, import protection, as well as public sector procurement criteria, among others. A significant number of the industries with the highest level of Chinese import penetration are traditional labour intensive sectors such as, textiles and clothing, footwear, leather products and furniture. Chinese competition in these industries therefore is likely to have a severe adverse impact on domestic employment especially of unskilled workers and is likely to increase the unemployment trends and thus increase poverty levels too. One may add by pointing out that government is perceived to be willing to give more incentives to foreign firms than to domestic companies who invest in SA textile, clothing as well as manufacturing firms. Therefore government should remove differential incentives and promote the development of an economy with an attractive climate for investment in general as this will increase both the gross domestic as well as the human capital formation.

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