POLAC INTERNATIONAL JOURNAL OF ECONOMICS
AND MANAGEMENT SCIENCE (PIJEMS)
DEPARTMENT OF ECONOMICS AND MANAGEMENT SCIENCE
NIGERIA POLICE ACADEMY, KANO

TRADE OPENNESS, EXCHANGE RATE AND ECONOMIC GROWTH RELATIONSHIP IN SELECTED OPEC COUNTRIES

Mohammed A. Sani Monetary Policy Department, Central Bank of Nigeria
A.A. Alexander Department of Economics, Nigerian Defence academy, Kaduna
M. Muktar Department of Economics, Bayero University, Kano
Y. Alfa Department of Economics, Nigerian Defence academy, Kaduna

Abstract

This study examines trade openness, exchange rate and economic growth relationship in selected OPEC countries. Four countries (Nigeria, Saudi Arabia, Venezuela and Indonesia) were selected from OPEC for the study. Annual panel data from World Bank Development indicators were collected on exchange rate (EXCR), gross domestic product growth rate (GDPG), trade openness (TRDO), oil price (OILP) and foreign reserve (FORR). The data were analyzed using the fixed and the random effect models of panel co-integration. Findings from the study show that trade openness, has a significant impact on economic growth of the four member countries of OPEC while the impact, on economic growth, of exchange rate is not significant. Based on the findings the study recommends that OPEC member countries should improve cooperation among economic actors by using export consortia to help SMEs in the region access the international markets. In addition, they should use long term export-led-growth policies such as export promotion policies and other domestic policies aimed at enhancing productivity and technological content of domestic products.

Keywords: *Trade openness, exchange rate, FEM, REM, panel co-integration*

JEL Classification: F43; L16; N7; Q4

1. Introduction

Literature on international trade recognizes trade as a vital catalyst for economic development. The theoretical literature has argued that trade openness leads to economic growth (Dollar 1992; Sachs & Warner 1995; Rodríguez & Rodrik 2001, Winters, 2004; and Rodríguez, 2007). From empirical literature studies such as that of Jan and Awudu (2017); Jamilah, Zulkornain and Muzarar (2016); Marjan and Karim (2016), it was observed that trade openness lead to economic growth as recent studies is concerned. However, other studies such as, Ryan (2012) and Gries and Redlin (2012), where not in consensus with the view that trade openness does not lead to growth.

According to World Trade Organization (2017), trade has continued to support economic growth and development, helping to reduce poverty around the world. Statistics from World Trade Organization (2017) indicate that world merchandise exports have increased in value by about 32 per cent since 2006, reaching $ 16 trillion in 2016. At the same time, world exports of commercial services have accelerated by about 64 per cent, reaching a total of $ 4.77 trillion (WTO, 2017). However, the Dwindling world trade growth is both a contributing factor and a symptom of the global economic slowdown. The global trade growth has been volatile over the past four decades, (WTO, 2017); the volatility of trade growth has resulted to macroeconomic fluctuation across various economies especially among OPEC countries. OPEC has contributed to global trade through production and export of crude oil.

The knowledge of the patterns of inter-country propagation of economic shocks and the degree of vulnerability of a particular country to shocks originating from other countries is crucial for sound macroeconomic management (Canova, 2005). The recent global economic crisis which has affected majority of the oil exporting countries due to the fall in international crude oil prices has made a lot of countries to revisit their trade policies. This situation has renewed interest in understanding both the determinants of the cyclical fluctuations of international trade and the role of international trade in transmitting business cycles across integrated economies.

Furthermore, according to Francisco and Luis (2002) international trade can induce macroeconomic fluctuations in a small open economy. These fluctuations in emergent countries exhibit a high volatility of the

terms of trade. This volatility is particularly intense in petroleum exporting countries most especially members of the OPEC. Indeed, an important fraction of trade in these economies comes from oil exports and associated with oil price change. Moreover, a narrow range of non-oil commodities constitutes a less significant fraction of their exports, and their main import items are intermediate inputs, consumable goods and capital goods. Their export revenues are highly unstable due to recurrent and sharp fluctuations in crude oil prices. These countries are extremely vulnerable to changes in the world oil market. A thorough understanding of the sources of macroeconomic fluctuations in OPEC economies requires a good grasp of the impact of external shocks, namely fluctuations in the prices of exported primary commodities, import of both consumable and capital goods.

The Angola Government established a tax import of luxury products, which are now subject to a one percent surcharge (WTO, 2016). Ecuador's import policies are increasingly restrictive and results to an uncertain environment for traders in many sectors (WTO, 2015). Since 2011, Ecuador has pursued a strategic policy of import substitution (WTO, 2016). According to the WTO trade policy review (TPR), Ecuador's tariff structure has been more complex. Ecuador generally apply a simple four-tiered tariff structure with levels of 5% for most raw materials and capital goods, 10% or 5% for intermediate goods, and 20% for most consumer goods (WTO 2013). The products subject to selective import substitution measures include; fertilizers, agrichemicals, pesticides and fungicides, soaps, detergents and cosmetics, other chemicals, ceramic tiles and floors, textiles, clothing, footwear, leather, radios, television, telephones, electronics, and electrical appliances (WTO, 2016).
As a member of the Gulf Cooperation Council (GCC), Kuwait started applying the GCC common external tariff since 2003 (WTO, 2011). As a result, the simple average tariff declined from 7.7% in 2002 to 4.8% in 2011. According to WTO (2017), Kuwait tariffs averages 5.7% on agricultural products and 4.6% on non-agricultural products; 98.6% of all tariff lines are ad valorem, with 19 mixed tariff lines on tobacco and tobacco products. Kuwait bound all tariff lines, except on oil, petroleum, and petrochemicals (WTO, 2017). The tariff rate in Saudi Arabia averages 5%. Saudi Arabia applies free trade policy to general products, placing no quantitative or price controls on imports (WTO, 2011).

However, Saudi law prohibits importation of the following products; weapons, alcohol, narcotics, pork, pornographic materials, distillery equipment, and certain sculptures. Imported foods are subject to health and sanitation requirements, as well as point of origin labeling (WTO, 2011). These policies are implemented for several reasons, one of it is to manage the level of macroeconomic fluctuation associated with increased in transmission of trade shocks and promote economic growth.

However, the growing concern on the relationship between trade openness and economic growth has taken relevance in both theoretical and empirical literature. Studies on oil exporting countries have been centered on the volatility of oil prices and its effects on economic growth and most studies look at oil price volatility as the major cause of macroeconomic fluctuation in most of the oil exporting countries. However, it seems that researchers have ignored the fact that trade shocks may lead to macroeconomic fluctuation in oil exporting countries especially the developing oil exporting countries and most of these countries are members of Organization of Petroleum Exporting Countries (OPEC).

The nature of small open economy such as that of developing oil exporting countries most especially OPEC countries, are characterized by high importation and low level of exportation mainly one commodity exports which is crude oil export, are more likely to exhibit a high volatility of the terms of trade. The imbalances between advance economies and small open economies have seen the later experience macroeconomic fluctuations induced by external trade shocks.

Given the above, this study employed the Panel Vector Autoregression (PVAR) of Abrigo and Love (2015) to investigate the transmission of trade shocks and macroeconomic fluctuations among OPEC countries and employed the dynamic panel data models to examine the relationship between trade openness and economic growth in OPEC countries. This study was motivated by considering the nature of the economy of OPEC countries that are highly imported dependent, and one commodity (oil) export dependent.

2. Literature Review

2.1 Trade Openness

For a long time, economists have attempted to find comparative measures of trade openness but this has proven to be controversial and difficult. As Winters (2004) posited, the definition and measure the degree of trade openness of an economy is indeed a tough task and is a common problem associated with most studies (Winters, 2004). According to Alcala and Ciccone (2003), trade openness can be measured in different ways. It is difficult to construct a universally acceptable measure of trade openness. Various contending measures of openness such as trade intensity, tariff and non-tariff

barriers, the indices constructed by Dollar (1992) and Sachs and Warner (1995) are available to potential researchers.

To investigate this measurement, this study acknowledges that openness is a multidimensional concept. However, some studies choose openness measures due to data availability and some other researchers have constructed indices that measure the degree one country exports and imports goods, such as Dollar (1992), Sachs and Warner (1995) and Leamer (1998).

Further arguments suggest that, trade dependency ratios are the most popular of these measures. Their main advantage is that the data required to compute them are available for nearly all countries and over a rather long period (Bourdon, Chantal & Mariana, 2014). Their main weakness is that they are mainly outcome-based measures, and as such, are the result of very complex interactions between numerous factors so that it is not clear what such measures exactly capture. Another limitation of these trade dependency ratios as pointed out by Bourdon, Chantal and Mariana (2014) lies in their endogeneity in growth regressions, which requires specific estimation techniques (such as instrumental variables techniques as in Frankel and Romer, 1999, and Irwin and Tervio, 2002, or identification through heteroskedasticity techniques as in Lee, Ricci, & Rigobon, 2004).

For the purpose of this study, the study will use the trade dependency ratio that is the ratio of exports and import to GDP as measure for trade openness. This is because of availability of data and it is most widely used trade openness measure in recent literatures. The nature of the study necessitates the use of this trade openness measure since the study will try to ascertain the external shocks that cause macroeconomic dynamics in the economy of OPEC member countries.

2.2 Exchange Rate

Exchange rate is the price of one country's currency in terms of another (Adeneye, Otto & Cookey, 2014). In a more formal sense, exchange rate indicates the international value of money in terms of purchasing power, and changes in exchange rate indicates changes in this value. The importance of exchange rate derives from the fact that it connects the price systems of two different countries making it possible for international trade to make direct comparison of traded goods. In other words, it links domestic prices with international prices.

In order for currencies to trade in a common market, one currency must be expressed in terms of the other. An exchange rate is the price of one currency in terms of another (Mishkin and Eakins, 2009). They can either be direct or indirect whereby a direct quotation refers to how much of the home currency is required to buy a unit of the foreign currency while an indirect quotation refers to how much a unit of the foreign currency can be obtained for a unit of the home currency (Howells and Bain, 2007) (Kabura, 2014).

Mohagheghazadeh, Nasiri and Mohagheghazadeh (2014) describe exchange rate as one of the most important economic variables that can affect many of the basic variables. Both the demand side and the supply side will be influenced by exchange rate. The demand sector will be influenced by exchange rate through exports and imports as well as changing at reserves, and on the other hand the supply sector will be influenced by exchange rate through imported intermediate goods. Many economic researchers have focused on the changes in exchange rate due to its major role in the price of a set of economic variables, and the interplay of them.

In addition, the real exchange rate, as a measure of equity value of the national currency against the currencies of other countries, reflects a country's economic situation compared with other countries. Exchange rate is divided into two types: official and unofficial. The official exchange rate is set by the government according to the specific conditions that rule on the economy. It will be announced and supported by the central bank under a system of fixed exchange. In contrast, there is a parallel market. The unofficial market is known as free market or black market that is based on extra supply and demand in the market and its rate is usually higher than official rate.

According to Martins (2015), Exchange rate volatility (ERV) is defined as a variation of the prices of one currency in terms of another. By depreciating or appreciating the value of a foreign currency, profitability of foreign exchange trades will be affected. Volatility in this case takes into account all the movement and changes that are influential for a depreciation/appreciation of a currency. As volatility is referred to as an unpredictable and unobservable pattern, foreign investors became more aware and tried to get much more information in order to make it possible to dispend less transaction costs by hedging against exchange rate volatility risk. By hedging against exchange rate volatility, investors have to take into account that these methods bring with them some drawbacks. For example, when dealing with forward contracts or some type of foreign business contract in which, one party could immediately convert its money to

the foreign currency to avoid negative consequences from volatility. However, the drawback of this hedging strategy is that, the money invested and converted in the foreign currency, is no longer useful for future domestic opportunities. Despite the hedging strategies against ERV, there is always (like in any other investment) a sunk cost to be endured, and for foreign investors, this is as always a huge disincentive for them to invest abroad, especially with a huge uncertainty that ERV brings.

2.3 Hecksher – Ohlin (HO) Theory of International Trade

The Heckscher-Ohlin (HO) model was developed by two Swedish economists; Eli Heckscher (in a 1919 article) and his student Bertil Ohlin (developed Heckscher's ideas further in his 1924 dissertation). The Hecksher-Ohlin theory focuses on the differences in relative factors endowments and factors prices between nations as the most determinants of trade (On the assumption of equal or similar technology and tastes). Hecksher Ohlin maintained that the sources of the factors endowments determine a nation's comparative advantage. On this basis the theory is referred to as the Factor Endowment Theory. The theory analyzed the differences in factors endowment on international specialization. The model was based on two main prepositions; firstly, a country with specialization in the production and export of a commodity whose production requires intensive use of abundant resources. This implies that goods differ in factor requirement. Secondly, countries differ in factor endowment. Some countries have mush capital per worker and some have less. Countries could be ranked by factor abundance (Hassan 2007).

Hassan (2007) explained that the model assumed two countries, two commodities and two factors. There is perfect competition in both factor and product market. It assumed that factor inputs; labour and capital in the two countries are homogeneous. Production function also exhibits constant return to scale. Production possibility curve is concave to the origin.

On Heckscher-Ohlin theorem, a capital-abundant country will export a capital-intensive good and a labour-abundant country will export a labor-intensive good is well explained by Dung (2015). Consider two countries, Japan and Nigeria for example, and the assumptions applied to the Heckscher-Ohlin theory include a similarity in production functions (identical technology) and aggregate preferences across the two countries. The difference in resource endowments between two countries is sufficient to generate different PPFs, such that equilibrium price ratios would be different in autarky.

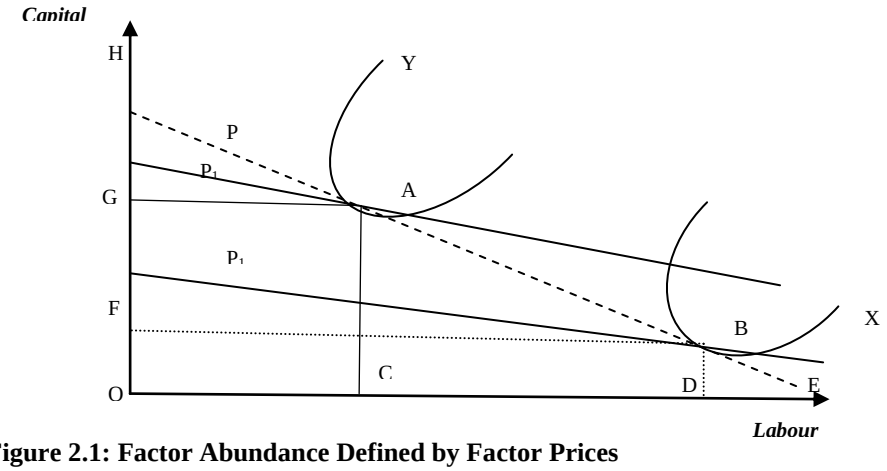


Figure 2.1: Factor Abundance Defined by Factor Prices
Source: adopted from Dung (2015)

Since the Heckscher-Ohlin theorem assumes identical constant-returns-to-scale production technologies in both countries, the relationship between factor price ratio and commodity price ratio should be examined. Figure 2.1 shows the unit isoquant curve for the labor-intensive good X (Agric produce) and the capital-intensive good Y (steel). Japan is relatively capital abundant and has a factor price ratio represented by the line P, while that of Nigeria is represented by the line P1. One unit of capital-intensive good Y is produced by OG units of capital and OC units of labour.

However, capital and labour can be exchanged for each other, therefore OC units of labour can be exchanged for GH units of capital, and OG units of capital are worth CE units of labour. Thus, the cost of producing one unit of the capital-intensive good Y in Japan, measured in units of capital, is OH; and measured in units of labour is OE. Similarly, the cost of producing one unit of the labor-intensive good X is OE when measured in units of labour, and OH when measured in units of capital.

The factor price ratio P1 of Nigeria is tangent to the unit isoquant curve for good Y (steel) at point A, which

means capital is relatively more expensive in Nigeria than in Japan. A parallel shift of P1 to P'1 is tangent to the unit isoquant curve for good X (Agric produce) at point B, certainly below P1. Therefore, in Nigeria, it is relatively more expensive to produce good Y (steel) than X (Agric Produce).

All of the above implied that any difference in autarky prices between the Japan and Nigeria is sufficient to induce profit seeking firms to trade. The higher price of the capital-intensive good Y (steel) in Nigeria will induce firms in the Japan to export steel to Nigeria to take advantage of the higher price. Likewise, the higher price of the labor-intensive good X (Agric Produce) in Japan will induce Nigerian firms to export Agric products to Japan. For that reason, if the price definition of factor abundance used, a country is relatively more capital abundant than the other if the price of capital is relatively cheaper in that country. So, in conclusion, we can say that the capital-abundant country will export the capital-intensive good, and the labour-abundant country will export the labor-intensive good.

2.4 Empirical Literature Review

Ghulam, Marian and David (2017) examined the tree-way relationship between Economic Growth, Human Development and Openness to Trade. They based their empirical analysis on the Cobb-Douglass Production Theory. They employed Pooled OLS, 2 stage Least Square and 3 Stage least Square to estimate the relationship between Trade Openness, FDI, and Market Size among 12 developing ASIAN Countries from 1970-2011 (42 years). The countries are Bangladesh, India, Nepal, Pakistan, Sri Lanka, Indonesia, Malaysia, Philippines, Singapore, South Korea, Thailand, and China. The three sets of results were comparable; less comparable but still qualitatively similar are the results from fixed effects estimations which are available from the authors. Their study concluded that Trade Liberalization policies lead to higher growth as well as higher human development.

Furthermore, Iyoha and Okim (2017), investigated the relationship between trade and economic growth in ECOWAS countries from 1990 to 2013, they made use of 15 ECOWAS countries to estimate the relationship between per capita real income, total exports (a proxy for trade), real gross domestic capital formation, human capital, proxied by number years in school, growth rate of population, nominal exchange rate and inflation rate. They reported that all the 4 estimated regression equations had high coefficients of determination and F-statistic. In all the equations, exports, exchange rate and investment were significant determinants of per capita real income growth. Exports were consistently positively related to growth, thus confirming the hypothesis of trade having a significant positive impact on economic growth in ECOWAS countries. The study concluded that there is positive long run relationship between trade openness and economic growth in ECOWAS countries.

Jamilah, Zulkornain and Muzarar (2016), investigated the relationship between openness and economic growth in 87 selected countries which includes Organization of Economic Co-operation and Development Countries (OECD) from 1977 to 2011, using GMM estimation, they examine the relationship between GDP per capita, Trade Openness. The results indicated that Openness yields a significant positive impact on economic growth. And Bidirectional causality between openness and economic growth was found.

In addition, Marjan and Karim (2016), examined the relationship between trade openness, economic growth, financial development and quality of environment in OPEC member countries from 1990-2010. They used simultaneous equations and GMM estimation to examine the relationship between Carbon Dioxide Emission, Trade Openness, Squared GDP, Financial Development, GDP, Capital, Foreign Direct Investment, Inflation and Energy UR in percentage of Urban Population. They concluded that there is a bidirectional relationship between variables.

Also, Karman, Haider, Mushtaq, Mustafa and Bano (2016), examined the realistic relationship between trade openness and economic growth of 20 different countries (no justification for selecting these countries was given by the authors). The study employed fixed effects and random effects to explore the relationship between GDP, Trade Share, Import penetration ratio and export penetration ratio. The study concluded that there is lack of statistically robust association between trade openness and long-run growth.

Adolfo and Mário (2015), examined the relationship between inflation and trade openness using 152 countries from the period of 1950 to 1992 examine the relationship between inflation and trade openness using Fixed Effects, Random Effects and GLS techniques, the result showed that there is negative relationship between inflation and openness are neither restrict to a subset of countries or a time period.

Farshid, Akhoondzadeh, and Reza (2014), investigated the interactions between trade liberalization, economic growth, and income inequality using the observations in 30 developed and developing countries within the period 2000–2011 using the econometric model of generalized method of moments (GMM) for dynamic panel models.

The results showed that there is a positive correlation between trade liberalization and economic growth.
Nowbutsing (2014) analyzed the relationship between openness and economic growth for Indian Ocean Rim Countries in a panel data framework. The panel consists of 15 countries over the time period 1997 to 2011. Three measures of openness are used namely trade as a percentage of GDP, exports as a percentage of GDP and imports as a percentage of GDP. The study estimates a Panel unit root and panel cointegration technique. Fully Modified Ordinary Least Square (FMOLS). The results showed that the three measures of openness positively affect economic growth. However, imports as a percentage of GDP has the highest impact on economic growth in terms of size.

Mercan, Gocer, Bulut, and Dam (2013), examined the effect of trade openness on economic growth in BRIC-T countries from 1989 to 2010. They employed the fixed effects model and random effect model to estimate the relationship between trade openness variable, the rate of external trade (Export-import) to GDP. It was found that the effect of openness on economic growth was positive, and statistically significant in line with theoretical expectations.

Blagrave and Vesperoni (2018), examined the cross-border spillovers from China's growth slowdown onto partner country exports from $2002Q_1$ to $2016Q_4$ for 48 advanced and emerging market economies. The study employed the Panel VAR technique to examine the contemporaneous relationship between GDP, real exchange rates, and export-intensity. The study suggests that spillovers to different trading partners will depend on their sectoral linkages with the Chinese economy. At the regional level, the analysis indicates that countries whose trade linkages with China are strongest such as those in Asia would be most affected.

Ali and Anwar (2017), examined the impact of anticipated and unanticipated Terms of Trade (ToT) shocks on aggregate output, inflation and the trade balance (TB). The study used Dynamic Stochastic General Equilibrium (DSGE) model to examine the contemporaneous relationship between GDP, real exchange rates, inflation and monetary policy instruments based on Taylor rule. The study found out that, concerning the *J*-curve phenomenon, continues to hold even if the assumption of rational expectations about the ToT is relaxed. Further analysis reveals that the presence of a cost channel of monetary policy increases the intensity of the *J*-curve effect.

Fatih and Sevda (2014), analyzed the impacts of institutions, openness and macroeconomic stability on economic growth: a panel data analysis on middle income countries, the study conclude though the positive effects of the indirect determinants on economic growth are small, that the indirect determinants in middle income countries catch the trend of a continuous and steady growth together with the direct determinants are among the important cases which can approach middle income countries to high income countries.

Ghironi and Meltiz (2014), develop a stochastic, general equilibrium, two-country model of trade and macroeconomic dynamics. Productivity differs across individual, monopolistically competitive firms in each country. Firms face a sunk entry cost in the domestic market and both fixed and per-unit export costs. Only relatively more productive firms' export. Exogenous shocks to aggregate productivity and entry or trade costs induce firms to enter and exit both their domestic and export markets, thus altering the composition of consumption baskets across countries over time. In a world of flexible price, the model generates endogenously persistent deviations from PPP that would not exist absent our microeconomic structure with heterogeneous firms. Finally, the model successfully matches several moments of U. S. and international business cycles.

Cakir and Kabundi (2013), studied the trade linkages between South Africa and the BRIC (Brazil, Russia, India and China) countries. The study applied a global vector autoregressive model (GVAR) to investigate the degree of trade linkages and shock transmission between South Africa and the BRIC countries over the period 1995Q1–2009Q4. Their model contains 32 countries and has two different estimations: the first one consists of 24 countries and one region, with the 8 countries in the euro area treated as a single economy; and the second estimation contains 20 countries and two regions, with the BRIC and the euro area countries respectively treated as a single economy. The results suggest that trade linkages exist between these economies; however, the magnitude differs between countries. Shocks from each BRIC country are shown to have considerable impact on South African real imports and output.

Cacciatore and Montréal (2012), studied how labor market frictions affect the consequences of trade integration in a two-country, stochastic, general equilibrium model of trade and macroeconomic dynamics with heterogeneous. firms, endogenous producer entry, and frictional labor markets. The model successfully reproduces important empirical regularities that characterize trade integration both in the long run and over the business cycle. Two key results emerge. First, trade integration is always beneficial for welfare by

inducing higher productivity, but unemployment can temporarily rise as trade barriers are lowered. Gains from trade are smaller in countries with more rigid labor markets, as production gradually shifts toward more flexible economies. Second, trade integration has important business cycle consequences.

Haddad et al. (2010) noted that the effect of trade openness on growth volatility reduces with the degree of export diversification, both across products and markets. According to them, not only product diversification (number of goods exported) but also market diversification (number of destination markets) plays an important role in moderating the volatility effects of trade openness on growth.

Funke, Granziera and Imam (2008), examined the macroeconomic impact of negative terms of trade shocks and tries to identify factors that contribute to a fast recovery in growth after persistent negative shocks with a sample of 159 countries for 1970–2006. They used probit model to analyze what economic policies differentiated countries that successfully recovered from those that did not. The analysis focuses on shocks above the 10 percent threshold, given that relative few numbers of observations take place in the thresholds above 30 percent; there are only five cases of countries recovering from the 30 percent level seven if we bring the threshold down to 20 percent. They explore the relationship between GDP, Real exchange rate, budget balance, trade, aid, and Law. The results suggest that policies matter. Fast recoveries are fairly robustly related to real exchange rate depreciation and improvements in government stability and the institutional environment. A timely increase in aid may also support recovery.

The study uses panel data drawn from the World Bank Development indicators. The data cover thirty seven years, from 1983 to 2019. The variables on which data were collected are exchange rate (EXCR), gross domestic product growth rate (GDPG), trade openness (TRDO), oil price (OILP), foreign reserve (FORR). GDPG, which is the dependent variable, was used as proxy for economic growth of the four OPEC member countries.

Model Specification

To achieve the broad and the specific objectives of the study the study employs the fixed effect and the random effect model and testing hypotheses for co-integrating vectors in dynamic time series panels. The model was originally designed in the work of Phillips and Hansen (1990) to provide optimal estimates for co-integrating regressions. Phillips and Hansen (1990) note that the FMOLS accounts for serial correlation effects and for the endogeneity in the regressors that result from the existence of co-integrating relationship. The advantage of this method, according to Pedroni (2000), is that it accommodates considerable heterogeneity across individual members of the panel.

Indeed, one important advantage to working with a co-integrated panel approach of this type is that it allows researchers to selectively pool the long run information contained in the panel while permitting the short run dynamics and fixed effects to be heterogeneous among different members of the panel. Also, in addition to producing asymptotically unbiased estimators, the FMOLS also produces nuisance parameter free standard normal distributions. In this way, inferences can be made regarding common long run relationships which are asymptotically. The co-integrating regressions in heterogeneous panels for a panel of I =1, . . ., N

3. Methodology

Members is specify as:

$$\mathbf{Y_{it} = \alpha_i + \beta X_{it} + \mu_{it}} \quad \textbf{..... (1)}$$

$$\mathbf{X_{it} = X_{it-1} + \xi_{it}} \quad \textbf{..... (2a)}$$

Where;

$$\mathbf{Y_i\ (GDPG),\ X_i\ (\beta_1 TRDO,\ \beta_2 EXCR,\ \beta_3 FORR,\ \beta_4 OILP)} \quad \textbf{..... (2b)}$$

The expression in (2b) above is a vector of the dependent and the independent variables which are said to co-integrate for each member of the panel, with co-integrating vector β if Y_{it} is integrated of order one. X_i is a dimensional vector of regressors, which are not co-integrated with each other.

α_i = the intercept which allows the co-integrating relationship to include member specific fixed effects.

$\xi_{it} = (\mu_{it}, \lambda_{it})$ is the vector error process which is stationary with asymptotic covariance matrix θ_i, defined as:

$$\boldsymbol{\theta_i} = \begin{bmatrix} \boldsymbol{\theta 11 i} & \boldsymbol{\theta 12 i} \\ \boldsymbol{\theta 21 i} & \boldsymbol{\theta 22 i} \end{bmatrix} \quad \textbf{..... (3)}$$

ξit = (μit, λit) is partition so that the first element is a scalar series and the second element is an *m* dimensional vector of the differences in theregressors $\lambda_{it} = X_{it} - X_{it-1} = \Delta X_{it}$, so that from the asymptotic covariance matrix, $\boldsymbol{\theta_i}$ =

$\begin{bmatrix} \theta 11i & \theta 12i \\ \theta 21i & \theta 22i \end{bmatrix}$, θ11i becomes the scalar long run variance of the residual μ_{it}, and θ_{22i} is the m x mlong run covariance among the λ_{it}, and θ_{21i} is an mx1 vector that gives the long-run covariance between the residual μ_{it} and each of the λ_{it}.

Techniques of Data Analysis

3.4.1 Panel Unit Root Test

The study adopt the panel unit root tests developed by Breitung (2000) and Levin et al.(2002). This is on the basis that the approach has the highest power and smallest size distortions of any class of the so-called first generation panel unit root tests (Houskova and Wagner, 2006). The Breitung (2000) panel unit root test is given as:

$$\boldsymbol{y_{it} = \eta_{it} + \sum_{k=1}^{p+1} \beta_{ik}\, x_{i,t-k} + \varepsilon_t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

The test statistic examines the null hypothesis that the process difference stationary:

$$\boldsymbol{H_0: \sum_{k=1}^{p+1} \beta_{ik} - 1 = 0} \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

The alternative is that the panel series is stationary; that is $\sum_{k=1}^{p+1} \beta_{ik} - 1 < 0$ for all *i*.

The Breitung (2000) uses the following transformed vectors to construct the test statistics:

$$\boldsymbol{Y_i^* = AY_i = \left[y_{i,1}^*, y_{i2,}^*, \ldots., y_{i,T}^*\right]} \qquad \boldsymbol{\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)}$$

$$\boldsymbol{X_i^* = AX_i = \left[x_{i,1}^*, x_{i2,}^*, \ldots., x_{i,T}^*\right]',} \qquad \boldsymbol{\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)}$$

The standardized from of (11) and (12) above is given as:

$$\boldsymbol{\lambda_B = \frac{\sum_{i=1}^{N} \sigma_1^{-2}\, Y_i^{*'} X_i^{*'}}{\sqrt{\sum_{i=1}^{N} \sigma_1^{-2} X_i^{*'} A' A X_I^*}}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (8)$$

Panel Co-integration

The panel co-integration model was adopted in this study to test for the existence of long-run relationship among the variables of the study. The choice was on the basis that the panel data analysis offers major advantages over cross-sectional analysis. For example, it incorporates changes into the model and by so doing, allows individual changes in the variables of the study to be measured directly. The panel co-integration model that was adopted in this study follows that of the earlier study by Pedroni (1999). The original model is stated as:

$$\boldsymbol{Y_{it} = \alpha_{it} + \beta_{it} t + \gamma_{it} X_i + e_{it}} \qquad \boldsymbol{\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (9)}$$

Where

i = 1, 2 …… N

t = 1, 2 ……T

N = finite sample size

T = time period

Y_{it} = vector matrix of dependent variables with (N * T) x 1 dimension for each member

X_{it} = vector matrix of independent variables with (N* T) x m dimension for each member

α_{it} and β_{it} = fixed effects for each country of the study

t= deterministic trend,

e_{it} = is the stochastic error term.

To test for the null hypothesis of no co-integration, Pedroni (1999) develops two types of asymptotic tests (the within- dimension approach and the between-dimension approach) that allow for heterogeneity among individual members of the panel, and heterogeneity in both the long-run cointegrating vectors. The 'within-

dimension approach' comprises four panel statistics which are the panel v-statistic, the panel ρ- statistic, the panel PP-statistic, and the panel ADF-statistic. On the other hand, the 'between-dimension approach' includes three statistics which are group q-statistic, group PP-statistic, and group ADF-statistic. The mathematical notation for the various statistic(s) is as follows:

Panel v-statistic

$$Z_v = \left(\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{L}_{11i}^{-2}\,\hat{e}_{it-1}^{2}\right)^{-1} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (10)$$

Panel ρ-statitic

$$Z_\rho = \left(\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{L}_{11i}^{-2}\,\hat{e}_{it-1}^{2}\right)^{-1}\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{L}_{11i}^{-2}\left(\hat{e}_{it-1}\Delta\hat{e}_{it}-\hat{\lambda}_i\right)\ldots\ldots\ldots\ldots\ldots\ldots\ldots (11)$$

Panel PP statistic:

$$Z_t = \left(\hat{\sigma}^2\sum_{i=1}^{N}\sum_{t=1}^{T}L_{11i}^{-2}\,\hat{e}_{it-1}^{2}\right)^{-\frac{1}{2}}\sum_{i=1}^{N}\sum_{t=1}^{T}L_{11i}^{-2}\left(\hat{e}_{it-1}\Delta\hat{e}_{it}-\hat{\lambda}_i\right)\ldots\ldots\ldots\ldots\ldots\ldots (12)$$

Panel ADF

$$Z_t^* = \left(\hat{s}^{*2}\sum_{i=1}^{N}\sum_{t=1}^{T}L_{11i}^{-2}\,\hat{e}_{it-1}^{*2}\right)^{-\frac{1}{2}}\sum_{i=1}^{N}\sum_{t=1}^{T}L_{11i}^{-2}\hat{e}_{it-1}^{*}\Delta\hat{e}_{it}^{*}\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (13)$$

Group ρ-statistic:

$$\tilde{Z}_\rho = \sum_{i=1}^{N}\left(\sum_{i=1}^{T}\hat{e}_{it-1}^{2}\right)^{-1}\sum_{t=1}^{T}\left(\hat{e}_{it-1}\Delta\hat{e}_{it}-\hat{\lambda}_i\right)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (14)$$

Group PP-statistic

$$\tilde{Z}_t = \sum_{i=1}^{N}\left(\hat{\sigma}^2\sum_{i=1}^{T}\hat{e}_{it-1}^{2}\right)^{-1/2}\sum_{t=1}^{T}\left(\hat{e}_{it-1}\Delta\hat{e}_{it}-\hat{\lambda}_i\right)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (15)$$

Group ADF

$$\tilde{Z}_t^* = \sum_{i=1}^{N}\left(\sum_{i=1}^{T}\hat{s}_i^2\hat{e}_{it-1}^{*2}\right)^{-1/2}\sum_{t=1}^{T}\left(\hat{e}_{it-1}^{*}\Delta\hat{e}_{it}^{*}\right)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (16)$$

4. Result and Discussion of Findings

Table 1

Panel unit root tests results

Levin, Lin & Chu Unit Root test Process			
Variables	**Statistic (level)**	**Statistic (Difference)**	**Order of integration**
GDPG	-2.60989	-9.1372*	I(1)
TRDO	-0.19524	-5.66254*	I(1)
EXCR	-0.59661	-3.90283*	I(1)
OILP	-0.17421	-6.78818*	I(1)
FORR	0.71724	-5.15324*	I(1)

Source: Author's Computation Using E-views 10

Table 1 shows the panel stationarity test results. The results indicate that all the panels contain unit roots at levels in Levin, Lin and Chu (LLC) test. Based on the result, it can be concluded that some variables were stationary at first difference at 5% level of significance. Deducing from the above therefore, the specified equation is estimated at first difference of the variables to yield robust results.

Table 2
Panel Co-integration Test
Null hypothesis: no c-integration

Panel (within dimension)			**Group (between dimension)**		
Statistics	**Value**	**Prob.**	**Statistics**	**Value**	**Probability**
Panel v-stat	0.859241	0.1951			
Panel rho-stat	-2.492670**	0.0063	**Group rho-stat**	1.317910	0.0938
Panel PP-stat	-6.976822**	0.0000	**Group PP-stat**	-6.313989**	0.0000
Panel ADF-stat	-2.673759**	0.0038	**Group ADP-stat**	-2.238755**	0.0126

*****suggest rejection of null hypothesis at 5%***
Source: Author's Computation Using E-views 10

Table 2 presents the results of panel co-integration estimates, both within and between group dimensions. The estimates in table 2 show that the entire tests reject the null hypothesis of no co-integration except panel v-statistic. Considering the fact that only the panel v-statistic accept the null hypothesis but other three statistic rejected the null hypothesis; it is reasonable to accept the existence of the long run co-integration among the series for all the countries investigated. Based on the result the long run co-integrating equation, fixed and random effect model can be estimated.

Table 3
Fixed effect and random effect model

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
Fixed Effect Model (FEM)	C	3.031800	0.767483	3.950317	0.0001
	EXCR	0.000304	0.000203	-1.496328	0.1369
	FORR	1.05E-12	4.18E-12	-0.250897	0.8023
	OILP	0.317530	0.021729	11.46131	0.0000
	TRDO	-0.234001	0.028011	-2.803146	0.0336
Fixed Effect Model (REM)	C	2.752402	0.913125	3.014266	0.0031
	EXCR	-0.000125	0.000121	-1.038543	0.3008
	FORR	-2.11E-13	3.46E-12	-0.060834	0.9516
	OILP	0.117060	0.022232	5.265600	0.5993
	TRDO	-0.211217	0.081120	-3.417369	0.0336

Source: Author's Computation Using E-views 10

The results of FEM and REM for four countries and group panel estimates are reported in Table 3. The result is estimated without time dummy is reported at the bottom of the table. The result shows that for Nigeria, Saudi Arabia, Venezuela and Indonesia, exchange rate (EXCR) and foreign reserve (FORR)are not significant in explaining GDPG but oil price (OILP) and trade openness (TRDO) are statistically significant at 5 per cent and 5 per cent respectively. The impact analysis suggests that, for FEM, GDPG increases by 0.30 but decreases by 0.01 per cent for REM, following a one per cent increase in EXCR. The REM results agrees with Iyoha and Okim (2017) for ECOWA countries while the FEMresult agrees with Canova (2005) for USA.

Similarly, OILP and TRDO have significant impacts on GDPG, as revealed by both the FEM and the REM estimates. The FEM results shows that a one per cent increase in OILP increases GDPG by 31.8 per cent while a one per cent increase in TRDO decreases GDPG by about 23.4 per cent. Furthermore, the REM results shows that a one per cent increase in OILP increases GDPG by 11.7 per cent while a one per cent increase in TRDO decreases GDPG by about 21.1 per cent. These results conformed to the apriori expectation and supports Muzarar (2016); Marjan and Karim (2016), Ryan (2012) and Gries and Redlin (2012).

Post Estimation Results

Post estimation diagnostics tests were carried out to ascertain the quality of the data used in the study. the diagnostic test include the test of autocorrelation, heteroscedasticity and normality. The autocorrelation test was carried out using the Residual Portmanteau Tests for Autocorrelations while heteroscedasticity test was conducted using VEC Residual Heteroskedasticity Tests. The normality plot was used to test whether or not the data is normally distributed. The results are as shown below:

Table 4
Test of Autocorrelation
H_0: ***No residual autocorrelations up to lag h***

Lags	Q-Stat	Prob.	Adj Q-Stat	Prob.	Df
1	1.906	NA*	1.919	NA*	NA*
2	26.85	0.526	27.23	0.506	28

**The test is valid only for lags larger than the VAR lag order.*
df is degrees of freedom for (approximate) chi-square distribution
Source: Author's Computation Using E-views 10

Table 4 shows the result of autocorrelation of the error residuals conducted with a lag length of 2. From the result, the probabilities of Q-statistic and adjusted Q-statistic were 0.526 and 0.506 respectively. That is the estimates are greater than 5 per cent. Hence the null hypothesis cannot be rejected and as such, the conclusion is that the data set is not suffering the problem of autocorrelation.

Table 5
Test of Heteroskedasticity

Joint test:

Chi-sq	Df	Prob.
0.3504	200	0.2010

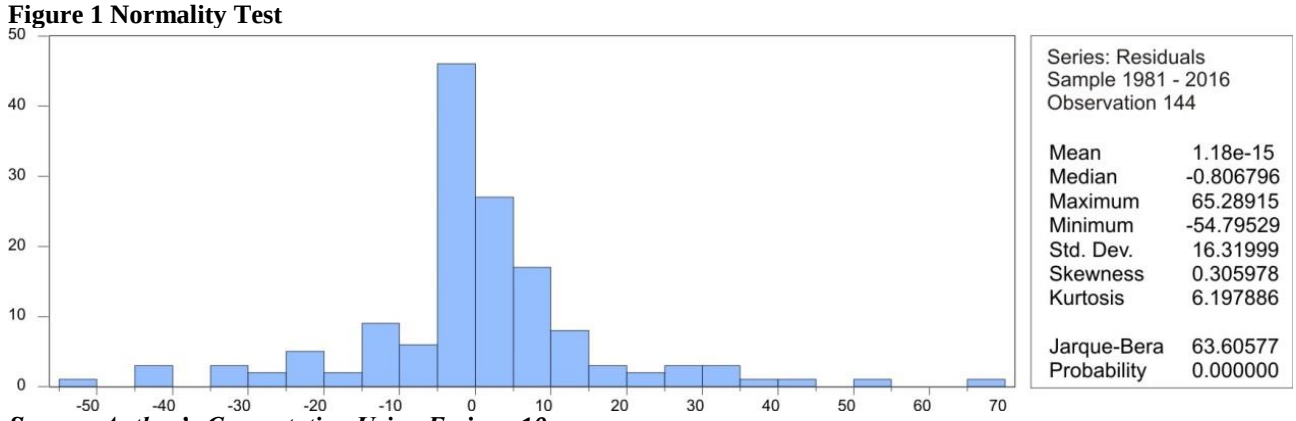
Individual components:

Dependent	R-squared	F(20,119)	Prob.	Chi-sq(20)	Prob.
res1*res1	0.420185	4.311900	0.0000	58.82595	0.0000
res2*res2	0.155632	1.096690	0.3620	21.78846	0.3521
res3*res3	0.527486	1.042228	0.1000	73.84808	0.0000
res4*res4	0.046908	0.292842	0.9987	6.567173	0.9979
res2*res1	0.187488	1.372967	0.1494	26.24829	0.1578
res3*res1	0.332949	2.969854	0.0001	46.61282	0.0007
res3*res2	0.237081	0.848997	0.2227	1.019140	0.3321
res4*res1	0.264452	2.139209	0.0063	37.02331	0.0116
res4*res2	0.245660	1.397685	0.3154	1.239234	0.4236
res4*res3	0.191172	1.406322	0.1326	26.76407	0.1420

Source: Author's Computation Using E-views 10

From the table 5, the joint test of heteroscedasticity suggests that the residuals are homoscedastic rather than heteroscedastic. Similarly, the result of the individual components show that the number of individual components that homoscedastic (12) is more than those that are heteroscedastic (8). Hence, we conclude that the errors are heteroscedastic

Figure 1 Normality Test



Source: Author's Computation Using E-views 10

Figure 1 shows the result of normality. From the result, the null hypothesis of normality cannot be accepted because the probability value of Jarque-Bera estimate is less than 5 per cent. Hence, the data set used for the study is not normally distributed.

5. Conclusion and Recommendations

Analysis of the 4 member countries of OPEC on the relationship between trade openness, exchange rate and economic growth shows that trade openness has highly significant positive influence on growth of the selected OPEC member countries while exchange rate does not. In other word, trade openness has strong positive influence on growth in Nigeria, Saudi Arabia, Venezuela and Indonesia. This implies that trade is beneficial to OPEC member countries in the long-run. The study concludes that foreign trade openness significantly influences growth of most OPEC member countries in the long-run and that international trade is more beneficial to countries that have improved quality of exports where the value is relatively higher than imports.

Based on the findings and conclusions, the study recommends that OPEC member countries should improve cooperation among economic actors by using export consortia to help SMEs in the region access the international markets. In addition, they should use long term export-led-growth policies such as export promotion policies and other domestic policies aimed at enhancing productivity and technological content of domestic products. More so, the countries should pursue a twin strategy of trade and competitiveness. This is because, improved exports is fundamental for countries' economic competitiveness which in turn boosts growth.

References

Acemoglu, D. & F. Zilibotti. (1997). "Was Prometheus Unbound by Chance? Risk, Diversification, and Growth." *Journal of Political Economy*. Vol. 105 (4): 709-751. cited in Joya O. (2011), Macroeconomic Instability in Afghanistan: Causes and Solutions, unpublished Master's dissertation in Applied Economics: Development, University of Bordeaux

Adolfo. S & Mário J.C.M (2015), Inflation and Trade Openness Revised: An Analysis Using Panel Data. Discussion Paper, Institute for Applied Economic Research – ipea2015, Brasília: Rio de Janeiro: ISSN 1415-4765, CDD 330.908, JEL: C23; E61

Agénor, P R. (2004). "The Economics of Adjustment and Growth." Second Edition. Harvard University Press, cited in Joya O. (2011), Macroeconomic Instability in Afghanistan: Causes and Solutions, unpublished Master's dissertation in Applied Economics: Development, University of Bordeaux

Aghion, P., P. Bacchetta, & A. Banerjee.(2004). "Financial Development and the Instability of Open Economies."*Journal of Monetary Economics*. Vol. 51 (6): 1077-1106.cited in Joya O. (2011), Macroeconomic Instability in Afghanistan: Causes and Solutions, unpublished Master's dissertation in Applied Economics: Development, University of Bordeaux

Ahmad Z.A.J, Mukaramah H & Siti H.C.M (2012), Macroeconomic Instability and Fiscal Decentra-lization: An Empirical Analysis, DOI: 10.18267/ j.pep.416, JEL Classification: E31, H5 H6 H7

Aisen, A. & Veigaj F. J. (2006). Does Political Instability Lead to Higher inflation? A panel Data Analysis. *Journal of Money, Credit and Banking 38(5). Pp. 1379-1389*

Alcala, F., & Ciccone, A. (2003). Trade, Extent of the Market, And Economic Growth 1960-1996. Departament d'Economica i Empresa, UPF; 765.

Ali, S.Z. & Anwar S. (2017), Anticipated versus unanticipated terms of trade shocks and the *J* curve phenomenon, *Journal of International Money and Finance* (2017), doi: https://doi.org/10.1016/j.jimonfin. 2017.10.003

Allegret, J.P. Couharde C. & Guillaumin C. (2012). The impact of external shocks in East Asia: Lessons from a structural VAR model with blocks exogeneity. International Economics 132, pp. 35-89.

Arellano, C., A. Bulíř, T. Lane, & L. Lipschitz.(2009). "The dynamic implications of foreign aid and its variability." *Journal of Development Economics*. Vol. 88 (1): 87-102 cited in Joya O. (2011), Macroeconomic Instability in Afghanistan: Causes and Solutions, unpublished Master's dissertation in Applied Economics: Development, University of Bordeaux

Baxter, M., & Kouparitsas M.A (2005). Determinants of Business Cycle Co-Movements: A Robust Analysis. *Journal of Monetary Economics* 1(1), pp. 66-85

Belingher D. (2015), A PVAR Model Built On The Ricardian Approach To Deficits In Central A and Eastern Europe, ECOFORM journal, Volume 4, Special Issue 1, 2015*Institute for Economic Forecasting, The Romanian Academy*

Bergset P. U (2013), Macroeconomic stability and economic growth in developing countries, unpublished Msc thesis, Department of Economics University of Oslo, http://www.duo.uio.no

Bernard J & Mandal S.K (2016), The impact of trade openness on environmental quality: an empirical analysis of emerging and developing economies. www.witpress.com, ISSN 1743-3541 (on-line) WIT Transactions on Ecology and The Environment, Vol 203, © 2016 WIT Press www.witconferences.com doi:10.2495/EID160181

Blagrave, P. & Vesperoni, E. (2018), The Implications of China's Slowdown for International Trade.*Journal of Asian Economics* https://doi.org/10.1016/j.asieco. 2018.01.001

Bourdon, M. H Chantal M.M, & Mariana V. (2014). The relationship between trade openness and economic growth: some new insights on the openness measurement issue. XIIIème Congrès de l'Association Européenne des Economistes Agricoles (EAAE), Aug 2014, Zurich (CH), Switzerland.<hal-00729399>

Breitung J. (2000). *The Local Power of Some Unit Root Tests for Panel Data* in B. Baltagi (ed.), Non stationary Panels, Panel Co-integration, and Dynamic Panels, Advances in Econometrics, Vol. 15, Amsterdam: Jai, 161-178.

Broda, C. (2004). "Terms of trade and exchange rate regimes in developing countries."*Journal of International Economics*. Vol. 63 (1): 31-58 cited in Joya O. (2011), Macroeconomic Instability in Afghanistan: Causes and Solutions, unpublished Master's dissertation in Applied Economics: Development, University of Bordeaux

Bulent U. (2014), Openness to International Trade and Economic Growth: A Cross-Country Empirical Investigation, Central Bank of the Republic of Turkey 2014, working paper NO: 14/07

Bulíř, A. & J. Hamann. (2008). "Volatility of Development Aid: From the Frying Pan into the Fire?" *World Development.* Vol. 36 (10): 2048-66 cited in Joya O. (2011), Macroeconomic Instability in Afghanistan: Causes and Solutions, unpublished Master's dissertation in Applied Economics: Development, University of Bordeaux

Caballero, R.J. (2007), *Specificity and the Macro-economics of Restructuring*. Cambridge University. The MIT Press

Cacciatore M & Montréal H (2012), International Trade and Macroeconomic Dynamics with Labor Market Frictions, unpublished online paper, JEL Codes: E32, F16, F41, J60

Cakir. M. Y & Kabundi. A (2013), Trade shocks from BRIC to South Africa: A global VAR analysis. Economic Modelling 32 (2013) 190–202, Retrieved from Sciencedirect.com, journal homepage: www.elsevier .com/locate/ecmod

Calderon. C.,& Levy-Yeyati. E. (2009). Zooming in: From aggregate volatility to income distribution. The World Bank Policy Research Working Paper No. 4895.

Canova F (2005) The Transmission of US Shocks to Latin America, *journal of applied econometrics* J. Appl. Econ. 20: 229–251 (2005)

Canova, F. & Perez F,F., (2012). Estimating over identified, non-recursive, time varying coefficients, structural VARs, UPF working paper.

Canova, F., (2004). Testing for Convergence Clubs in Income per Capita: A Predictive Density Approach. International Economic Review, 45, 49-77.

Canova, F., Ciccarelli, M., & Ortega, E., (2007). Similarities and Convergence in G-7 Cycles, Journal of Monetary Economics, 54, 850-878.

Canova, F., Ciccarelli, M., & Ortega, E., (2012). Do institutional changes affect business cycles? Journal of Economic Dynamics and Control, 36, 1520-1533.

Central Bank of Nigeria (CBN). (2004). *Statistical Bulletin*. Abuja, CBN.

Ciccarelli, M., Ortega .E. & Valderrama, M.T (2012).Heterogeneity and cross - country spillovers in macroeconomic-.financial linkages. ECB WP forthcoming.

Clark, T & Van Wincoop E. (2001). Borders and Business Cycles. *Journal of International Economics* 55(1), pp 59-85.

Collier P (2008),. "*The Bottom Billion.*" Oxford University Press cited in Joya O. (2011), Macro-economic Instability in Afghanistan: Causes and Solutions, unpublished Master's dissertation in Applied Economics: Development, University of Bordeaux

David, H. L. (2008). So You Want to Use a Measure of Trade Openness? In K. Banaian, B. Roberts, P. Macmillan, & L. H. David (Eds.), *The Design and Use of Political Economy Indicators*

DeJong, D. N. B. F. Ingram, & Whiteman C. H. (2000) Keynesian impulses versus Solow residuals: identifying sources of business cycle fluctuations. *Journal of Applied Econometrics* 15, pp. 311-329.

Dung T.L (2015), A Review of Modern International Trade Theories, *American Journal of Economics, Finance and Management*, Vol. 1, No. 6, 2015, pp. 604-614, ISSN: 2381-6864 (Print); ISSN: 2381-6902 (Online)

Easterly, W., R. Islam, & J.E. Stiglitz. 2000. "*Explaining Growth Volatility.*" Mimeo. World Bank. Washington D.C. cited in Joya O. (2011), Macroeconomic Instability in Afghanistan: Causes and Solutions, unpublished Master's dissertation in Applied Economics: Development, University of Bordeaux

Eberhardt, M. (2012). Estimating panel time-series models with heterogeneous slopes. *Stata Journal, 12,* 1,61-71.

Eberhardt, M., & Teal, F. (2010). Econometrics for Grumblers: A New Look At Cross-Country Growth Empirics, *Journal Of Economic Surveys*, Forthcoming

Edwards, S. (2006). Monetary Unions, external shocks and economic performance: A Latin American perspective. International Economics and Economic Policy 3(3), pp. 225-247.

Erden, I & Ozkan I (2004) Determinants of international transmission of business cycles to Turkish Economy. Economic Modelling 36, pp. 383-390

Farshid. S, Akhoondzadeh. T & Reza. M. A (2014), The Triangle of Trade Liberalization, Economic growth and Income Inequality, Volume 2014, Year 2014 Article ID cacsa-00026, 15 Pages doi:10.5899/2014 /cacsa-00026 Jel classification**:** C33, C36, D31, F43,

Fatás, A. & I. Mihov. (2005). "*Policy Volatility, Institutions, and Economic Growth.*" Discussion Paper No. 5388. CEPR cited in Joya O. (2011), Macroeconomic Instability in Afghanistan: Causes and Solutions, unpublished Master's dissertation in Applied Economics: Development, University of Bordeaux