

Trade Openness and GDP Growth Nexus in South Africa

Mike Nyamazana Sikwila¹

¹ Chinhoyi University of Technology

Received: 9 December 2013 Accepted: 3 January 2014 Published: 15 January 2014

Abstract

In this article, the authors look at whether trade openness has had positive effects on growth and development in South Africa. A time series regression method that depicts the long and short term effects of trade openness on the South African economy was used. We carry out a long and short term regression analysis using quarterly data for the period 1994 through to 2013. The results of the regression analysis indicate that there was an enormous long and short term influence of trade openness on growth and development in South Africa.

Index terms— trade-openness, long-term, short-term? gross domestic product, growth.

1 Introduction

his paper is a follow-up to our earlier paper regarding the importance of trade openness on less developing economies in Africa such as that of South Africa (Mosikari & Sikwila, 2013). However, this work differs from our previous paper in that we have included focal theory on trade extending the data from 2008 to 2013, and concentrated on the short-and long term effects of trade to economic growth. In the literature trade -openness was measured by the ratio of aggregate exports and imports over gross domestic product (Dollar, 2003). The rapid Asian countries economic growth over the last two decades has sparked debate on trade openness and economic growth (Sachs & Warner, 1995). The desire to achieve faster economic growth and move out of poverty is important for countries in the Sub-Saharan African region. Although South Africa is relatively developed compared to other countries in the Sub-Saharan region, unemployment and poverty levels are still high in the country (du Toit, 2005). Compounded with the poverty, is the inequality which is depicted by the higher Gini coefficient which increased in the period 1994 through to 2013 (Musterd & Ostendorf, 2013), and the manifestation of poverty as depicted by industrial unrest such as strikes (Hedley, 2014). The South African economy has registered relatively low levels of economic growth in the period under study compared to countries in the BRICS (Brazil, Russia, India, China and South Africa) union of which South Africa is a member (World Bank, 2013). We argue that the poor economic growth in South Africa in the period 1994 to 2000 through to 2013 might have been affected by relatively restrictive trade policies compared to those in the BRICS and these policies were expected to negatively impact on the wider economic growth.

The current literature highlights a link between GDP growth and Trade openness across countries (Frankel & Romer, 1999; Sachs & Warner, 1995). The purpose of the study is to investigate whether trade openness and other related variables had an impact on economic growth in South Africa. The objective was to establish the long-and short term effects of trade openness particularly on the wider economic growth of a country. The motivating factor for this study was that countries that have pursued export oriented policies (trade openness) happen to have an impressive economic growth rates, for instance, Hong Kong, Taiwan, South Korea, Brazil, India, China, and Singapore (Nassem, 2003:637; World Bank, 2013). The existing research in the area of trade openness and growth connection has been based on large crosscountry studies using cross-section data (Frankel & Romer, 1999; Sachs & Warner, 1995; Ben-David, 1993). This kind of approach has methodological limitations in that, what is true for one country does not necessarily carry over to other countries. But authors have used same measures across countries in disregard of different degrees of country openness. In addition, the current literature suffers from conceptual drawback in that most of the studies have used policy variables to explain openness and growth connection (Dollar, 1992; Vamvakidis, 2002; Sachs & Warner, 1995; Rodriguez &

Rodrik, 2000). Our research, to bridge this interstice, will therefore, provide a case study of South Africa using aggregate trade data rather than using policy variables which are difficult to measure, and that there was policy instability and inconsistency within and across-countries in less developing countries (Rodrik, 1990(Rodrik, & 1991)). Moreover, the lack of data for the policy variables has persuaded previous authors to use surrogate variables (Edwards, 1993). Further, our study differs from these studies in two ways, first, we choose to use a sub-Saharan African country that has potential for growth; second, we employed a time-series for a single country than using a group of countries and we examine both short-and long term effects of trade on economic growth. Our study indicates that import-GDP ratio was significant implying that South Africa was relatively open to world trade (Romer, 1993;Jin, 2000). Correspondingly, the Exports-GDP ratio was significant and positively related to growth in South Africa, implying that when export share expands, economic growth improves (Jin, 2000). The study is expected to be useful to policy makers in countries experiencing relatively low economic growth rates and poverty levels. In addition, the study adds to recent literature in the area of trade openness and growth.

2 II.

3 Literature Review

Although the theory of infant industry is popular among developing countries, particularly in Sub-Saharan Africa, and other regions where colonialism was manifest, the theory of infant industry propagates that, the domestic newly born industries could not effectively compete with foreign firms; therefore, they needed protection to enable them to mature. However, the infant-industry theory has been challenged in literature (Baldwin, 1969). Baldwin (1969) questioned the efficacy of the tariff levies in achieving an effective resource allocation in infant industries in order for them to grow and contribute to economic growth. As Edwards (1993) also points out that there was ample evidence that suggested that open and export oriented economies performed better than countries which followed inward oriented policies (Edwards, 1993 ??Edwards, :1359)). Another widely used strategy by developing countries in their effort to develop domestic industries and economic growth was import substitution policy. To protect domestic consumer goods and encourage their production at home; extensive quantitative restrictions, subsidies and high tariffs rates, were employed. The countries that favoured import substitution policies assume that economic growth would be achieved by inward oriented trade policies. The restrictions under import substitution inhibit competition and innovation and economic growth (Barro & Sala-i-Martin, 1995). Moreover, new theories of endogenous economic growth supported the connection of trade openness and growth (Romer, 1986;Lucas, 1988).The question is, Does trade protection foster economic growth better than open trade policies? Or put in another way, is there a connection between trade openness and economic growth? In an attempt to answer this question, several cross-country studies for both developed and developing countries have examined the relationship between trade openness and economic growth (Edwards, 1993; ??wok use, 2008;Morley & Morgan, 2008;Sato & Fukushige, 2007;and Flatters & Stern, 2007). These empirical studies have shown that trade openness had a positive effect on economic growth as noted by Vamvakidis (2002) and Awok use (2008). Nevertheless, there is still an incongruity among economists concerning the character of the relationship between trade and economic growth. The main difference was on the proxies used for trade openness and the data used in these studies.

Turning to previous empirical work on trade openness, countries that had policies that supported trade also improved factor productivity growth, and thereby economic growth (Economidou & Murshid, 2007). As Economidou and Murshid (2007) explains, factor productivity growth for manufacturing industries across OECD countries substantially improved resulting from trade in the period between 1978 and 1997 and this had a positive influence on economic growth. Also, supporters of export promotion point out that the development of the export sector permits countries to have access to higher levels of technology and technologically rich capital, an example could be the East Asian countries, Taiwan, Singapore, Hong Kong and South Korea (Naseem, 2003). The acquired technology subsequently leads to high economic growth. The inflow of foreign capital and transfer of technology would not have been possible without the export sector providing the means for payment. Vamvakidis (2002) explains that the issue of the connection between trade openness and growth is far from resolved. The author asserts that several studies involving regression analysis of cross-country data had found a positive correlation between trade openness and growth, these include: Frankel & Romer, 1999; Sachs & Warner, 1995; Harrison, 1996. However, there are other studies (Rodriguez & Rodrik, 1999; Levine & Renelt, 1992; Ben-David, 1993) that are skeptical of these results and argued that the positive relationship between trade openness and growth was not robust, perhaps, due to problems of different measures of openness and model specifications employed in the regression equations. Vamvakidis (2002) employs a historical cross-country data for 1970 to 1990 to estimate a regression equation using the following proxy for openness to trade-Sachs and Warner (1995) openness dummy, average trade share, average ratio of import duty revenue to total imports, average trade share purchasing power parity (PPP) adjusted, average tariff, and non-tariff barrier coverage. The results indicate that PPP adjusted trade share, trade share and openness dummy were positive and statistically significant at the 5% level of significance. The average tariff rate recorded a negative sign, but was statistically significant at the 5% level of significance, while the duty ratio and non-tariff variables had a negative sign and insignificant. Dollar (1992)

4 B

index of real exchange rate distortion (regression analysis) using price data compiled by Summers and Huston (1988). The author concluded that Asian economies that includes the gang of four -Taiwan, Hong Kong, South Korea and Singapore were most open, and thereby outward oriented than countries in Africa and Latin America included in the sample. Nevertheless, Rodriguez and Rodrik (2000) argue that the cross-country index of exchange rate distortion used by Dollar (1992) had conceptual deficiency as a measure of trade restrictions. Also, variability in the exchange rate, though robust was, perhaps, a measure of instability only.

Although economists differ on the causes of rapid economic growth in Asia, the export push strategies followed in 1965-90s by these countries (Taiwan, South Korea, Hong Kong and Singapore) could explain their impressive economic growth and development (Naseem, 2003; World Bank, 1993; Radelet & Sachs, 1997). To summarize, the recent literature on the connection between trade openness and growth have revealed glaring contradictions in methodology and conceptual approach, in particular, the difficulty in finding appropriate proxies for measuring openness across-countries is apparent. Most of the data used in these studies was a cross-country data, but specific situations for individual countries remained concealed, and thereby difficult for policymakers to appreciate the results. Notwithstanding the challenges, studies have shown that countries that have implemented outward oriented trade policies have grown faster than those that followed trade protectionism policies. However, empirical studies differ on the determinants that led to faster economic growth, and thereby prompting the need for further research in order to identify plausible effects of trade openness on GDP growth.

5 III.

6 Research Methodology

We follow a mixed methodology of quantitative and qualitative analytical approach. We use quarterly data covering the period 1994Q1-2013Q4 to determine the relationship between trade openness and GDP growth rates in the South African economy. The quarterly data begins from 1994Q1 since this was the start of South Africa data series without the effects of Apartheid policies. The study uses secondary data collected from the South African Reserve Bank, which is an official source of economic statistical data. Following Jin (2003; Awokuse, 2008) the model variables are-GDP growth rates the dependent variable and volume of exports (X), volume of imports M, were used to obtain the export to GDP ratio (X / GDP), imports to GDP ratio the dependent variables. The capital formation captures the attractiveness of foreign investment induced by the trade liberalization. We assume that investors can easily repatriate their profits in an economy that is liberalized. The import variable indicates the import permeations which represent the degree of the country's trade openness (Jin, 2000:8). Openness indicates relatively less protectionism. Like all times series data, prior to estimation of the model adopted, an Augmented Dickey-Fuller (ADF) test was employed to check for first order unit roots. A cointegration test was also applied to determine whether the variables were cointegrated. The long run function is given as; $GDP = f(M / GDP ; X / GDP ; Kinv / GDP ; ?)$ (1)

The linear form of equation (1) is given as: $GDP_t = \alpha_0 + \alpha_1 (M / GDP)_t + \alpha_2 (X / GDP)_t + \alpha_3 (Kinv_t / GDP) + \epsilon_t$ (2)

Where GDP is gross domestic product in levels, α and ϵ are parameters to be estimated, X, M, Kinv, (X/GDP), (M/GDP) and $Kinv/GDP$ are defined as observable variables representing factors affecting gross domestic product in South Africa, t is the time, ϵ_t is a random error term with a mean of zero, representing measurement error and unmeasured and immeasurable factors and equations (2) is estimated using quarterly time series data.

7 The Long run Cointegration results

Cointegration determines the long term relationship between gross domestic product and the independent variables. Hence the estimate of equation (1) is run at levels and the residuals obtained were tested for stationarity and used for the estimation of the short run equation (6). The co-integration test indicates that all variables were found to be integrated of order one $I(1)$. The long run regression equation is presented as $GDP_t = \alpha_0 + \alpha_1 (M / GDP)_t + \alpha_2 (X / GDP)_t + \alpha_3 (Kinv_t / GDP) + \epsilon_t$ (2)

The capital investment (Kinv) and Exports volume (X) are expected to be positively related to GDP, while the imports volume is negative, ϵ_t is the error term. In estimating equation (1) the results are presented in table 3, for the long run, it shows that all the independent variables have a positive impact on GDP growth. There is a positive indication of trade openness measured by exports and imports ratios to GDP, where exports seem to be more significant than import.

8 Global Journal of Management and Business Research

Volume XIV Issue VII Version I Year 2014 ()

9 B

(M/GDP) and the gross capital formation was used to get the gross capital formation to GDP ratio ($Kinv / GDP$) The residuals computed from the long run were tested for stationarity and found to be stationary and were included in the estimation of the error correction model.

10 Error-Correction Model (ECM)

The short run equation captures seasonal variations that include industrial unrest (strikes) and poor harvest that are expected to impinge on trade and economic growth. The short run equation using the ratios of exports and imports to GDP is presented as; $\Delta \log(\text{GDP}) = f\{\log(\text{X}/\text{GDP})_t, \log(\text{M}/\text{GDP})_t, \log \Delta \text{Kinv}_t, \log \text{GDP}_{-1}, (\text{X}/\text{GDP})_{-1}, (\text{M}/\text{GDP})_{-1}, \varepsilon_t(-1)\}$ (6)

Where, Δ , is the first difference of variables over time, \log is the logarithm, GDP is the domestic product, X is gross exports, M is gross imports, (-1) indicates a lagged variable and $\varepsilon_t(-1)$ is a random disturbance Equation (6) can be presented in a linear form as: $\log \Delta(\text{GDP})_t = \alpha_0 + \alpha_1 \Delta \text{Kinv}_t / \text{GDP} + \alpha_2 \log(\text{M}/\text{GDP})_t + \alpha_3 \log(\text{X}/\text{GDP})_t + \alpha_4 \Delta \text{GDP}_{-1} + \alpha_5 \log(\text{X}/\text{GDP})_{-1} + \alpha_6 \log(\text{M}/\text{GDP})_{-1} + \varepsilon_t(-1)$

Equation (7) is then estimated to obtain the results shown in table 4. Table 4 shows the results of the estimation of the short run ECM equation (7), all the variables are expressed in their first difference. In the short run the capital formation, $\Delta \log(\text{Kinv})$, is significant at the 5% level of significance, implying that investment promotes economic growth.

11 Discussion

It follows that capital inflows are possible in an economy that was relatively liberalized. The ratio of imports to GDP variable, $\log(\text{M}/\text{GDP})$, which is a proxy of openness (Harrison, 1996; Jin, 2000) is statistically significant at the 5% level in the short run, implying that import share indicates import penetration and is significant in the case of South African economy. The result of the study indicates relatively more imports of goods and services flowing into the country. In addition, the significant capital formation to GDP ratio is consistent with the view that an open economy allows foreign direct investment to flow in the country (Selelo & Sikwila, 2012). This indicates that openness leads to more investment in the form of imported machinery and equipment like those in textiles and motor industries, among others. The residuals variable, $\varepsilon_t(-1)$, was significant at the 10% significant level and it indicates an 18% spend of adjustment of GDP growth to its long term levels following shocks in the economy. In the short term exports ratio exhibits the expected positive impact on GDP growth, but insignificant. The lagged import share $(\text{M}/\text{GD})_{-1}$, export ratio, $(\text{X}/\text{GDP})_{-1}$ and GDP_{-1} are all insignificant in the short term. However, the log-lagged change variable, $\log(\text{GDP}_{-1})$, are significant at the 5% level, implying that previous growth rate impact on the current GDP. The significant import share variable indicates the relatively openness of the south African economy compared to other Sub-Saharan countries. Furthermore, the results shows that trade openness was an important factor that led to economic growth in the South African economy and other similar less developing countries, implying that a rise in trade improved balance of payment, employment, and thereby economic growth and development.

V.

12 Conclusion

We investigated the influence of trade openness on the economic growth of the South African economy. The study used quarterly data (1994Q1-2013Q4) aggregate GDP, export, import and capital formation time-series data for South Africa which is different from recent current study that employ cross-country policy variables. We employed regression equation and cointegration method to estimate the Openness-GDP nexus for South Africa. The results showed that there was long-run relationship (positive correlation) between exports, imports and gross fixed capital formation with GDP growth. The relationship between trade openness and estimating the short-and long term effects. The ratio of imports to GDP as a proxy for openness was significant, implying that South African economy was relatively open unlike other African countries which have maintained high trade barriers through tariffs and quantitative restrictions. The challenge for the South African authorities is to continue improving the trade openness policy in order to sustain economic growth and development whilst continually evaluating implementation in order to counteract policy reversals and conceivable adoption of half measures that can, possibly, undermine the intended objectives of boosting trade and exports thereby collapsing protectionism. Evidence suggested that strengthening and additional trade liberalisation strategy enhanced export diversification pointing to the importance of policies that afford South Africa access to inputs at world prices as well as comparative-competitive exchange rates. We, therefore, recommend that openness trade policy is an appropriate strategy for South African economy in the long term, using the period of transition to global economy, creating competitiveness enhancing infrastructures and strengthening institutions involved in the promotion of trade openness, exerting major influence on the composition and aggregate growth of trade.

¹© 2014 Global Journals Inc. (US)

²For example: the four East Asian countries; Taiwan, Hong Kong, South Korea and Singapore.



Figure 1:

3

Variable	
C	9778593.68
X/GDP	15617304
M/GDP	- 1195.98 324.30.27
Kinv	2.68.29.99

Figure 2: Table 3 :

4

Year Observations = 60; R-squared = 0.93; D.W statistics = 2.3

2014

Volume

XIV

Is-

sue

VII

Ver-

sion

I

(

)

B

Global Variable

Variable	Coefficient	Std. Error	t	-statistics	C
of OG(X/GDP)	0.0097	0.078	0.125		
Man OG(M/GDP)	0.273	0.138	1.96		
age(Kinv)	0.282	0.123	2.31	**	
ment)	-0.428	0.123	-3.52	**	
and1	0.027	0.045	0.600		
Busil	-0.043	0.063	-0.630		

Journal

of OG(X/GDP) 0.0097 0.078 0.125

Man OG(M/GDP) 0.273 0.138 1.96

age(Kinv) 0.282 0.123 2.31 **

ment) -0.428 0.123 -3.52 **

and1 0.027 0.045 0.600

Busil -0.043 0.063 -0.630

ness

Re-

search

(?) (-1)

0.266 0.149 -1.779

** Statistically significant at 5% level

Observations = 60; R -squared = 0.41; Durbin-Watson statistics = 1.94

[Note: IV.]

Figure 3: Table 4 :

- [Levine and Renelt ()] 'A Sensitivity of cross-country growth regression'. R Levine , D Renelt . *American Economic Review* 1992. 82 (4) p. .
- [Radelet and Sachs ()] 'Asia's Reemergence'. S Radelet , J Sachs . *Foreign Affairs* 1997. 76 (6) p. .
- [Morley and Morgan ()] 'Causality between Exports, Productivity and Financial Support in European Union Agriculture'. B Morley , W Morgan . *Regional Studies* 2008. 42 (2) p. .
- [Du Toit ()] *Chronic and structural poverty in South Africa: Challenges for action and research*, A Du Toit . 2005. Centre for Social Science Research University of Cape Town
- [Engle and Granger ()] 'Cointegration and Error Correction: Representation, Estimation and Testing'. R F Engle , C W J Granger . *Econometrica* 1987. 55 p. .
- [Selelo and Sikwila ()] 'Determinants of Fixed Direct Investment in Botswana'. S E Selelo , M N Sikwila . *Journal of Economics and Behavioural Studies* 2012. 4 (7) p. .
- [Frankel and Romer ()] 'Does Trade Cause Growth?'. J A Frankel , D Romer . *American Economic Review* 1999. 89 (3) p. .
- [Barro and Sala-I-Martin ()] *Economic Growth*, R J Barro , X Sala-I-Martin . 1995. New York: Mc Graw-Hill.
- [Sachs and Warner ()] 'Economic Reform and the process of Global Integration'. J D Sachs , A Warner . *Brooking Papers of Economic Activity* 1995. 0 (1) p. .
- [Ben-David ()] 'Equalizing Exchange: Trade liberalization and Income convergence'. D Ben-David . *The Quarterly Journal of Economics* 1993. 108 (3) p. .
- [GDP (current US)WorldDevelopmentIndicators.WorldBank.Accessed(2013)] 'GDP (current US\$)'. www.worldbank.org World Development Indicators. World Bank. Accessed 2013. September 2014. 23.
- [Vamvakidis ()] 'How Robust Is the Growth-Openness Connection? Historical Evidence'. A Vamvakidis . *Journal of Economic Growth* 2002. 7 (1) p. .
- [Rodrik (1990)] *How Should Structural Adjustment Programmes be Designed?* World Development, D Rodrik . 1990. July. p. .
- [Romer ()] 'Increasing returns and long run growth'. P M Romer . *Journal of Political Economy* 1986. 94 (5) p. .
- [Granger ()] 'Investigating causal relations by econometric models and cross-spectral methods'. C W J Granger . *Econometrica* 1969. 37 p. .
- [Lucas ()] 'On the mechanics of economic development'. R E Lucas . *Journal of Monetary Economics* 1988. 22 (1) p. .
- [Harrison ()] 'Openness and Growth: A Timeseries, cross-country analysis for Developing Countries'. A Harrison . *Journal of Development Economics* 1996. 48 p. .
- [Jin ()] 'Openness and growth: an interpretation of empirical evidence from East Asian countries'. J C Jin . *The Journal of International Trade & Economic Development* 2000. 9 (1) p. .
- [Romer ()] 'Openness and inflation: Theory and evidence'. D Romer . *The Quarterly Journal of Economics* 1993. p. . (CVIII)
- [Edwards ()] 'Openness, trade liberalization and growth in developing countries'. S Edwards . *Journal of Economic Literature* 1993. 31 (3) p. .
- [Dollar ()] 'Outward-oriented developing economies really do grow more rapidly: Evidence B from 95 LDCs'. D Dollar . *Economic Development and Cultural change* 1992. 1976-1985. 40 (3) p. .
- [Rodrik ()] 'Policy Uncertainty and Private Investment in Developing Countries'. D Rodrik . *Journal of Development Economics* 1991. 36 p. .
- [Naseem ()] 'Review article: Rethinking the East Asian Miracle'. S M Naseem . *Journal of Economics Studies* 2003. 30 (6) p. .
- [Hedley (2014)] *Rising labour unrest motivates manufacturers to turn to mechanisation*, N Hedley . www.bdlive.co.za/business/industrials/2014/06/02/r June 2014. 23 September 2014. (ising-labour-unrest-motivates-manufacturers-to-turn-to-mechanisation)
- [Sato and Fukushige ()] S Sato , M Fukushige . *The End of Import-Led Growth? North Korean Evidence: Discussion Papers in Economics and Business. Discussion Paper*, 2007. p. .
- [Murshid ()] 'Testing the linkages between trade and productivity growth'. C Murshid , AP . *Utrecht School of economics* 2007. p. . (Discussion Paper Series)
- [Baldwin ()] 'The case against infantindustry tariff protection'. R E Baldwin . *Journal of political Economy* 1969. 77 (3) p. .
- [The East Asian Miracle: Economic Growth and Public Policy ()] *The East Asian Miracle: Economic Growth and Public Policy*, 1993. New York, NY: Oxford University Press.

- 266 [Mosikari and Sikwila ()] *The Relationship Between Trade Openness and GDP Growth Rate: The Case Study of*
267 *South Africa*, T J Mosikari , M N Sikwila . 2013. 1994Q 1 , 2008Q 4.
- 268 [Flatters and Stern (2007)] *Trade and Trade Policy in South Africa: Recent Trends and Future Prospects*, F
269 Flatters , M Stern . 2007. June. Development Network Africa.
- 270 [Awokuse ()] 'Trade openness and economic growth: is growth export-led or import-led?'. T O Awokuse . *Applied*
271 *Economics* 2008. 2008. 40 p. .
- 272 [Rodriguez and Rodrik ()] *Trade policy and Economic Growth: A skeptic's Guide to the cross-Nation Evidence*,
273 F Rodriguez , D Rodrik . 1999. (NBER Working Paper 7081)
- 274 [Rodriguez and Rodrik ()] 'Trade policy and economic growth: A skeptic's guide to the crossnational evidence'.
275 F Rodriguez , D Rodrik . *Macroeconomics annual*, Ben Bernanke, S Kenneth, Rogoff (ed.) (Cambridge) 2000.
276 2000. MIT Press.
- 277 [Musterd and Ostendorf ()] 'Urban segregation and the Welfare State'. S Musterd , W Ostendorf . *Routledge:*
278 *South Africa* 2013.