International Journal of Maritime, Trade & Economic Issues *pp. 33-48*
Volume I, Issue (1), 2013

Estimating Import Demand Function in Oil Exporting Countries: Panel Cointegration Approach

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Abstract:
This article examines the empirical determinants of import demand in oil exporting countries. We show by a panel cointegration analysis that the import demand in these countries depends positively on domestic demand and exports, the real exchange rate and oil prices. While the current account balance tends to reduce demand for imports.

Key Words:
Import demand, oil exporting countries, panel cointegration
***JEL Classification**: F14, Q43*

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1. Introduction

Oil prices rose sharply during 2002 -2008. This seems to have exacerbated global imbalances; high oil prices have contributed to the worsening current account deficit of some states, for example, according to figures from the Bureau of Economic Analysis U.S. trade deficit U.S. States with the OPEC countries increased from U.S. $ 35, 4 billion in 2002 to USD 125, 7 billion in 2007. The oil exporters have benefited from rising oil prices and used their windfall to export to some extent to buy foreign products. However, oil exporters are running record current account surpluses and have replaced Asia as the region's current account surplus more important, corresponding to about half the U.S. external deficit.

According to the IMF, the average current account surplus of oil exporters rose less than 4% of GDP in 2002 to over 13% of GDP in 2007 (IMF, 2008). These observations have led to increased interest in the impact of higher oil prices on global imbalances (IMF, 2006 and 2008; Reserve Bank of San Francisco, 2006; Treasury Department, 2006). In particular, oil exporters have been asked to contribute to an orderly adjustment of global imbalances by increasing spending and imports and in some cases, the increased flexibility of exchange rates. There are several research questions arising from such a policy recommendation. First, the direct impact of oil prices on import demand from oil exporting countries through wealth effects has not been studied thoroughly. A second question is whether and to what extent a real appreciation stimulates imports in these countries.

Third, it is important to consider other factors influencing behavior in the import of Petroleum Exporting Countries. In particular, it is interesting to know whether the oil-exporting countries are unique in terms of their import elasticities with respect to real activity. In this paper, we implement an empirical model of import demand of Petroleum Exporting Countries. The analysis is based on a model of cointegration in panel 6 of the Petroleum Exporting Countries for the period 1982 to 2007.

The estimation results show that import demand of Petroleum Exporting Countries depends positively on domestic demand and exports, the real exchange rate and oil prices. Budget surpluses tend to reduce demand for imports.

The paper is organized as follows: In section 2, we review the existing literature on the empirical determinants of import demand in general and oil-exporting countries in particular. In Section 3, we established an empirical model of import demand in oil exporting countries, we present our estimation results. Section 4 concludes and outlines some policy implications.

2. Literature review

In view of the importance of foreign trade to economic growth and development, a number of empirical studies on the import demand functions have been carried out. The objective here is to review some of these studies as a guide to the choice of appropriate variables used in this study. Ho (2004) estimated the import demand function of Macao by testing two popular models: aggregate and disaggregate import demand model with the components of aggregate expenditure using quarterly data over the 1970-1986 period. Using JJ-Maximum likelihood cointegration and error correction technique, he found significant partial elasticities of import demand with respect to investment (0.1396),exports (1.4810) and relative prices (-0.3041) with their expected signs implied by the economic theory in the disaggregated model. Narayan and Nayaran (2005) applied the bounds testing approach to cointegration to estimate the long-run disaggregated import demand model for Fiji using relative prices, total consumption, investment expenditure, and export expenditure variables over the period 1970-2000.Their results indicated a long-run cointegration relationship among the variables when import demand is the independent variable; and import demand to be elastic and statistically significant at the 1 per cent level with respect to all the explanatory variables in the long-run and short-run. The results revealed that long-run elasticities of 0.69 for both export expenditure and total consumption expenditure respectively, followed by relative prices (0.38) and investment expenditure.

Bahamani and Kara (2003) estimated the import and export demand function for nine industrial countries like Australia, Canada, Denmark, U.S. and etc. By using quarterly data for the period 1973-98 they used ARDL approach for estimation. Their results show that long-run income elasticities are greater in import demand function than in the export demand functions are relatively inelastic .They fail to provide any specific answer to the policy question that which policy has the quickest impact on trade. According to them, trade flows of different countries do react differently.

Senhadji (1998) estimates an import demand function for 77 countries, including some oil-exporting countries. Using GDP minus exports as the activity variable, he finds that most of the coefficients have the expected sign and are significant. The elasticity with respect to this measure of income is relatively small for the oil exporting countries. In fact, this elasticity is below unity for all oil exporting countries and even below 0.1 for the case of Norway, possibly because export revenues account for a notable part of national income in these countries.

The impact of oil prices on imports of oil producing countries have been analyzed in studies specific to each country. For example, the International Monetary Fund (2006) calculate the "marginal propensity to import from oil revenues," which seems

to have decreased in most oil-exporting countries since the 1970s, but perhaps started to increase again more recently (OECD, 2008). To formally verify whether the propensity to import is just like in the past, the authors estimate an error correction model for imports in several oil exporting countries. In a year out of out of sample forecasting, it is found that expenditure on imports in the OPEC countries is only slightly lower than that implied by past behavior.

For the Gulf Cooperation Council (GCC) countries, on the other hand, the authors find that the expenditure over income was significantly lower than past relationships would suggest. The IMF (2006) also attempts to quantify the impact of oil prices on the current account of oil exporting countries and importing countries. To this end, the authors developed a comprehensive approach, the VAR multiregion. In this model, an increase of 10 permanent U.S. dollar oil prices led to a significant deterioration but short of the current account of oil importers and an increase in the income fuel exporters' current of about 2 cent of GDP.

Using an approach to macroeconomic balance in a recent IMF study also examines the Medium-term determinants of current account surpluses in oil exporting countries, showing that they can only be explained to some extent by structural determinants (factors eg demographic) similar to that of other countries (IMF, 2008). To summarize, the general literature of import demand has often neglected the specific characteristics of the Petroleum Exporting Countries. In the few available studies on import demand in the export of oil documents of most countries to analyze the response of current account developments in oil prices or terms of trade. Since the current account reflects both price and volume effects, it is not possible to distinguish between them in these studies. We add to the empirical literature on import demand in oil exporting countries in different ways. First, we disentangle the effects of price and volume by estimating an error correction dynamic panel model for real imports. Second, we base our analysis on a wide range of new data set of the Petroleum Exporting Countries.

Third, we perform robustness tests of our different results and present a simple calculation of the impact of higher oil prices on global imbalances by recycling of trade in oil revenues. Chang *et al.* (2005) showed imports, income, and relative prices were co-integrated in the case of South Korea. They projected long-run elasticities of import demand with respect to income and relative price were .86 and -0.2 respectively. Hye (2008) found that long run relationship exist between the real quantity of imports, relative prices and real Gross National Product (GNP) in Pakistan. The long run income elasticity is greater than one (1.36) and positive, but the income elasticity in the short run is also positive but less than one (0.59) and the price elasticity in the long run (-0.54) and short run (-0.56) both are negative but less than one. Ozturk and Acaravci (2009) found volume of imports demand negatively related to relative prices and positively to real income in the case of Latin American

and Caribbean Countries. Thalassinos and Politis (2012) have analyzed USD currency and oil prices using VAR models. Serge and Yue (2010) empirically examined the import demand function in the case of Cote D'Ivoire and found that investment and exports are the main determinants of imports in the long run.

Shaista Alam *et al*. (2010) estimated the import demand function for Pakistan employing ARDL approach. The result from ARDL analysis, support the hypothesis that in Pakistan there exist a long run relationship among, import demand, real economic growth, relative price of imports, real effective exchange rate and volatility of real effective exchange rate. It found that aggregate import demand is positively affected by real gross domestic product suggesting that import demand in Pakistan is growth driven. Further it found that relative price of imports may not decrease the import demand, which is quite obvious for growth driven economy. It also found that real depreciation of local currency and volatility of real effective exchange rate has no effect to decrease import demand in Pakistan in the long run. The evidence based on short run dynamic tends to indicate that real economic growth, relative price of imports, real effective exchange rate and real effective exchange rate volatility Granger cause import demand in the short-run.

According to Pelinescu (2006), the real effective exchange rate (REER) measures the changes in the competitiveness of a country by taking into account the changes in the relative prices between the countries involved.

3. Methodology

3.1 Data

The estimations are based annual data of 6 oil exporting countries i.e. Saudi Arabia, United Arab Emirates, Kuwait, Qatar, Islamic Republic of Iran, and Nigeria for the period from 1982 to 2008. The variable to be explained is real imports (IMP) which we take (in 2000 constant prices) from the IMF World Economic Outlook database. The first explanatory variable is an activity variable capturing real demand (EXP). We propose to also include real exports as oil export revenues make up a big part of national income in oil exporting countries. We therefore use "domestic demand and exports" defined as the sum of real domestic demand and real exports as explanatory variable. The data for domestic demand and exports is taken from the national accounts of the respective countries. The activity variable is expected to have a positive impact on real import demand: With higher domestic demand the demand for imports will also rise. With higher real exports the oil exporting countries have also more revenues to spend on foreign products. Thus, exports of oil exporting countries are likely not to depend on the real exchange rate (TCER). This should not be the case for imports. Even though there is almost no data available, it is likely that imports to oil exporting countries are invoiced in the currency of the producer. The third explanatory variable is the price of oil in U.S. dollar (PRP). We use data

from the IMF's WEO database. The fourth explanatory variable is the share of government balances (BOC) in nominal GDP. Where available, we use the general government balance, otherwise we refer to the central government balance. This variable is expected to have a negative effect on import demand.

3.2 Statistics of descriptive variables for the six countries of OPEC

Table 1: Descriptive Statistics - Panel 1

	IMP	EXP	TCER	PRP	BOC
Mean	9.417898	9.911350	4.998748	2.922757	7.861185
Median	9.405543	9.831828	4.856929	2.909879	6.296500
Maximum	12.07539	12.62597	7.312001	6.220857	84.13700
Minimum	7.002156	6.992096	1.505469	0.000000	-242.1880
Std. Dev.	1.087495	1.061973	1.629174	1.106768	27.32479
Skewness	-0.006167	0.004905	-0.829845	-0.064616	-4.402473
Kurtosis	2.868397	2.982636	2.673412	4.245047	44.91134
Jarque-Bera	0.117932	0.002685	19.31331	10.57618	12380.09
Probability	0.942739	0.998659	0.000064	0.005051	0.000000
Observations	162	162	162	162	162
Cross sections	6	6	6	6	6

Descriptive statistics of the series studied are presented in Table 1. This shows that the real value of imports IMP presents the highest value compared to other values. Expounds the ratio from the current account in GDP of these countries BOC shows the level of highest risk, followed by the effective exchange rate REER and real import value IMP. The coefficient of skewness (Skewness) is often negative only if the variable EXP and the test statistic of Jarque Bera (JB) strongly rejects the assumption of normality.

Table 2: Correlations between Different Variables - Panel 2

	IMP	EXP	TCER	PRP	BOC
IMP	1.0000				
EXP	0.9244* (0.0000)	1.0000			
TCER	-0.0563 (0.4768)	-0.0820 (0.2995)	1.0000		
PRP	0.4630* (0.0000	0.4030* (0.0000	0.0443 (0.5753)	1.0000	
BOC	-0.0496 (0.5305)	0.1747* (0.0262)	-0.0227 (0.7747)	0.1273 (0.1066)	1.0000

Source: Author's estimations

Correlation coefficients significant at 10% are marked with a star. () Is the probability of rejecting the hypothesis of no significance of the correlation coefficient.

Table 2 shows the correlations between different variables for the six countries of OPEC. These correlations are weak and negative, as they are strong and positive.

4. Estimation results

The model used to explain the real value of imports based IMP real income from oil exports EXP, the effective exchange rate REER, real oil price and GWP ratio which traces from the current account in GDP BOC countries. The equation to estimate is:

$$IMPit = \beta + \alpha 1EXRit + \alpha 2TCERit + \alpha 3PRPit + \alpha 4BOCit + \varepsilon it$$

All these variables are specified in logs, and that we expect will be close to unity from a theoretical point of view while empirical studies suggest that more than one and less than one. The coefficient should be positive and the coefficient should have a negative sign.

The necessary tests performed, tests for autocorrelation and Hausman managed to conclude that the model should be estimated by the OLS fixed effect because the probability of Hausman test is less than 10%, which implies the fixed effects model is preferable to random effects model. The estimation results are entered in Table 3, below:

Table 3: Estimating a fixed effects model

IMP	Coef	Standard deviation	t-student	Probability
EXP	0.9257	0.0384	24 .06	0.000
TCER	0.1879	0.0546	3.44	0.001 (significant)
PRP	-0.0170	0.0332	-0.51	0.609 (not significant)
BOC	-0.0077	0.0092	-8.36	0.000
Constant	-0.587	0.5115	-1.15	0.253 (not significant)

Source: Author's estimations

All variables are significant only in the case of variable real price of oil. This brings us to explain the relationship of oil and the currency rate (REER), for example, crude oil and the dollar had a strong relationship. There are several reasons behind the strong relationship between the global economy and the price of oil: countries that have oil wealth to benefit the high price of oil. The economy of a country's currency is strong value gains in the exchange rate. Conversely, countries that depend on others to import their oil will not benefit from low prices. Their

economies will suffer when the price of oil increases. This indicates that if a country produces and exports oil, it will have a stronger economy. Therefore, the exchange rate of that currency will be higher in value.

The significant relationship between the ratio which traces from the current account in GDP of these countries BOC and the real value of imports implies that IMP-country export growth has been slowed by the deflationary effects of higher prices of energy and manufactured goods. This result goes against the theory as rising oil prices can increase the financial means of exporting countries and transmits to the growing financial and monetary flows to non-exporters, so it can meet their financing needs.

So the real effective exchange rate has a positive and significant influence on the values of imports: "The econometric work done at the CEPII show that over a long period (1974-2004), the real oil price, defined as the price dollar oil reported to price index U.S. consumer is positively related to the real effective exchange rate of the dollar, is to tell the real exchange rate of dollar against all trading partners United States."

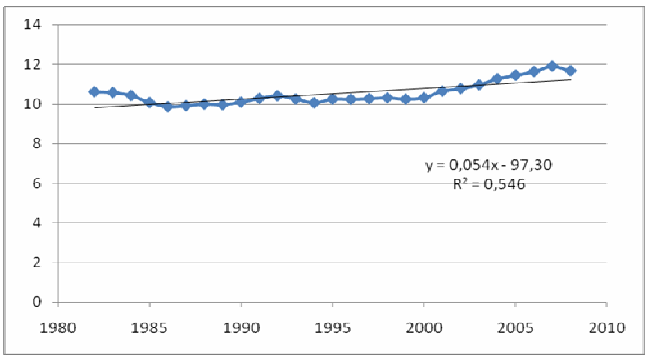
4.1 The study of the existence of a long-term relationship between IMP and PRP

The objective of this analysis is to examine the existence of a long-term relationship between the real value of imports IMP and the real price of oil PRP. We start, first, by analyzing each country

a. Saudi Arabia

The graphs represent the weight of petroleum products in the import show the evolution of imports of petroleum products as a percentage of the total imports for the period from 1982 to 2008 for each country.

Graph 1: Percentage of petroleum products in the import of Saudi Arabia



***Source*:** Author's graph on the basis of IMF data, 2008

Saudi Arabia produces over 3 billion barrels of oil per year and will probably remain the largest exporter of oil in a probable future, with a quarter of proven oil reserves and production costs among the lowest in the world.

According to the Oil and Gas Journal, Saudi Arabia has 262 billion barrels of proven oil reserves, roughly a quarter of global reserves of conventional oil established. Although Saudi Arabia has around 80 oil and gas fields, more than half of its reserves are in only four fields, and more than half its output comes from a single field, Ghawar field. A challenge for the Saudis to keep or increase their production is the production of their current fields decreases by 5 to 12% per year, thus seeking additional annual capacity equivalent. The International Energy Agency predicted that Saudi oil production will intensify over the next two decades, penetrating extraction of 7 billion barrels per year in 2020.

From the graph of Saudi Arabia, we see a gradual change between years and the evolution of imports of petroleum products (R2 = 0.546) during the period between 1982 and 1989, a period of cons oil shock (second oil shock), the weight of petroleum imports declined in 1982 and 1983 and varied form of sawtooth until 1989. This reminds us of the change trend of consumption of crude oil during the same period.

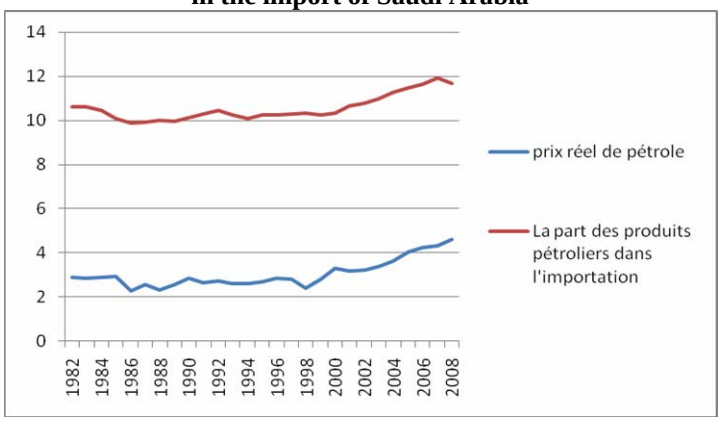
A period of stability between 1990 and 1997 is characterized by a weight of 8% of petroleum products in total imports. Indeed, this period was also a period of stability to oil prices of around $ 18. A fall in 1998 accompanied the stability up to 5% of the total imports. This year corresponded with the fall in oil prices below 12 dollars a barrel.

The share of petroleum products in total imports increased to reach 11% in 2000, with rising oil prices again in 1999. In recent years, the share of petroleum products in total imports is somehow related to changes in oil prices. In fact, it increases with increasing prices and decreases with the fall thereof with a sharp increase of 13% by 2009.

Internationally, Saudi Arabia led an effective foreign policy. Leading oil power, head of global reserves, thanks to its additional provisions readily available, it advocates a regulatory attitude and dialogue between key market players. Without bringing into question its agreement with the United States, joining the G20 has established the status of major power in the Middle East and internationally by inspiring its policy to vary its regional alliances to counter the rise of his rival Iran. But Saudi Arabia has suffered the negative effects of the global economic crisis, which prompted a sharp drop in production and oil revenues, tighter credit and declining domestic demand. Real GDP is expected to contract by 1% in 2009, when he was up 4.5% in 2008, before returning to solid growth in 2010. Despite this,

"Saudi Arabia faces the global crisis into a position of strength, reflecting a context of prudent macroeconomic policies and structural reforms have strengthened the resilience of the economy."

Graph 2: The evolution of real oil price and the share of petroleum products in the import of Saudi Arabia



***Source*:** Author's Graph on the basis of IMF data, 2008

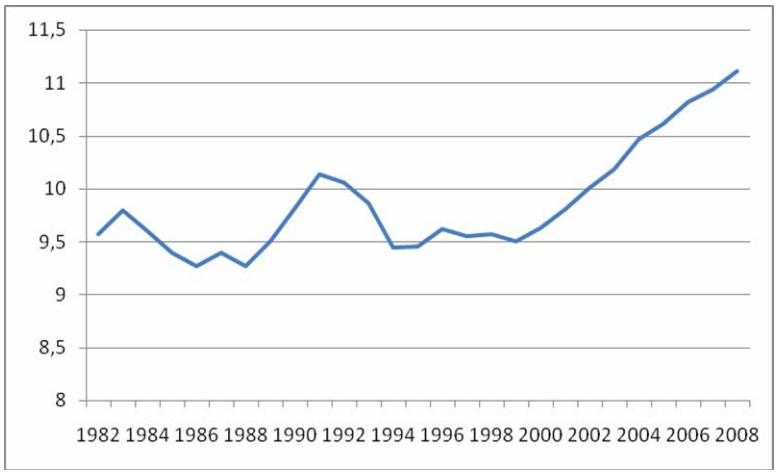
b. Iran

Iran has the second largest oil reserves in the world and is the third largest exporter. In 2006, the Iranian crude indicated 5% of global crude production. In 2009, there were 52 layers in Iran active producing wells and 1853 (Chart. 3 shows the progressive value of imports of petroleum). Iran has abandoned the last thirty years the oil as a source of electricity generation, taking advantage of rising oil prices on the world market and maintaining export. Iran seems to direct its resources sparingly in petroleum, which he knows he can always count on. Iran also possesses the largest gas reserves in the world (15.8% of world total). Is the gas that has replaced oil as the main source of electricity production in Iran. Today, much of the gas produced by Iran is consumed in Iran, either to generate electricity or as fuel (LPG is widely used in Iran in recent years). Iran is now the third largest natural gas consumer after the United States and Russia. With giant basins of North and South Pars discovered some years ago and plans enclosing their exploitation, the exploitation of Iranian natural gas is expected to increase in years to come. The natural gas consumption in the domestic market should continue to increase by about 7% per annum in the near future, making Iran the country with the highest rate of growth in the use of natural gas.

Iran produces an average of about 1.5 billion barrels per year, in sharp decline over 6 billion barrels per year that occurred when the Shah of Iran was in power. The U.S. defends the import of Iranian oil, which limits its length, but does not reduce

the likelihood of a disruption of Iranian production induces a surge in oil prices in the world. U.S. pressure on Iran to let the Iranian nuclear program are at high risk of military confrontation and political risks on Iranian oil weigh much heavier than the geological risks.

Graph 3: Changing value of the import- Iran



***Source*:** Author's graph on the Basis of IMF data, 2008

c. United Arab Emirates (UAE) and Kuwait

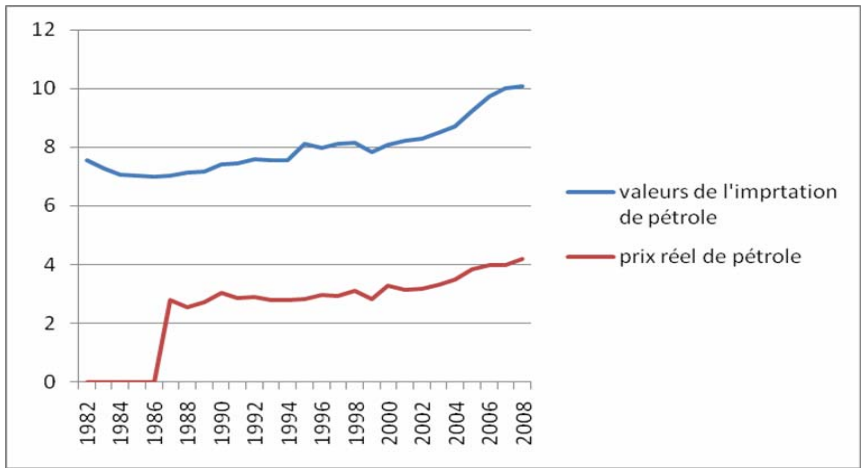
The UAE and Kuwait are equal almost to the fifth largest reserves of conventional oil in the world with 98 and 97 billion barrels, respectively. The UAE produces about 0.8 billion barrels per year and have about 100 years of reserves at that rate while Kuwait produces about the same amount and has almost 100 years of reserves. Abu Dhabi has 94% of UAE oil reserves while most of Kuwait's oil reserves are in the Burgan field, the second largest oil field after Ghawar field of Saudi Arabia. Kuwait plans to increase its oil production to reach a capacity of 4 million bbl / d by 2020, but since the Burgan field was found in 1938 and became very advanced, it will be a competition. Moreover, according to leaks from the Kuwait Oil Company (KOC), the remaining oil reserves proved and unproved Kuwait are only half of the official figures - 48 billion barrels.

d. Qatar

From Graph 4 we notice a rapid change in real price of oil, even in the values of imports, Qatar is characterized by economic growth will again meet the 10% for 2009 through the sharp increase in natural gas production. In 2010, Qatar has produced 77 million tonnes of LNG and oil side, 822,000 b/d. The two key sub-sectors of oil, which slowed growth in 2009, should continue to increase during the scheduled period, but growth in LNG production to trigger squeeze after 2015.

Furthermore, the Government informed infrastructural expenditure program which is estimated at 20 billion USD over the next five years, equivalent to 15% of GDP in 2010.

Graph 4: The evolution of real oil price and the share of petroleum products in the import to Qatar



***Source*:** Author's graph on the basis of IMF data, 2008

e. Nigeria

Fossil fuel plays a vital role in economic and political life of all countries. Exports and imports of oil and gas account for the majority of trade in Nigeria, Cameroon, Chad and Mauritania. The importance of oil consumption in these economies can be illustrated by a cross-country comparison of national oil consumption per unit of GDP. According to this indicator, the West African countries consume on average 30% more oil than any European country. Four of them have a higher consumption than the United States. Even considering that GDP is underestimated (because of the existence of a strong informal economy) or that oil consumption is overestimated, the overall trend remains the same. Several reasons explain the relative importance of oil consumption: the weight of trade in GDP, the geographical context (large countries with difficult access), the virtual absence of alternatives to road transport and the relatively high oil in electricity generation (thermal power plants or diesel generators for private use. With 50% of oil consumption absorbed by the transport sector and the importance of trade in the economy, rising oil prices have an impact on most economic sectors. Today, 86% of total oil production in West Africa and almost all gas production are Nigerian. The majority of the deposits discovered in the basin of the Niger Delta, an area of 75,000 km2 which continues to Cameroon and Equatorial Guinea. And, with real prices accessing their highest level since early 1980 and assuming there are no signs of trend reversal, the oil industry continued to

impose the economies of these countries. Thus, following the price increases of recent years, Nigeria's oil revenues repeat approx. This positive impact on exporting countries has its counterpart in the importing countries.

4.2 Panel unit root tests

The literature on unit root tests and cointegration in panel saw significant developments in recent years and differentiate between tests of the first generation calm on the assumption of independence of individuals inter-individual panel, and tests the second generation, incorporating various possible types of dependencies between individuals. It is well known that the panel data admit to working with small sample size in the temporal dimension, considering a large number of observations in the individual dimension, which actually decreases the likelihood of being considered to break structural and also helps to treat the classical problem of the low power of tests in small sample. To test the existence of interdependence between different countries, we have implemented the test of Pesaran (2004). Its null hypothesis is the lack of interdependence between countries and under H0, the test statistic is asymptotically distributed following a normal distribution. The tests most frequently used are those of Levin and Lin (LL) and Im, Pesaran and Shin (IPS). In our work, we seek to study the properties of non-stationarity and cointegration. If the IPS test is an advance over that of Levin and Lin (1992), it has two major limitations: the panel must be cylindrical and the number of delays in administering each ADF test did not differ between sets. Therefore, we also test Maddala and Wu (1999). Finally, the test of Hadri (2000) based on the null hypothesis of stationarity of the panel. Tests of the IPS, LL, Hadra and MW test shows that there is no correlation between individuals of the panel (that is to say, the independence between individuals). This assumption is not very robust. Because there is an interdependence between countries.

Table 4: Panel unit root tests

Variables	Model Specification	LLC	IPS Hadri		MW
IMP	Model with trend	-11.277 (0.000)	-10.721 (0.000)	0.4723 (0.075)	-13.420 (0.000)
	Model without trend	-12.720 (0.000)	-11.340 (0.000)	2.0007 (0.161)	-14.339 (0.000)
PRP	Model with trend	-3. 100 (0.00545)	-2.147 (0.000)	4.603 (0.000)	-3.69 (0.0001)
	Model without trend	-1.7620 (0.0471)	-2.4034 (0.0071)	6.355 (0.000)	-3.92 (0.0078)

Source: Author's Estimations

The hypothesis test is the presence of a unit root, so the probability of the test below 10%, 5% and 1% led to rejection. Thus, whatever the model, tests are conducted

with fixed effects and the number of delays as the Akaike criterion is set at 8. The results in Table show that the series of imports and oil prices are stationary. Only in the case of test HADR for variable IMP, the model without trend, the unit root hypothesis is accepted. We turn at this stage and at the test Hadri, to study the existence of a long term relationship building on the work of Pedroni (1997, 1999). PEDRONI tests are tests of the null hypothesis of no cointegration-based unit root tests on the estimated residuals. Pedroni has developed seven cointegration tests. In seven tests, four are based on the size within (intra) and three are based on the dimension between (inter). These two criteria are based on the null hypothesis of no cointegration (non-stationarity of estimated residuals), the distinction between the two categories is the level of the alternative hypothesis.

$$\begin{cases} \rho_i = \rho \prec 1 \forall i & \text{within} \\ H_1 = & \\ \rho_i \prec 1 \forall i & \text{between} \end{cases}$$

Each of the seven statistics follows a normal distribution, center, and for N and T sufficiently large, the null hypothesis of no cointegration-based unit root tests on the estimated residuals.

Table 5: Dimension Within and Between

Alternative hypothesis: Within dimension: intra-individual dimension

Panel V-stat	-0.312
Panel Rho-stat	-12. 56
Panel PP-stat	-14.590
Panel ADP-stat	-13.239

Alternative hypothesis: Between dimension: inter-individual dimension

Group Rho-stat	-15.635
Group PP-stat	-18.102
Group Rho-stat	-15.401

Source: Author's estimations

From the results of tests of cointegration PEDRONI we can discern that all statistics are below the critical value of the normal distribution for a threshold of 5% (-1.64). So all of these tests requires the existence of a cointegrating relationship between the two series.

5. Conclusion

This study focused on changes in real prices of oil and changes induced by the macro-economic policy and specifically on the values of imported oil. From this point of view, we found a significant negative balance of current account and positive and significant impact of real exchange rate. However, rising oil and other raw materials is due to different factors:

- An increase in demand for these products in countries OPOP experiencing rapid growth and rapid urbanization when political instability and capacity close limit their supply.
- The fall of the dollar increase per barrel in dollars when the purchasing power decline in the exporting countries that have a different currency than the dollar, for example, "The easing of U.S. monetary policy, followed a relaxation of monetary policy in countries whose currency was linked to the dollar by a fixed rate (the Gulf countries for example) or that maintain undervalued currency to promote export-led growth (such China and other informal members of the so-called dollar zone Bretton Woods). This has fueled a new asset bubble in commodities and overheating of the economy of these countries."

We also note the importance of oil price changes to explain the appreciation of real effective exchange rate of the OPEC countries. The influence of oil price fluctuations in the exchange rate is higher but a rise in price the exchange rate depreciates.

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