

Validating Twin Deficit Hypothesis: The Zambian Case

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Abstract

The fundamental goal of the research was to verify if the Twin Deficits Hypothesis holds for the economy of Zambia using time series data from 1980-2014. The current account and budget deficit were employed as key variables. The exchange rate was also used as a transmission mechanism to see how it contributes in the nexus. Cointegration tests confirmed a long run association of the variables. After fitting the VECM model, Granger causality tests confirmed the existence of twin deficits for Zambia. The results supported uni-directional reverse causality. The exchange rate was shown to be more significant in the long run than in the short run. The implosion of the time series as shown by the predicted cointegration equation implies that unless drastic measures are taken to cure the deficits, using the current account as the major target variable, twin deficits will persist for some time. The major policy implication of this research is that given that Zambia is a primary commodity-dependent developing country subsisting largely on copper revenues to sustain the economy, there is a need to move away from “copper addiction,” given the recent volatility of earnings of primary commodities (e.g. through diversification of the economy, import substitution, and other strategies).

Keywords Zambia, Twin Deficit, Granger Causality, VECM

1. INTRODUCTION

The first quarter of the 2016 International Monetary Fund (IMF) World Economic Outlook painted a gloomy picture of the global economic growth. The slow growth mode is exacerbated in developing countries, particularly those from sub-Saharan Africa and other economies based on natural resources. The IMF points to primary commodity driven countries such as Angola, Nigeria, Djibouti, Zambia etc. as among the most vulnerable.¹⁾ China, the world's largest consumer of Zambia's copper exports has caught a cold. As a result, Zambia's economy is sneezing as well, which has seen its export volumes plummet to its lowest levels in recent times. The country is hard hit. Statistics from UNCTAD attest to this. UNCTAD shows that normally 60% of Zambia's export

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1) imf : world economic update outlook <http://www.imf.org/external/pubs/ft/weo/2016/update/01/>

receipts come from copper. Presently, mining activity is depressed and at low levels.

Declining export receipts have resulted in the deterioration of both the current account and the budget, resulting in the current account deficit and budget deficit respectively. This phenomenon is called twin deficits by economists, a term which has given birth to twin deficit hypothesis (TDH) studies. It is against this backdrop that the research intends to investigate the existence of the twin deficits in Zambia and the extent to which this is attributable to its status as a commodity-dependent developing country (CDDC).

RESEARCH OBJECTIVES

The study aims to empirically diagnose the existence of twin deficits in Zambia and if the twin deficit holds in the country, the direction of causality between the current account deficit and budget deficit.

2. LITERATURE REVIEW

THEORETICAL LITERATURE REVIEW

Background to the Twin Deficit Hypothesis Study

The twin deficit hypothesis (TDH) is a proposition that states that there is a strong link between the Budget Deficit (BD) and the Current Account Deficit (CAD). The concept is not an intellectual orphan, as it has been in existence from the days of Keynes. It has, however, gained prominence around the 1980s when studies on the US economy showed that the trajectory of the CAD and BD from the 1980s to the early 1990s was in sync.

Economic theory opines that persistent twin deficits are likely to trigger a weakening of a currency, which can have a negative effect on an economy. According to Magazzino (2012), the TDH is based on a Keynesian proposition. The proposition has foundations rooted in the Mundell Fleming framework. Further, he argues that the THD asserts that fiscal deficits can trigger trade deficits or vice versa.

THEORETICAL FRAMEWORK FOR THE TWIN DEFICIT HYPOTHESIS

The development of the theoretical framework of the TDH owes much to the national income equation, which is given as:

$$Y = C + I + G + X - M \dots\dots\dots (1)$$

Y = national income

C= consumption

G= government expenditure

X-M= net exports

Economic theory also postulates that an individual's income is either consumed, saved, or spent on taxes, which leads to the following relationship:

$$Y = C + S + T \dots\dots\dots (2)$$

T= taxes

Substituting for Y in (1) gives;

$$C + S + T = C + I + G + X - M \dots\dots\dots (3)$$

Reducing (3) and re-arranging yields;

$$X - M = (I - S) + (G - T) \dots\dots\dots (4)$$

The resulting equation is very useful in giving us insight into the relationship between BD and CAD. The equation has led other economists to view fiscal deficits (G-T) as having a direct cause of current deficit (X-M) (Mandishekwa et al. 2014). It gives us a starting point in trying to characterize the relationship between the current account deficit and the fiscal deficit.

NEXUS BETWEEN THE CURRENT ACCOUNT DEFICIT AND FISCAL DEFICIT

The existence of a relationship between the two macroeconomic variables has given birth to several dimensions of understanding the relationship. This is mainly because different backgrounds within respective economies yield different relationships of the two macro variables. According to Kim and Kim (2006), which was cited in Magazzino (2012), there are basically four causation linkages of fiscal and trade deficits explained by the following hypothesis:

MUNDELL FLEMING MODEL

This is the conventional or traditional view of the TDH (Magazzino, 2012). This model is grounded in the Keynesian Absorption Theory. It is premised under the following assumptions. For a small economy near full employment, the interest rate between the domestic and international is

assumed to be the same, and the two deficits are assumed to be positively related. Opeyemi (2012) argues that causality between the two deficits is triggered from the budget to the current account. A crucial link in this model is the exchange rate. Whenever there is a budget deficit, domestic absorption increases, thereby spiking up the aggregate demand in the economy. The net effect of this is to push domestic interests above the international interest rate. Imports will increase, consequently deteriorating the current account. Wilson et al (2006) cited in Prasad (2013:16) points out that the budget deficits will affect savings, capital formation, factor prices, and the exchange rate. The model thus assumes a unidirectional path, with causality starting from the budget to the current deficit.

The major shortcoming of the Mundell Fleming framework is exposed when the role of inflationary expectations is factored in. This can result in reverse causality. Kim and Kim (2006) cited by Opeyemi (2012) pointed out that the current account deficit can lead to a slower pace of economic growth, plunging the economy into a massive financial crisis.

NEOCLASSICAL VIEW

According to this view, the current account for an economy is deteriorating, which may result in a massive triggering of the fiscal deficits. This will be in anticipation of an imminent recovery. Thus, according to this view, the TDH will run from the current account to the budget.

RICARDIAN EQUIVALENCE HYPOTHESIS

Magazzino (2012), citing Kim and Kim (2006), describes this as the neutrality view. The Ricardian Equivalence hypothesis (REH) states that the two deficits have no link since economic agents are preoccupied by contemporary tax rates and budget deficits, (Mandishekwa et al. 2014). Thus, according to Prasad (2013), any change in government has no effect on variables such as investment, interest rates, and hence the trade deficits. Further, he argues that economic agents behave rationally when faced with tax cuts. They save more in the present for the future, which in turn invalidates the possibility of twin deficits.

The REH above is further supported by Magazzino (2012). He argues that any movements in variables such as taxes and budget deficits do no matter for real interests, quantity of investment, or the current account, thus resulting in no nexus between the two variables.

BI-DIRECTIONAL CAUSALITY

Another explanation of the relationship between the two deficits is offered by Kim and Kim (2006). According to Prasad (2013), this view is associated with studies carried out on Latin

American countries during the financial crisis. According to this view, in as much as fiscal deficits cause budget deficits, equally trade deficits can cause fiscal deficits.

TRANSMISSION MECHANISMS

An integral component in analysing the relationship between the current and fiscal deficits is how the BD feeds into the CAD. There are various conduits through which the BD can feed into the CAD. Abbas et al. (2010) in Opeyemi (2012), pinpoints three main channels, i.e. the real exchange rate, real interest rates, and real income. The overall impact of each on the BD CAD nexus hinges mainly on the features of each economy (Opeyemi 2012). For instance, the exchange rate is crucial in an economy where it is a floating rather than fixed regime. Prasad (2013) justifies the inclusion of the exchange rate in his analysis on the study of TDH for Nepal because of its role in international trade.

The real exchange rate is important because its oscillations have a direct bearing on price, which in turn affects consumption decisions in the economy. Niame (2008) points to this by citing the works of Fleming (1962), Mundell (1963), Volcker (1987), Kearney and Monadjeni (1990), and Haug (1990). All the experts emphasize the importance of interest rates and exchange rates as transmission mechanisms. For instance, they argue that for if there is an increase in BD, this forces interest rates to rise, thus causing capital inflows. This results in an appreciation of the exchange rate through an increased demand of domestic financial assets, further deteriorating the current account.

EMPIRICAL LITERATURE REVIEW

Vyshnyak (2000) carried out empirical work on investigating the presence of twin deficits for Ukraine and the direction of causality. He employed quarterly time series data and used the exchange rate as a transmission mechanism. The researcher employed the Granger causality test. The results showed that twin deficits exist for Ukraine and the budget deficit was causing the current account deficit.

Yanik (2006) sought to discover the relationship between the fiscal and trade deficit for Turkey for time series quarterly data spanning from 1988-2005. In the study, the researcher included a number of variables in the variable space unlike the bivariate model normally used in most research. This saw the inclusion of real interest, exchange rate, and real output. According to Kim and Roubini (2003) in Yanik (2006), this is better than a bivariate model, which is restricted, yet the two deficits could be linked by some other mechanisms. Yanik employed the ECM and Granger test in the study. The empirical findings showed a Ricardian equivalence since there was no

convergence of the two deficits.

South Korea is one of the countries with a fascinating history of economic development from being a pariah state in the early 1950s to becoming a high income state in the 1990s. Kim and Kim (2006) investigated the TDH in the context of Korea by employing the Granger and Wald tests. The researchers used time series data from 1970-2003. Their findings suggested that TDH was present for the period under study. However, the deficit runs from the CAD to the BD.

Ngakosso (2016) studied the applicability of the TDH to the economy of the Republic of Congo using data from 1980-2013. Congo has a relatively small economy to which the relationship of causality has significant macroeconomic impact. The tools employed for the research were the Cusum test and Granger test. Empirical findings confirmed the TDH. However the direction of causality was reverse.

Using time series data from 1970-2006, Niame (2008) undertook a study to investigate presence of TDH for the economy of Lebanon. The other objective of the study was to investigate the direction of the causality. The researcher applied standard econometric tools of the Granger test and cointegration tests. Empirical findings confirmed the existence of the THD running from the BD to the CAD. This was consistent with the small economy of Lebanon.

Argentina is a countries still in the early phase of economic development. Information on the relation between fiscal deficits and trade deficits becomes crucial. Ng (2011) investigated the case for TDH in Argentina using data from the first quarter of 1976 to the third quarter of 2010. In order to ensure that the error terms were uncorrelated, the researcher applied the Durbin Watson test. The whole study was grounded in the VAR framework. In order to determine causality, the Granger test was applied. The empirical results confirmed neutrality between the two deficits.

Italy is a developed country that mainly exports automobiles and machinery. Magazzino (2012) sought to investigate the presence of the TDH for the economy of Italy. Using 40 years of time series data from 1970-2010, the researcher applied the Granger causality test and the Johansen cointegration test to check on the long-term relationship of the two variables and the VAR framework. The researcher concluded that for the period under study, Italy had twin deficits running from the trade deficit to the fiscal deficit.

Although similar studies had been done earlier on the Nigerian economy, Opeyemi (2012) re-examined the nexus between the current deficit and the budget deficit for the country. The research used data from 1970-2010. The Multivariate Granger test was the methodology that the researcher employed. The findings revealed the existence of reverse causality, i.e. the deficit ran from the current account to the budget.

Peru has a small economy, and identifying the presence of twin deficits is crucial. Using quarterly data from 1980-2012, Sobrino (2012) discovered reverse causality between the deficits,

i.e., the CAD was the one feeding into the BD. The researcher made use of the Wald test in the analysis alongside the VAR framework.

Panagiotidis (2013) studied the concept of twin deficit in the context of Greece as a follow up to similar studies which had been conducted by Vamvoukas in 1994 using data from 1948-1994. The researcher, however, employed data from 1960-2010. The study was carried out within the VAR framework and also used the Granger test. The study found no relationship between the two deficits.

Employing the VECM model, Prasad (2013) was able to reveal the existence of twin deficits for the economy of Nepal. The research used 31 years of time series data from 1980-2011. The exchange rate was also used as a transmission mechanism. Prasad recommended that for an economy such as Nepal, it is imperative for productive capacity to be revamped, which goes a long way in quashing the deficits. The findings concluded that a uni-directional twin deficit exists for Nepal from the budget to the current balance.

Research was carried by Chaoneka (2014) for a number of selected countries in the regional block of SADC. The research covered 1980 to 2011 using the Granger test and the VAR framework. The two countries confirmed a unidirectional causality as well as the other two, which confirmed reverse causality.

Mandishekwa et al. (2014) revealed the presence of twin deficits for the case of Zimbabwe using time series data from 1980-2011. The Granger test and cointegration framework were factored into the study. The results confirmed the existence of twin deficits but with a lag length of two.

Yasmin (2015) studied the TDH for the economy of Pakistan. Pakistan is a fragile state which still heavily reliant on agriculture and imports of petroleum products, etc. She used annual time series data from 1990- 2010 in a bivariate framework. The methodology employed was the Granger test. Empirical findings suggested the presence of twin deficits and reverse causality.

RELEVANCE OF TWIN DEFICIT STUDY FOR THE ZAMBIAN ECONOMY

Twin deficit is a befitting and relevant study for the economy of Zambia due to a number of facts. Ever since the oil price shocks of 1973 and the resulting effect on commodity prices such as copper, the economy of Zambia has never fully recovered. Its budget and trade position has shown that the economy was and still is badly exposed due its massive “addiction” to copper revenues.

In the same vein, a result of the poor performance of its main export commodity on the global market over time, the exchange rate of the Kwacha has been gradually weakening, further straining the economy. For an import-dependent economy, this puts massive strain on the budget, further widening the rift between revenues and expenditures.

2. METHODOLOGY

DATA SOURCES AND DATA DESCRIPTION

The research uses secondary sources of data. These include data from the Bank of Zambia, the IMF, UNCTAD, INFOMINE, research papers on the TDH, trading economics, AfDB, the Ajou University Library, and then Ministry of Finance Zambia. The annual time series data used in this study is from 1980-2014.

MODEL SPECIFICATION

A trivariate model is adopted in this study. The key variables are current account deficit, budget deficit, and exchange rate, i.e. CAD, BD, and EXCH respectively. Most research on the TDH normally uses CAD and BD as the main variables.

This research, however, will also include exchange rate as an important channel of transmission (Niame 2008). This is further supported by Czinkota et al. (2011). They argue that exchange rate has become an important factor in trade volumes. Including the exchange rate also helps us capture as much possible information in order to avoid the omitted variable problem which normally occurs when a model is underspecified. The exchange rate of Zambia was fixed from 1964-1991 when it was liberalised. The volatility of the exchange rate since then has been crucial for its export performance. The research will rely on time series data spanning 34 years from 1980-2014. Data points on CAD and exchange rates are derived from the AfDB portal, UNCTAD statistics, and the Bank of Zambia.

ECONOMIC MODEL

This research involves the testing of economic theory as it is essential to construct an economic model. This is one of the critical steps in empirical analysis (Wooldridge 2009).

The economic model is as follows:

$$CAD_t = f(BD_t, EXCH_t)$$

ECONOMETRIC MODEL

The above economic model helps to show the functional form of the variables under study. The resulting econometric model of the above economic model is given as:

$$CAD_t = \beta_0 + \beta_1 BD_t + \beta_2 EXCH_t + e_t$$

CAD_t = current account balance

BD_t = the budget balance

$EXCH_t$ = The rate of real exchange rate

$\beta_0, \beta_1, \beta_2$ = unknown parameters

e_t = error/ disturbance term

ESTIMATION TECHNIQUES

UNIT ROOT TESTS

When using time series data (TSD), it is essential to ascertain whether the data is stationary. Thus unit root tests must first be conducted. Nelson and Plosser (1982) in Magazzino (2012) argue that most TSD are none stationary. This is also supported by Fleegeer (2006), cited in Opeyemi (2012). According to Magazzino, if there is a unit root, it implies that the mean and variance of the data are not time invariant.

The research makes use of three tests - the Augmented Dick Fuller test (ADF) and the Phillips-Perron (PP) test - to check on unit root.

Table 1 ADF Test Results

VARIABLE	Test Statistic	1 % Critical value	5 % Critical value	Remark
CAD	-2.702	-3.689	- 2.975	1 (1)
BD	-0.049	-3.689	- 2.975	1 (1)
EXCH	-0.681	-3.689	- 2.975	1 (1)

Table 2 PP Test Results

VARIABLE	Test Statistic	1 % Critical value	5 % Critical value	Remark
CAD	-2.651	-3.689	- 2.975	1 (1)
BD	-0.177	-3.689	- 2.975	1 (1)
EXCH	-0.578	-3.689	- 2.975	1 (1)

A variable is not stationary when the test statistic is less than the critical value at its level form. The null hypothesis for checking unit root is non stationary. From the tables using the two tests, it can be seen that all the three series are non-stationary and hence the null hypotheses cannot be rejected. Otherwise all the time series are integrated and of order 1, i.e., they follow 1 (1) process.

LAG LENGTH SELECTION CRITERIA

According to Mandishekwa et al., the lag length criteria are determined by the researcher. The research adopted AIC, LR and FPE criteria. According to Liew (2004), these two criteria are superior in case of samples of 60 and less. This is because they minimise chances of underestimating time lag while at the same time maximising the chance of recovering time lag.

Table 3 Lag Length Criteria Results

LAG	LR	FPE	AIC
1	.	6.2e+13	40.2694
2	11.07	7.9+13	40.493
3	31.719*	5.2e+13*	40.0504*
4	7.1263	8.0e+13	40.4012

Note: * chosen criteria of LR, FPE and AIC imposes maximum lag of 3.

COINTEGRATION TESTS

To analyse the long run association of the time series, the study carried out cointegration tests. According to Baum (2013), cointegration tests provide a framework for estimation, inference, and interpretation when variables are not covariance stationary. Both maximum statistics and trace statistics are reported in the Table below;

Table 4 Cointegration Test Results

Number of Cointegrating Ranks	Maximum Statistic	5 % Critical Value	Trace Statistic	5 % Critical Value
0	34.1443	20.97	47.8376	29.68
1	9.6807	14.07	13.6933	15.41
2	4.0127	3.76	4.0127	3.76
3				

Both trace and maximum statistics show that the null hypothesis of zero cointegrating equations can be rejected since both trace statistics and maximum statistics are greater than the 5% significance level. Presence of the list 1 cointegration equation can however not be rejected since the trace and maximum statistics are less than the 5% critical value.

GRANGER CAUSALITY TESTS USING VECM MODEL

The Vector Error Correction Model (VECM) framework being used produces the following equations:

$$\Delta CAD_t = \alpha_1 + \sum \beta_1 \Delta CAD_{t-1} + \sum \theta_1 \Delta BD_{t-1} + \sum \gamma_1 \Delta EXCH_{t-1} + \lambda_1 ECT_{t-1} + \epsilon_{1t} \dots (1)$$

$$\Delta BD_t = \alpha_2 + \sum \beta_2 \Delta BD_{t-1} + \sum \theta_2 \Delta CAD_{t-1} + \sum \gamma_2 \Delta EXCH_{t-1} + \lambda_2 ECT_{t-1} + \epsilon_{2t} \dots (2)$$

$$\Delta EXCH_t = \alpha_3 + \sum \beta_3 \Delta CAD_{t-1} + \sum \theta_3 \Delta BD_{t-1} + \sum \gamma_3 \Delta CAD_{t-1} + \lambda_3 ECT_{t-1} + \epsilon_{3t} \dots (3)$$

denotes differences of each preceding variable. λ_i is for the long run adjustment towards the equilibrium. α_i, β_i and θ_i are short run dynamics for all $i = (1, 2, 3...)$

Table 5 Granger causality test results

VARIABLES	(1)	(2)	(3)
	CAD	BD	EXCH
L._ce1	-0.106 (0.538)	-0.433*** (0.0000)	6.72e-06 (0.855)
LD.CAD	-0.0120 (0.955)	0.284*** (0.0000)	-9.88e-06 (0.827)
L2D.CAD	-0.437** (0.044)	0.337*** (0.0000)	1.14e-06 (0.980)
LD.BD	0.0576 (0.883)	-0.494*** (0.001)	9.72e-05 (0.244)
L2D.BD	-0.0448 (0.932)	-0.534*** (0.007)	6.90e-05 (0.536)
LD.EXCH	-1,068 (0.325)	405.3 (0.321)	-0.295 (0.202)
L2D.EXCH	459.9 (0.660)	-53.95 (0.891)	0.231 (0.299)

Notes: 1: p-values in parentheses

2: ***, ** and * indicate 1%, 5 % and 10 % significance levels

The p-value of 0.0000 shows that unidirectional long run causality from CAD→BD is strongly supported, and short run causality is also supported. The BD is also affected by its past values as shown by p-values in the region of 0.000. EXCH is more significant in the long run causality than in the short run. Results are consistent with findings for other natural resource-based economies such as those that depend on oil and mineral extraction.

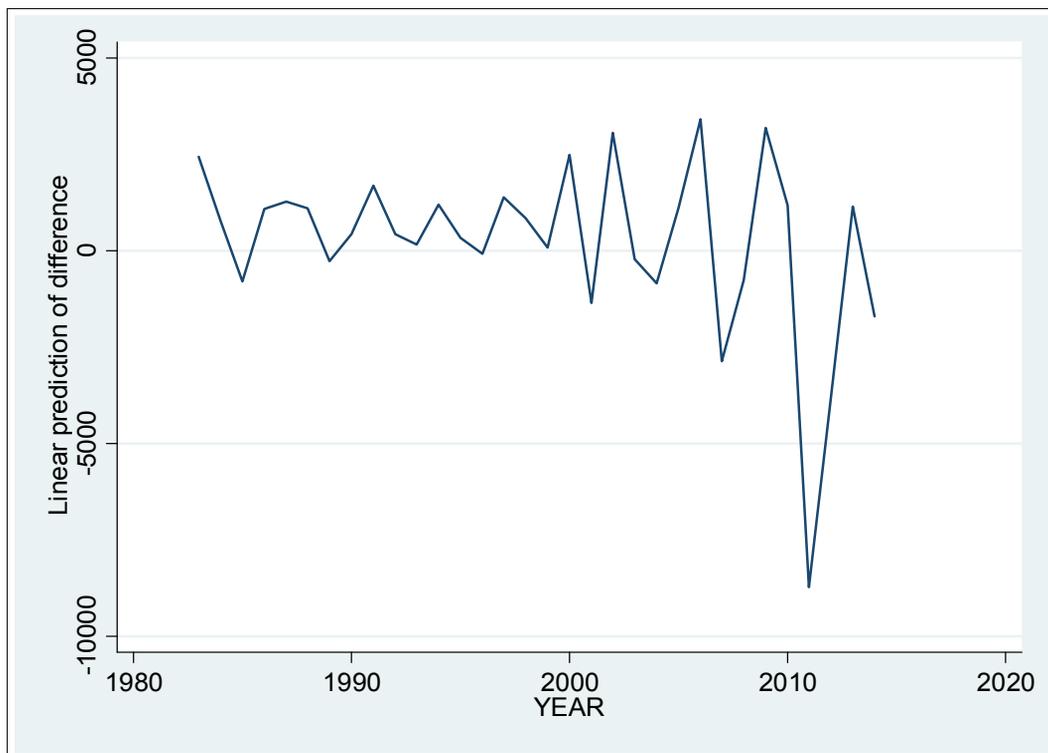
POSTESTIMATION SPECIFICATION TESTING

For post-estimation procedures after fitting the VECM model, the study carried out three procedures: (a) the prediction of the cointegration equation, (b) stability tests, and (c) 2 autocorrelation tests using the Lagrange Multiplier Test and the Breusch-Godfrey Test.

PREDICTING COINTEGRATION EQUATION

It is important to estimate the cointegrating equation of the time series. Baum (2013) argues that this helps to show how the cointegrating variables are related overtime. It also helps to predict their likely trajectory in the future. Figure 1 shows that the time series was somehow stable initially. Later on, it implodes. A possible explanation according to this research can be traced from two possible sources, i.e., the exchange rate and the movement of copper prices overtime. Both variables became much more unstable around the year 2000, which is when then time series becomes much more unstable as shown and is likely to persist into the future.

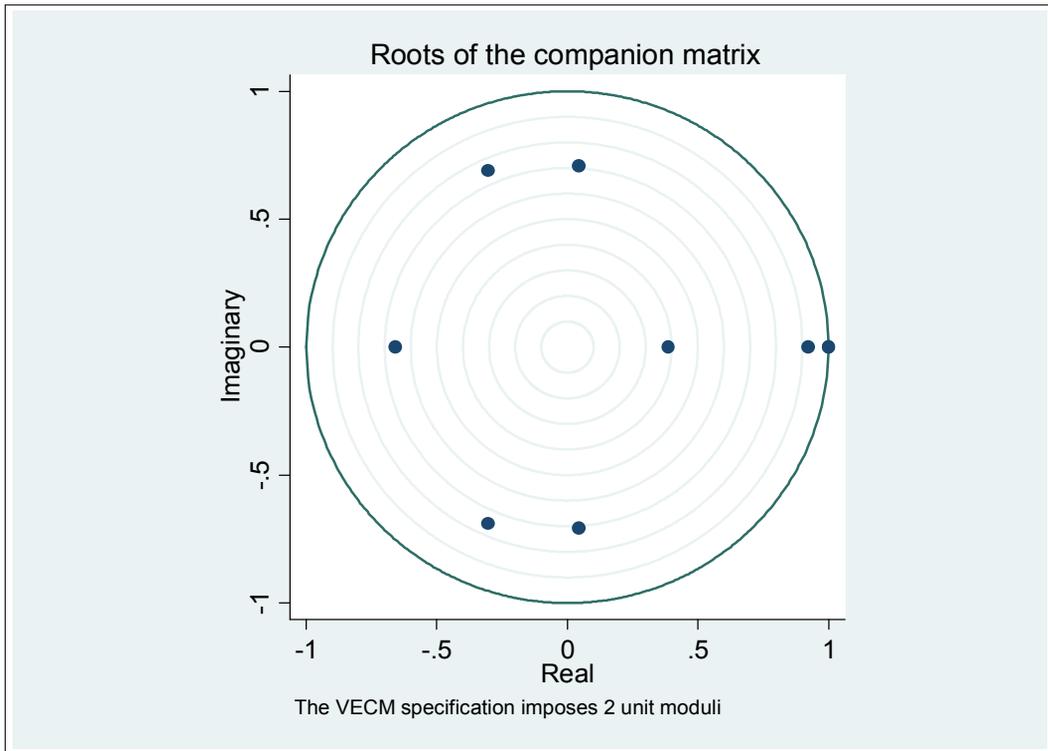
Figure 1 Cointegrating Equation



STABILITY TESTS

According to Adkins and Hill (2008), in order to see if we have correctly specified the number of cointegrating equations, the study uses stability tests employing the use of the companion matrix. Stability tests help us check whether the process of fitting the VECM was stable.

Figure 2 COMPANION MATRIX



All the Eigen values lie within the unit circle as shown in the companion matrix, further supporting that the model is stable. Thus the results from the companion matrix and the Eigen value stability tests show that the model fitted well and hence the results are reliable. It also shows that the fitted VECM model is efficient.

AUTOCORRELATION TESTS

The study employed the Lagrange Multiplier and Breusch–Godfrey tests for autocorrelation. The null hypotheses in both cases is no autocorrelation. The results are shown below.

Table 6 Lagrange Multiplier Test Results

lags	chi2	df	Prob > chi2
1	4.2711	9	0.89268
2	8.9636	9	0.44064

The p-value results show that there is no autocorrelation in the model both at the first and second lags, since there is weak evidence against the null hypothesis.

Table 7 Breusch- Godfrey Test Results

lags	chi2	df	Prob > chi2
1	0.079	1	0.7785

The result of the p-value shows that there is weak evidence against the null hypothesis, and hence there is no autocorrelation in the model.

3. DISCUSSIONS AND POLICY IMPLICATIONS

Well thought and prudent policy prescriptions are required if the Zambian economy hopes of any chance of extricating itself from the jaws of twin deficits. The predicted cointegration equation results show that unless drastic measures are taken to stabilise the trend, the time series will continue to be volatile for some time. The rift between the current account and the budget will continue to widen. Strategies targeting both the current account and the budget can work the desired magic on the economy starting, however, with the current account, as reflected in the direction of causality in the findings. There is need for diversification of the economy. This is a long run strategy to ensure that the economy gradually moves away from “addiction” to copper revenues. It can take a cue from Saudi Arabia, which recently announced a plan (Vision 2030) to diversify the economy in the wake of a slump in oil prices.²⁾ As of late, global demand has been sluggish, and primary commodity-dependent economies have been badly exposed. Options to diversify should not be limited to agriculture alone since the sector too is under severe threat from El Nino-induced drought, a serious exogenous shock.

Zambia also needs to work on improving its ease of doing business rankings. As of 2016, the country is now ranked at 98 out of 190, from ranking 97 in 2015.³⁾ More could be done to improve

2) the national <http://www.thenational.ae/business/economy/saudi-arabias-vision-2030-economic-diversification-plan-finalised-set-for-approval>

3) the world bank doing business rankings <http://www.doingbusiness.org/rankings>

this. It includes ensuring availability of key infrastructures (e.g., electricity) in the economy. Also, incentives should be availed to court numerous investors to other potential sectors beyond copper mining, such as manufacturing. This would help to bolster the export sector, improving the current account via the accompanying multiplier effects and boosting revenues as well.

Fiscal discipline is also called for in order to control government expenditures. In particular, ministries should live within their means, given limited fiscal space. This would help narrow the budget deficit. However, the proposal to create four more ministries by the new administration is likely to worsen budget deficits. The government should try to have a lean cabinet, which would help keep expenditures in check. The current size is too large and unsustainable for a small economy.

The productive capacity of the economy needs to be enhanced as well in order to add value on exports such as copper, the main export, cobalt, sugarcane, tobacco, etc. This would help to increase the value of exports, thus increasing foreign currency and boosting revenues.

There is need for import substitution measures to be implemented. Zambia still depends on massive imports of fuel, machinery, and a great deal of consumer goods. Thus, imports are a source of hemorrhaging foreign currency, causing the depreciation of the Kwacha over the years as shown in Figure 3, fueling massive external imbalances.

The main shortcoming of this study is that of the short data span used due to information unavailability. For further studies, I recommend more research into other explanatory variables as well as including the money supply model and other models.

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