LIBYAN IMPORT DEMAND WITH EXPENDITURE COMPONENTS

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ABSTRACT

As a developing economy, Libya can achieve significant economic growth through favorable international trade. The findings of the study imply that import demand in Libya can be explained significantly by the country's private and public expenditure. The results show relative prices of imports have little significance on the growth of import demand in the economy of Libya. The model specification adopted for the current study can assist to capture changes in the macroeconomic trends of import demand. The study tested for correlation, unit root, and cointegration of the variables. The study also used of error correction models of import demand. Theory suggests that import is determined by two important factors: prices and expenditure. Three components of expenditure were inserted in the model of import demand: investment, consumption, and government expenditure. All components of expenditure are found to be significant determinants of import demand in Libya.

Keywords: import demand, price of imports, price of domestic goods, expenditure components, income

1.   Introduction

Determinants of economic growth of a country comprise several external and internal factors. Majorly, the former consists of international trade while the latter entails local demand. Conventional understanding of foreign trade is that it is an arrangement in which an economy is open to exploitation because of the imports and exports. Eventually, there is an accumulated growth due to the production of higher incomes over time. Moreover, it is important to note that consumers have different income levels hence different expenditures within a given economy. The interpretation here is that distribution of expenditure changes based on relative prices in high and low-income goods (Fajgelbaum & Khandelwal, 2016). Therefore, the imports of an economy is affected, and the requirement for significant economic measures to manage this effect.

Libya is a developing economy hence it depends on imports. The nation has been affected by the international trade for its economic survival and growth. Alternatively, the continued export of oil in Libya has led to a substantial increase in imports because theresulting returns have allowed consumers to acquire products from other regions. There has been an evident increase in the domestic supply in goods and services leading to an elevated economic prosperity in Libya. Imports play a central role in domestic growth of an economy. However, a country must consider control measures to help manage changes due to increased global trade. In Libyan case, the government has to reflect on the conflicting objectives due to the increased level of imports to achieve the desired positive economic growth by the virtue of liberalization as a result of international trade. Hence, there is a need for an examination of the relationship between of Libyan import demand with expenditure components.

Government plays a significant role in an economy. Alongside its traditional function of providing defense and security, the Libyan government provides free medical care and education. It also controls public utilities, telephone, and the mass media. With the exception of commerce, Libyan government is both the main producer and investor in the services sector. Its current expenditures consist of purchases of goods and services for operational and administrative purposes (Braun, 1992). These expenditures increased from L.D. 26.0 million in 1962 to L.D. 1400.3 million in 1977. In majority cases, the government mostly acquires account of previous levels of its revenues and expenditures in addition to expected revenues in making a decision of its current purchases of goods and services.

1.1 Problem Statement

There are interesting facts about Libyan efforts to promote its economic growth. In 1951, the government decided to stimulate economic expansions a big thrust was required to conquer its retarded state. The government has assembled the available resources and directed them for construction and development. It commenced some projects which are either non-profitable or beyond the hold of the private sector, for instance, a national airline carrier, the specialized banks, and all the major manufacturing industries. Public investment constitutes the expenditures on the national economic development plans (Brian, 2006). However; international trade promotes the performance of the public investment decision in a country.

Talking about international trade, it is one of those relations in which two nations share resources for their growth. Although foreign demand is widely accepted as a growth-promoting factor, countries are observed to create some restriction in certain cases and periods. Hence, a question arises as to what determines whether a country should liberalize or limit trade. This question can be answered once the benefits of international trade are realized, and its role in economic growth of a country is understood. Therefore, the current paper will be able to explore and examine case Libyan import demand with expenditure components.

1.2 Research Question
What is the relationship between Libyan import demand and expenditure components?

1.3 Research Objectives
1. Exploring and examining the role of international trade in the process of economic growth and development of Libya.
2. Examining the relationship between current revenue and expenditure components of Libyan economy.
3. Determining the effects of aggregate import demand on Libyan economic growth.

1.4 Research Hypothesis
H_0: Import demand has a significant relationship with expenditure components (price of imports, price of domestic imports, and income).
H_A: Import demand does not have a significant relationship with expenditure components (price of imports, price of domestic imports, and income).

1.4 Justification and Contribution of Study
The following considerations justify the current study. This research advances empirical work on factors determining an increase in import demand for developing countries. The assumption is that import content and final demand ought to be the same. Hence, both current revenue and lagged expenditures and revenues will be used as explanatory variables in the behavioral equation of the government's current expenditures. As a result, the study addresses the extent to which Libyan import demand promotes economic growth because of the continued international trade.

1.5 Organization of Study
The work is structured as follows. After introduction, a brief economic background is provided. The sections that follow are review of literature, research methodology, and data analysis for empirical results. Finally, there is a conclusion part with significant implications of the paper as well.

2.   Economic Background
2.1 Introduction
The primary goal of this research is to explore and examine Libyan import demand with expenditure components. In this case, it is important to understand organization of Libyan internal and external trade activities. The background information regarding investment, consumption level, and government expenditures is required. Details of these components are provided as follows.

2.2. Investment
2.2.1. Investment Initiatives
Libya invested in the banking sector of African countries to boost the economy of these countries. It aimed to invest in African countries to boost their economies. It also aimed to provide oil reserves to these countries at the concessionary rate to strengthen their economies. As part of this initiative, it funded two banks in Kenya. These were Sahel-Sahara Investment and Trade Bank. The investment amounted to US$150M.

Libya is the member of the Sahel-Saharan States (CENSAD). It is a community of 28 members. Kenyan joined only recently this community. The bank funded by Libya was to act as the bank for CENSAD. Libya also purchased a major hotel in Kenya. It aims to provide funds to the coffee industry of Kenya. Kenyan coffee is a major source of export revenues. By strengthening this industry, Libya aims to improve the economic prospects of Kenya. Libya in return will import Meat and tea from Kenya. Libya also signed an agreement with Kenya to give it oil at subsidized rates (EIU, 2008, p. n.d).

2.3. Consumption
In a report published by the World Bank in 2010, Libya private consumption factor was estimated at 0.94 in 2009 as compared to 2008 rate of 0.92. Libya's purchasing power parity is regarded as the strongest among the African countries since the discovery of oil in the 1950s. For a long time, Libya has been running a centrally planned economy, but after the earlier sanctions by the United Nations and America, the government embarked on a more market-oriented restructuring. The country has continuously reduced private subsidies to its citizens and privatized many state corporations.

2.4. Government Expenditures
Prior to 1963, any complete national economic development plan did not exist; however, a series of ad hoc agencies financed by grants from western governments were formulated to deal with economic development problems in the Libyan economy. During the period 1951-60, foreign aid played a significant role in financing the expenditures on development projects. The Libyan government, during that period, received L.D. 36 million ($163.32 million) of which L.D. 32.7 million were spent on development programs (The Development of Public Finance in Libya 1943-1963, 1965).

Both private and public investment disaggregated into five sectors, namely, investment in the agricultural, manufacturing, oil, construction, and services sectors. Public investments in the five sectors, as well as private investment in the oil sector, were considered exogenous while private investments in the remaining four sectors were endogenous. Moreover, a general reduction in total private real investment was observed in the years 1967, 1970, 1971, 1976, and 1977. The decrease was apparent in all sectors during 1974-77. With the exception of the services sectors, the reduction in private real investment was accompanied by a similar reduction in the divisional value added.

3.   Literature Review

3.1 Introduction

This section provides a review of selected literatures on import demand with expenditure components. It is worth noticing that several studies have been conducted globally to study the effects of aggregate import demand on the growth of economies (GDP). Investigations of studies conducted for Libyan economy for estimation studies of determinants of aggregate import demand are limited. Hence, this study will heavily rely on other related studies carried out in other countries. The chapter will rely on studies that used disaggregate approach.

3.2 Classification of Import Demand

There are dissimilar ways of classifying import demand. The major important categorization are the import demand a function of aggregate income and prices, use of disaggregate imports in an economy as a function of income and relative prices, or aggregate imports as a function of disaggregate components of total income or expenditure (Alias, Tang, & Othman, 2001; Chani & Chaudhary, 2012; Hor, Keo & Suttiprapa, 2018; Yahia, 2015; Ziramba, E., & Bbuku, 2013). Studying import demand in all this classified ways takes price determinants of import demand as relative prices or can use the local prices and import prices separately. Ahad, Afza, and Shahbaz (2017) explored the association between financial development and import. The primary focus was on the aspect of economic growth based on import process as contributors. Ahad et al. (2017) used empirical evidence and confirmed that there is evident relationship between import prices and economic growth.

3.3 Empirical Literature on Import Demand Estimation for Developing Economies

Different developing economies have showed a relationship between import demand and expenditure components. Rehman (2007) provided a study conducted in Pakistan using data collected between 1975 and 2005 for Pakistan and applying Johansen co-integration technique. The author confirmed a long run relationship among the variables of aggregate import demand and prices, real income, and local price levels in the country. The study indicated that elasticity of local prices was insignificant in the long run and in the short run, while the elasticity of income and import prices were highly significant in short and long run.

Similarly, Hor et al. (2018) conducted an empirical study for Cambodia and examined import demand factor using series data of 1993-2015. The investigation employed autoregressive lag model. Hence, Hor and his colleagues were able to determine how relative prices, consumption expenditure, exchange rate, exports, and foreign direct investment impact import demand for Cambodia both in short and long-term. The findings of the research were that relative prices negatively affected the import demand while the exports impacted positively the import demand for Cambodia. However, the study concluded that foreign direct investment, consumption expenditure, and exchange rate had insignificant effect on import demand.

In a small developing country, Narayan (2005) estimated import demand function for Fiji and discovered that import demand was inelastic to total consumption, relative prices, investment, and export expenditure. In a similar country case, two studies on the existence of co-integrating relationship among income, import, and relative price by Hye (2008) and in Cote D'ivoire by Constant and Yue (2010) prove the existence of co-integrating relationship. However, Hye (2008) did not investigate the long run relationship of income and relative prices.

Constant and Yue (2010) used time series analysis of demand function using data collected between 1970 and 2007 and autoregressive lag models to co-integrate the results and check for the long run relationship among the consumption expenditure, import demand, investment expenditure relative price and exports. Further analysis indicates that import demand in Cote D'ivoire is price inelastic. The variables of relative price are insignificant to import demand in the long and short run.

A study on Namibia as another developing country showed interesting facts regarding import demand and expenditure components. Ziramba and Bbuku (2013) used time series data ranging 1980 to 2009 and examined the short and long-run association between aggregate imports and relevant expenditures. Similar to Hor et al.' (2018) research, Ziramba and Bbuku (2013) employed autoregressive lag model in and were able to capture the relationship between final consumption, investment, export expenditures and relative import prices. The major results were that aggregate import demand is a co-integrated with these variables. Moreover, Ziramba and Bbuku (2013) affirmed that there is a different degree to which the expenditure components affect relative prices for import in both short and long-run. However, they are all crucial factors affecting the aggregate import demand.

Libyan economic development is a crucial partner for ASEAN countries, and hence the need to examine various researches on the relationship between import demand and expenditures for these nations. Mohammad et al. (2001) work, reported by Chani and Chaudhary (2012), explored the long-run co-integration between imports and expenditure using Johansen multivariate approach and found out that there is a long-run relations association of import demand with expenditure components in the ASEAN countries. Min et al. (2002) had conducted the case scenario for South Korea using Johansen co-integration as outlined by Chani and Chaudhary, 2012. The study reported that relative prices negatively affected the import demand. Alternatively, elastic long run association between import demand variable and consumption expenditure showed a positive relationship. For the case of China, Tang (2003) as also reported by Chani and Chaudhary (2012) in their work, had used testing cointegration. The investigation revealed that import demand and relative prices had a negative long-run relationship.

International trade is about being open to other economies. It is important to consider studies done on import demand with expenditure components for Gulf Cooperation Council countries. The study "The Determinants of the Demand for Imports in GCC Countries" appearing in *International Journal of Economics and Finance* explored empirical estimates of Bahrain, United Arab Emirates, Kuwait, Oman Qatar, and Saudi Arabia (Aljebrin & Ibrahim (2012, p.126). The researchers used annual time series-cross section data (1994-2008) and employed Seemingly Unrelated Regression model to examine (Aljebrin & Ibrahim,

2012). The critical parameters considered were imports, real income, international reserves, private consumption, and gross capital. The conducted empirical results also considered both short and long-run aspects. The findings indicated a positive and significant association of the mentioned determinants with import demand in both the short and long-run. Conversely, a negative and significant correlation was evident between demand for imports and domestic prices as well as government consumption but in the long run.

3.4 Import Demand for Advanced Economies

An investigation on import demand for advanced economies has been documented as well. Morel (2015, p.1) stipulated the primary assumption for a slowdown in trade and weak global demand to be "increased protectionism, production off-shoring and shift toward a less trade-intensive auto industry. Specifically, the study noted that Constantinescu, Mattoo, and Ruta (2011) and Krugman (2013) works argued that structural factors had affected the expansion of global trade (Morel, 2015). On their part, Bussière et al. (2013) concluded that cyclical factors explained the existing weakness in import demand components. These researchers had estimated the relationship between import intensity-adjusted and aggregate demand based on stylized theoretical model. Their argument was that demand is a crucial factor in facilitating trade dynamics especially for import-intensive expenditure such as investment and exports.

Nevertheless, Morel's (2015) did not consider structural or cyclical factors as determinants for slowdown in global demand. Meanwhile, the author elaborated the development of Bussière et al.'s (2013) work from a perspective of country-specific measures of the global demand. This allowed the author to examine relative price and estimate export demand equations for 18 countries under Organization for Economic Co-operation and Development (OECD). Morel (2015) found out unique differences in the advanced economies for European and non-European nations.

In particular, there was a sluggish foreign demand for European exports due to competitiveness gains after the post-crisis structural adjustments (Morel, 2015). However, this was not the case with non-European countries. According to Morel (2015), there was an inconsistent in the changes for foreign demand and relative prices because of the increased intensive trade between China with Japan and Korea since China experienced a positive and rapid economic growth. Eventually, Morel (2015) findings were that weak investment and the resulting post-crisis demand contributed to sluggish foreign demand for advanced countries.

4. Research Methodology

4.1 Introduction

Import demand is a function of relative price of imports, price of domestic products, and income. Therefore, the research comprises a dynamic structure that explored and examined price of imports, price of domestic products, and income (independent variables) as determinants of import demand (dependent variable). This section presents the research methodology based on the aspects of conceptual framework, empirical analysis, and data source.

4.2 Conceptual Framework

The present work uses import demand model comprising consumption expenditure as an aggregate of price of imports, price of domestic products, and income (total investment). We also posit that import demand has a positive relationship with real income and negative function with relative prices. The former mentioned presumption is also supported by other studies (see Adam, Katsimi, & Moutos, 2011; Kalyoncu, 2006; Sadeghi & Ramakrishna, 2014).Based on the aforementioned arguments, the conceptual model for the current study is formulated below:
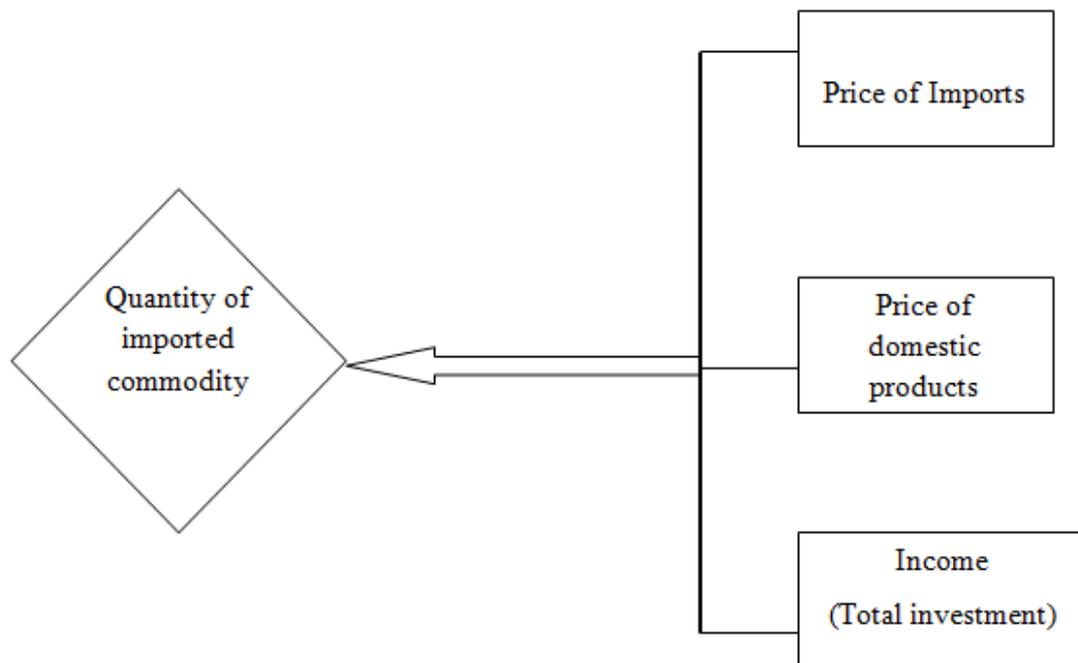
$M = f(P_d, P_f, Y)$

Where:

M = Quantity of the imported commodity
P_f = Price of Imports
P_d = Price of domestic products
Y = Income

***Figure 1.* Import demand with expenditure components conceptual framework**

4.3 Model Specification

In the existing literature on import demand, the import demand function is most commonly estimated as:

$M = f(P_d, P_f, Y)$ ...   *(1)*

Where:

M = Quantity of the imported commodity
P_f = Price of Imports
P_d = Price of domestic products
Y = Income

The specification of the import demand equation is based on the conventional demand theory obtained from the neo-classical economy and the income as suggested by the Keynesian view. A key assumption also made in most of the studies is the assumption of imperfect substitution (Dutta & Ahmed, 2006; Musyoka, 2010). The presumption is that neither imports nor exports are perfect substitutes for domestic goods of the countries under consideration (Dutta & Ahmed, 2006). Musyoka (2010) argued that imperfect substitute's model is derived from the supposition that imports cannot be considered as perfect substitutes to local or domestically produced goods.

Import demand in Libya can be represented as following linear function:

     $M_t = f(Y_t, PR_t)$ ...   *(2)*

Where PR is the price ratio or relative price measured as the ratio of import price (Pf) to domestic price (Pd) of Libya. An autoregressive function of equation 1 can be written as:

     $M_t = f(Y_t, PR_t, M_{t-1})$ ...   *(3)*

The regression equation of the function in equation 2 is:

     $M_t = \alpha_9 + \beta_{91} Y_t + \beta_{92} PR_t + \beta_{93} M_{t-1} + u_{9t}$ ...   *(4)*

Where, α9 is the intercept of Libya's import, β91 measures the effect of Libya's economic growth on imports. β92 measures the effect of price ratio on Libya's imports. β93 measures the effect of Libya's imports in the previous year on Libya's imports in the current year. u9t captures the effect of all those factors that affect Libya's import but are not included in equation 4.

The study utilizes import demand function model for Libya with consumption expenditure as the sum of government and domestic expenditure. Relative prices and other components such as exports and investment are included in the econometric model. Arguments from other studies such as the Chani et al. (2011) support this theoretical framework with Giovannetti (1989) stipulating that government expenditure and household consumption expenditure have different import contents. Tang (2003) also proposes that time trend should be included in import demand function to represent the role of taste and habits in the import demand function. The function in equation 2 can be extended as:

$M_t = f(C_t, G_t, I_t, X_t, PR_t)$ ...   *(5)*
Where,

C = Household consumption expenditure of Libya
G = Government consumption expenditure of Libya
I = Total investment of Libya

The regression equation of function in equation 4 is:
$$M_t = \alpha_{10} + \beta_{101} C_t + \beta_{102} G_t + \beta_{103} I_t + \beta_{104} X_t + \beta_{105} PR_t + u_{10t} \qquad \dots (6)$$

In this section, all the models required in the objectives and the equations required for sub-objectives have been introduced. Different statistical methods are employed in the study for the estimation of the above equations.

4.4 Augmented Dickey Fuller test (Test of stationary series)

We perform a unit root test on each variable in our model using the Augmented Dickey- Fuller (ADF) test. ADF test is applied to each time series. Let A_t be a time series, and then following hypothesis can be formulated to test the existence of unit root in Y_t.

$$\Delta A_t = \alpha + \gamma t + \beta A_{t-1} - \theta_1 \Delta A_{t-1} + \mu_t \qquad \dots \qquad (8)$$
$$H_0: (\alpha, \gamma, \beta) = (\alpha, 0, 0) \dots v \dots H_1: (\alpha, \gamma, \beta) \neq (\alpha, 0, 0)$$

The joint hypothesis $\gamma = \beta = 0$ is tested performing F-test. If the null hypothesis is not rejected, the next step is the test $\beta = 0$ using t-statistics. Following is the estimation equation,

$$\Delta A_t = \alpha + + \beta A_{t-1} - \theta_1 \Delta A_{t-1} + \mu_t \qquad \dots \qquad (9)$$
$$H_0: (\alpha, \beta) = (0, 0); H_1: (\alpha, \beta) \neq (0, 0)$$

Rejection of H_0 requires that series contain a unit root and should contain a drift term. The above-described form uses the values of Y and hence it is called the level form. If Y is replaced by its initial difference or changed difference with evidence of unit roots, the series is said to be integrated of order one – I (1), meaning that they must be modeled in first difference ($\Delta A_t = at - A_{t-1}$) to make them stationary. A time series is stationary if it does not change over time, which implies that its values have constant variability. This enables us to avoid the problems of spurious regressions that are associated with non-stationary time series models.

After the confirmation that unit root vanishes at first difference form or second difference form, the series a used to find out long-run relationship. As a non-stationary series, even if not related in the short run, may be related in the long run to the other series. Johansen's Cointegration Test is used to determine the long-run relationship between the variables.

4.5 Johansen's Cointegration Test

After testing for unit roots, we proceed to test for cointegration (the long run relationship between variables). This study uses Johansen's and Juselius's (1990) definition of cointegration. Johansen's cointegration procedure was used to test for the possibility of at least one co-integrating vector between variables in the models. Cointegration between two series depicts the existence of a significant relationship between two variables. Though Ordinary Least Square (OLS) method also does the same, cointegration is useful where the series are non-stationary at level form while OLS estimates are spurious in a situation. Let A and B be two non-stationary time series such that their difference with the lagged term is stationary. Cointegration test for the two series require estimation of the following regression equation via OLS:

$$A_t = \alpha + \beta B_t + \mu_t \qquad \dots \qquad (10)$$

Where μ is the residual term. If μ is stationary, then A and B are co-integrated. For this purpose, ADF test is employed on the residual term. Remember that in OLS, residual terms are assumed to be white noise, that is their mean is zero and variance are constant. Mathematically,

$$E(\mu) = 0,$$
$$Var(\mu) = \sigma$$

Also, the error terms are assumed to follow a normal distribution. Symbolically,
$$\mu \sim N(0, \sigma)$$

Therefore, t-statistics is not appropriate as it uses the values of mean and standard deviation. Software packages contain a built-in program to test cointegration using Trace statistics and Max Eigen statistics. To enhance further clarification of the change in the dependent variable, Vector Error Correction Model is useful.

4.6 Vector Error Correction Model (VECM)

Once it is confirmed that the dependent variable is affected by the independent variables, in the long run, the changes that occur in the dependent variable in the short run as well as in the long run can be determined by VECM. Crucial parameters are involved in the VECM model estimation. Andrei, D and Andrei, L. (2015, p.572-573) stipulates that "the coefficient of the error correction term, which measures the speed of adjustment of economic growth to its equilibrium" is a crucial parameter. The VCEM model has other specifications involved in establishing the effect of variables. Andrei, D. and Andrei, L (2015) explained that variables in the model must be taken as endogenous and exogenous so that the association between them in short and long-run can be made. Therefore, the current study applied VECM model with cointegrating equations.

The result of a VECM depicts whether the dependent variable is above or below the equilibrium-level and how much of the equilibrium level is achieved in one year. By equilibrium level, it is meant that the value of dependent variable includes the complete effect of the independent variable. In this way, there is a description of how much time is required for a time series variable to adjust in the long run. Let A and B are two time-series with cointegration between them tested via following cointegration equations:

$$A_t = \alpha + \beta B_t + EA_t \quad ... \quad (11)$$
$$B_t = \theta + \lambda A_t + EB_t \quad ... \quad (12)$$

Where α and θ are intercept values of A and B respectively. β is the effect of B on A and λ is the effect of A on B. EA and EB are the error term of equations 11 and 12 respectively. Equation 11 and 12 together form a model whose Vector Error Correction Model (VECM) is as follows consisting of two equations:

$$\Delta A_t = \varphi + \psi_1 \Delta B_{t-1} + \psi_2 EA_{t-1} + \mu_t \quad ... \quad (13)$$
$$\Delta B_t = \theta + \lambda_1 \Delta A_{t-1} + \lambda_2 EB_{t-1} + \upsilon_t \quad ... \quad (14)$$

The symbol Δ represents the difference of the corresponding variable from its lagged value. φ and θ are the intercept values of ΔA and ΔB respectively. ψ_1 is the effect of the change in B in the previous year on the change in A in the current year and λ_1 is the effect of the change in A in the previous year on the change in B in the current year. EA_{t-1} and EB_{t-1} are the lagged values of the error terms in equation 9 and 10 respectively. They are called error correction terms with coefficients ψ_2 and λ_2. According to Robinson (1992), "the error correction term captures the long run relationship, short-run dynamics is provided by the lagged values of the difference terms". Mukherjee, P., Mukherjee, V and & Das (2017) add that lagged values are included as regressors, and they assist to explain the model. Using these methods of investigation enables the researcher to prove causality advanced by the Granger causality test.

The test uses the t statistics and F statistics to test the lagged values of each explanatory variables being investigated. In order to accept the null hypothesis, t-test for the lagged error correction coefficients is to be statistically significant for long term due to the bidirectional causation between the variables (Caner & Kilian, 2001). A significant coefficient of the error correction term implies disequilibrium in the value of the dependent variables. If ψ_2 has a negative sign, it implies A is below the equilibrium level, and a positive sign implies that A is above the equilibrium level. The magnitude of ψ_2 shows how much of the value of A is adjusted in one year towards the equilibrium level. A similar association is defined between λ_2 and B.

4.7 Data Source

The data in this study covered 1971 to 2009. Most of it was sourced from the Libyan Central Bank, International Monetary Fund, World Bank, and other internet sources that are publicly available. All the data is either real or indexed. If real data is not available in real form, it is transformed from nominal to real using an indicator of inflation.

5. Data Analysis, Results, and Discussion

The section presents the empirical results of the model in equation 6 developed in previous section. The model is same as the model in equation 4 except that it incorporates the factor of expenditure. Following table illustrates the output of the ADF test to test unit root in the three series of expenditure.

Table 5.1: ADF Test Results for Expenditure Components

Series	Level From		First Difference Form	
	Prob.	Unit Root	Prob.	Unit Root
C	0.2023	Yes	0	No
G	0.41	Yes	0.0005	No
I	0.5352	Yes	0.0073	No

The result of ADF test at the level form shows that the three series, annual household consumption expenditure, annual government consumption expenditure, and annual investment, contain a unit root and are not stationary. Research shows that most economic time series are characterized as non-stationery, and such variables in a model might generate estimation of spurious regression co-efficient (Adebayo, Adebusuyi, & Ishola (2014).In a similar study that showed results based on ADF test, Adebayo, Adebusuyi, and Ishola (2014) found that expenditure components (government expenditure on general administration, economic service, transfer, and social services) were stationery. However, the researchers had to normalize the equation through co-integrating coefficient for the long-run. The results were that government expenditure for industrial growth as well as public expenditure maintained a long-run relationship.

The three series do not follow a trend, and their current values cannot be predicted only on the basis of lagged values. At the first difference form, there is no unit root in each of the three series. Hence, annual household consumption expenditure, annual government consumption expenditure, and annual investment are stationary at the first difference form. The change in the series follows a trend, and it is predictable using the previous adjustments that occurred in these series. In Ayodotun's and Farayibi's (2016) study, import demand had a linear relationship prices, foreign exchange, while lagged imports showed a positive linear relationship with all the variables. The interpretation here is that lagged values of import indicate a positive influence for import demand in Libya. Cointegration among the variables of equation 6 is illustrated in the following table.

Table 5.2: Unrestricted Co integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.06 Critical Value	Prob.
None	0.707274	179.119	159.5297	0.0027
At most 1	0.604728	125.0642	125.6154	0.054
At most 2	0.511186	84.22416	95.75366	0.2378
At most 3	0.393338	52.73015	69.81889	0.5171
At most 4	0.25741	30.7397	47.85613	0.6804
At most 6	0.229039	17.64481	29.79707	0.5924
At most 7	0.131419	6.199622	15.49471	0.6719

Table 5.3: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.06 Critical Value	Prob.
None	0.707274	54.05481	52.36261	0.0332
At most 1	0.604728	40.84	46.23142	0.1689
At most 2	0.511186	31.49401	40.07757	0.3314
At most 3	0.393338	21.99045	33.87687	0.6084
At most 4	0.25741	13.09489	27.58434	0.8796
At most 6	0.229039	11.44519	21.13162	0.6029
At most 7	0.131419	6.199346	14.2646	0.5878

The hypothesis of no co-integration is rejected on the basis of both Trace and Max Eigen statistics. The values of Trace statistics are greater than the critical values for the hypothesis on no co-integration and at most one co-integration depicting that these two hypotheses can be rejected. The value of Max Eigen statistics is greater than the critical value only for the hypothesis of no cointegration. Hence, this hypothesis is rejected. Therefore, there is only one cointegration between the variables in equation 6. The existence of a linear relationship is not enough for modeling the import demand of Libya. Taking import as dependent and indicators of government expenditure and private consumption as independent variables, an OLS regression is estimated taking Imports of Libya as the dependent variable. Following is the output of import model estimated via OLS.

Table 5.4: OLS Output of Import Demand with Expenditure Components

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	2.17E+08	1.71E+08	1.267221	0.2126
D(Y)	-0.032355	0.026279	-1.231201	0.2256
D(PR)	5.14E+09	1.78E+09	2.879755	0.0064
D(I)	0.701009	0.091832	7.633611	0.0000
D(F)	0.043574	0.060876	0.715783	0.4784
D(G)	0.069103	0.104803	0.659359	0.5135
R-squared	0.793395	**F-statistic**		29.95325
Adjusted R-squared	0.766907	**Prob(F-statistic)**		0.000000

The result of the OLS regression shows that income, relative price, and the components of expenditure explain approximately 80% of the variation in Libya's imports as depicted by the value of R square. This proposed model of Libya demand is overall significant as shown by the F statistic 29.9 with p-value zero. The individual significance shows that effect of Libya's income on the country's import demand is negative. In other words, as GDP of Libya increases the country reduces the import demand.

There is an explanation about the unpredictable increase in GDP despite the reduced level of import demand. An increase in the level of investment as well as consumption may lead to an increase in the imports and thus a consequent decrease in exports, although the GDP level will still increase (Lin, J. & Li, Y., 2003). Therefore, there is a negative relation between Libyan GDP and net exports.

The estimated coefficient of income's effect on import demand is not significant as the t statistic is -1.23, with a p-value greater than 0.05. There is an explanation that income coefficient is either positive or negative. The former is a situation when imports are considered as any other goods in consumer's demand equation or there is a limited domestic product of goods, which means that import demand is interpreted "as a demand function for the good itself" (Onwuka & Zoral, 2009, p.2364).

Conversely, a negative income coefficient for import demand indicates a negative relationship if the imported goods have relatively close substitutes (Onwuka & Zoral, 2009). The implication of insignificant income effect is that exposing Libyan economy to foreign trade might result in adverse effects. Nevertheless, the resulting changes in the income (total investment) may not affect Libya's import demand since its economy relies on imports to a great extent and the demand for imports is considered almost inelastic in this scenario.

The results show that effect of relative price on import demand is positive and significant too as the t statistic is 2.8 with a p-value less than 0.05.Mostly, relative price is expected to have a negative relationship with import demand. Demand theory argues that an increased import prices lead to a reduced demand level for imports since these goods are offered at an expensive price (Onwuka & Zoral, 2009). Moreover, an increase in prices for imported goods results in an increase in domestic prices.

However, Libyan is a growth driven economy and hence import demand is positively driven by relative prices. Ayodotun's and Farayibi's (2016) results also reported a positive relative price coefficient for Sub-Saharan African countries, implying that these economies depend on import despite an increase in the relative prices. Import is a necessity for Libya and hence the country still depends on imports.

Multiple equations can be estimated for the linear relationship between cointegrated series. It is done here using VECM. Moreover, VECM can be estimated once cointegration is established among the variables as it uses the residual term of co-integration as error correction term. Following table illustrates the output of VECM.

Table 5.5: VECM Output for Import Demand Model with Expenditure Components

Error Correction:	D(Y)	D(M)	D(PR)
CointEq1	-1.07196*	-0.12572*	4.68E-12*
	-0.13509	-0.02732	-2.90E-12
	[-7.93539]	[-4.60150]	[1.60830]
D(Y(-1))	-0.03414	0.106095*	1.73E-12
	-0.12968	-0.02623	-2.80E-12
	[-0.26327]	[4.04483]	[0.61788]
D(Y(-2))	-0.36119*	0.053083*	-1.16E-12
	-0.13284	-0.02687	-2.90E-12
	[-2.71905]	[1.97575]	[-0.40706]
D(M(-1))	0.954896	-0.4113*	6.90E-12
	-0.66939	-0.13539	-1.40E-11
	[1.42651]	[-3.03784]	[0.47880]
D(M(-2))	0.78526	-0.15834	-3.49E-13
	-0.60212	-0.12178	-1.30E-11
	[1.30417]	[-1.30014]	[-0.02692]
D(PR(-1))	3.88E+08	-5.32E+09*	0.521889*
	-8.80E+09	-1.80E+09	-0.18978
	[0.04404]	[-2.98642]	[2.74994]
D(PR(-2))	3.65E+09	-1.26E+09	-0.08383
	-9.40E+09	-1.90E+09	-0.20161
	[0.38960]	[-0.66799]	[-0.41580]
Constant	-4.40E+10*	-5.15E+09*	0.139429
	-6.30E+09	-1.30E+09	-0.1353
	[-7.00812]	[-4.05128]	[1.03048]
I	2.937477*	0.543977*	-1.39E-11*
	-0.36265	-0.07335	-7.80E-12
	[8.10005]	[7.41628]	[-1.78361]
C	0.877129*	0.171679*	-1.53E-12
	-0.25042	-0.05065	-5.40E-12
	[3.50266]	[3.38956]	[-0.28307]
G	0.577905	-0.18491*	2.72E-13
	-0.39106	-0.0791	-8.40E-12
	[1.47777]	[-2.33776]	[0.03226]
R-squared	0.771086	0.820772	0.342101
Adj. R-squared	0.69955	0.764763	0.136508
F-statistic	10.77903	14.65431	1.663969

R-square is high for the autoregressive equation, which has imports as the dependent variable and the equation with GDP as the dependent variable. Error correction term (ECT) has a significant coefficient for all the three equations. The coefficient of ECT for GDP is negative depicting that the annual value of GDP is below the equilibrium level and the magnitude of ECT show that annual adjustment in GDP is 107%. The coefficient of ECT for imports is also negative depicting that the annual value of import is below the equilibrium level and the magnitude of ECT show that annual adjustment in import is 12%. The coefficient of relative price for imports is positive depicting that the annual value of relative price is above the equilibrium level and the

magnitude of ECT show that annual adjustment in the relative price is very low. Effect of total investment and household consumption expenditure on Libya's GDP is positive and significant.

6. Conclusion and Policy Implication

Against the empirical studies for determining the factors for an increase in import demand for developing countries, the endeavor of the current study was to shed light about assumption that import content and final demand ought to be the same. In this case, the research has explored current revenue and lagged expenditures as well as revenues as explanatory variables in the empirical model specification and addressed the relationship between Libyan import demand with expenditure components. The study has assisted to understand the benefits of international trade and its role in economical growth for a developing country. In this case, it was possible to explore and examine the role of international trade in economic growth and development of Libya. Thus the hypothesis that import demand has a significant relationship with expenditure components was answered.

The empirical findings for this research were similar to other related studies. Sadeghi and Ramakrishna (2014) found that there is a cointegrated relationship between import demand and expenditure components. Specifically, it is notable that price of domestic products have positive and long-run relationship with import demand. Moreover, there is a positive relationship between import demand and relative prices. Ayodotun and Farayibi (2016) had reported similar findings and argued that developing economies depend on import. Therefore, an increase in the relative price of imports implies that Libya still has to import goods. The autoregressive equation showed that income (total investment) for Libya is positive and significant. Kalyoncu (2016) also applied autoregression method and stipulated that there is a long-run as well as statistically significant relationship between price elasticities and import demand.

In light with the aforementioned findings, the policy implication of this study is as follows: (1) Libya needs to formulate an economic policy geared towards increasing the level of its capital goods. For this case, the country requires to utilize its domestic resources to reduce the expenditure attributes to an increase in price of imports. Since the economy depends on oil as a major export, value-added needs to be done instead of exporting it as a raw material; (2) The positive and significant level of import demand elasticities based on relative prices implies that Libyan economic growth can result in high import demand. Locally, Libyan government can design fiscal policies that assist to manage the existing expenditures in order to reduce trade deficit. Specifically, Libyan government must promote local investment through export oriented production of goods.

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