

The possibility of applying the import substitution policy on petrochemical products in Algeria

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Abstract:

This study seeks to identify Algeria's ability to adopt an import substitution policy that would maintain its exchange reserves as well as avoid economic dependency. The approach used in the study is the analytical descriptive approach, where the phenomenon of import substitution has been described. The phenomenon has also been analyzed through a series of data and statistics to determine Algeria's ability to implement the policy of import substitution in petrochemical products. Concerning the study's findings, several findings had been reached: Algeria has enormous potential for fuel production but needs the sufficient absorptive capacity to cope with the production backlog of petrochemical derivatives. Through these results, we propose some recommendations, namely, to provide storage for the material produced and expand the refinery's scope at the national level.

Keywords: Trade balance, petrochemical products, import substitution policy

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I- Introduction:

The Algerian economy is one of the economies that depend mainly on the hydrocarbon sector. This puts all economic indicators at the mercy of the barrel price. One such indicator is the trade balance; the value of its exports remains dependent on its high price, which has made it difficult to control imports because imported goods prices are imposed. This affects the trade balance's situation and makes it precarious dominated by deficits. In order to avoid this, many rentier states in general and Algeria in particular seek to diversify exports or at least cover consumption with domestic production. Perhaps among the local products, we find petrochemical products that Algeria is abundant with its primary materials, which remain dependent on the extent to which the state can provide all the necessary factors for the production of these goods locally.

Problem:

Can Algeria eliminate imports of petrochemical products?

Sub-questions:

- 1) Does Algeria have sufficient capacity to produce petrochemicals?
- 2) Are production costs lower than the import price?
- 3) Can the import substitution policy on petrochemical products be implemented?

To answer the sub-questions, the following hypotheses were proposed:

Hypothesis:

- 1) Algeria has sufficient capacity for petrochemical production.
- 2) Production cost is less than the value of petrochemical industry imports.
- 3) Petrochemical import substitution policy can be implemented.

In order to test hypotheses, the following axes were discussed:

The first axis: the conceptual framework of import substitution policy and the petrochemical industry.

The second axis: the reality of the trade balance.

The third axis: The reality of Algeria's petrochemical industry as a mechanism for reducing imports.

The first axis: the conceptual framework of import substitution policy and the petrochemical industry

First: Generalities on the import substitution policy:

1- Concept of import substitution policy:

Import substitution policy is defined as manufacturing to replace local goods and industries with simple imported goods, including non-durable consumer goods such as food industries and household items. The import substitution policy can be considered as a strategy aimed at meeting domestic needs while pursuing a protectionist policy for the purpose of preventing foreign products from competing with domestic industries. This strategy focuses mainly on the manufacture of light and durable consumer goods. (Al-Achqar, p. 92)

2- Import Substitution Manufacturing Policy:

Most Third World countries, having decolonized themselves, realize that independence alone is not enough, as underdevelopment must be remedied. As a result, new ideas began to come to the minds of politicians, and many newly independent States sought

to promote industrialization, focusing on import-substitution policy in order to achieve economic development. These countries achieved new growth rates during this phase, relying on an economic direction based on restricting imports, mainly industrial products, and transforming the demand for these products for domestic production.

This strategy is known as the Import Substitution Manufacturing Strategy, which was adopted by the United States of America and European countries in the second half of the nineteenth century. These countries relied on the protection and development of start-ups (Charef, p. 35).

Import substitution strategy is based on a set of principles, the most important of which are: (Charef, p. 35)

- Working to raise the prices of imported goods by imposing a tariff.
- Working to start in consumer industries that do not need technological and technical expertise.
- Through the collapse in the international exchange rate, which is not in favor of primary products, manufacturing is a must.

3- Import substitution policy tools:

Import substitution policy tools consist of: (Ali, 2006, p. 11).

a) Protection: The imposition of tariffs is one of the protection mechanisms established for emerging industries so that they are not competed against by foreign products located locally or externally. Import substitution policy is based on three considerations:

- Tariffs for a gradual decline.
- The purpose of protection is to diversify sources of income.
- Gradually shifting from consumer goods production to intermediate goods and then final goods.

b) Subsidies:

They are among the instruments that influence the direction and size of international trade by influencing the credit of goods and products. The method of subsidies relates to exports as the state promotes international trade.

4- Import substitution course:

The import substitution course is based on two approaches: (Atrmane)

a) Substitution from bottom to top: This substitution is based on the consumer goods sector and progresses to the substitution of heavy industries as well as production equipment. This has been done by many states, including Latin American States. What is known about this pattern is that the substitution cost is no longer high, as the required capital is weak and also does not require a highly skilled labor force or sophisticated technology.

b) Substitution from top to bottom: This begins with the replacement of capital goods and equipment, which requires capital that exceeds the state's financial capacity to finance factories through export revenues, as it requires sophisticated technology.

Through the two approaches, we can say that substitution from the bottom-top is more realistic. The industry needs to be built on the state's raw materials, especially in the early

possibility of applying the import substitution policy on petrochemical products in Algeria

stages of the manufacturing process due to the relative importance of raw materials in determining the cost of production.

Second: Generalities on Manufacturing

According to the UN, manufacturing industries can be regarded as mechanical conversions of material considered inorganic to generate new materials through the use of manual or mechanical means, whether found in factories or homes. It can therefore be considered that manufacturing seeks to respond to man's growing and multiple needs, including the availability of consumer or secondary goods that can be used as raw materials in manufacturing (Al-Nasser, 06/07 November 2018, page 02).

Manufacturing is also defined as one of the branches of the industrial sector that transforms extractive industry materials, which aims at satisfying consumer and productive needs.

Manufacturing is the true measure of a nation's contemporary economic development and an important means of raising the standard of living.

Third: The Importance of manufacturing

The importance of manufacturing is as follows:

- a. Manufacturing influence the balance of payments by producing different goods in order to meet needs rather than import them.
- b. Manufacturing contributes significantly to increasing national income through optimal exploitation of raw materials.
- c. Manufacturing is reducing instability in single-product economies in their national income composition.

Second axis: The reality of Algeria's trade balance

Given the oil crisis in the petroleum-producing countries in general and Algeria in particular, and given the developments in the economic and global system, which depend on freedom of trade and the attempt to remove trade restrictions and the trend towards economic liberalization, the latter provides for the unconditional liberalization of international trade in all countries of the world.

First: Development of exports in Algeria

Table (01): Development of Algerian exports for the period 1970-2018

Unit: \$1 million

Year	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
value	1010	816	1224	1950	4944	4501	5221	6009	6340	9484	13652
1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
14112	13509	12742	12792	13074	8065	9029	7620	9534	12964	12330	11510
1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
10410	8890	1025	13210	13820	10140	12320	21650	19090	18710	24612	32083
2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
46001	54613	60160	79290	45190	57050	73480	71860	64970	62880	37780	30020
2017	2018										
35190	41160										

Prepared by the researcher based on bank statistics.

Algeria's exports have fluctuated considerably as a result of higher and lower oil prices. It is the latter that controls the coverage of imports and contributes to avoiding the trade balance deficit. The value of exports is affected by the impact on the oil market

globally, as well as by global economic and political conditions. For example, the October 1973 war had a significant impact on petroleum prices as well as the reverse shock of 1916, which in turn affected oil prices as well as the value of the state's oil exports.

Oil exports in the post-2008 crisis also experienced an acceptable performance on the level of the trade balance. The surplus knew approximately 20% of the gross domestic product (GDP). This reflects the persistent rise in petroleum prices at that point, which saw a rise of 33% compared with the average hydrocarbon prices for 2007. Thus, total exports reached \$79.29 billion, of which about 77.19 were from hydrocarbon exports.

a. Algeria's merchandise export structure

Table (02): Merchandise export structure / Unit: \$1 million

Years	Food	Energy	Raw materials	half-manufactured materials	IndustrialEquipment	Agricultural Equipment	Food consumer goods
2000	32	21419	44	465	11	47	13
2001	28	18484	37	504	22	45	12
2002	35	18091	51	551	20	50	27
2003	48	23939	50	509	01	30	35
2004	59	31302	90	571	00	47	14
2005	67	45094	134	651	00	36	19
2006	73	53429	195	828	01	44	43
2007	88	58831	169	993	01	46	35
2008	119	77361	334	1384	01	67	32
2009	113	44128	170	692	00	42	49
2010	315	55527	94	1056	01	30	30
2011	355	71427	161	1496	00	35	15
2012	315	69804	168	1527	01	32	19
2013	402	62960	109	1458	00	28	17
2014	323	60304	109	2121	02	16	11
2015	235	32699	106	1597	01	19	11
2016	327	28221	84	1321	00	54	19
2017	349	33261	73	1410	0.29	78	20
2018	373	38338	92	2242	0.30	90	33

Source: ChlihiTaher, Algeria's Foreign Trade and the Most Important Challenges During the Period (2018-2022), Journal of Social Sciences and Humanities – University of Batna, June 2020, p. 97.

The table shows that the energy sector accounts for the lion's share of total Algerian exports over all years, as the value of Algeria's exports is directly affected by petroleum prices.

Exports in 2008 experienced a qualitative leap, reaching \$77 billion. After 2014, petroleum prices began to deteriorate, causing Algeria's exports to fall to \$60 billion and \$32 billion in 2015, thus falling to almost 45.77%.

However, we find other items that do not contribute to the export structure, such as the half-manufactured products sector, which contributed \$2.24 billion in 2018.

b. Development of exports as a proportion of GDP

Table (03): represents the development of exports as a proportion of GDP

Year	Exports as a proportion of GDP	Year	Exports as a proportion of GDP
1980	34.33	1999	28.15
1981	34.58	2000	42.074
1982	30.92	2001	36.69
1983	27.94	2002	35.50
1984	25.71	2003	38.24
1985	23.58	2004	40.05

possibility of applying the import substitution policy on petrochemical products in Algeria

1986	12.85	2005	47.20
1987	14.27	2006	48.80
1988	15.50	2007	47.06
1989	18.63	2008	47.97
1990	23.44	2009	35.37
1991	29.11	2010	38.44
1992	25.31	2011	38.78
1993	21.78	2012	36.88
1994	22.53	2013	33.21
1995	26.19	2014	30.21
1996	29.76	2015	23.17
1997	30.90	2016	20.87
1998	22.57	2017	22.66

Source: World Bank statistics

From the table it can be considered that Algeria's exports have developed significantly during the period under study. The highest percentage is known in 2006 and this is due to the rise in oil prices since the structure of Algerian exports depends mainly on hydrocarbons, as their value remains dependent on the rise or fall in fuel prices. The year 1986 witnessed the lowest percentage of gross domestic product (GDP) after the year of the second reverse shock to petroleum-producing countries that wanted to put pressure on petroleum-consuming countries, which led to a sharp decline in petroleum prices.

The fact that the structure of exports remains unified and depends on a single commodity threatens the balance of trade whenever the price of that commodity falls.

Second: Development of imports in Algeria

Table (04): Algeria's import structure.

Unit: \$1 million

Years	Food	Energy	Raw materials	half-manufactured materials	Industrialequipment	Consumergoods
2001	4152	154	428	1655	3068	1393
2002	2395	140	478	1872	3435	1466
2003	2678	145	689	2336	4423	1655
2004	3385	158	733	4223	6681	2610
2005	3374	199	706	3845	7950	2922
2006	3572	230	792	4637	8015	2830
2007	4656	305	1245	6678	9361	3546
2008	7397	560	1318	9502	14394	4122
2009	5125	516	1281	5579	14114	8685
2010	5726	888	1335	9446	14794	5687
2011	9261	1094	1676	10047	15091	6890
2012	8483	4659	1729	9994	12793	9400
2013	9013	4139	1732	10642	15233	10539
2014	10550	2720	1812	12301	18115	9894
2015	8946	2472	4891	48211	36916	2435

Source: General Directorate of Algerian Customs, 2017

According to the table, it appears that the structure of imports includes a wide range of goods, and perhaps the period from 2001 to 2015 shows that imports of foodstuffs knew the largest share of total imports, while also finding a terrible rise in energy. Energy imports rose by 16.05% compared to 2001 owing to increased consumption and higher prices. In addition, we find the country producing raw materials and importing energy at a higher rate. In 2015, the percentage was 2.37% of total imports, which can be increased unless the state pursues a policy of substitution of imports because it has the elements and capabilities to achieve self-sufficiency as well as to reduce the burden of the trade balance.

Third axis: The reality of Algeria's petrochemical industry as a mechanism for reducing imports

First: Algeria's petrochemical industry

Algeria's petrochemical industry includes a range of commodities, including fertilizer and pesticides, the polyester and plastic industry, the basic organic chemical industry, the paint industry, and the pharmaceutical industry. The petrochemical industry experienced different figures, reaching 196 billion dinars in 2015, after which the industry began to decline, resulting in a decline in production capacity to 27.9% in 2015 after it was 35.7% in 2014 (Mni'ei, 2018, p. 870).

Second: Reasons for the uses of the petrochemical industry in Algeria

Algeria seeks to reach out to the petrochemical industry by adopting forward and backward linkages that will support the industrial sector while supplying other productive sectors with their needs from the production of the petrochemical industry. Among the most important factors contributing to interest in the petrochemical industry are the following:

- 1) Decrease in natural gas prices in global markets.
- 2) Work to provide job positions.
- 3) Coping with increasing needs from the petrochemical industry.
- 4) Optimize the exploitation of natural resources by promoting local industries in order to reduce the risk of volatility in global markets.
- 5) Global economic policies are geared towards interest in this industry as the industry of the era.
- 6) Algeria has the raw materials needed to promote the petrochemical industry, mainly oil and natural gas.

Third: Application of import substitution policy on petrochemical products

The import substitution policy remains dependent on Algeria's absorptive capacity in the petrochemical industry, through which Algeria's potential to produce petrochemical derivatives and the state efficiency in oil production should be determined. To this end, the Algerian state's efficiency in oil derivatives can be addressed through the following table.

Table (05): Production capacity of petroleum derivatives during 2019

Oil derivatives	One barrel oil production	Daily oil production	Total production of petroleum derivatives
Dieselfuel	38 liters	954200 daily	36259600 liters
Distillation residues	4.7 liters	954200 daily	4484740 liters
Aviation fuel	14.80 liters	954200 daily	14122160 liters
Gasoline	73.25 liters	954200 daily	69895150 liters
Liquefied Gas	6.51 liters	954200 daily	6211842 liters
Heavy fuel oil	6.35 liters	954200 daily	6059170 liters
Engine oil	¼ liters	954200 daily	238550 liters
Candles	127 Candles	954200 daily	121183400 candles
Wax Pen	27 Pens	954200 daily	25763400 pens
Asphalt	4.54 liters	954200 daily	4332068 liters
Coal briquettes	1.81 briquettes	954200 daily	1727102 briquettes
Liquid Gas	11 Barrels	954200 daily	10496200 Barrels
Toothbrush	540 Toothbrushes	954200 daily	515268000 Toothbrushes
Hair comb	750 combs	954200 daily	715650000 combs
Polyester shirt	39 shirts	954200 daily	37213800 shirts
Home Phone	11 phones	954200 daily	10496200 phones

possibility of applying the import substitution policy on petrochemical products in Algeria

Source: - Fouad Ali AbderrahmanDawood et al, Annual Report 2020, Organization of Arab Petroleum Exporting Countries OPEC, Kuwait, 2020, pp. 76-88.

- Barrel Oil, What does it produce, <https://www.youtube.com/watch?v=INPOSnTH6tI> Access on October 15, 2021.

- Economic information <https://www.youm7.com/story/2019/7/19/> Access on October 15, 2021 at 14:37.

From the table, we note that Algeria can make a qualitative breakthrough in achieving a decent production level for petrochemical products, as it has enormous potential in oil production. For example, Algeria could achieve a relative advantage in the production of gasoline, which was widely consumed, while enjoying a significant proportion of the value of imports.

Furthermore, we note that Algeria can produce significant quantities of diesel fuel, where the quantity can reach more than 13 billion liters per year, which is a considerable amount that enables the state to cover its requirements for this substance as well as export to other markets. As far as aviation fuel is concerned, it contributes significantly to the activation of people's and cargo's mobility, considering that without it, aircraft transport cannot be activated. As it is known, given Algeria's enormous oil potential, it can produce this substance locally. As a single barrel of oil produces 14.80 liters of aviation fuel, and thus the state can produce more than 05 billion liters annually of this substance, which is an indication that Algeria has the potential to produce what it needs of this substance locally so that it can provide the value of its import invoice and thus prevent the erosion of the exchange reserve.

Through the same table, we note that Algeria also has the potential to achieve a competitive advantage in the production of asphalt, which is a material that contributes to local development, which in turn contributes to economic and social stability. Because Algeria imports this substance in large quantities, it may affect the balance in trade balance, where it can produce this substance, with a capacity of more than 1 billion liters per year.

Through it all, we can say that Algeria can achieve its needs for petrochemical derivatives in terms of productive efficiency.

Table (06): Quantities consumed in Algeria from petroleum derivatives during (2015-2019)

Unit: 1,000 barrels per day

Years	Liquefied gas	Gasoline	Kerosene	Aviation fuel	Gas and oil diesel	Fuel oil	Other oil derivatives	Total
2015	60.1	103.1	0.4	9.7	210.3	0.0	13.0	396.6
2016	60.4	99.1	0.4	9.8	203.9	0.0	12.0	385.6
2017	63.6	96.6	0.4	10.1	199.7	3.4	10.8	384.6
2018	71.0	91.6	0.4	12.3	206.1	3.0	11.5	395.9
2019	77	91.2	0.3	10.1	209.0	2.5	18.0	408.1

Source: Fouad Ali AbderrahmanDawood et al, Annual Report 2020, Organization of Arab Petroleum Exporting Countries OPEC, Kuwait, 2020, pp. 76-88.

We note from the table that Algeria consumes large quantities of petroleum derivatives because of the population density and the economy that tries to emerge from the rent to a diversified economy.

The year 2019 witnessed the highest consumption of these oil derivatives, which reached 408 thousand barrels per day. While during the temporal field of the study (2015-

2019), 2017 knew the lowest consumption of oil derivatives due to the high prices of these materials stated by the financial laws.

Conclusion:

Through the above, we can say that the natural potential of the state is sufficient to achieve high levels of petrochemical derivatives production at a lower cost. This enables the Algerian trade balance to avoid deficits so that the technical competence remains the decision maker in the production of this type of material, which contributes to the comfortable placement of exchange reserves.

The policy of import substitution in Algeria is conducive to avoiding the indebtedness to which any country is exposed, so the problem of absorptive capacity in Algeria remains what worries economic decision-makers, and this would be considered one of the aspirations of the state to achieve the import substitution policy.

Among the conclusions reached are the following:

- Algeria has tremendous potential for fuel production.
- Algeria is experiencing a trade balance deficit as a result of low petroleum prices.
- Algeria consumes large quantities of petrochemical products.
- Algeria needs storage capacity to be sufficient to cope with the production backlog of petrochemical derivatives.
- Economic diversification or import substitution policy is an imperative for single-supplier economies, but their success requires adherence to a number of principles, foremost is the creation of a suitable and stable climate.
- Algeria's economy is regarded as primarily rentier and still confined to the oil sector, with oil exports contributing at least 98% of total exports and thus not yet rising to the level of economic diversification.
- The financial surpluses derived from oil revenues were negatively reflected in Algeria's economy owing to their uneven distribution to productive sectors and the absence of effective public policies.
- Algeria's economic diversification through import substitution is still far-reaching at present, as it continues to rely on oil revenues as a primary source of national income.
- Industry, agriculture, and tourism are among the best alternative sectors for economic diversification. In the context of the diversification of the economic base, Algeria has several comparative advantages in various productive sectors.
- Diversifying exports out of the hydrocarbon sector and manufacturing policy to replace imports is the first to be seriously pursued now. We do not deny the country's long-standing efforts in this area, but we are disadvantaged by the lack of diligence and seriousness in their application. Most of the actions and measures taken in this regard have been characterized by stalemate and lack of flexibility as a result of the prevailing legal and economic environment.

Through these results, we propose a number of recommendations:

possibility of applying the import substitution policy on petrochemical products in Algeria

- ✓ The increase in the level of export diversification is a key development priority and the main focus of various public policies.
- ✓ The need to diversify exports outside of the hydrocarbon sector and direct oil revenues to invest in productive economic sectors.
- ✓ Undertake structural reforms at the level of the national economy and be guided by leading international experiences in the field of economic diversification.
- ✓ Maintain oil surpluses rather than wasting them on domestic consumption, and create a comprehensive development plan that covers all sectors as well as economic and social aspects.
- ✓ Provide mechanisms to attract FDI in order to attract as many foreign investors as possible to stimulate productive work, especially in petrochemical production, and utilize technology to increase production for export.
- ✓ The need to pursue a long-term strategy of economic diversification and move away from temporary circumstantial policies.
- ✓ Work to provide storage of the material produced.
- ✓ Expand the refinery at the national level.
- ✓ Work on the preparation of the oil refinery project for Sidi Abed at Tiaret.
- ✓ Raise the performance of the two oil refineries of Skikda and Arzew.

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