

Importance of Trade Liberalization in Economic Growth Accounting: Evidence from Nigeria

Francis Ekanem

Submitted to the
Institute of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of

Master of Science
in
Economics

Eastern Mediterranean University
October 2017
Gazimağusa, North Cyprus

Approval of the Institute of Graduate Studies and Research

Assoc. Prof. Dr. Ali Hakan Ulusay
Acting Director

I certify that this thesis satisfies the requirements as a thesis for the degree of Master of Science in Economics.

Prof. Dr. Mehmet Balcılar
Chair, Department of Economics

We certify that we have read this thesis and that in our opinion it is fully adequate in scope and quality as a thesis for the degree of Master of Science in Economics.

Asst. Prof. Dr. Kemal Bağzıbağlı
Supervisor

Examining Committee

1. Assoc. Prof. Dr. Kamil Sertoğlu

2. Asst. Prof. Dr. Kemal Bağzıbağlı

3. Dr. Yenal Süreç

ABSTRACT

How trade liberalization influences economic growth is a subject of interest that has attracted a large number of researchers. This thesis investigates the importance of trade openness in accounting for the dynamics of per capita real income in Nigeria, during the period 1981-2015. This study makes use of the vector error correction model (VECM) as the method of estimation. The VECM is used in analyzing the short-run and long-run dynamics of economic variables, namely, gross domestic product per capita, oil rent, value added of agriculture, human capital, gross capital formation and trade openness used as a proxy for trade liberalization.

The estimation results of the thesis suggest that the speed of adjustment of disequilibrium among the variables of interest is around 25%. That is to say, it takes the variables 4 years to get back to their long-run equilibrium. The results also highlight the higher importance of the agricultural sector relative to the oil industry over the long-run. Our empirical analyses point out that trade openness does not have a significant impact on long-run adjustment among the real per capita income, human capital, agricultural value added and oil rent in Nigeria.

Keywords: Trade liberalization, Economic growth, Agricultural value added, Oil sector, Vector error correction model, Nigeria.

ÖZ

Ticaret serbestleşmesinin ekonomik büyümeyi nasıl etkilediği birçok araştırmacının ilgisini çekmiş bir konudur. Bu tez, 1981-2015 döneminde Nijerya'nın kişi başına düşen reel gelirindeki dinamikleri açıklamada ticaret açıklığının önemini incelemektedir. Çalışma tahmin yöntemi olarak vektör hata düzeltme modelini (VECM) kullanmaktadır. Kişi başına düşen gayri safi yurt içi hasıla, petrol rantı, tarım katma değeri, beşeri sermaye, gayri safi sermaye oluşumu ve ticaret açıklığı değişkenlerinin kısa ve uzun dönem dinamiklerini analiz etmek için VECM kullanılmıştır.

Tezin tahmin sonuçları değişkenler arası dengesizliğin düzelme hızının %25 civarı olduğunu belirtmektedir. Bu demektir ki, değişkenlerin geri uzun dönemli dengeye gelmeleri için 4 sene gerekmektedir. Bulgular ayrıca tarım sektörünün uzun dönemde petrol endüstrisine göre daha yüksek öneme sahip olduğunun altını çizmektedir. Ampirik analizlerimiz, ticaret açıklığının Nijerya'nın kişi başına düşen reel geliri, beşerî sermayesi, tarımsal katma değeri ve petrol rantı arasındaki uzun dönemli dengesizliğin düzelmesinde önemli etkisinin olmadığına dikkat çekmektedir.

Anahtar Kelimeler: Ticaret serbestleşmesi, ekonomik büyüme, tarımsal katma değer, petrol sektörü, vektör hata düzeltme modeli, Nijerya.

DEDICATION

I dedicate this work to God Almighty; my Creator

ACKNOWLEDGEMENT

All thanks to God, who gave me the strength, wisdom, and health throughout the period of this programme.

My profound and endless gratitude goes to my supervisor Asst. Prof. Dr. Kemal Bağzıbağlı for his tireless coaching, tutelage, and guidance through my thesis stage and my entire master programme.

I also seize this opportunity to sincerely extend my heartfelt gratitude to my wonderful parents: Mr. & Mrs. Ekanem for their prayers and support all the way. I want to also appreciate my siblings.

Finally, I want to thank my spectacular friends and colleagues who were also very helpful throughout this programme (Usman, Idoko, Tobi, Olalekan, Juliet, Bekun, Selah, and Williams). Love you all, see you at the top!

TABLE OF CONTENTS

ABSTRACT.....	iii
ÖZ.....	iv
DEDICATION.....	v
ACKNOWLEDGEMENT.....	vi
TABLE OF CONTENTS.....	vii
LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
LIST OF ABBRIVETIONS.....	xi
1 INTRODUCTION.....	1
1.1 Background of the Study.....	1
1.2 Statement of the Problem.....	3
1.3 Research Questions and Objectives.....	3
1.4 Structure of the Study.....	3
2 LITERATURE REVIEW.....	5
2.1 Economic growth and Trade liberalization.....	5
3 OVERVIEW OF THE NIGERIAN ECONOMY AND TRADE THEORIES.....	9
3.1 Overview of the Nigerian Economy.....	9
4 METHODOLOGY, DATA ANALYSIS AND THE EMPIRICAL RESULTS... ..	12
4.1 Methodology.....	12

4.2 Vector Error Correction Model (VECM).....	13
4.3 Unit Root Test Results	13
4.4 Johansen Multivariate Co-integration	15
4.5 Empirical Results	15
4.6 Granger Causality Tests	18
4.7 Residual Serial Correlation LM Test	19
4.8 Stability Test	20
5 CONCLUSIONS.....	21
REFERENCES	22
APPENDICES	27
Appendix A: Descriptive Statistics	28
Appendix B: Vector Error Correction Estimates	29

LIST OF TABLES

Table 1: The Summary of the Literature on Trade Liberalization.....	7
Table 2: Nigerian Economic Indicators from Pre and Post Trade Liberalization Periods (1973-2012).....	10
Table 3: Summary of Trade Policy Trends in Nigeria.....	10
Table 4: Unit Root Tests Results For ADF and PP (AT LEVEL).....	14
Table 5: Integration Result.....	15
Table 6: VECM Results	16
Table 7: Granger Causality Test Result	19
Table 8: The Result of VEC Residual serial correlation LM Test.....	19

LIST OF FIGURES

Figure 1: AR root graph.....	20
------------------------------	----

LIST OF ABBREVIATIONS

CETA	Comprehensive Economics and Trade Agreement
FDI	Foreign Direct Investment
NAFTA	North America Free Trade Agreement
OLS	Ordinary Least Squares
SAP	Structural Adjustment Program
TPP	Trans-Pacific Partnership
VECM	Vector Error Correction Model

Chapter 1

INTRODUCTION

1.1 Background of the Study

The financial exercise that encompasses globalization comes in three principle diversities or measurements. These are monetary measurement, political measurement, and social measurement. One of these financial interests is the trade openness which is among branches of the monetary measurement. How trade liberalization influences economic growth is a subject of interest that has attracted a large number of researchers. Trade openness has been analyzed by different scholars such as Rajan and Zingales (2003), Senay and Balcilar (2012), G. Gozger (2003), Jenkins and Larrin (1998), among others. They have found openness to be a great stimulus to economic growth and as a positive way of speeding up the development process. Romain and Kareen (2000) made the remark in their work that countries which open their economies for external trade always experience greater levels of economic growth than countries that are still having trade restrictions.

It is understood and well known that growth and trade liberalization can increase the development of a country by improving its standard of living, reducing the unemployment rate and increasing tax revenues which can be used for future public investments

Nigeria is a lower middle-income country with a mixed economic system. That is to say, she has an economic system that features characteristics of both market economy and centrally-controlled economy. Nigeria has gone through different kinds of trade reforms for the purpose of economic growth and development. In the 1970s the import substitution policy was the earliest form of trade liberalization before the introduction of structural adjustment programs (SAP) in 1986. As a result of an unproductive macroeconomic environment, such policy did not achieve much success. The start of SAP in 1986, however, leads to the introduction of trade liberalization, in terms of elimination of price control and complete removal of foreign exchange control. The reason behind the implementation of the SAP was to make a conducive environment to boost capital inflows, transfers, to increase the implementation of latest technologies and to increase the government's tax revenues. As a result, it would help to minimize the total dependence of Nigeria on the revenue emanating from the sales of crude oil.

In its present approaches, Nigeria recognizes further exchange mix as a way to cultivate financial development and mitigate over dependence on the oil sector. Export duties are being reduced, trade and exchange directions are under survey and control, and driven development programs for the domestic administrations and port framework have been controlled. The anticipated changes include extensive lifting up of importation bans, by enhancing the productivity of creation and utilization, while requiring modification of policies to the new, more focused monetary conditions.

1.2 Statement of the Problem

Over the past several decades the world had witnessed increased globalization. Researchers have consistently sold the idea of a more open global trade is necessary for economic growth. However, in recent times the world has begun to experience a pendulum slung towards protectionism, examples include occurrences like Brexit and North American Free Trade Agreement (NAFTA), Trans-pacific Partnership (TPP) and Comprehensive Economics and Trade Agreement (CETA). Nigeria is likewise not left out of this current trend. The nation has continuously placed bans on imported items as means of devaluating the value of the local currency. For example, the federal government of Nigeria has recently placed a ban on 25 imported items in addition to many others already banned. It is therefore important to investigate the implication of such trade protection policies on the economy of the country.

1.3 Research Questions and Objectives

Given the abovementioned problems of the Nigerian economy, we raise the following research questions in this thesis: Is oil sector the only driver of the Nigerian economy? What is the impact of trade openness on the economic growth of Nigeria? Does accounting for trade openness make any empirical difference for the analysis of economic growth of Nigeria? The main objective of this thesis is to analyze and try to answer these research questions using empirical data from the period of 1981-2015.

1.4 Structure of the Study

This research work is structured into five chapters. First chapter encompasses the introduction, the background of study, the statement of problem, the questions and objective of the research work, and as well the structure of the thesis. Chapter two comprises of the literature review, which entails theoretical and conceptual

framework of the causal effect of trade liberalization on growth with emphasis on the Nigerian economy. Chapter three focuses on the overview of the Nigerian economy. Chapter four contains the research methodology of the vector error correction model (VECM) framework. Chapter five consists of the conclusion and policy recommendations.

Chapter 2

LITERATURE REVIEW

2.1 Economic growth and Trade liberalization

The link between growth and trade liberalization has remained an issue questioned in the theoretical and empirical literature for a very long time. Although there is an extensive body of literature that focused on the relationship between trade openness and economic growth, there is, however, no general consensus on the nature of the relationship. While most development and international trade economists argue that trade openness is a key driver of both domestic and global economic growth, some other economists argue that protectionism has better effects on economic performance of countries. Supporters of trade openness claim that trade liberalization leads to specialization, increase resource productivity, increase output and as well employment generation (such as Dollar and Kraay, 2004; Frank and Romer, 1999; Freund and Bolark, 2008). On the other hand, opponents of trade openness (such as Musila and Yiheyis, 2015; Polat, Shahbaz, Rehman, and Satti, 2015; Ulasan, 2015; Valstou, 2010) claim that liberalization could i) be detrimental to economic growth by increasing inflation and lowering exchange rates, ii) introduce unfair competition between advanced technologies of developed nations and less advanced technologies of developing nations.

This chapter presents the related literature on the research topic. As mentioned above, the relationship between economic growth and trade liberalization has been

an issue questioned in the theoretical and empirical literature for a very long time. In the rest of this chapter, we summarize the literature on the relationship between trade openness and economic growth mainly in Nigeria together with some other selective studies.

Josheski et al. (2012) examined whether economic growth is influenced by international trade. The authors studied time series data from 208 regions and countries using Ordinary Least Squares (OLS) regression analysis. The variables used were trade openness, real investment to GDP as a proxy for physical capital and secondary school enrollment rate as a proxy for human capital. The empirical results of Josheski et al. (2012) show that i) the proportion of trade volume to GDP as a proxy of trade openness has a positive effect on economic growth, ii) black market premium as a proxy for the imbalance in macroeconomic policies have negative effect on economic growth, iii) in the presence of macroeconomic policies, trade has statistically and economically significantly positive effect on growth.

Burhan (2009) investigated the causal link between trade and economic growth in Tanzania for the period of 1950-2008. The estimation results show a short-run positive relationship and the long-run negative relationship between trade openness and economic growth. Burhan (2009) also suggests that there is bi-directional causality between openness and growth in Tanzania

Olaifa et al. (2003) applied OLS technique to GDP, trade openness, foreign direct investment (FDI), exports and imports in Nigeria in order to analyze the importance of trade openness for economic growth in Nigeria for the period of 1970-2012. They find a positive impact of trade on the economic growth of Nigeria.

Olabisi et al., (2015) estimated a fully modified OLS (FMOLS) using GDP, trade liberalization, exports, imports and population of Nigeria during 1980-2011. Empirical findings of the paper contradict with that of Olaifa et al. (2003) and Oseni (2015), which suggest a negative effect of trade openness on the growth of Nigerian economy. Olufemi (2004) estimated a VECM for Nigeria using data from 1970 to 2012. The paper observes a positive long-run relationship between openness and economic growth. This finding is then supported by Okon et al. (2013), Nduka (2013), Christopher et al. (2014) and Olaleye et al. (2015), where the relationship between trade openness and economic growth is analyzed using, respectively, autoregressive distributed lag (ARDL) in Okon et al. (2013) and Johansen co-integration in other three studies.

Table 1 below contains details of the studies cited in the previous paragraphs of this chapter.

Table 1: The Summary of the Literature on Trade Liberalization

AUTHORS	VARIABLES / COUNTRIES	DATA PERIOD	METHODOLOGY	CONCLUSIONS
Burhan (2009)	GDP, exports, imports, and export plus imports (total volume of trade) all as a percentage of GDP. Tanzania	1950-2008	Augmented Dicker Fuller, Johansen Co-integration, Granger causality, impulse response and the VAR model	Short-run positive relationship and the long-run negative relationship between openness and growth. Bi-directional causality between openness and growth.
Josheski et al., (2012)	trade openness, real investment as a percentage of GDP and human capital. Turkey and the European Union.	1960-2000	Ordinary Least Squares (OLS) technique	Positive relationship between trade openness and economic growth
Olabisi et al., (2015)	GDP, LIB, EXP, IMP, POP. Nigeria	1980-2011	ADF TEST, Johanssen integration, and FMOLS.	A negative effect of trade openness on economic growth.

Saibu et al., (2004)	GDP, TV, EXRT, EXP, IMP, NCI. Nigeria	1970-2012	ADF TEST, Johanssen integration technique and VECM.	A positive relationship between trade openness and economic growth
Olaleye et al., (2015)	RGDP, FDI, EXRT, and TO. Nigeria	1981-2012	ADF TEST, Johanssen integration	A positive relationship between trade openness and economic growth.
Christopher et al., (2014)	RGDP, TV, REXRT, TO, RIR, UNEMPLOY. Nigeria	1970-2010	OLS, ADF and Johanssen integration technique	A positive relationship between trade openness and economic growth.
Okon et al., (2013)	Interest rate spread (IRS), TO, EXRT, and IMP. Nigeria	1970-2008	ADF TEST, ARDL	A positive relationship between trade openness and economic growth.
Eleanya et al., (2013)	GDP, INV, (Govt) = Government Expenditure and TO. Nigeria	1970-2008	ADF TEST, Johanssen integration technique, and Granger causality	A positive relationship between trade openness and economic growth.
Akomolafe et al., (2015)	Carbondioxide(CO_2) emissions, EXP, IMP, RGDP,urbanization, and,ruralization. Nigeria	1960-2010	ADFTTEST,co-integration test, VECM, and Granger causality test	A negative relationship between trade openness and economic growth. Unidirectional causality from openness to growth

Table 1 clearly shows that studies analyzing different variables with different empirical techniques conclude differently on the relationship between trade openness and economic growth. This conclusion is present not only for Nigeria but for other economies summarized above. Given this inconsistency in the literature on Nigeria, we aim in this thesis to empirically analyze this important topic using the most recent data spanning the period 1981-2015.

Chapter 3

OVERVIEW OF THE NIGERIAN ECONOMY AND TRADE THEORIES

3.1 Overview of the Nigerian Economy

According to World Bank classifications, Nigeria is a lower middle-income country with expanding manufacturing sector, entertainment sector, telecommunication sector, services sectors, technology and financial sectors. In the aspect of nominal GDP, it is positioned as the 21st biggest economy in the world (20th according to the purchasing power parity). It is the biggest economy in Africa. Its re-emergent manufacturing sector turned into the biggest in the continent in 2013.

As we mentioned in the Introduction chapter of the thesis, the introduction of structural adjustment programs in 1986 is considered as the beginning of the trade liberalization in Nigeria.

Table 2 below shows some economic indicators of the Nigerian economy from the pre- and post-trade- liberalization periods.

Table 2: Nigerian Economic Indicators from Pre and Post Trade Liberalization Periods (1973-2012)

Economic Indicators (In US \$M)	Pre-Liberalization			Post-Liberalization			
	1973-77	1978-82	1983-86	1987-91	1992-97	1998-2002	2008-2012
GDP Growth Rate (%)	4.8	4.2	2.1	6.4	2.5	2.6	7.2
GDP per capita	413	772	331	273	314	445	1443
FDI inflow(\$M)	373	401	455	712	1.079	2.140	7.548
Exchange Rate	0.50	0.67	1.01	9.90	21.88	102.10	139.30
Interest Rate	1.2	3.5	3.8	5.7	7.1	4.2	18.8
Trade % of GDP	11.2	19.8	13.4	27.0	45.2	42.7	52.1
Total Population	67	74	85	97	112	123	156
Inflation Rate	9.0	17.8	44.6	57.2	10.0	15.2	11.7

The economic indicators above show that trade, as a percentage of GDP, doubled in the period of the post-liberalization. The net inflow of FDI also showed a similar movement. Approximately all the indicators indicated an increasing trend from the period of pre-liberalization to the period of post-liberalization.

Table 3: Summary of Trade Policy Trends in Nigeria

Years	Objectives	Tools and enforcement
1986-1994	Raw material imports were discouraged to promote food production locally made substitute goods. Tariff stabilization and harmonization growth of GDP through openness while reducing overdependence on the oil sector.	Reduction of tariff on intermediate goods to Raise capacity utilization and a mild ISI through import and export licenses.
1995-2000	Seven-year tariff programme to enhance tariff predictability and quantitative restriction on certain goods like maize, rice (WTO 1998) more commitment to liberalize trade	A tariff rate on final goods was reduced while that on raw materials and intermediate goods was raised. Here also quite a few products were prohibited.

	negotiations and agreements especially that of WTO	
2001 to date	Much greater commitment to liberalize trade and incorporate the third world countries into contributing positively to the world economy. Quest for regional groupings and comply with trade agreements with ECOWAS and reintegrating itself into the comity of the nations after military rule in 1999. Stabilizing the international value of naira	Agreements to fully establish ECOWAS free trade zone through i). Adopting a common trade and competition policy. ii) Adopting a common currency under the WAMZ protocol and eventual removal of all non-tariff barriers to trade, and introduction of a common external tariff regime....see NEEDS 2004 lowering tariff between 0-150% and final consumer commodities accruing higher tariff rates Further plans to conform to ECOWAS/UEMOA Rates of 0-20%

Sources: Nwafor, M, and WTO 1998 and 2005 Reports

Chapter 4

METHODOLOGY, DATA ANALYSIS AND THE EMPIRICAL RESULTS

4.1 Methodology

We mentioned earlier that the main objective of this thesis is to investigate the impact of trade openness on the growth of the Nigerian economy. The method adopted is the vector error correction model (VECM), making use of a time series data from the period 1981-2015, and making use of the World Development Indicators (WDI) as the source of our data. The five variables used include real gross domestic product per capita (RIPC) in constant 2010 US dollars, foreign direct investment as net inflows at current US dollars, oil rents as the percentage of GDP, trade openness as the share of trade volume (imports + exports) in GDP, human capital and gross capital formation at constant 2010 US dollars. See Appendix 1A for historical plots of these indicators.

The empirical route of this study proceeds as follows: First, we have tested the variables for the unit root, i.e. nonstationarity. We used the Augmented Dicker Fuller (ADF) and the Phillip Perron (PP) tests for this purpose¹. We also tested the variables for a long-run relationship with the aid of Johansen (1988) co-integration test. Third, we checked the direction of causation with the aid of Granger (1969) causality test. Given the conclusions of the abovementioned preliminary analyses, the study

¹ See Dickey and Fuller (1979) and Phillips and Perron (1998) for technical details of these tests.

employs a VECM to analyze the short- and long-run relationships between trade openness and economic growth with the help of other macroeconomic indicators.

4.2 Vector Error Correction Model (VECM)

Basically, VECM is a vector autoregression (VAR) model in error correction form which “treats each variable as potentially endogenous and relates the change in one variable to past equilibrium errors and to past changes in all variables in the system” (Onafowora and Owoye, 1998).

Our VECM depends on the following representation of the per capita output:

$$RIPC_t = \beta_0 + \beta_1 TO_t + \beta_2 AGRIC_t + \beta_3 HC_t + \beta_4 OILR_t + \beta_5 GCF_t + \varepsilon_t \quad (1)$$

In this system, the one-period lagged value of the residual enters the model as the error correction term (ECT). We estimate the long-term co-integration relationship in equation (1) and derive the ECT from this relationship. As mentioned earlier, we use the Johansen (1988) in order to estimate the cointegrating relationship among the variables in equation (1).

In light of equation (1), our VECM specification is as follows:

$$\begin{aligned} \Delta RIPC_t = & \alpha_0 + \sum_{i=1}^h \alpha_1 \Delta RIPC_{t-i} + \sum_{i=1}^k \beta_i \Delta TO_{t-i} + \sum_{i=1}^m \gamma_i \Delta AGRIC_{t-i} \\ & + \sum_{i=1}^n \delta_i \Delta HC_{t-i} + \sum_{i=1}^l \eta_i \Delta OILR_{t-i} + \sum_{i=1}^j \zeta_i \Delta GCF_{t-i} + \varphi ECT_{t-1} + \mu_t \end{aligned} \quad (2)$$

4.3 Unit Root Test Results

Table 4 below displays the ADF and the PP test results. The lag length was selected in a way to ensure that the residuals are white noise. The results indicate that all

variables are stationary at first difference, i.e. they are all I(1). Hence, all the variables enter the empirical model of the thesis in first difference.

Table 4: Unit Root Tests Results For ADF and PP (AT LEVEL)

	LNRI PC	HC	LNGCF	OILR	LNAGRIC	TO
ADF($\mu, \beta t$)	-2.009	-3.242	-3.185	-1.828	-2.100	-4.985
ADF(μ)	0.443	-0.526	-0.296	-0.636	0.324	-4.947
ADF(*)	1.141	1.666	0.641	-0.739	-4.235	-0.691
PP($\mu, \beta t$)	-2.097	-3.242	-3.450	-2.678	-2.108	-5.146
PP(μ)	0.177	-2.420	-1.342	-2.227	0.324	-4.947
PP(*)	0.930	6.645	0.082	-0.884	4.235	-1.347

Unit Root Tests Results (AT FIRST DIFFERENCE)

	LNRI PC	HC	LNGCF	OILR	LNAGRIC	TO
ADF($\mu, \beta t$)	-4.903*	-1.072*	-2.929*	-7.970*	-5.621*	-6.002*
ADF(μ)	-4.346*	-1.611*	3.183*	-7.427*	-5.634*	-6.148*
ADF(*)	-4.251*	0.110*	-3.025*	-7.517*	-3.943*	-6.230*
PP($\mu, \beta t$)	-4.852*	-1.072*	-5.135*	-14.88*	-5.621*	-9.394*
PP(μ)	-4.332*	-1.611*	-4.428*	-6.891*	-5.634*	-9.190*
PP(*)	-4.218*	-0.010*	4.498*	-6.933*	-4.139*	-9.421*

*Significant at 1%, ** Significant at 5%, ($\mu, \beta t$) Intercept and Trend, (μ) Trend no Intercept
 (*) No Intercept and Trend

Following the results of Table 4, we can conduct the Johansen co-integration test in order to test the existence of the long-run relationships among the variables. The results are displayed in Table 5 below.

4.4 Johansen Multivariate Co-integration

Table 5: Integration Result

Null Hypothesis		Trace	0.05	
H_0	Eigenvalue	Statistic	Critical Value	Prob.
$r=0$	0.7193	128.4488*	95.7537	0.0001
$r\leq 1$	0.6647	87.7945*	69.8189	0.0010
$r\leq 2$	0.6236	52.8241*	47.8561	0.0159
$r\leq 3$	0.3572	21.5554	29.7971	0.3239

*Rejection of the Hypothesis at 0.05 level

Table 5 shows that there exist three co-integrating vectors in the model. This allows us to base our main empirical results on a VECM.

4.5 Empirical Results

As mentioned earlier, we can estimate a VECM when all the variables in the model are integrated at the same level, i.e. $I(1)$, and show that there is a long-run relationship among them, i.e. they are co-integrated. The VECM method shows the speed of adjustment of the variables towards their long-run equilibrium. This coefficient is known as the error correcting term (ECT). When the term is negative and statistically significant, it indicates that the variables are converging towards their long-run equilibrium at the speed of the magnitude of the coefficient. Table 6 displays the results we have obtained by estimating a VECM with three co-integrating vectors, as suggested by the Johansen co-integration test results.

Table 6: VECM Results

Cointegrating Eq:	CointEq1	CointEq2	CointEq3			
LNRIPC(-1)	1.000000	0.000000	0.000000			
TO(-1)	0.000000	1.000000	0.000000			
HC(-1)	0.000000	0.000000	1.000000			
LNGCF(-1)	-0.121946 (0.04209) [-2.89698]	4069845. (3562053) [1.14256]	-0.072167 (0.02394) [-3.01427]			
LNAGRIC(-1)	-0.598259 (0.03319) [-18.0280]	-22022982 (2808143) [-7.84254]	-0.203471 (0.01887) [-10.7802]			
OILR(-1)	-0.007960 (0.00203) [-3.91943]	246644.0 (171858.) [1.43516]	0.004935 (0.00116) [4.27208]			
C	10.30539	3.89E+08	5.102858			
Error Correction:	D(LNRIPC)	D(TO)	D(HC)	D(LNGCF)	D(LNAGR)	D(OILR)
CointEq1	-0.267971 (0.07505) [-3.57054]	8897348. (8693139) [1.02349]	-0.034584 (0.00750) [-4.61198]	-0.210816 (0.25941) [-0.81269]	0.190963 (0.09665) [1.97574]	-12.83643 (10.4277) [-1.23099]
CointEq2	1.34E-10 (1.3E-09) [0.10242]	-0.664334 (0.15174) [-4.37804]	-6.11E-11 (1.3E-10) [-0.46647]	-7.20E-09 (4.5E-09) [-1.58936]	-6.67E-10 (1.7E-09) [-0.39538]	-4.51E-07 (1.8E-07) [-2.47997]
CointEq3	-0.372710 (0.22868) [-1.62984]	24518884 (2.6E+07) [0.92566]	0.021900 (0.02285) [0.95845]	0.866739 (0.79041) [1.09657]	0.863145 (0.29451) [2.93083]	-93.58375 (31.7734) [-2.94535]
C	0.012796 (0.00935) [1.36812]	475071.4 (1083365) [0.43851]	0.019959 (0.00093) [21.3574]	0.005500 (0.03233) [0.17013]	0.055895 (0.01205) [4.64037]	-0.416631 (1.29954) [-0.32060]
R-squared	0.384355	0.413424	0.770224	0.357869	0.246523	0.352510
Adj. R-squared	0.322791	0.354766	0.747247	0.293656	0.171175	0.287761
Sum sq. resids	0.089229	1.20E+15	0.000891	1.066000	0.147991	1722.569
S.E. equation	0.054537	6317049.	0.005449	0.188503	0.070236	7.577530
F-statistic	6.243134	7.048075	33.52071	5.573154	3.271806	5.444250
Log likelihood	52.78561	-578.5141	131.1018	10.61770	44.18444	-114.9725
Akaike AIC	-2.869742	34.26553	-7.476576	-0.389276	-2.363790	6.998383
Schwarz SC	-2.690170	34.44511	-7.297005	-0.209705	-2.184219	7.177955
Mean dependent	0.012796	475071.4	0.019959	0.005500	0.055895	-0.416631
S.D. dependent	0.066272	7864219.	0.010839	0.224290	0.077148	8.978727
Determinant resid covariance (dof adj.)	19360.66					
Determinant resid covariance	9136.379					
Log-likelihood	-444.5038					
Akaike information criterion	28.61787					
Schwarz criterion	30.50337					

Our VECM results suggest that the speed of adjustment of any disequilibrium among the variables of interest is 26.8%². That is to say when the variables diverge from their long-run equilibrium, every period (the year in our case) 26.8% of the disequilibrium is adjusted (corrected) and it takes the variables 3-4 years to get back to their long-run equilibrium. Our estimation results also show that this finding is statistically significant even at 1% level of significance.

Estimation results additionally and importantly suggest that the long-run impact of the agriculture sector on the per capita income is much higher than that of the oil sector. We reach this conclusion by comparing the coefficients of LNAGRIC(-1) and OILR(-1) which are -0.598259 and -0.007960, respectively. In other words, over the long-run, the increase in the value added of the agricultural sector in Nigeria is more effective than that in the oil sector in terms of their impact on per capita income of the country. This finding is of importance for policymakers who should not focus only on the oil sector and ignore other important sectors of the economy.

In order to investigate the empirical importance of accounting for trade openness when it comes to understanding the short-run and long-run dynamics of per capita income, we have conducted robustness estimations by dropping the TO variable from the model in Table 6. The estimation results of this model are presented in the table in Appendix B. Given the higher Schwarz criterion of the results in Table 6 relative to that in Appendix B, we conclude that accounting for trade openness in the context of interest of this thesis does not improve the fit of VECM to the data. When we compare the long-run coefficients of the agricultural value added (LNAGRIC) and

² This finding is read from the coefficient of CointEq1 for the first difference of the dependent variable, i.e D(LNRIPC) in Table 6.

the oil (OILR) variables in the models with and without trade openness (TO), we observe that importance of the agricultural sector relative to the oil industry is still present. Comparison of two results finally highlights that the speed of adjustment among the variables of interest is still around 25%. That is to say, TO does not play a significant role in bringing a long-run equilibrium among the variables in Table 6 other than TO.

4.6 Granger Causality Tests

The vector error correction (VEC) Granger causality is usually conducted to determine the direction of the relationship among variables and here we use VAR Granger Causality/Block Exogeneity Wald Tests³. The test results of Granger causality among the variables of interest tells us that there is a Granger causality running from only LNAGRIC to LNRIPC, HC to LNRIPC. Here we reject the null hypothesis that LNAGRIC does not Granger cause LNRIPC, HC does not Granger cause LNRIPC at 5% significance level. The implication is that the past values of LNAGRIC and HC can be used to predict LNRIPC. And also there is no Granger causality running from LNGCF to LNRIPC, OILR to LNRIPC. Here we fail to reject the null hypothesis that LNGCF and OILR do not Granger cause LNRIPC at the 5% level of significance. The implication is that the past value of LNGCF and OILR cannot be used to predict LNRIPC.

³ See Granger (1981) for details of this methodology.

Table 7: Granger Causality Test Result

Dependent variable: LNRIPC			
Excluded	Chi-sq	df	Prob.
HC	6.307963	2	0.0427
LNGCF	2.861129	2	0.2392
LNAGRIC	20.15023	2	0.0000
OILR	3.282803	2	0.1937
All	66.34733	8	0.0000

4.7 Residual Serial Correlation LM Test

Table 8 below presents the serial correction test results. We have conducted this test under the null hypothesis of no serial correlation among the residuals of the estimated model. According to the test results, we reject the null hypothesis at the 5% significance level and conclude that the residuals of our VECM are not a serially correlated. This is an indication of the stability of the estimated model in explaining the estimated relationship described earlier.

Table 8: The Result of VEC Residual serial correlation LM Test

Lags	LM-Stat	Prob
1	28.57773	0.2820
2	30.34909	0.2115
3	25.75648	0.4207
4	19.63229	0.7658
5	14.36284	0.9550

Probs from chi-square with 25 df.

4.8 Stability Test

As we can see from the graph below, all the inverse roots of the autoregressive characteristic polynomial are in the unit circle which shows that our model is stable.

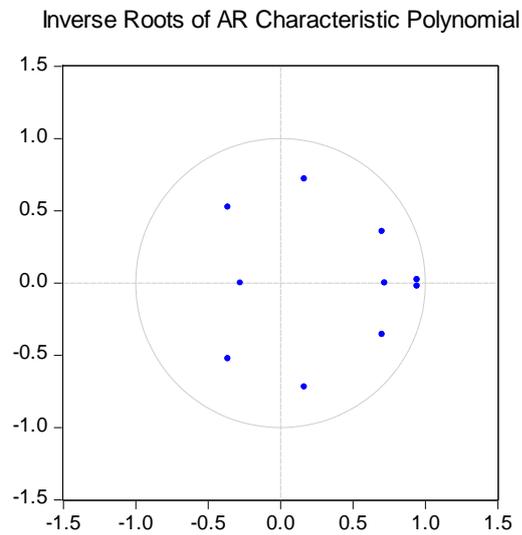


Figure 1: AR root graph

Chapter 5

CONCLUSIONS

This thesis has tried to shed some light on the importance of trade openness in empirically accounting for the short-run and long-run dynamics of per capita real income in Nigeria. The thesis has employed the VECM technique in order to analyze the cointegrating relationships of economic variables, namely, gross domestic product per capita, oil rent, value added of agriculture, human capital, gross capital formation and trade openness used as a proxy for trade liberalization.

The estimation results of the thesis suggest that the speed of adjustment of disequilibrium among the variables of interest is around 25%. That is to say, it takes the variables around 4 years to get back to their long-run equilibrium. The results also point out that inclusion of trade openness into the VECM of the thesis does not increase the speed of adjustment among the variables of real per capita income, human capital, agricultural value added and oil rent. Our Granger causality test results also suggest that there is no Granger causality from trade openness to economic growth. That is to say, the historical values of trade openness are not useful for predicting future values of economic growth in Nigeria. We consider these empirical findings in line with the inconclusive status of the literature on the impact of trade openness on economic growth of developing economies.

REFERENCES

- Adeniyi, O., Omisakin, O., Egwaikhide, F. O., & Oyinlola, A. (2012). Foreign direct investment, economic growth and financial sector development in small open developing economies. *Economic Analysis and Policy*, 42(1), 105-115.
- Burhan (2009). Causal link between trade and economic growth: evidence from Tanzania. *Proceedings of GBATA (2009)* 298-309.
- Chimobi, O. P. (2010). The causal relationship between financial development, trade openness and economic growth in Nigeria. *International Journal of Economics and Finance*, 2(2), 137.
- Ekpo, A. H., & Egwaikhide, F. O. (1994). Export and economic growth in Nigeria: A reconsideration of the evidence. *Journal of Economic Management*, 1(1), 100-115.
- Ekpo, Akpan H. "Openness and Economic Performance in Nigeria: A time series approach" A selected paper for the 1995 annual conference The Nigerian Economic Society. : 107-121.
- Frankel, J. A., & Romer, D. (1999). Does trade cause growth? *American Economic Review*, 379-399.

- Goldberg, L. S., & Klein, M. W. (1999). International trade and factor mobility: an empirical investigation (No. w7196). *National Bureau of Economic Research*.
- Granger, C. W. (1981). Some Properties of Time Series Data and Their Use in Econometric Model Specification. *Journal of Econometrics*, 121-130
- Jenkins (1998). Trade, protectionism, and industrial adjustment: the consumer electronics industry in North America. *Harvard Institute for international development*. Development discussion paper No. 267
- Johansen, S. (1988). Statistical Analysis of Co-integration Vectors. *Journal of Economic Dynamics and Control*, 231-254.
- Josheski, Dushko, Lazarov, and Darko (2012). International trade and economic growth: cross-country evidence. *GRP International Journal of Business and Economics* ISSN 2048-8556(online) vol. 1 No.2, pp.87-95
- Kalu, U., Nwude, C. E., & Nwonye Nnenna, E. (2016). Does Trade Openness Engineer Economic Growth in Nigeria? (Empirical Evidence Covering 1991 to 2013). *Global Journal of Management and Business Research*, 16(4).
- Nduka, E. K. (2013). Openness and Economic Growth in Nigeria. *Journal of Education and Practice*, 4(1), 68-73.

- Nduka, E. K., Chukwu, J. O., & Nwakair, K. I. U. O. N. (2013). Trade openness and economic growth: A comparative analysis of the pre and post-structural adjustment programme (SAP) periods in Nigeria. *Asian Journal of Business and Economic*, 3(3.4).
- Olabisi, Olabode, and Eric (2015). Trade liberalization and economic growth in Nigeria: do concern matter? *International Journal of Economics and Empirical Research*. 3(6), 313-318.
- Olaife, Kolawole, and Biala (2013). Trade liberalization and economic growth in Nigeria; a co-integration analysis. *Journal of Business, Economics, and Finance* ISSN: 2146-7943.
- Oladipo, O. S. (1998). Trade Liberalisation and Economic Growth. *Ife Social Science Review*, 15(1), 80.
- Onafowora, O. A., & Owoye, O. (1998). Can trade liberalization stimulate economic growth in Africa? *World Development*, 26(3), 497-506.
- Paudel, R. C. (2014). Growth and export performance of developing countries: is landlockedness destiny? *The Australian National University*,
- Rajan and Zingales (2003a). Trade and economic growth in developing countries: evidence from sub-Saharan Africa. *Journal of African Trade*, JEL classification f14; 040

- Rajan and Zingales (2003b). The great reversals: the politics of financial development in the twentieth century. *Journal of Financial Economics*, 69, 5-50.
- Ravinthirakumaran, N. (2014). Applicability of Openness-led Growth Hypothesis in Sri Lanka: An ARDL Bounds Test. *South Asia Economic Journal*, 15(2), 241-263.
- Rodriguez, F., & Rodrik, D. (2000). Trade policy and economic growth: a skeptic's guide to the cross-national evidence. *NBER Macroeconomics Annual*, 15, 261-325.
- Saibu, Muibi, and Olufemi (2004). Trade openness and economic growth in Nigeria: further evidence on the causality issue. SAJEMS NS 7 (2004) No 2. JEL F14, 43.
- Sarkar, P. (2007). Does Foreign Direct Investment Promote Growth? Panel data and Time Series Evidence from Less Developed Countries, 1970-2002. *The Munich Personal RePEc Archive*, 5176.
- Senay and Balcilar (2012). Trade openness and financial openness: a time series evidence from Turkey (1989:1-2007:2). *International Journal of Banking, Accounting, and Finance*, 2012, vol. 4, issue 2, 172-201.

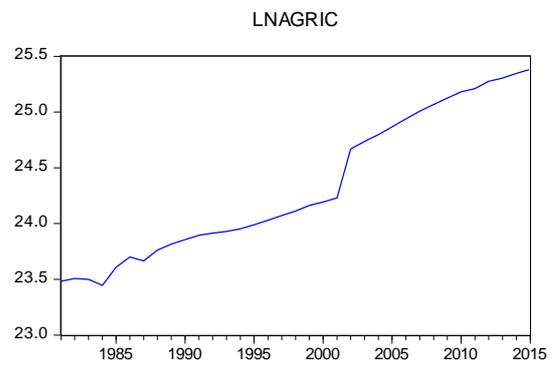
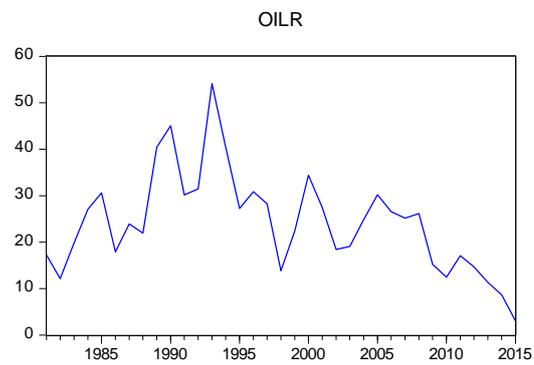
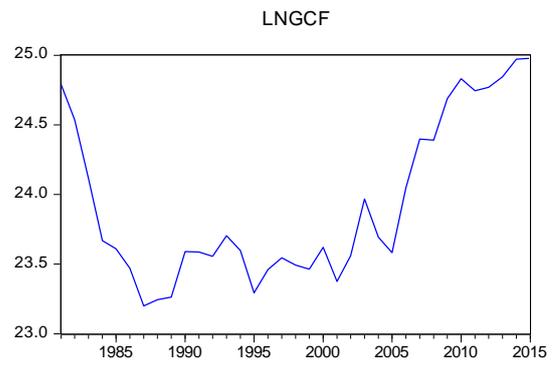
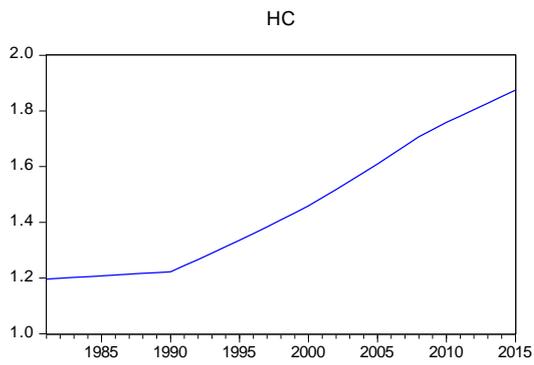
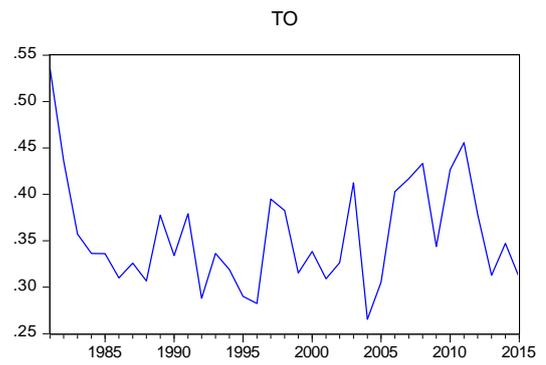
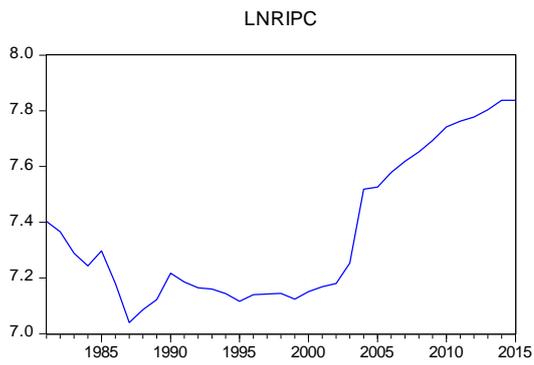
Uka, E. M. (1999). The reform of theological education in Nigeria/Africa: Interco transformation. *Journals of Dharma*, vol.24, 301-317

Uwakaeme, O. S. (2015). Economic Growth in Nigeria: An Empirical Investigation of Determinants and Causal Relationship (1980–2012). *American Journal of Economics*, 5(1), 9-20.

Yanikkaya, H. (2003). Trade openness and economic growth: a cross-country empirical investigation. *Journal of Development Economics*, 72(1), 57-89.

APPENDICES

Appendix A: Descriptive Statistics



Appendix B: Vector Error Correction Estimates

Sample (adjusted): 1982 2015
 Included observations: 34 after adjustments
 Standard errors in () & t-statistics in []

Cointegrating Eq:	CointEq1	CointEq2	CointEq3		
LNRIPC(-1)	1.000000	0.000000	0.000000		
HC(-1)	0.000000	1.000000	0.000000		
LNGCF(-1)	0.000000	0.000000	1.000000		
OILR(-1)	-0.006279 (0.00239) [-2.62840]	0.005792 (0.00104) [5.55513]	0.014252 (0.00836) [1.70560]		
LNAGRIC(-1)	-0.717306 (0.03832) [-18.7198]	-0.276018 (0.01672) [-16.5038]	-0.973479 (0.13403) [-7.26289]		
C	10.24212	5.119769	-0.597077		
Error Correction:	D(LNRIPC)	D(HC)	D(LNGCF)	D(OILR)	D(LNAGRI C)
CointEq1	-0.237887 (0.08610) [-2.76293]	-0.034506 (0.00868) [-3.97693]	0.127628 (0.28029) [0.45535]	4.567816 (11.3144) [0.40372]	0.259984 (0.10840) [2.39847]
CointEq2	-0.392785 (0.23213) [-1.69207]	0.022999 (0.02339) [0.98317]	0.739866 (0.75568) [0.97908]	-99.49022 (30.5047) [-3.26147]	0.856026 (0.29225) [2.92913]
CointEq3	0.039285 (0.04066) [0.96628]	0.002323 (0.00410) [0.56699]	-0.317690 (0.13235) [-2.40039]	-6.019215 (5.34261) [-1.12664]	-0.139729 (0.05118) [-2.72994]
C	0.012796 (0.00930) [1.37536]	0.019959 (0.00094) [21.2882]	0.005500 (0.03029) [0.18160]	-0.416631 (1.22261) [-0.34077]	0.055895 (0.01171) [4.77200]
R-squared	0.390820	0.768727	0.436384	0.426892	0.287516
Adj. R-squared	0.329902	0.745600	0.380022	0.369582	0.216268
Sum sq. resids	0.088292	0.000897	0.935658	1524.683	0.139940
S.E. equation	0.054250	0.005467	0.176603	7.129009	0.068298
F-statistic	6.415505	33.23895	7.742561	7.448732	4.035411
Log likelihood	52.96506	130.9914	12.83480	-112.8980	45.13544
Akaike AIC	-2.880298	-7.470081	-0.519694	6.876353	-2.419732
Schwarz SC	-2.700726	-7.290509	-0.340122	7.055924	-2.240160
Mean dependent	0.012796	0.019959	0.005500	-0.416631	0.055895
S.D. dependent	0.066272	0.010839	0.224290	8.978727	0.077148
Determinant resid covariance (dof adj.)	4.46E-10				
Determinant resid covariance	2.39E-10				
Log-likelihood	135.4300				
Akaike information criterion	-5.907647				
Schwarz criterion	-4.336393				