Business Administration and Business Economics

Analysis of the Role of Export Value on the Reserve of South Africa

Collins C. Ngwakwe[1]

Abstract: South Africa's reserve played a vital economic defence role during the economic crises of the recent past. However, little research has examined the relationship between export value and the reserve of South Africa. This paper contributes by assessing the impact of four independent variables (export value, government effectiveness, foreign direct investment and GDP) on the reserve of South Africa. Data were from the World Bank Archives of Global Financial Indicators and from the World Bank Archives of Governance Indicators from 1996 to 2014. A cointegration and the OLS regression test showed a long run relationship between export value, government effectiveness, foreign direct investment and the reserve of South Africa. The Granger causality test revealed that foreign reserve may influence export value (unidirectional), and that reserve may enhance government effectiveness. The paper offers policy recommendations that may improve the level of reserve and provides an agenda for further research.

Keywords: export value; reserve; economic growth; governance; public policy

JEL Classification: D4; D24; O4

1. Introduction

In this paper, the author attempts to evaluate the influence of export value on the total reserve of South Africa. This research is significant given the acclaimed critical role of a nation's reserve as a shock absorber against external economic turbulence and internal inflation cushioning. The paper is also pertinent because South Africa's economic and financial credibility has recently come under scrutiny with attendant uncertainty by international rating agencies. However, a nation's reserve plays a vital economic defence role against any form of financial turbulence or economic crises (Rodrik, 2006). South Africa's previous reserve cushioned the country against the recent-past global financial crisis. However, whilst much research exists on the benefits of foreign reserve on economic stability, little exists in existing research on the unique effect of the export value on the total reserve of South Africa. This paper

[1] Turfloop Graduate School of Leadership, Faculty of Management & Law, University of Limpopo, South Africa, Address: Turfloop Campus, Tel.: +27(0)152683332, Corresponding author: collins.ngwakwe@ul.ac.za.

is unique as it goes beyond export value effect on foreign research; it also looks into the likely effect of foreign direct investment and governance effectiveness on foreign reserve. Inclusion of governance effectiveness became apposite since Aizenman and Marion (2004) highlight that political economy might influence the level of reserve, but the truism in this assertion remains untested in South African setting. Another genre of literature point to the fact that economic policies affect government effectiveness (Dunleavy, 2014; Ilzetzki et al. 2013; Stiglitz & Rosengard, 2015; Fernández-Villaverde et al, 2015). However, the salient relationship between export value, reserve and the implication on government effectiveness is not common in South African literature.

2. Research Problem

The global financial crisis of the recent past galvanises the need for strengthening financial and economic policies (Rey, 2015). Research indicates that trade, investment and the concomitant creation of foreign reserve are vital ingredients to enhance governance (Jensen, 2003; Globerman & Shapiro, 2002). Interdependencies between economic policies, trade and investment deserve understanding for policy makers and administrators to strengthen economic progress of nations (Sternberg, 2015). Whilst some literatures have highlighted export-led growth in reserve, others have also indicated the importance of governance effectiveness, foreign direct investment (FDI) and GDP on reserve (Aizenman & Marion, 2004; Stevens & Lipsey, 1992; Aizenman, Cheung & Ito, 2015). However, to the best of the researcher's knowledge, no current research in South Africa has attempted to explore the combined relationship between the four independent variables (export value, governance effectiveness, FDI, and GDP) on the reserve of South Africa. Therefore, this paper aims to bridge this gap in the literature within the South African context and therefore contribute a new knowledge to the literature by analysing the combined relationship of the above four independent variables on the reserve of South Africa. The outcome of the analysis should provide a policy direction for improving reserve and as well, serve as an agenda for academic and research debate.

The following sections of the paper proceeds as follows. Immediately after the introduction, the paper presents a review of related literature. This is followed by the methodology and data analysis section. The final section presents the conclusion and recommendations.

2.1. Research Questions and objectives

Drawing from the preceding research problem, this research attempts to provide an answer to the following questions:

- How does export value relate to reserve?;

- Does governance effectiveness have a relationship with reserve?;
- What is the relationship between the GDP and reserve?;
- Does foreign direct investment relate to reserve?.

Therefore, given the research question above, this research reclines on the following objectives:

- to examine the relationship between export value and reserve;
- to evaluate the relationship between governance effectiveness and reserve;
- to analyse the relationship between the GDP and reserve;
- to assess how foreign direct investment relates to reserve.

3. Related Literature

In their analysis of precautionary demand for international reserves, Aizenman and Marion (2004) demonstrated that political issues might affect the amount of foreign reserve of a nation. They equally provide a stunning evidence to demonstrate that political venality tend to diminish the level of commitment by government to increase reserve in preference to increased external borrowing, which has the tendency of plunging a nation to greater financial risk and instability. As emerging markets exports increases, there is a higher propensity to accumulate enough income to pay off debts. This is why a decline in international debt of emerging markets has been found to boost their international reserves (Lane & Milesi-Ferretti, 2007). Higher reserve and/or growth in reserve against debt accumulation absorb countries from financial crisis (Bussière, Cheng, Chinn & Lisack, 2015). In a study on the effect of export on growth in India, the cointegration and Granger causality tests disclosed no long run association between economic growth and export values (Kumari & Malhotra, 2014); differing results in past research findings are attributed to variations in timing of data, proxies of variables used and analytical techniques (Kumari & Malhotra, 2014). A slight difference is notable in the findings of export led growth research in Europe; export diversification and portfolio increase amongst trading partners might add more value to growth (Ribeiro, Santos & Carvalho, 2013). Export-led growth and reserve accumulation has therefore been found to have a strong statistical relationship in current research (Srinivasan, Mahambare & Ramachandran, 2015). Nevertheless, the relationship that exists between exports and reserves can be conditional upon trade intensity and/or composition (Aizenman, Cheung & Ito, 2015).

Related study, which applied econometric approach within the Southern African Development Community (SADC) have shown a long-run positive relationship between export of manufactured products and economic growth of the region

(Mosikari, Senosi & Eita, 2016). Similarly, in another current exploratory review paper, Odhiamb and Malefane (2016) found a linkage between exports and economic growth of Lesotho; emphasis is on the need for exports to emanate be from manufacturing sector to enhance economic growth (Odhiamb & Malefane, 2016). These findings have been corroborated by another research from Kosovo, which concludes that the reserve of a nation can be enhanced through domestic production of goods and a properly strategized export oriented economy; this is important to avoid a country's spending outweighing its income (Merovci1 & Sekiraça, 2014). Other research has also supported earlier findings of export enhancement potential on economic growth (Iyidoğan et al, 2017; Shirazi & Manap, 2005). However, the levels of sophistication of goods play a significant role in enhancing economic growth (Jarreau & Poncet, 2012).

Despite the bourgeoning extant research on export-led growth, little research has examined specifically the relationship between export value, reserve and government effectiveness in South Africa. Therefore, this paper hopes to contribute by adding this genre of analysis from the South African perspective to the existing literature.

4. Research Method

The paper adopted a quantitative research approach by using the ordinary least square and Pairwise Granger Causality regression. Data were collected from the World Bank Archives of Global Financial Indicators and from the World Bank Archives of Governance Indicators covering from 1996 to 2014. Data analysis was first conducted by performing the co-integration test, followed by the Granger Causality test (Granger, 1969); thereafter the regression model for this paper was tested to determine the extent of relationship by using the least square approach. The Eviews Software was used in conducting the analysis.

The regression model:

$$\gamma = \beta_0 + \beta_1\chi_1 + \beta_2\chi_2 + \beta_3\chi_3 + \beta_4\chi_4\ \varepsilon$$

where:

Y = Total reserve;

b_0 = Y intercept ;

$b_{1\text{-}4}$ = regression coefficients;

χ_1 = export value.

Control variables:

χ_2 = Government effectiveness (GE);

χ_3 = foreign direct investment (FDI);

χ_4 = GDP;

e = error.

5. Analysis of Results

Table 5.1. Cointegration Test

Sample (adjusted): 1998 2014				
Included observations: 17 after adjustments				
Trend assumption: Linear deterministic trend				
Series: X1 X2 X3 X4 Y				
H0: variables are not cointegrated at 0.05				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.950091	135.3786	69.81889	0.0000
At most 1 *	0.881545	84.42026	47.85613	0.0000
At most 2 *	0.848761	48.15548	29.79707	0.0002
At most 3 *	0.572160	16.04429	15.49471	0.0413
At most 4	0.090423	1.611190	3.841466	0.2043

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: author's statistical analysi

Table 5.2. Granger Causality Tests

Pairwise Granger Causality Tests			
Sample: 1996 2014			
Lags: 2			
Where: χ_1 = export value; χ_2 = Government effectiveness; χ_3 = foreign direct investment; χ_4 = GDP			
Null Hypothesis:	Obs	F-Statistic	Prob.
X2 does not Granger Cause X1	17	1.27077	0.3158
X1 does not Granger Cause X2		18.9687	0.0002
X3 does not Granger Cause X1	17	1.31264	0.3051

X1 does not Granger Cause X3		2.63288	0.1127
X4 does not Granger Cause X1	17	0.52119	0.6067
X1 does not Granger Cause X4		0.90106	0.4319
Y does not Granger Cause X1	17	18.8783	0.0002
X1 does not Granger Cause Y		0.60599	0.5614
X3 does not Granger Cause X2	17	2.59990	0.1153
X2 does not Granger Cause X3		3.04954	0.0849
X4 does not Granger Cause X2	17	1.97916	0.1808
X2 does not Granger Cause X4		1.15636	0.3473
Y does not Granger Cause X2	17	39.6629	5.E-06
X2 does not Granger Cause Y		0.22042	0.8054
X4 does not Granger Cause X3	17	1.29904	0.3085
X3 does not Granger Cause X4		0.56933	0.5805
Y does not Granger Cause X3	17	3.03427	0.0858
X3 does not Granger Cause Y		1.23732	0.3247
Y does not Granger Cause X4	17	1.03635	0.3844
X4 does not Granger Cause Y		0.36930	0.6988

Source: author's statistical analysis

Table 5.3. Ordinary Least Square (OLS) Test Result

Dependent Variable: Y
Method: Least Squares
Sample: 1996 2014
Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.23657	7.661786	1.988645	0.0667
X1 (ExportValue)	0.128434	0.016776	7.655621	0.0000
X2 (GovEffectivenss)	-30.23358	9.387059	-3.220772	0.0062

X3	(ForeignDI)	0.606126	0.293077	2.068142	0.0576
X4	(GDP)	-0.262093	0.570492	-0.459416	0.6530

R-squared	0.976555	Mean dependent var	24.29474
Adjusted R-squared	0.969857	S.D. dependent var	18.23575
S.E. of regression	3.166046	Akaike info criterion	5.363778
Sum squared resid	140.3339	Schwarz criterion	5.612315
Log likelihood	-45.95589	Hannan-Quinn criter.	5.405841
F-statistic	145.7882	Durbin-Watson stat	2.611878
Prob(F-statistic)	0.000000		

Source: Author's statistical analysis

Table 5.4. Normality Test: Jarque-Bera Test for Normality

Ho: Data is not normally distributed *Since P = 0.023, we reject the null hypothesis, hence research data is normality distributed*	
Series Residuals Sample 1996 – 2014 Observations 19	
Mean	-7.64e-15
Median	0.045796
Maximum	8.321059
Minimum	-5.246968
Std. Dev.	2.792190
Skewness	0.948256
Kurtosis	5.418251
Jarque_Bera	7.477051
Probability	0.023789

Source: Author's statistical analysis

Table 5.5. Heteroskedasticity Test: ARCH

Heteroskedasticity Test: ARCH *Ho: there is no ARCH effect* *Since P > 0.05, we accept the null hypothesis that there is no Arch effect*				
F-statistic	0.213469	Prob. F(6,6)		0.9589
Obs*R-squared	2.286915	Prob. Chi-Square(6)		0.8915

Source: Author's statistical analysis

6. Discussion

This paper aimed at examining how export value relates to the reserve of South Africa, in doing this, the researcher added other three variables highlighted in the literature as having potential relationships with reserve, which are governance effectiveness, FDI and GDP. The preceding analysis from the OLS show that, indeed export value relates to reserve within the period of analysis, but the relationship is unidirectional because the Granger causality test shows that reserve might affect the level of export. Similarly, the Granger causality test shows that the reserve of South Africa might affect the level of government effectiveness. This might be plausible, as a nation with enough reserve would use available financial resources to provide service delivery rather than servicing of accumulated debts. The statistical results can be interpreted to be valid since the normality and heteroskedasticity tests indicate that research data were normally distributed and that there is no Arch effect – showing there is no heteroskedasticity. In addition, although the Granger causality test does not show causal effect on FDI, but the OLS results show that foreign direct investment (FDI) might boost the reserve of South Africa, this is noteworthy for economic policy makers. This finding can be comparable to the findings of Temiz and Gokmen (2014) in which they find relationship between FDI, balance of payment and export value.

7. Conclusion & Future Direction for Research and Policy

Results from the analysis of data, has shown that a relationship does exist between South Africa's reserve and export value. However, the relationship is unidirectional since the findings show that reserve might affect the level of export value. A noteworthy finding is that South Africa's reserve might affect the level of government effectiveness and level of export value. Additionally, FDI is depicted to have a relationship with the reserve of South Africa. These findings offer important economic policy and future research implications. Rather than preference to the importation of goods, South Africa's economic policy should assume a radical stance by encouraging manufacturing-FDI inflow as this might improve the level of reserve, thereby reducing borrowing and debt servicing; this will enable the channelling of internally generated revenue to basic service provision. In addition, given the dire need for improved government effectiveness in South Africa, the paper recommends that economic policies should encourage a boost in the level of manufactured exports to increase the reserve of the nation. Such policies might include financial liberalisation that would enable the growth of private finance businesses and improved local manufacturing businesses, which exists in developed countries.

Future research is apposite to add corruption to the regression model to ascertain the likelihood that corruption might affect the level of reserve.

8. References

Aizenman, J. & Marion, N. (2004). International reserve holdings with sovereign risk and costly tax collection. *The Economic Journal*, 114(497), pp. 569-591.

Aizenman, J.; Cheung, Y.W. & Ito, H. (2015). International reserves before and after the global crisis: Is there no end to hoarding?. *Journal of International Money and Finance*, 52, pp. 102-126.

Bussière, M.; Cheng, G.; Chinn, M.D. & Lisack, N. (2015). For a few dollars more: Reserves and growth in times of crises. *Journal of International Money and Finance*, 52, pp. 127-145.

Cheng, G. (2015). Balance sheet effects, foreign reserves and public policies. *Journal of International Money and Finance*, 59, pp. 146-165.

Claessens, S., Stracca, L., & Warnock, F. E. (2015). International dimensions of conventional and unconventional monetary policy. *Journal of International Money and Finance*.

Dunleavy, P. (2014). *Democracy, bureaucracy and public choice: Economic approaches in political science*. Routledge.

Fernández-Villaverde, J.; Guerrón-Quintana, P.; Kuester, K. & Rubio-Ramírez, J. (2015). Fiscal volatility shocks and economic activity. *The American Economic Review*, 105(11), pp. 3352-3384.

Globerman, S. & Shapiro, D. (2002). Global foreign direct investment flows: The role of governance infrastructure. *World development*, 30(11), pp. 1899-1919.

Granger, C. (1969). Investigating causal relation by econometric models and cross-spectral methods. Econometrica, 37(3), pp. 424–438.

Ilzetzki, E.; Mendoza, E.G. & Végh, C.A. (2013). How big (small?) are fiscal multipliers?. *Journal of Monetary Economics*, 60(2), pp. 239-254.

Iyidoğan, P.V.; Dalgiç, B. & Akbulut, H. (2017). Is there a non-linear relationship between trade and growth? A panel threshold analysis for Central and Eastern European countries. *Acta Oeconomica*, 67(1), pp. 117-136.

Jarreau, J. & Poncet, S. (2012). Export sophistication and economic growth: Evidence from China. *Journal of development Economics*, 97(2), pp. 281-292.

Jensen, N. M. (2003). Democratic governance and multinational corporations: Political regimes and inflows of foreign direct investment. *International organization*, 57(03), pp. 587-616.

Kumari, D. & Malhotra, N. (2014). Export-led growth in India: Cointegration and causality analysis. *Journal of Economics and Development Studies*, 2(2), pp. 297-310.

Lane, P.R. & Milesi-Ferretti, G.M. (2007). The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970–2004. *Journal of international Economics*, 73(2), pp. 223-250.

Merovci1, S. & Sekiraça, E. (2014). The Impact of Trade Balance in the Current Account of Kosovo's Balance of Payments. *Acta Universitatis Danubius. Œconomica,* 10(1), pp. 94-107

Mosikari, T.J.; Senosi, C.M. & Eita, H.J. (2016). Manufactured exports and economic growth in Southern African Development Community (SADC) region: A panel cointegration approach. *Acta Universitatis Danubius. Œconomica,* 12(5), pp. 266 – 278.

Odhiamb, N. & Malefane, M. (2016). The Role of International Trade in Lesotho's Economic Growth: A Review. *Acta Universitatis Danubius. Œconomica,* 12(5), pp. 211-226.

Rey, H. (2015). *Dilemma not trilemma: the global financial cycle and monetary policy independence* (No. w21162). National Bureau of Economic Research.

Ribeiro, A.P.; Santos, P.G.T. & Carvalho, V. (2013). *Export-led growth in Europe: Where and what to export?* No. 5265. EcoMod.

Rodrik, D. (2006). The social cost of foreign exchange reserves. *International Economic Journal*, *20*(3), pp.253-266.

Rosenau, J.N. (1995). Governance in the Twenty-first Century. *Global governance*, 1(1), pp. 13-43.

Shirazi, N.S. & Manap, T.A.A. (2005). Export-led growth hypothesis: further econometric evidence from South Asia. *Developing Economies*, 43(4), pp. 472-488.

Srinivasan, N.; Mahambare, V. & Ramachandran, M. (2015). *Capital Controls, Exchange Market Intervention and International Reserve Accumulation in India*. No. 2015-103.

Sternberg, C.S. (2015). Political legitimacy between democracy and effectiveness: trade-offs, interdependencies, and discursive constructions by the EU institutions. *European Political Science Review*, 7(04), pp. 615-638.

Stevens, G.V. & Lipsey, R.E. (1992). Interactions between domestic and foreign investment. *Journal of international money and Finance*, 11(1), pp. 40-62.

Stiglitz, J.E. & Rosengard, J.K. (2015). *Economics of the Public Sector: Fourth International Student Edition*. WW Norton & Company.

Temiz, D. & Gökmen, A. (2014). FDI inflow as an international business operation by MNCs and economic growth: An empirical study on Turkey. *International Business Review*, 23(1), pp. 145-154.