# AN ANALYTICAL STUDY OF IMPORTS IN ALGERIA DURING THE PERIOD (1992-2012)

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**Abstract**

This study showed a number of previous studies which focused on the demand for imports of many countries, whether developed or developing countries and in varying degrees of economic growth; where the aim of these studies search for variables and factors that determine the overall demand for imports. The majority of the studies concluded that income and relative prices are considered key factors in the interpretation and determine the level of aggregate demand for imports.

The study aimed to identify the factors that affect the composition of each commodity and geographical distribution of imports in Algeria; and have been used in order to achieve this some standards for concentration commodity and geographical location, and the relative importance from the period from 1992 to 2012.

**Keywords:** Algeria, Imports, Gini Coefficient, Geographical Concentration

## Introduction

the imports of goods and services in foreign trade is an important part of the local economy, where he gets through it a goods and services that are not able to produce and display with a comparative advantage better than other countries. Imports also contribute to the growth of the components of GDP, they enhance the standard of living for individuals through consumer spending on imported goods and services, as well as it raises the level of domestic investment and increases productivity of economic sectors through foreign capital goods.

At the beginning of the nineties and after the opening of the Algerian economy on the world by liberalization of foreign trade which plays an active role in the economy, both in terms of its contribution to the gross

domestic product or to satisfy the needs of basic economic, as imports represent great importance in the trade balance of Algeria; so that spending on imports represents percentage to be reckoned by increasing the demand for imports year after year. During the period 1990-2012, the value of total imports increased from 86,479 million dinars to 3,906,754.2 million, which indicates that its economy is largely dependent on the external sector, especially after the adoption of the policy of an open economy and the degree of openness to the global economy has reached (the ratio of foreign trade to GDP) 31.06% in 2012 compared with 16.90% in the year 1990. This shows the importance of the external economy in the local economy dynamics.

Moreover, a large part of the Algerian economy depends on foreign goods and imported services, whether in the form of products to the final consumption or in the form of raw materials and intermediate goods for the purposes of domestic production.

**Literature Review of the Determinants of the Demand for Imports:**

There are multiple studies addressed the function of import demand in many countries, including developed countries as well as developing countries. The objective of these studies searches the variables and factors that determine the level of aggregate demand for imports, in addition to seeking the elasticity estimate of demand for imports in the short and long term. In this part we will look at the most important studies, whether applied in studies of the aggregate demand for imports or demand for certain goods or groups of certain goods.

**Study of Houthakker et Magee (1969)**:

The study of " Houthakker et Magee" is one of the first studies that has been applied to estimate function of aggregate demand for imports in 1969. The study has covered from period (1951-1969) a group of developing and developed countries. The two researchers used the assumption that the demand for imports depends on the income and the general level of prices of domestic and international; and the Logarithmic equation of demand for imports is as follows:

$$\log \mathrm{M_{it}} = \propto_{0i} + \propto_{1i} \log Y_{it} + \propto_{2i} \log \left( {Pm_{it}}/{WPI_{it}} \right) + \mu_{it}$$

Where:

$M_{it}$:Imports of Goods for state I in year t with 1958 prices
$Y_{it}$:Index of GDP for state I in year t with 1958 prices
$Pm_{it}$:The index of import prices for state I in year t with 1958 prices
$WPI_{it}$:The index of whole sale prices for state I in year t with 1958 prices

$\mu_{it}$:Random error

$\propto_{0i}$ ، $\propto_{1i}$، $\propto_{2i}$ : Parameters section, income elasticities, price elasticities respectively

In this study they have reached that the income elasticity and the price of the demand for imports is low for most countries; but this study focused particularly on the United States, so divided exports and imports according to countries that are dealing with it, then according to their collections commodity. For the countries that deal with it the results show that the developed countries have high income elasticity than the less developed countries; while in the study which relates to commodity groups, it used a dynamic model in the form of a double logarithmic. The results have shown a disparity in price and income elasticities in long-term between commodity groups.

**Khan Study (1975)**

Khan in his assessment of the demand function for imports and estimate partial demand functions in Venezuela during the period from (1953- 1972), divided imports to nine commodity groups covering 80% of the total imports of Venezuela; in addition to the total imports, and adopted in his analysis that required imports quantities an function of price of imported commodity, for the price of local alternative commodity and the level of real income, and he used for this purpose logarithmic function. The study shows the importance of relative prices and real income in the interpretation of a change in imports at the macro and micro level. In addition to other factors that determine the demand for imports, such as economic climate and trade restrictions (quantitative restrictions on imports and tariffs)

**Sarmad Study (1987-1988)**

Sarmad studied the function of aggregate demand for imports for the group of developing countries (Morocco, Kenya, Peru, Portugal) from 1960 to 1981; and the conclusion of his study shows that the logarithmic form is the best format for an import demand function . The researcher added to aggregate demand traditional imports function a new independent variables is a balance of foreign currency, it turns out that the variables of price and income have a significant degree of acceptance; but for the balance of foreign currency decreased the degree of acceptance to 80% in the case to entered as one of the function under study variables. In addition to this the study, Sarmad & Mahmoud studied a new estimate of the function of aggregate demand and partial imports of Pakistan during the period (1969-1980), so they 'enter a new independent variables that is the impact of tariffs when calculating prices. The results showed that the price elasticities are low

and income elasticities are high compared to the developed countries elasticities. They also reached that the import substitution policies of consumer goods led to the increase in imports of raw materials used in the manufacturing of these goods.

**Study of Abedelhak SENHADJI (2002)**

The researcher studied the function of the demand for imports for 77 countries using least squares method and (Monte Carlo) method. He concluded that the response of imports for the relative prices and income is slowing, and the income elasticity of the developed countries is high, while the price elasticity of developing countries is low.

**Study of Tang Tuck Cheong 2003**

Tang Tuck Cheong studied the determinants and behavior of demand for imports for 18 countries of the OIC (Organization Islamic Conferences) that included the following countries: Algeria, Morocco, Tunisia, Mauritania, Egypt, Syria, Jordan, Iran, Mali, Guinea, Nigeria, Senegal, Turkey, Pakistan, Indonesia, Malaysia, Bangladesh and finally Chad during the period (1990- 2000) with assumption that the demand for imports depends on real economic activity (income) and relative prices. He chose this group due to the most of this countries during the study period were suffering from an imbalance in the balance of trade, especially Bangladesh, Chad, Egypt, Guinea, Jordan, Malil, Mauritania, Morocco, Nigeria, Bakstan, Senegal, Tunisia and Turkey; but for Algeria it was in (1990.1993, 1995 and 1998), Indonesia (1995 and 1997), Iran (1990-1993), Malaysia (1991 and 1993-1995), and finally Syria was a deficit in the trade balance during the (1991-1998).

Researcher in his model used dynamic-optimizing intertemporal approach(DOI) and he relied on simple logarithmic formula of imports demand, and are as follows:

$\ln M_t = a_0 + a_1 \ln NCF_t + a_2 \ln RP_t + a_3 Time + e_t$

Where:

$\mathbb{M}$: Total imports

$NCF_t$ :Real economic activity

$RP_t$ : Relative prices which is the ratio between domestic prices and international prices.

Researcher reached a conclusion that each of the total imports, real economic activity and prices relative integrated with each other for ten countries under study, and represented in Algeria, Egypt, Syria, Iran, Chad, Guinea, Indonesia, Nigeria, Turkey, Pakistan. It was clear that the income elasticities and relative prices are not flexible for the following countries: Chad, Egypt, Guinea, Pakistan and Turkey, while showing that the flexibility

of relative prices are flexible for Algeria only and for income elasticities are flexible except for Nigeria and Indonesia.

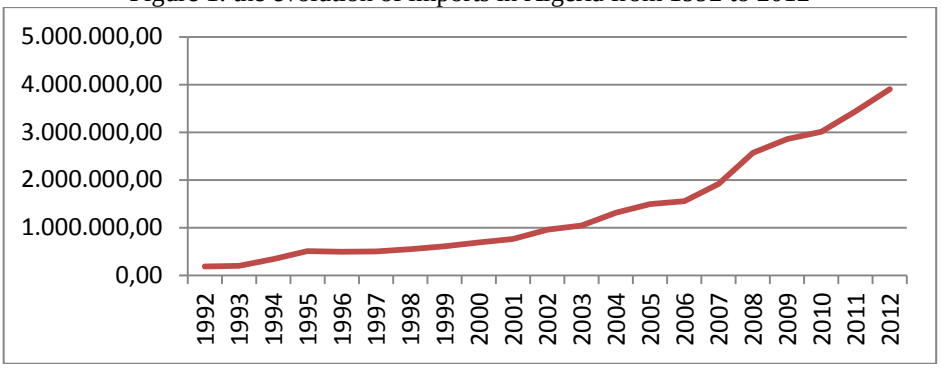
**Study of Huseyin KALYONCU (2006)**

This study aimed to identify the factors affecting the demand for imports in Turkey for the period (1994-2003) and has been used integration model vector error correction model. The study concluded that there is a balanced relationship between real value of imports and all of relative prices and income.

**The Analysis of the Commodity Composition and Ceographical Imports in Algeria during the Period (1992-2012)**

Period between 1992 and 2012 showed a significant rise in the value of imports, where it reached in 2012 approximately 3,906,754.2 million dinars compared with 1992 it reached 188,547.1 million dinars, with a rate equal 20.72 times during this period as shown in Figure 01. This was mainly due to greater openness of national economy in front of global markets and of many reforms have been taken to liberalize foreign trade.

Figure 1: the evolution of imports in Algeria from 1992 to 2012




Source : Prepared by the researcher based on: data from the National Bureau of Statistics (1992-2011) and the General Directorate of Customs (2012)

**Analysis of the Commodity Composition of Imports in Algeria during the Period (1992-2012)**

To study the commodity structure of imports, we will use (Gini index) to measure the degree of concentration of commodity imports where $X^2$ represents the relative importance of a range of goods from the total imports and n is the number of commodity groups, and the benefit to calculate this index to see the extent of the diversity of imports in terms of its structure. On the other hand, the extent of countries reliance on commodity or certain commodities. Gini index takes the following formula:

$$\text{Gini index} = \sqrt{\sum_{i=1}^{n} x_i^2} \times 100.$$

Applying the previous equation on the data of commodity composition of imports of Algeria during the period (1992-2012), we found that the value of the index trending upward until it reaches a maximum value in 2009 by an estimated of 53.27%, which shows the extent of the subordination of the Algerian economy, where it is directed in particular to the industry, especially of capital goods so that represents the largest commodity group in terms of the relative importance of its total import value as shown in table 02; as seen from table 01 that the degree of concentration of commodity imports took to fall in the next period to reach the lowest value in 2012 increased by estimated at 44.07%. This decline can be attributed to the growth that has occurred in imports of both consumer goods, foodstuffs, oils and energy has moved from 11.76% in 2009 to 19.85% in 2012, and 14.93% in 2009 to 17.9% in 2012, and from 1.39% in 2009 to 9.84% in 2012, respectively, in exchange for a reduction in the growth of imports of industrial materials processing by an estimated 15.4%

**Table 1:** The evolution of the concentration coefficient of commodity imports in Algeria (1992-2012):

| Years | Coefficient of concentration | Year | Coefficient of concentration |
|---|---|---|---|
| 1992 | **47.17** | 2003 | **49.45** |
| 1993 | **47.4** | 2004 | **50.55** |
| 1994 | **48.065** | 2005 | **51.79** |
| 1995 | **46.86** | 2006 | **51.3** |
| 1996 | **49.63** | 2007 | **48.17** |
| 1997 | **49.26** | 2008 | **49.16** |
| 1998 | **48.84** | 2009 | **53,27** |
| 1999 | **49** | 2010 | **52,84** |
| 2000 | **48.8** | 2011 | **50,64** |
| 2001 | **48.66** | 2012 | **44,7** |
| 2002 | **49.67** | | |

Source : National Bureau of Statistics (1992-2011) and the General Directorate of Customs (2012)

Table 02 :The relative importance of commodity imports in Algeria in 1992,2009,2012

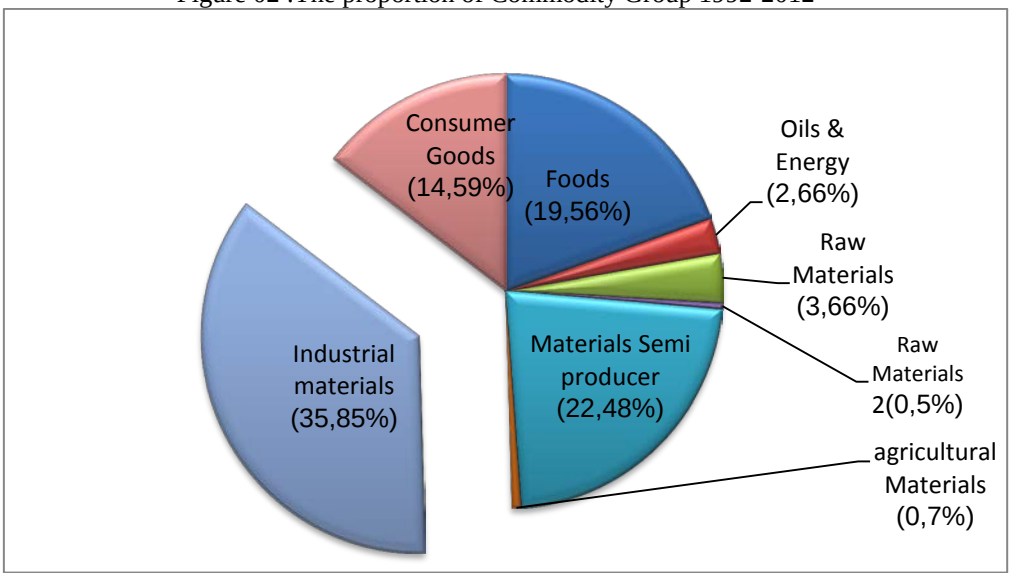
| Commodity Group | 1992* | 2009* | 2012* |
|---|---|---|---|
| Food | 24.88 | 14,93 | 17,9 |
| Oils and Energy | 1.43 | 1,39 | 9,84 |
| Raw materials (1) | 6.31 | 2,8 | 3,45 |
| Raw materials (2) | 0.96 | 0,26 | 0,21 |
| Materials Semi producer | 22.99 | 25,87 | 21,1 |
| agricultural Materials | 0.60 | 0,59 | 0,65 |
| Industrial materials | 29.09 | 42,4 | 27 |
| Consumer Goods | 13.71 | 11,76 | 19,85 |
| Total imports | 100 | 100 | 100 |

(*)the relative importance was calculated based on numbers and data from the National Bureau of Statistics (1992-2011) and the General Directorate of Customs (2012)

We can concluded Sort of commodity groups using the following ratio:

$$\frac{\sum_{i=1}^{n} \text{commodity group}}{\sum_{i=1}^{n} \text{imports}} \times 100 = \text{The proportion of Commodity Group}$$

Figure 02 :The proportion of Commodity Group 1992-2012

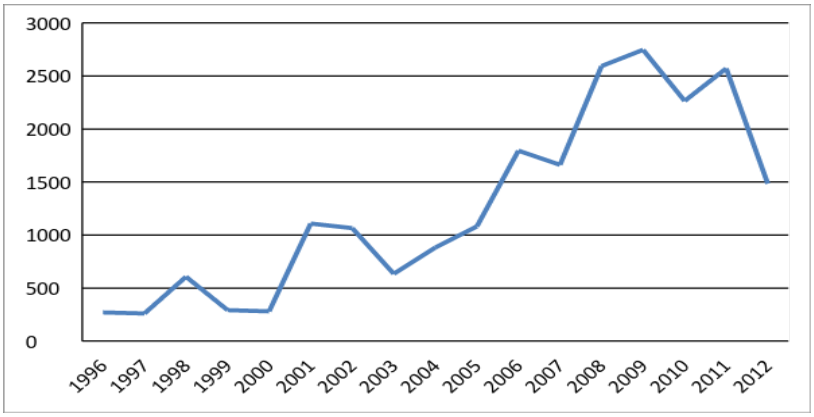



Source: prepared by the researcher based on: data from the National Bureau of Statistics (1992-2011) and the General Directorate of Customs (2012)

We note from the ratios in Figure 02 above that group of industry materials occupies the bulk of the imports, followed by semi finished products, where the form of each of these commodity inputs and requirements of the productive sectors in the local economy; while in the third place we find the food and then followed by other products with varying proportions.

The rise in food group due to the weakness of the national production which increased the value of imports of this group from 46.916,7 billion dinars in 1992 to 699.673,2 million dinars in 2012, we can interpreted a rise in imports for each group of industrial materials and semi finished products group to the rising of foreign investment as shown in Figure 03. In addition to the adoption of the state a development strategy which led to raise the value of government spending, especially in the area of infrastructure construction so that expenditures rose from 136 500 million dinars in 1990 to 7 058 173 million dinars in 2012.

Figure 03: The evolution of foreign direct investment in Algeria for the period 1996-2012
Unity million$




Source: prepared by the researcher based on: data CNUCED (1996-2012)

**Analysis of the Geographical Distribution of Imports in Algeria during the Period (1992-2012)**

Below we will identify the geographical distribution of imports using the same coefficient (Gini index) to measure the degree of geographic concentration. We can calculate this index to know the extent of the state's reliance on a specific source or many sources to get the needs of imported goods which shows how important the region geographical States trader with a commercial, and then see how the countries are dependent or independence with other groups of countries which deal with it. So $X^2$ represents the relative importance of the geographical range of the total imports and n is the number of geographic groups. After calculating this measure during the period (1992-2012) as shown in Table 03, we note that it has ranged between (57% and 65%), where he achieved a maximum value of 1992 and an average of 65.73% which confirms the high degree of concentration in the sources to obtain imports in the year mentioned above.

Table 03: coefficient of concentration of the geographical distribution of imports in Algeria (1992-2012)

| Year | Coefficient of Concentration | Year | Coefficient of concentration |
|---|---|---|---|
| 1992 | 65,73 | 2003 | 60,71 |
| 1993 | 62,26 | 2004 | 58,65 |
| 1994 | 60,28 | 2005 | 57,3 |
| 1995 | 62,91 | 2006 | 58.71 |
| 1996 | 65,12 | 2007 | 58.28 |
| 1997 | 60,62 | 2008 | 59.22 |
| 1998 | 61,2 | 2009 | 58,91 |
| 1999 | 59,99 | 2010 | 57,82 |
| 2000 | 61,16 | 2011 | 57,69 |
| 2001 | 62,41 | 2012 | 57,59 |
| 2002 | 59,06 | | |

(*) Concentration Coefficient was calculated depending on the above equation and using numbers and data from the National Bureau of Statistics (1992-2008) and the General Directorate of Customs (2009- 2012).

Given the geographic distribution of the year 1992, we found that 63.25% of the total imports has obtained from European countries group, that's mean more than half of the value of imports was concentrated on this group as shown in Table 04

Table 04: Relative importance of geographical groups in 1992, 2005.2012

| **Geographical Group** | **1992*** | **2005*** | **2012*** |
|---|---|---|---|
| EU countries | 63,25 | 52,57 | 52,28 |
| Other European countries | 7,74 | 12,09 | 3,27 |
| North America | 13,1 | 7,76 | 12,23 |
| South America | 2,14 | 6,62 | 7,13 |
| Maghreb countries | 2,57 | 1,06 | 1,6 |
| Group of Arab States | 1,16 | 2,071 | 3,09 |
| African countries | 0,25 | 0,74 | 1,47 |
| Asian countries | 8,63 | 16,21 | 18,93 |
| The rest of the world | 1,12 | 0,845 | - |
| Total imports | 100 | 100 | 100 |

(*) the relative importance was calculated based on numbers and data of the National Bureau of Statistics (1992-2008) and the General Directorate of Customs (2009- 2012)

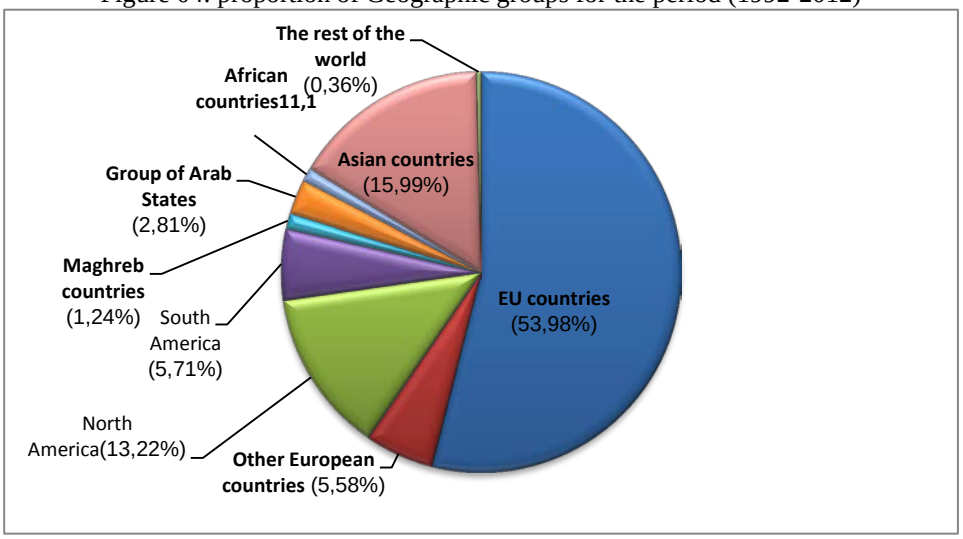
Illustrated to us also from Table 03 that the degree of concentration in the sources to obtain imports began to decline in relative terms, starting from the year 2003 to the year 2012 at a rate of 62.41% to 57.59% respectively, where the lowest value achieved in 2005 by an estimated 57.3%.This decrease can be explains by the diversity in sources to obtaining imports. Noting the increasing of relative importance of imports of some countries group at the expense shrinking of relative importance of other groups, where we note from Table 04, reduced relative importance for the European Union countries from 63.25% in 1992 to 52.57% in 2005, North America from 13.1% in 1992 to 7.76% in 2005 while the relative importance increased in South America and Asian countries from 2.14% in 1992 to 6.62% in 2005 and from 8.63% in 1992 to 16.21% in 2005 respectively.

As can be concluded order of the geographical distribution using the same ratio:

$\frac{\sum_{i=1}^{n} \mathbf{Geographicaldistribution}}{\sum_{i=1}^{n} \mathrm{Imports}} \times 100 =$ The proportion ofthe geographical distribution

Note from the ratios in Figure 04, the European Union occupies the bulk of the imports, as dominate almost two-thirds of the volume of foreign trade of Algeria and we can return the situation to the relations of cooperation between Algeria and the European Union countries and due to structure where it is dominated by producer goods by an average of 70% of total imports.

Figure 04: proportion of Geographic groups for the period (1992-2012)




Source : Prepared by the researcher based on: data the National Bureau of Statistics (1992-2008) and the General Directorate of Customs (2009- 2012)

Followed by Asian countries where their value raised from $ 16.284,1 million dinars in 1992 to 739.690,022 million dinars in 2012. This growth of the value of imports due to the most of the countries their economies depend primarily on the export and they are characterized by low-cost of imports compared to the factors of production. In third place we find North America group and then followed by the rest of the groups, in varying proportions we note that the Maghreb group countries characterized by low share of the total value of imports which represent just 1.24% during the study period. In addition to the group of Arab countries are extremely limited and barely ranging from about 3% of total imports due to the absence of complementary strategies between these countries and also to similar economic structure and production and due to lack of trade exchange between Arab countries and lack of business information .As for the rest of the groups of countries, the geographical distribution areas (countries of Africa, the rest of the world), they constitute only a small percentage of the total imports, and often due to its geographical location that making the high cost of import.

## Conclusion

This study examined and analysed the geographical distribution and commodity imports in Algeria between 1992 and 2012 using the Gini coefficient to measure the degree of concentration. The study showed the first rank of industries materials, semi-producer products and foodstuffs in the list of imports; this place occupied by these products due to the pursued industrialization policy represented by foreign direct investment and SME which depends mainly on the imported production components. These enterprises are in desperate need of intermediate goods needed for production and capital goods for investment programs which indicates that Algeria suffers from dependency to the outside and the EU specifically, where the latter took first place with 53.98% of the geographical groups throughout the study period 1992 to 2012

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