Algeria's Economic Complexity and Export Competitiveness: What can Algeria gain knowledge from industrial nations' experiences?

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Abstract:

Economic complexity can be defined as the composition of a country's production output and represents the structure that emerges for holding and combining knowledge. In terms of product categories and their complexity, the most complex products include machinery, chemicals, and metal products. The main exporters of the most complex products are developed countries. This means that these countries are highly export-competitive. Looking at the share of high-tech exports, Algeria's appears to be lower than it should be. This results in Algeria's relatively low economic complexity index and poor export competitiveness. According to the findings of the econometric studies carried out for this study, changes in the logistic performance index have a special influence on the economic complexity index. Countries must consequently pay more attention to invest more money in the logistics sector in order to reach a given level on the economic complexity index.

Keywords: Economic Complexity, Export Competitiveness, Algeria

JEL Classification Codes : C59 O40 O13 O55

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1. Introduction

Today, both industrialized and developing countries try to get the biggest share by increasing their shares' competitiveness in global trade. The key to gaining global competitiveness is increasing the production and export of value-added products. Undoubtedly, this can be achieved through a greater emphasis on research and development (R&D) in the manufacturing and exporting processes, as well as investment in technology.

There is an index called the Economic Complexity Index to analyze the production and export structures of countries. Complexity represents a country's level of knowledge and technology, from manufacturing to exporting. Countries with high technology and diversified production rank high in the index. Of course, these countries also have advantages in terms of export competitiveness. In addition, countries that rely on agricultural production and exports, with predominantly labor-intensive production, rank lower in the index values. In the research aimed at clarifying the relationship between export competitiveness and the index of economic complexity, we first focus on the definition and calculation of the index of export competitiveness and economic complexity. In the following sections, he will focus on products with high economic complexity and the countries that export them. In addition, this section analyzes Algeria's export competitiveness and the sophistication of these products.

In the final part of the study, indicators of the complexity index are provided through regression analysis on data from 110 countries. The extent to which the Logistics Performance Index and the Global Competitiveness Index (Business Sophistication, Higher Education and Training, Infrastructure, Innovation, and Technology Readiness) affect 110 countries can determine their economic complexity.

2. Literature Review

At least two new tools are added to economics' arsenal by the idea of economic complexity. It does this in two ways. (Balland, 2022) First, it broadens the approaches that can be used to examine a topic by reducing its dimensionality. Data aggregation is a typical strategy in economics; for instance, national accounts combine data from businesses, households, governments, and customs to determine aggregates like gross domestic product, investment, consumption, exports, and imports. This process condenses information by adding up several entries. By reducing the dimensionality of the data, economic complexity combines network theory and spectral analysis techniques to preserve more information than simple aggregates. Spectral approaches are used to measure economic complexity. Examples include the Economic Complexity Index (ECI), fitness, or production ability. The relatedness and complexity literature has developed methods that use data on locations and activities to estimate new measures of proximity between activities and locations, which are then studied as weighted networks. Examples of these methods include the product, industry, technology, and occupation spaces.

Second, economics has struggled to understand technology. It has a tendency to be measured through the effects it has, such as a shift parameter in aggregate production functions or total factor productivity measurements. However, it does not show how its effects are related to its causes, which might be found in data that was aggregated and then purged. Rich countries produce drastically

different products through radically different techniques of production; thus, they are not just like impoverished countries that produce more with the same inputs of labor and capital. What they produce is already present in the raw data. Economic complexity methods enable us to decrease the number of dimensions in our data while preserving information about country production, which has been proven to be crucial for understanding productivity, income, and growth.

A country-level analysis of how economic complexity boosts export competitiveness and economic growth has become more popular in recent years, according to the body of work that already exists in this field. The literature that is already available also looks into how factors like human capital, institutional quality, and foreign direct investment might influence economic growth while reducing economic complexity. Economic complexity is being used more and more in the empirically based literature, according to a 2015 study by Erkan and Yildirimci.

Examine how sophisticated and complex a production is and what impact it has on the diversification of global trade. According to the research by Hidalgo and Hausmann (2009) and Lapatinas et al. (2019), the economic complexity-based indicator affects exports, and nations with a higher economic complexity-based index profit more from trade. (Shahzad, 2022)

. In recent decades, empirical studies on the economic complexity of nations, innovation, technology, and economic competitiveness (Peng, 2022), (Lee, 2021). Nothing can make a country competitive just because it produces a lot of goods. (Qi, 2020) What makes a country extremely competitive is its ability to invest in research and development (R&D) to increase the complexity of its economy. Over the past decade, the economic complexities of nations have become a key consideration as they help place a nation in the right place in the global order. When using the concept of economic complexity, there is more than one definition in various analogies such as decision complexity, economic methodological complexity, etc. In this case, however, economic complexity is used to describe the production process of goods and services and their determinants of trade. (Bahar, 2020)

Table 1. Countries by complexity (2020)

Rank of Economic Complexity Index, **2020**)	Value of Economic Complexity Index	Country (Top 10 and **Algeria**)	Rank of Per Capita Income, **2020**)	Rank of Export, **2020**)	Rank of Human Development Index, **2020**)
1	2.99	Japan	27	4	**3**
2	1.99	Switzerland	2	16	**20**
3	1.97	China	79	1	**2**
4	1.88	Germany	19	3	**25**
5	1.88	South Korea	34	10	**4**
6	1.84	Singapore	12	8	**1**
7	1.59	Sweden	13	26	**8**
8	1.57	Czech	47	33	**24**
9	1.56	USA	6	2	**35**
10	1.52	Austria	18	26	**26**
112	-1.19	Algeria	151	65	**98**

Source (htt1):http://atlas.media.mit.edu/en/rankings/country/, http://data.worldbank.org/indicator/

It is not difficult to see from Table 1 that a high degree of economic complexity can be seen in developed countries in general. In this regard, these countries are among the highest in the world in terms of GDP per capita, export earnings, and the Human Development Index. Also, very

interestingly, the countries with the highest levels of development in the Human Development Index rank the highest. Algeria is significantly behind these countries in the complexity ranking (112). Due to the low production structure and level, this indicates a lack of sufficient scientific value-added manufacturing and exporting. In addition, Algeria's lower economic complexity index also indicates that the country is targeting fewer export markets. What's more, Algeria, which ranks low in the world rankings on the complexity index, also ranks low on development indices such as GDP per capita and the Human Development Index.

Table 2. Top 10 products by complexity in the world (2019-2020)

PRODUCT	2020	2019
Metalworking Transfer Machines	2.540	2.20 3rd
Developed Exposed Photographic Material	2.450	2.07 5th
Photo Lab Equipment	2.277	2.05 7th
Photographic Chemicals	2.087	1.94 10th
Cermet	2.084	1.54 50th
Metalworking Machines	2.079	2.09 4th
Artificial Textile Machinery	2.011	1.78 18th
Disc Chemicals for Electronics	2.001	1.97 8th
Other Esters	1.961	1.69 26th
Machinery Having Individual Functions	1.934	1.92 11th

Source: obtained by author by using data from (atl)://atlas.media.mit.edu/en/rankings/sitc/

The top 10 Complexity Index products in the 2020 data are listed in Table 2, and the top three exporting countries for these products can also be seen in the table. It is obvious that countries with a high complexity index lead in global trade exports. In particular, Japan, Germany, and the United States dominate the global market for the most complex products. As can be seen in Table 2, eight of them are scientifically based, and the top 10 products are listed for their level of sophistication and type of technology, with six being difficult to imitate and two being labor-intensive. This means that knowledge-based value-added products have a high level of complexity.

The 10 simplest products are shown in Table 3. It is not surprising that the countries that specialize in exporting these products are mainly developing or underdeveloped countries. These countries mainly export raw materials with no added value. Therefore, these countries have low income from exports. Looking at the technology-intensive production table, 8 out of 10 are raw material intensive and 2 are labor intensive. This is an important indicator of low export earnings for these countries. Products with a low complexity index use a lot of raw materials and are made in developing countries. In other words, when the use of science and technology in the production process decreases and the added value decreases, the complexity index decreases.

Table 3. Bottom 10 products by complexity in the world (2020)

PRODUCT	Product Group	PCI VALUE
Raw Sheep Skin without Wool	Raw material-intensive	-2.63322
Miscellaneous Vegetable Textile Fibres	Labour-intensive	-2.63322
Raw Cotton	Labour-intensive	-269092
Palm Nuts and Kernels	Raw material-intensive	-2.79018
Natural Rubber	Raw material-intensive	-2.90169
Uranium and Thorium	Raw material-intensive	-3.05744
Cocoa Beans	Raw material-intensive	-3.07003
Sesame Seeds	Raw material-intensive	-3.08837
Tin	Raw material-intensive	-3.36705
Crude Petroleum	Raw material-intensive	-3.46416

Source: obtained by author by using data from http://atlas.media.mit.edu/en/rankings/sitc/

Economic complexity means more to today's economies than it sounds. When you consider developed and In today's fast-moving country, it's easy to see that they invest heavily in R&D, making their products increasingly complex. The refinement of production, the processing of more complex commodities rather than raw materials and basic commodities, brings a country to a safe place where competitiveness and income are at a high level. Therefore, economic complexity represents the institutions that evolve to contain and combine knowledge and is expressed in the composition of a nation's productive output. (Hausmann, 2007)

The concept of economic complexity in a country refers to the production of domestic knowledge products and the diversification of national exports. In terms of economic complexity, the focus is on the intensive application of technical knowledge to product diversification, covering domestic consumer markets on the one hand and foreign markets on the other. However, the economic complexity of national production is not limited to the ability to apply knowledge to production processes; rather, it encompasses broader dimensions. (Sepehrdoust, 2019).

The concept of "production capacity" is closely related to growth and development literature. Capabilities are often discussed in the context of development as technologies, productive knowledge, infrastructure, and institutions that enable a country to increase productivity and achieve higher growth rates. (Mealy, 2020). The more diverse and mature a country's export basket is, the stronger and more economical its economic interactions will be at the international level. Hidalgo, Klinger, Barabassi, and Hausmann are the first to describe economic complexity. (Hidalgo, 2009).

While economic complexity is a relatively new concept, it helps to explain why some countries have a competitive advantage in global trade and even no longer produce quantities. Gullander et al.

(2011) describe useful frameworks for the different dimensions of complexity, namely static complexity, dynamic complexity, and objective complexity, involving individual capabilities in the system. The likes of Hidalgo and Hausman stand out for claiming that complexity is everything in a country. Some 240 years ago, Adam Smith asserted that the secret of national wealth is found in the division of labor. But they insist that it all depends on a country's ability to produce complex goods and its success in complicating its economy. The concept of economic complexity was first used in 2009 by Hidalgo and Hausman in their famous book, The Cornerstones of Economic Complexity. (Erkan, 2015).

Lego models are used to describe how a country can find its way by building Lego around a barrel of Lego Works that represents the necessary skills of the country. The more LEGO bricks, the more complex the model; like a child who has all the necessary parts, they can make amazing LEGO models (Hidalgo, 2009). Each piece helps the Lego model develop and take on its final form. Complexity provides the country with an unlikely chance to compete with others when it wants to take part in international trade. A country has no barrier to growth and development when it diversifies its exports, engages in R&D, and uses established science to enhance production. "More sophisticated items won't be as widespread since only nations with all the necessary knowledge will be able to produce them. Products that are more widely available should also require less understanding. (Botta, 2020)

3. Methodology and data

3.1. The measurement of economic complexity

How is economic complexity measured, then? The number of countries used by the Atlas of Economic Complexity website is based on data from international commerce. (Hausman, 2009). and the diversity and ubiquity[1] of each nation are computed using the following methods to make the proper calculation:

Diversity = $kc.o = \sum_p Mcp$ (1)

Ubiquity = $kc.o = \sum_c Mcp$ (2)

where, Mcp is a matrix made up of various nations and various goods. This allowed for the following calculation of the economic complexity index (ECI):

$$ECI = \frac{\vec{K} - <\vec{K}>}{stdev(\vec{K})} \quad (3)$$

Where stdev denotes the standard deviation, $< \vec{K} >$ is an average, and $\vec{K}$ looking at what has been researched, it is assumed in this modest work that economic complexity means generating goods and services with added value through the use of high-tech, innovation, spending on R&D, and

[1] Ubiquity measures the number of countries that are able to make a product.

implementing changes through training human capital. High levels of sophistication and uniqueness in goods and services indicate high levels of competition.

3.2. The measurement of export competitiveness

Liesner (1958) established the index of revealed comparative advantage, which was operationalized by Balassa (1965) to assess global competitiveness (Balassa, 1965). The ratio of a country's exports in one commodity category to its share of all goods exports is known as the export index of revealed comparative advantage (RCA). (Balassa, 1989).

$$RCA = \frac{\frac{X_{ij}}{X_j}}{\frac{X_{iw}}{X_w}}$$

Where X stands for exports, i, j and w refer to industry (product category), country and world respectively. (Erkan, 2015).

Making comparisons between nations and the international performance of various industries is made possible by the index, which cancels out the impact of a country's economy or industry's size. The value of the index ranges from zero, which denotes that a nation has no exports in the industry under consideration, to infinity, which denotes that the industry is a significant exporter in comparison to other sectors of the economy. A branch that has an RCA index of greater than one has a market share that is greater than the average export share of the nation. In comparison to the rest of its domestic economy, this indicates that it is competitive.

As a result, this branch is globally competitive, or, to use Balassa's definition, has a revealed comparative advantage. Balassa's RCA index can be divided into four stages according to a more in-depth analysis, which demonstrates the power of global competitiveness. (Basilio, 2020).

- Classification 1 → 0 < RCA ≤ 1; There is no competitiveness.
- Classification 2→ 1 < RCA ≤ 2; There is a week competitiveness.
- Classification 3→ 2 < RCA ≤ 4; There is moderate competitiveness.
- Classification 4→ 4 <RCA; There is a strong competitiveness

. There is competitiveness when we apply logarithms to the index and lnRCA > 0; in contrast, there is competitiveness when lnRCA 0.

3.3. Algeria’s export competitiveness and economic complexity analysis

3.3.1. Algeria’s export competitiveness

According to the value of a suitable average, Algeria is not competitive in the easy and difficult-to-imitate science-based commodities. Algeria's export competitiveness in easily copied science-based commodities is comparatively low and not promising. Despite recent advancements, Algeria still faces a competitive disadvantage in the export of complex scientific commodities. When

the coefficient of variation (CV)[2] for easily replicable scientific items is examined, it is shown that Algeria's RCA index volatility is rather constant.

According to the CEPII formula, the revealed comparative advantage (RCA) displays the contribution. of every industry to the nation's overall balance of trade. increasing the index. Alternatively, the higher the ranking, the greater the contribution of the sector to net exports (exports minus imports) and the trade balance.An index shows the distinction between actual net exports as well as the modified net exports after accounting for the total trade surplus and deficit for the country.

3.3.2. Relationship between Algeria's export competitiveness and economic complexity index

In 2020, Algeria will export goods worth $22.2 billion USD. Over the previous five years, exports have decreased by 9.9% on average annually, which has slowed down overall economic growth because exports are a declining sector of the economy. Non-oil exports have decreased by 2.5% per year over the last five years, trailing global average growth. With imports amounting to $41.5 billion USD in 2020, Algeria has a trade deficit in goods and services. Top 3 export destination countries: Italy **18.27%** France **15.44%** Spain **14.94%.**

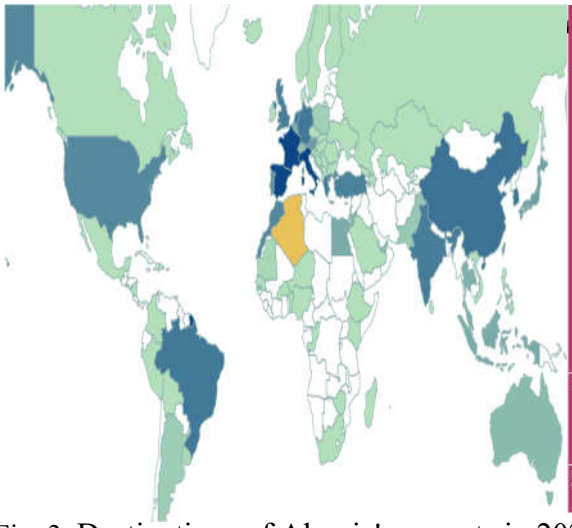

Fig. 3. Destinations of Algeria's exports in 2020

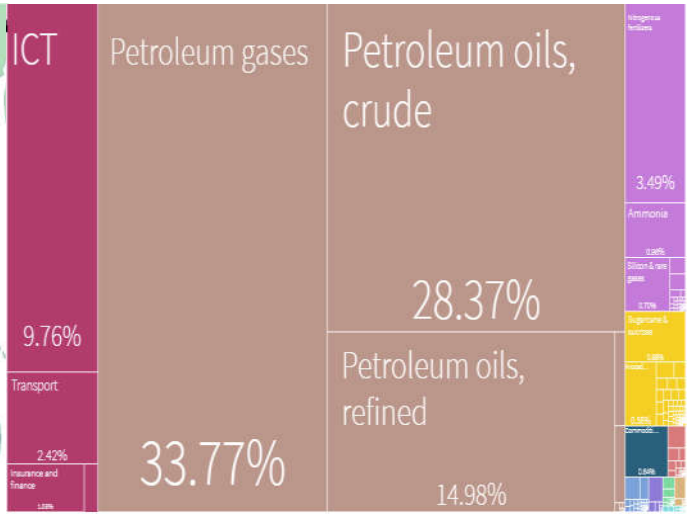

Fig. 4. What was exported by Algeria in 2020?

Source: https://atlas.cid.harvard.edu/

a. Product complexity index in Algeria

According to research from the Growth Lab, exports from nations that are more complicated than would be expected given their income levels increase more quickly. Therefore, broadening expertise to generate a wider range of increasingly complex goods and

[2] the CV is determined in a modeling context as the ratio of the dependent variable's mean to the root mean squared error (RMSE). The CV is frequently displayed in both contexts as the specified ratio multiplied by 100. A single variable's CV seeks to explain the variable's dispersion in a way that is independent of the measurement unit for the variable. The dispersion of the variable increases with increasing CV. A model's CV seeks to represent the model's fit in terms of the squared residuals and outcome values' corresponding sizes. The lower the CV, the smaller the residuals in relation to the projected value. This points to a solid model fit. HTTP://www.ats.ucla.edu/stat/mult pkg/faq/general/coefficient of variation.htm

services can spur growth. The two categories of low- and intermediate-complexity products that Algeria exports the most are minerals and chemicals, respectively.

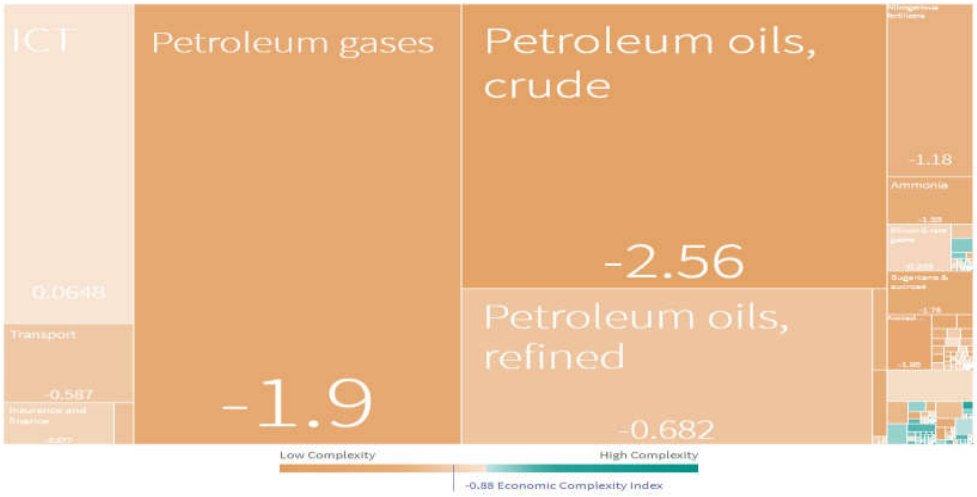

Fig. 5. ECI for Algeria in 2020

Source : https://atlas.cid.harvard.edu/

b. Product space in Algeria

According to our research, nations tend to diversify by pursuing adjacent and related industries or those that call for a similar set of skills in order to expand upon already-existing capacities. Using data from the actual world, the Product Space illustrates how more than 800 products are related. For instance, nations that manufacture textiles are likely to be able to produce other textiles as well, but they have limited connections to nations that produce machines. Based on the commonalities in the production-related knowledge needed to generate them, The Product Space illustrates the connections between products. For more details, hover over and click on one or more product nodes.

Table 5. Product space for Algeria in 2020

PRODUCT	Country Trade	World Trade	(RCA)	Sector
Live Fish	$4.21M	$1.86B	2.08	Agriculture
Avocados, pineapples, mangos, etc.	$128M	$14.7B	7.16	Agriculture
Wheat or meslin flour	$6.47M	$4.70B	1.12	Agriculture
Cereal meals	$1.87M	$1.30B	1.17	Agriculture
Seaweeds & edible vegetable products	$18.3M	$1.24B	11.9	Agriculture
Sugarcane & sucrose	$196M	$23.3B	6.74	Agriculture
Natural calcium phosphates	$62.1M	$2.35B	21.4	Minerals
Cements	$50.9M	$12.2B	3.41	Minerals
Petroleum oils, crude	$6.30B	$751B	7.35	Minerals
Petroleum oils, refined	$3.33B	$490B	5.66	Minerals
Petroleum gases	$7.50B	$255B	26.2	Minerals
Silicon & rare gases	$155M	$8.51B	15	Chemicals
Ammonia	$212M	$5.45B	31.1	Chemicals

Nitrogenous fertilizers	$775M	$20.7B	29.8	Chemicals
Phosphatic fertilizers	$2.24M	$1.32B	1.35	Chemicals
Tanned sheepskins	$5.23M	$609M	6.93	Agriculture
Tissue	$6.92M	$4.05B	1.37	Agriculture
Float glass	$15.1M	$4.73B	2.72	Stone
Other bars of iron, not further worked than forged	$24.5M	$13.2B	1.51	Metals
Household- or laundry-type washing machines	$21.6M	$13.9B	1.25	Machinery

Source: obtained by author by using data from **atlas.cid.harvard.edu/countries/66/paths**

When nations diversify into industries that need a similar set of skills and expand on their current competencies, they are more successful. Here, "Algeria's Product Space" demonstrates how connected its exports are as well as possible avenues for diversifying its economy.

c. **Feasible Opportunities[3] for Algerian product**

The Feasible Opportunities displays a country's opportunities for diversification based on what it currently exports. Countries expand by diversifying into new, more complicated products. Strategic new goods seek to strike a balance by:

- Distance to current capabilities: A product is "nearby" to existing know-how if the distance is low (close to 0).
- Complexity: Products with greater complexity typically support higher pay.

Gain for future diversification: Higher values have more connections to other complicated items, providing more chances for future diversification.

[3] determines how much a location could gain by creating a specific product in terms of expanding its diversification opportunities. Opportunity outlook gain measures the extent to which a new product can create connections to other, more sophisticated products. A product's strategic value is categorized by its opportunity outlook, based on the new avenues for diversification it opens up in more intricate industries. The complexity of products not produced in a region, as well as how close or far away that new product is from existing capabilities, are factors in opportunity outlook gain.

Table 6. Top 10 product by Opportunity Gain for Algeria in 2020

PRODUCT	World Trade	(RCA)	Distance [4]	(PCI)[5]	Opportunity Gain	Sector
Industrial electric furnaces	$4.99B	0.0003	0.992	1.93	1.74	Electronics
Machines n.e.c.	$119B	0.003	0.991	2.07	1.54	Machinery
Electric soldering machines	$10.4B	0.0007	0.991	1.75	1.52	Electronics
Screws and similar articles of iron or steel	$35.2B	0.0017	0.989	1.62	1.52	Metals
Petroleum resins	$5.82B	0.0044	0.992	1.96	1.5	Chemicals
Ion-exchangers based on polymers	$1.81B	0	0.992	1.86	1.48	Chemicals
Instruments for physical or chemical analysis	$46.6B	0.0051	0.992	1.89	1.47	Machinery
Interchangeable tools for hand tools	$19.7B	0.0126	0.988	1.71	1.45	Metals
Drafting tables and machines	$2.11B	0.0007	0.992	1.77	1.44	Machinery
Lubricants	$8.36B	0.0001	0.99	1.47	1.44	Chemicals

Source: obtained by author by using data from (htt2) http://atlas.media.mit.edu/en/rankings/sitc/

d. Global Market Share Increase

The customary structural reform process has not yet begun in Algeria. This process transfers economic activity from low to high productivity sectors, and it is a major driver of economic growth. In general, it shifts operations away from agriculture and into the manufacturing of textiles, electronics, and/or machinery. Over the past ten years, Algeria's global market share in textile exports has "stagnated," and the country's revenue growth is being constrained by the slow adoption of electronics and machines. Minerals have dominated Algeria's export dynamics for the last five years. Exports of "minerals" have decreased, which is alarming. As a result of its focus on a shrinking segment of international exports, "Algeria" has experienced slower economic growth.

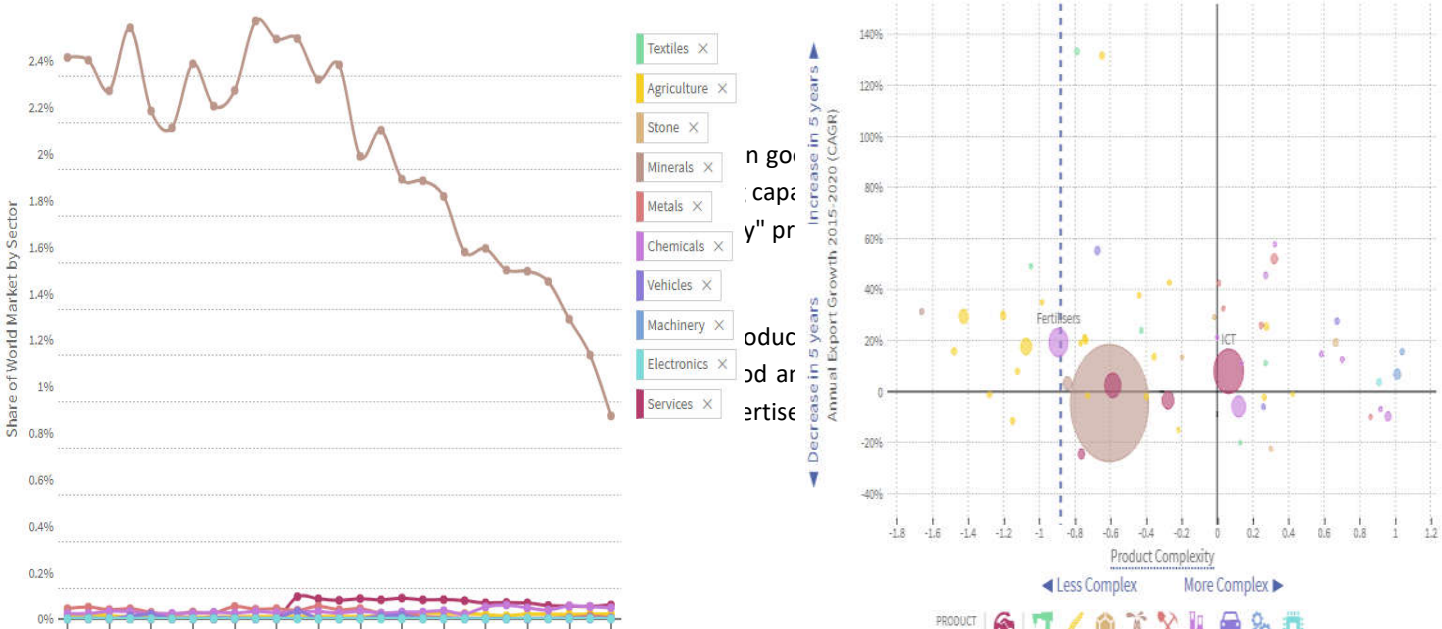

Fig. 7. expansion of global market share in Algeria 1994-2020

Fig. 6. Growth Dynamics of Exports of Algeria in 2020

Diversification into new, progressively more complicated products is what spurs economic growth. Since 2005, Algeria has added four new goods[6], and as of 2020, the income per capita from these goods was $5. Algeria has too little product diversity to make a significant contribution to income growth.

Table 7. New Export Products, 2005- 2020

COUNTRY	New products	USD per capita	USD total value
Tunisia	19	52	612M
Spain	13	19	908M
Libya	4	239	1.64B
Algeria	4	5	222M

Source: obtained by author by using data from (htt2) http://atlas.media.mit.edu/en/rankings/sitc/

3.4. Result of the empirical analysis

Regression was used in the model to assess the relationship between the variables for 110 nations (least squares approach, cross sectional analysis). One dependent variable and twelve independent variables were used to calculate the Economic Complexity Index. Infrastructure; higher education and training; innovation; business sophistication; taxation system corporations; services provided by public institutions; labor law and social protection; direct financial resources; competition and antitrust frameworks; public/private corporations. The Global Competitiveness Report provided the data for the year 2020. (Shwab, 2020), the Economic Complexity Index 2020

[6] Economic growth is fueled by diversification into new, progressively more complex products. Algeria has added four new products since 2005, and as of 2020, the country's income from these products was $5 per person. Algeria's product diversification is insufficient to significantly boost income growth.

(atl1) (https://atlas.media.mit.edu/tr/) and the Logistics Performance Index 2020 (htt3)(World Bank, 2020,10).

According to the regression analysis, there is a significant correlation (R-squared = 0.81) between the dependent variable and the selected independent variables. Economic Complexity Index, the dependent variable, also significantly correlates with Business Sophistication, Higher Education and Training, Infrastructure, and Logistics Performance Index.

Particularly, the Logistics Performance Index has a significant impact on the Economic Complexity Index. Table 8 shows that the LPI value is 0.31. It implies that the goods that the nations with strong logistics performances export are more complex. Product and market diversification in exports will also expand as countries engage more in logistics research and place more emphasis on their logistics. In fact, countries will use high-value-added products to appeal to a wider market as their logistical performance improves. Additionally, because logistics facilitates the movement and flow of numerous economic transactions, these impacts will have a favorable impact on all export-related economic activity along the whole supply chain. (Erkan, 2014).

Higher education and training both have a significant impact on the economic complexity index. These further suggest that the value chain needs to be lengthened in order to manufacture more complex items. Additionally, by increasing investment in higher education, the quality of education must rise.

Table 8. Results of the model

Estimation Method: Least Squares
Sample: 1 35
Included observations: 31
Total system (balanced) observations 31
Estimation settings: tol=0.00010, derivs=accurate mixed (linear)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.818623	1.588880	-0.515220	0.6123
C(2)	-0.026405	0.016085	-1.641608	0.1171
C(3)	-0.034697	0.020457	-1.696112	0.1062
C(4)	-0.006974	0.007216	-0.966451	0.3460
C(5)	-0.008115	0.028004	-0.289786	0.7751
C(6)	-0.001451	0.015699	-0.092395	0.9274
C(7)	0.003043	0.026672	0.114106	0.9104
C(8)	0.038177	0.019032	2.005970	0.0593
C(9)	0.318598	0.492302	0.647159	0.5253
C(10)	-0.033569	0.028660	-1.171286	0.2560
C(11)	0.130270	0.050202	2.594903	0.0178
C(12)	-0.015340	0.011878	-1.291500	0.2120

Determinant residual covariance 0.098876

Equation: ECI = C(1) + C(2)*BUSINESS_SOPHISTICATION + C(3) *COMPETITION_AND_ANTI_TRU + C(4)*DIRECT_FINANCIAL_RESOU RC + C(5)*HIGHER_EDUCATION_AND_TRA + C(6) *INFRASTRUCTURE + C(7)*INNOVATION + C(8)*LABOR_LAW_AND_ SOCIAL_PRO + C(9)*LOGISTIC_PERFORMANCE_IND + C(10) *PUBLIC_INSITUTION_SERVIC + C(11)*PUBLIC_PRIVATE_CORPOR ATI + C(12)*TAXATION_SYSTEM_CORPORAT
Observations: 31

R-squared	0.814533	Mean dependent var	1.065686
Adjusted R-squared	0.805053	S.D. dependent var	0.609021

S.E. of regression	0.401653	Sum squared resid	3.065170
Durbin-Watson stat	1.780349		

Source: own calculation

4. Conclusion

Algeria is a labor-intensive nation in terms of export and manufacturing. This condition makes it such that the nation neither produces value-added items nor exports products based on research and technology. Naturally, it hasn't grown to be a major economic force on the world stage. When the product complexity index is looked at, it is discovered that the most complex items have manufacturing processes that are heavily dependent on science- and technology-based research and development. As the level of complexity decreases, the manufacturing of things that require a lot of raw materials becomes simpler and more basic. Being a global leader in the export of these goods won't, in all honesty, enable the country's GDP to increase or its level of development. In order to enhance its economic complexity index, Algeria must expand its production of commodities with value added and engage in science-based manufacturing rather than exporting its products as raw materials. Algeria can thereby increase its strength and gain a larger portion of global markets.

The results of the econometric analyses conducted for this study reveal that changes in the logistic performance index have a particular impact on the economic complexity index. To reach a certain level on the economic complexity index, countries must therefore give the logistic sector greater attention and invest more money in it. Along with the quantitative and qualitative developments in the logistics industry, raising the standard of higher education and developing value chains to improve the creation of goods with added value in businesses would both benefit their ability to compete. As a result, businesses might offer a variety of R&D-based products to diverse markets.

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