منتدى الاستراتيجيات الأردني
JORDAN STRATEGY FORUM

Economic Complexity:
Where Does Jordan Stand?
Improving Exports and Competitiveness

August 2020

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The Jordan Strategy Forum (JSF) is a not-for-profit organization, which represents a group of Jordanian private sector companies that are active in corporate and social responsibility (CSR) and in promoting Jordan's economic growth. JSF's members are active private sector institutions, who demonstrate a genuine will to be part of a dialogue on economic and social issues that concern Jordanian citizens. The Jordan Strategy Forum promotes a strong Jordanian private sector that is profitable, employs Jordanians, pays taxes and supports comprehensive economic growth in Jordan.

The JSF also offers a rare opportunity and space for the private sector to have evidence-based debate with the public sector and decision-makers with the aim to increase awareness, strengthening the future of the Jordanian economy and applying best practices.

For more information about the Jordan Strategy Forum, please visit our website at www.jsf.org or contact us via email at info@jsf.org. Please visit our Facebook page at Facebook.com/JordanStrategyForumJSF or our Twitter account @JSFJordan for continuous updates aboutJordan Strategy Forum.

#JSFJo
@JSFJordan
/JordanStrategyForumJSF
Jordan Strategy Forum

Amman, Jordan
T: +962 6 566 6476
F: +962 6 566 6376

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1. Introduction

The question of why some economies experience strong economic growth and enjoy high per-capita income, while others are not that lucky has always caught the imagination of economists.

One strand of the economics literature argues that the income gaps between countries is due to their "productive capabilities". In other words, capable economies produce sophisticated goods such as airplanes and less capable can only produce simple goods such as tomatoes.

The fact that it is difficult to measure the productive capabilities of economies, the Harvard Team, led by Haussmann and Hidalgo, coined the term of Economic Complexity Index (ECI).

The ECI uses the exports of countries, and reduces every country's economic system into two dimensions: The "diversity" and "ubiquity" of the exported products. Diversity is the number of products that a country can export competitively. Ubiquity is the number of countries that export the product competitively.

To simplify, less complex countries, such as Pakistan and Peru, lie at the bottom of the ECI rank. Such economies export very few different types of products (not diversified) and those products are produced in many other countries. Complex economies, such as Japan and Germany, on the other hand, export many different kinds of sophisticated products, and those products are produced by few other countries that have similarly diversified productive capacities.

On average, the literature reports that complexity increases economic growth and helps countries climb from being middle-income to high-income (middle-income trap). For example, Malaysia's rank on the ECI is higher than other countries, such as Poland, Russia, Turkey, and Greece. However, the fact that these countries have similar GDP per capita, statistically speaking, it is likely that Malaysia will grow faster.

The fact that economic complexity have significant growth implications, policymakers should focus on encouraging specific productivity constraints in "key sectors" or "products" that are likely to unlock their economies' growth potential.

Figure 1 - Economic Complexity Rank versus GDP Per Capita

COVID-19 is a Tragedy. However, while governments, private sector, as well as households and individuals struggle with their respective immediate concerns, they all should look into the future and for any **hidden lessons and opportunities** within the tragedy.

The world will eventually succeed in containing COVID-19. What is less clear, however, is how the virus will affect the World Order, especially in its' trading dimension. Indeed, one might expect several changes to emerge. These include public policy at the national level, politics at the national level, and international political and economic relations. As if these were not enough, priorities of societies in general, and households and individuals in particular, might also change.

In this Policy Paper, the objectives of the Jordan Strategy Forum (JSF) are four-fold.

a) To briefly outline the basic logic of the ECI and its' other related concepts.

b) To highlight the relevance of economic complexity to Jordan.

c) To examine where Jordan stands on the ECI.

d) To outline some recommendations to enhance the complexity and exporting capacity of Jordan.

2. The Basic logic of the ECI and its Other Related Concepts

The notion that the prosperity of nations depends on their ability to develop complex and innovative products and have competitive advantage is not new. No two economists would disagree with such a statement. In other words, no nation would not become rich in a sustainable manner by simply making and exporting more of the same product.

To succeed, any nation must change what it produces and move to activities that are new and more productive. Over time, the diversification process results in more sophistication. Any nation cannot suddenly move from producing, for example, tomatoes to making satellites. A gradual build-up of capabilities and knowledge, and expansion into a new set of more sophisticated products make sense.

The sophistication of the products that any nation makes is an indication of its **"accumulated amount of productive knowledge and capabilities".**

To measure complexity, one can look at the composition of Gross Domestic Product (GDP). For example, one can argue that countries with high agriculture to GDP ratios in their economies are less complex than countries with lower ratios. However, this measure is too aggregate.

One can also look at **"product complexity**" and **"country complexity".**

1. The complexity of product A is lower than the complexity of product B. For example, a computer is more complex than a package of chewing gum (a priori classification).
2. The complexity of country A is lower than the complexity of country B because it spends less on, for example, research and development (R&D), and has a lower number of patents (a priori classification).

These two measures of the productive structure of countries do not really capture their levels of sophistication. They are too general or simply a priori definitions. These measures are also unidirectional. By definition, they run from products to countries or from countries to products.

To better measure complexity per se, one needs to consider the bidirectional relationship between the product-based and country-based definitions. To account for this, the Harvard team came up with the **"Economic Complexity Index".** The methodology of this index reduces each country's economic system into two dimensions:

1) **Diversity** of products in the export basket. Diversity is the number of products that a country exports competitively or with revealed comparative advantage (a country's exports of the product, as a share of total exports, is higher than global exports of the product as a share of total global trade).

2) **Ubiquity** of products in the export basket. Ubiquity is the number of countries in the world that are able to export a product competitively.

To ensure that the index captures economic complexity well, the ECI considers diversity and ubiquity iteratively and uses them to correct one another. For clarification, we can state:

a) It is not necessarily the case that all ubiquitous products are complex. Natural export products (i.e. diamonds) might be rare. However, if other countries that export such a rare good are not diverse, then its scarcity does not reflect complexity. Here, we have a case of non-ubiquity but without complexity.

b) It is not necessarily the case that a diverse economy is complex. Such an economy might export a wide range of products (fruits, vegetables, etc…) and these products are exported by many other economies too. Here, we have a case of ubiquity but without complexity.

These two examples show that diversity and ubiquity should be use simultaneously to correct the information that they carry. For the mathematically sophisticated, the used method is Moments of Reflections.

Based on the concepts of diversity and ubiquity, the Harvard team arrives at a summarized measure of knowledge required by a product (Product Complexity Index / PCI) and a summarized measure of knowledge present in a country (Economic Complexity Index / ECI).

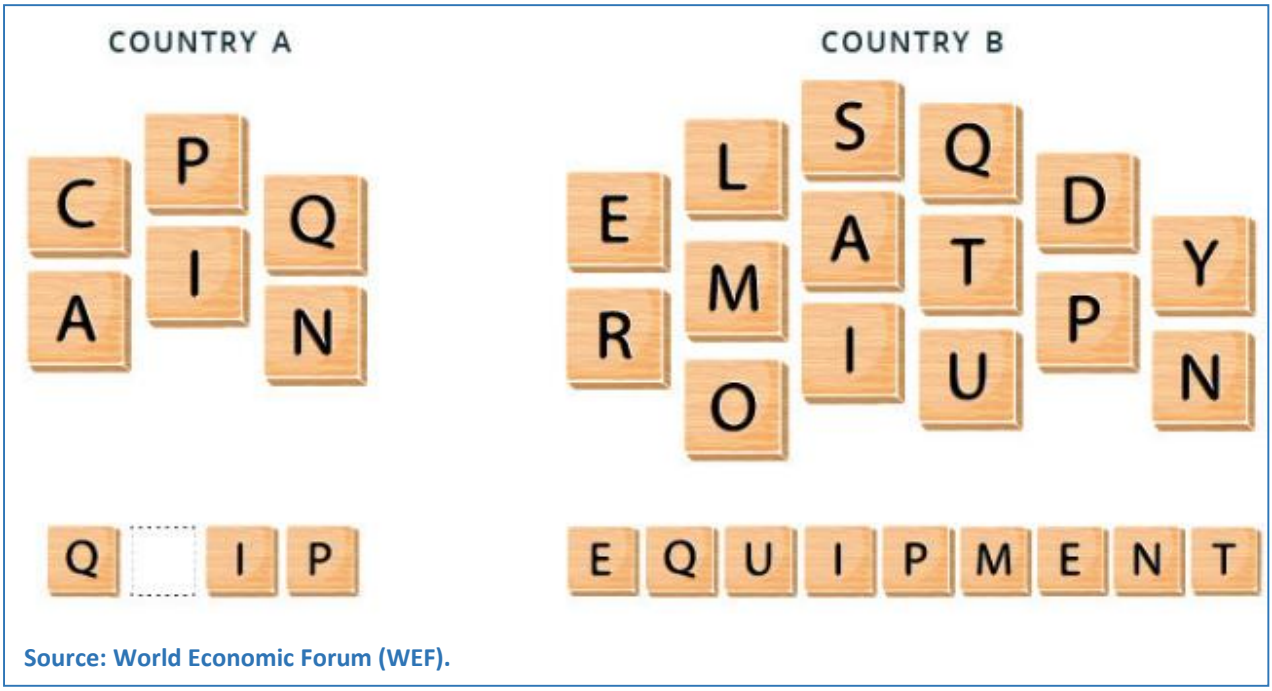
"The PCI is a number unique to each product that captures how complex it is. A product is complex if it is made by highly diversified countries that make predominantly rare products".

"The ECI is a number unique to each country that measures the average complexity of its products. Countries with a high ECI are well- diversified countries exporting, on average, high-PCI products".

The fact that the productive-knowledge and capabilities of any country are **abstract** and **immeasurable,** its' economic complexity can be revealed by the products it makes. To illustrate this, one Harvard team-member (M. Yildirim, 2014) provides us with a useful analogy.

Think of each type of productive knowledge as a letter and each product as a word composed of these letters. Every economy holds a set of letters and tries to make words out of them. For example, with letters H, M, O, W, and Y, we can construct six words and these are my, oh, how, who, why, and whom. Extending this analogy to countries and products, we can understand that a country that has a large diversity of letters can make more products, and more unique products. Words that require more letters cannot be produced by countries that have few pieces (letters). A graph, presented by the World Economic Forum (WEF), illustrates this analogy.

Countries that have diversified letters are able to produce more unique products. On the other hand, words that require more letters can be composed by economies that have all the requisite pieces (letters).



Source: World Economic Forum (WEF).

In addition to the ECI and PCI concepts, the Harvard team also argues that the assets and capabilities needed to produce one good can be used to produce other, somewhat similar, goods.

The **proximity** between two agricultural products is high. The inputs used for producing apples and oranges are close or similar. The closeness or proximity between auto parts and electronic goods also makes sense. This is why the Harvard team developed **"The Product Space"** using trade data on 133 countries.

The product space is a "visualization that depicts the connectedness between products based on the similarities of the know-how required to produce them. The product space visualizes the paths that countries can take to diversify. Products are linked by their proximity to each other, based on the probability of co-export of both of the two products"… "By using real export data over time, the shape of the product space teaches us how diversification works in practice: countries move from things they know how to do, to things that are nearby or related, or what they call the adjacent possible".

To illustrate this, let us consider the product spaces of simple and complex economies.

1. The circles represent the product space of all global trade. Each circle is a different exported product. The size of each circle denotes the product's share of world trade.

2. The different colors represent the broader industries of these products. The colored circles are the products that the country exports. The grey circles are products that the country does not export.

Figure 2 - Product Space of a Simple Economy

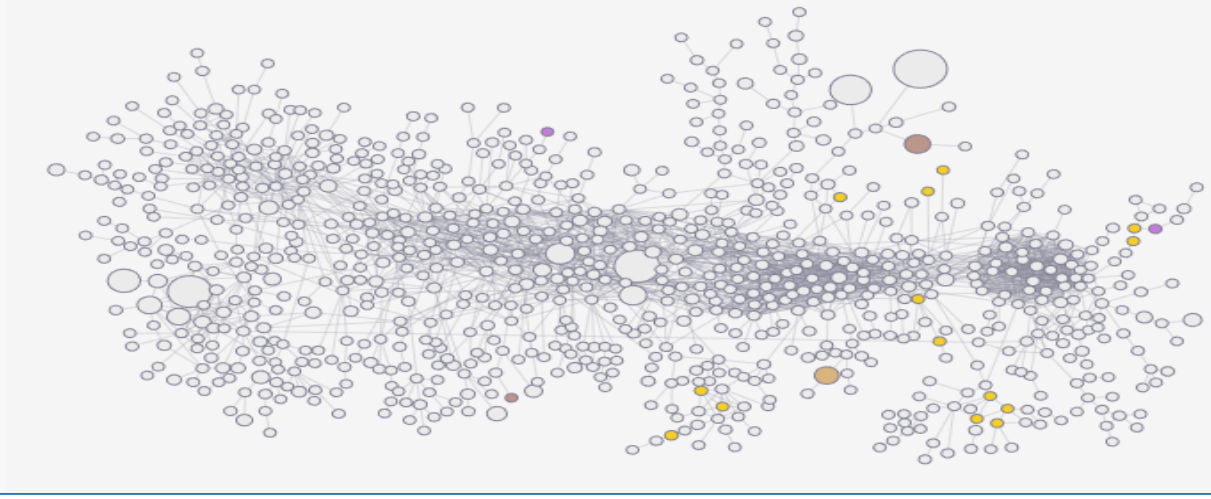
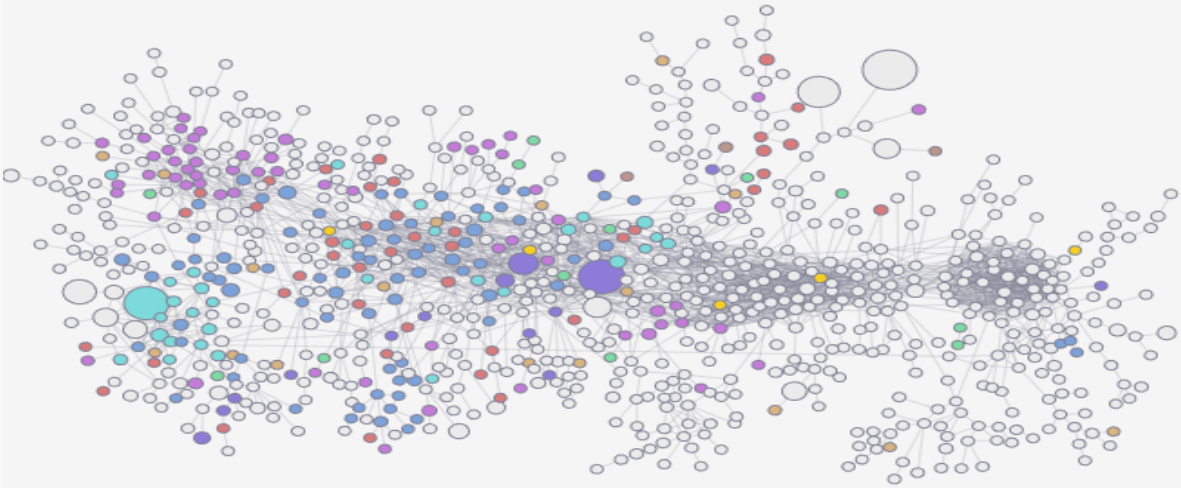


Figure 3 - Product Space of a Complex Economy



Two features of the product space illustrate these two countries' level of economic complexity.

a) The simple economy has a limited number of colored dots across the product space. The complex economy, on the other hand, has a large number of colored dots (diverse set of export products).

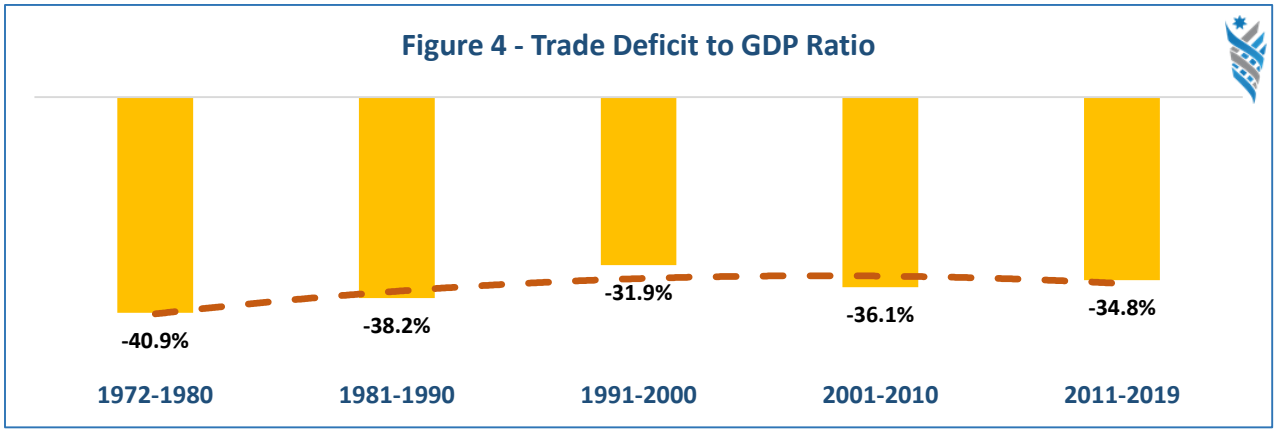
b) The simple economy has a limited number, if any, of product circles located at the center of the product space. This reflects poor connectivity to other goods. In addition, the product space of the simple economy reflects how difficult it is to increase complexity. Products that are not tightly connected do not share similar capabilities to produce.

3. The Relevance of Economic Complexity to Jordan

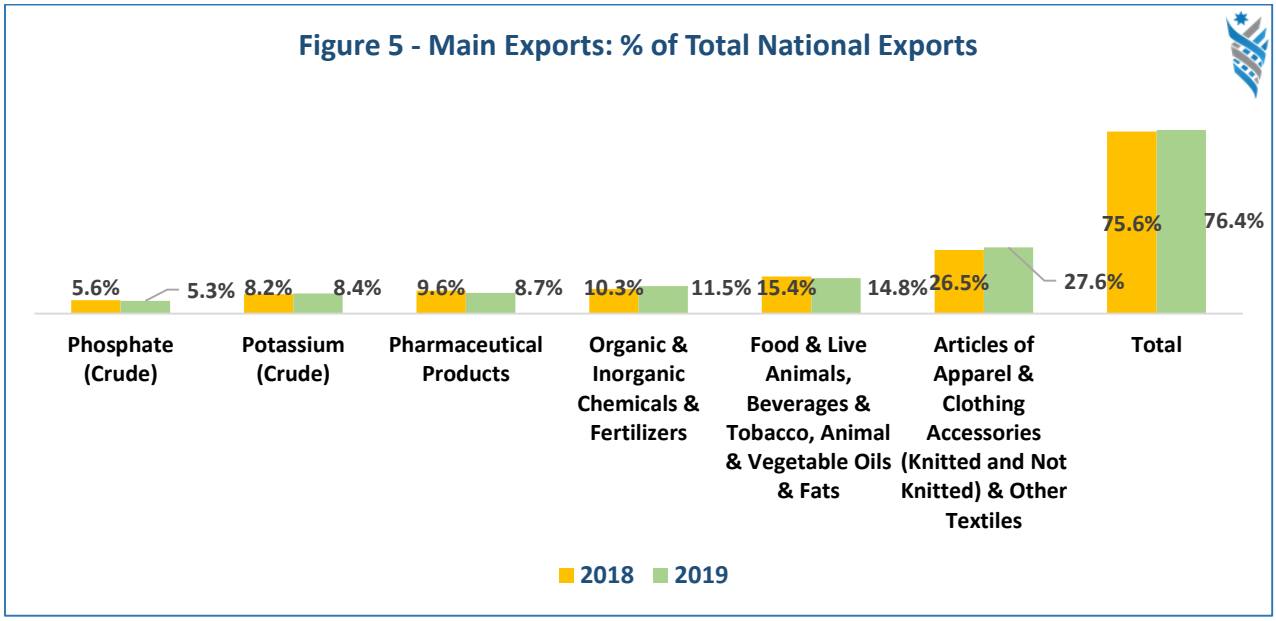
Before the onslaught of COVID-19, Jordan has been wrestling with a myriad of socio-economic challenges. Some of these challenges are consistently high unemployment rates, low labor force participation rates, increasing poverty levels, consistent budget deficits, and rising public debt levels.

To rise up to these challenges, Jordan must achieve strong and sustainable real economic growth. One way to realize this is to increase national exports. Within this context, it is unfortunate to note that Jordan's trading performance has always been weak. Below, we outline a number of observations.

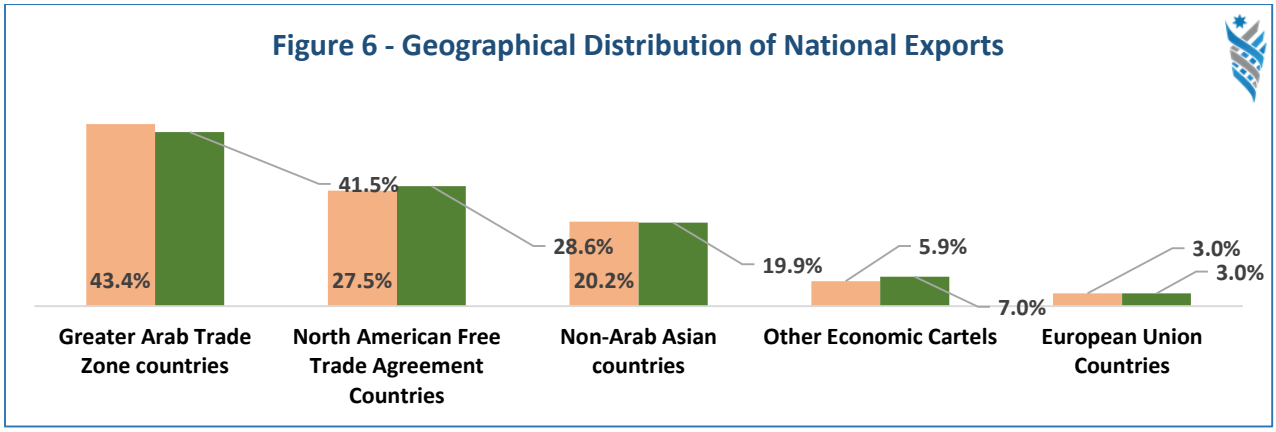
a) Since decades, the Jordanian economy has never realized a surplus in its trading performance.



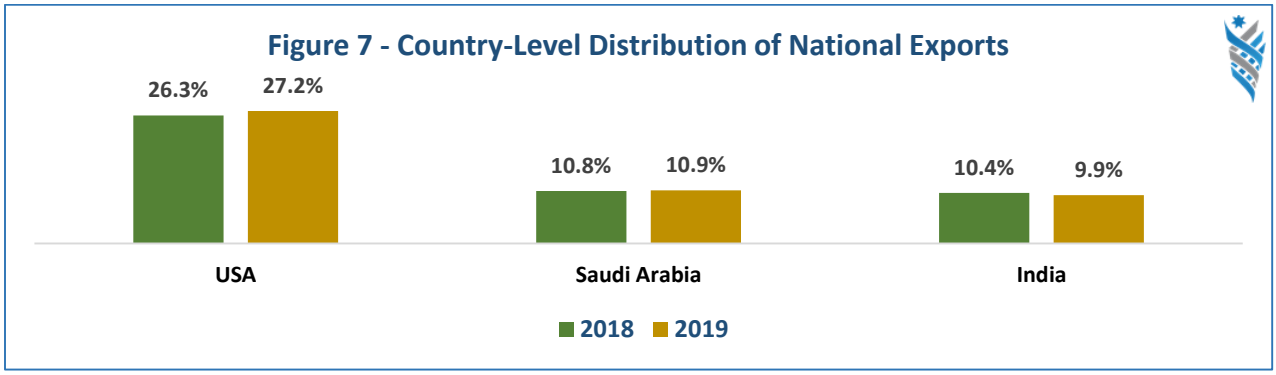
b) National exports are concentrated. Textiles and accessories make-up 27.6% of national exports.



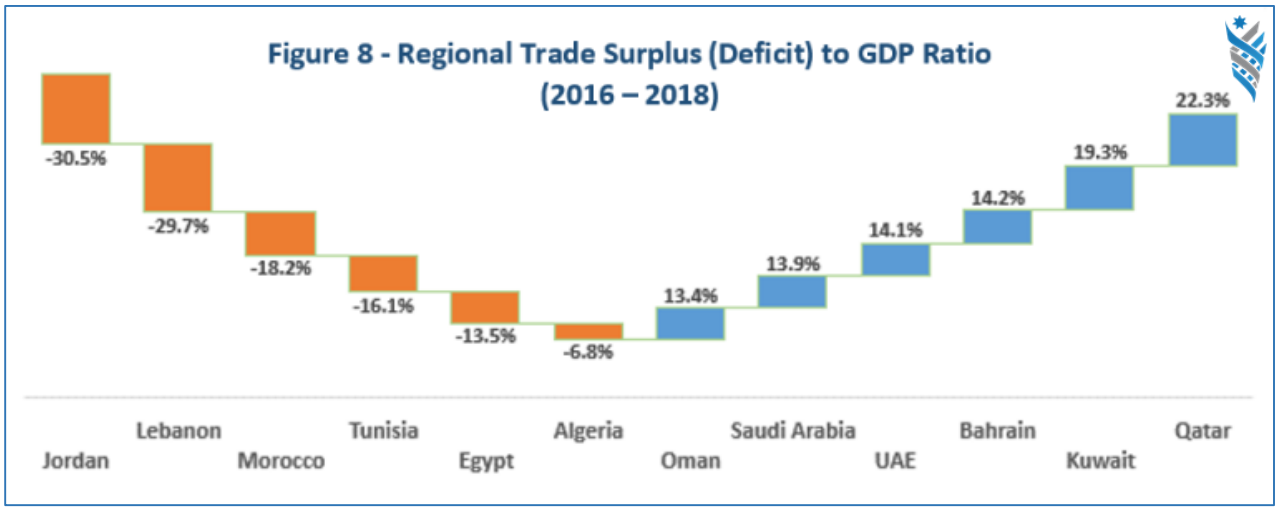
c) National exports are "concentrated" in terms of geographical distribution. The greater Arab Trade Zone Countries and North America make-up more than 70% of total national exports.



d) At the country-level, national exports are also concentrated. Three countries only (USA, Saudi Arabia, and India) make-up nearly half of total national exports.



e) Regionally, Jordan witnesses the highest trade deficit to GDP ratio (World Bank Database).



Nations have always traded with each other. International trade brings in a myriad of benefits. Trade encourages countries to specialize in the production of goods and services that they can produce more effectively and efficiently, and at a lower cost. Trade promotes competition and encourages innovation.

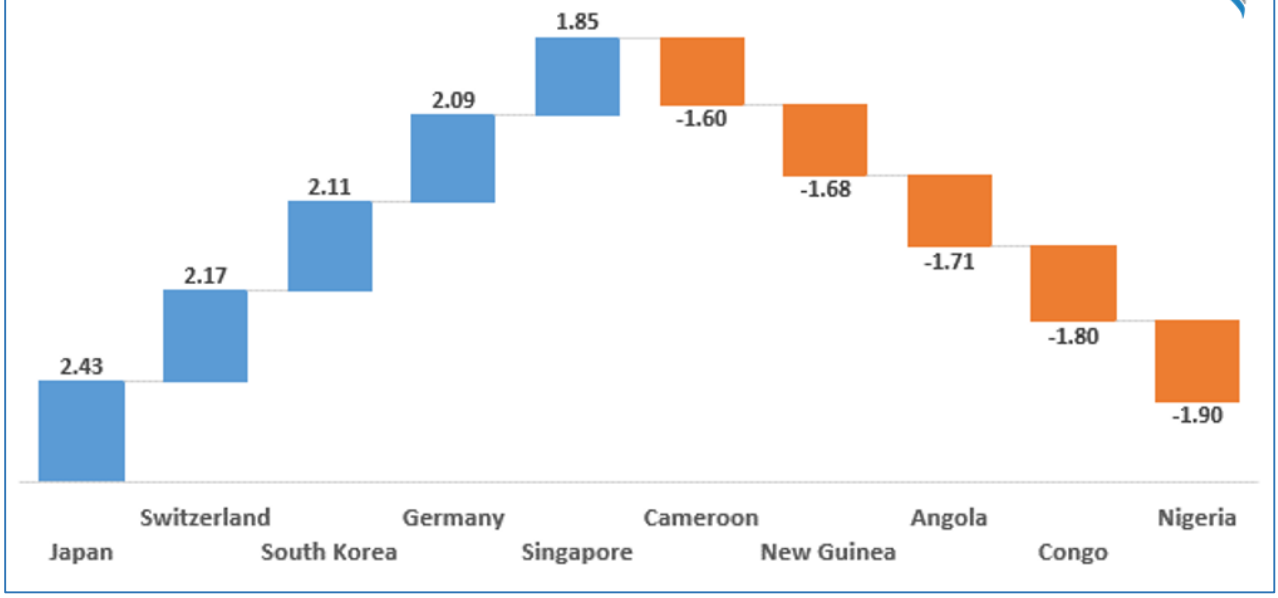
Given Jordan's underlying socio-economic challenges, and the economy's poor trading performance, the subject matter of economic complexity is important to look at. Indeed, this is one commonsensical way to not only increase national exports and enjoy stronger economic rates, but also to diversify exports into more sophisticated goods.

4. Economic Complexity & Product Space: Some Observations

Following our discussion of economic complexity in general, and the ECI, PCI, and product space in particular, we outline below a number of observations from the Harvard Team's webpage. Based on the latest available data (2018), the Harvard team's webpage contains the rankings and scores of the ECI for 133 countries. Below, we report some observations.

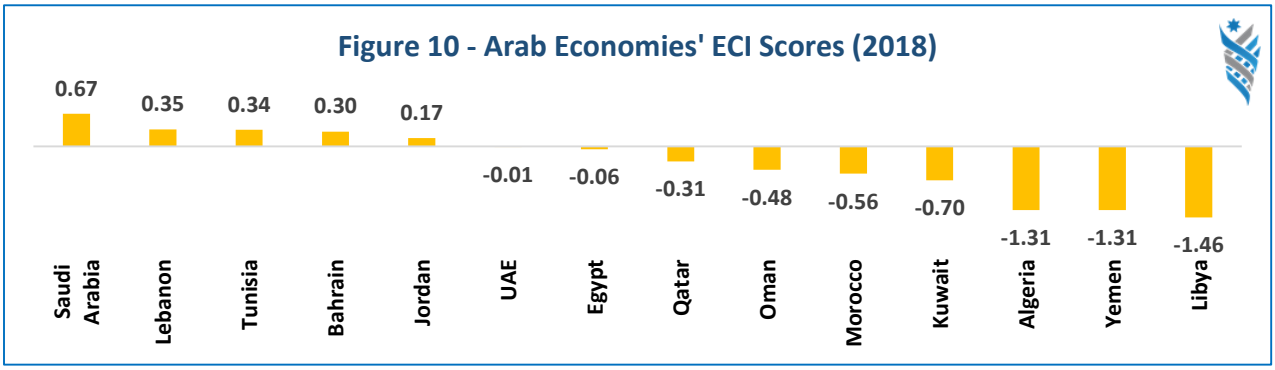
a) Japan, Switzerland, South Korea, Germany, and Singapore are the top five economies by economic complexity. With a score of -1.90, Nigeria ranks last (133rd). As explained above, the relatively high ECI scores is the result of economies being well diversified and on average, exporting complex products. A product is more complex if it is made by highly diversified countries that make predominantly rare products.

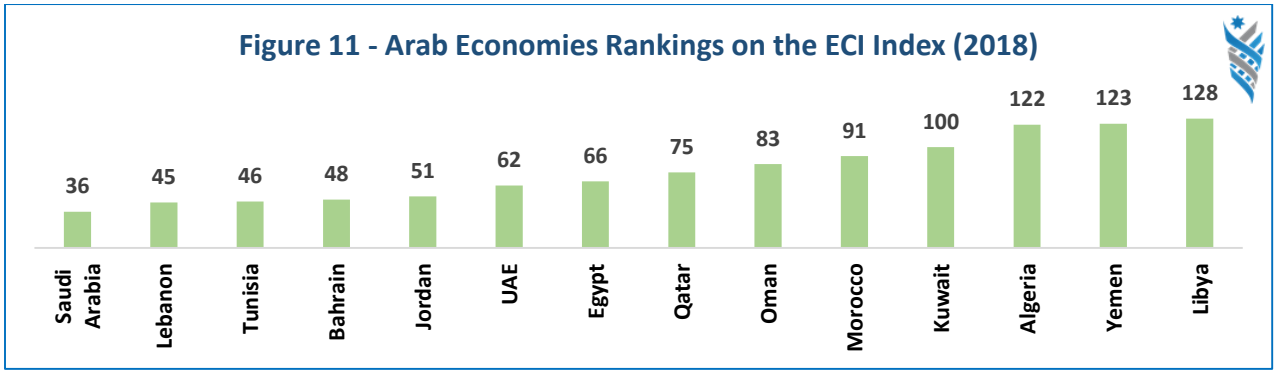
Figure 9 - ECI Scores for Top & Bottom 5 Countries (2018)



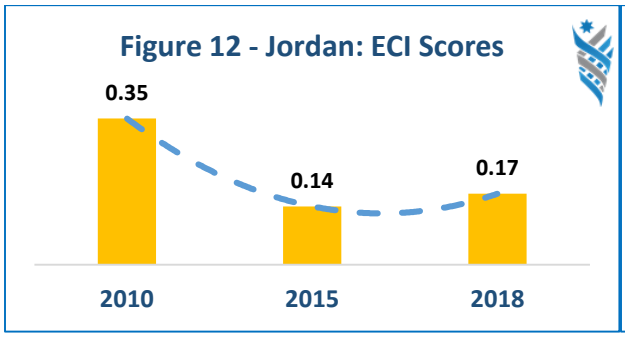
b) At the Arab economies level, Saudi Arabia is the most sophisticated. With a score of 0.67, Saudi Arabia ranks 36th out of 133 economies. Jordan ranks 51st.

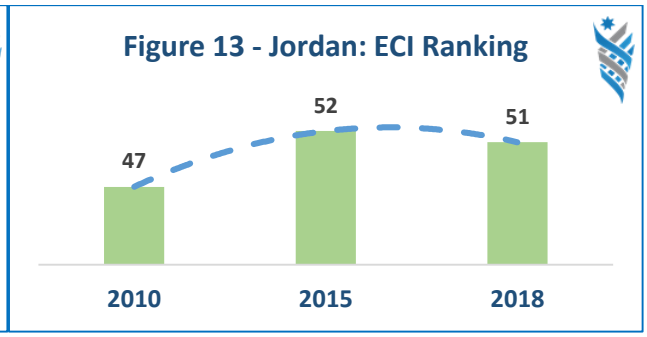
Figure 10 - Arab Economies' ECI Scores (2018)



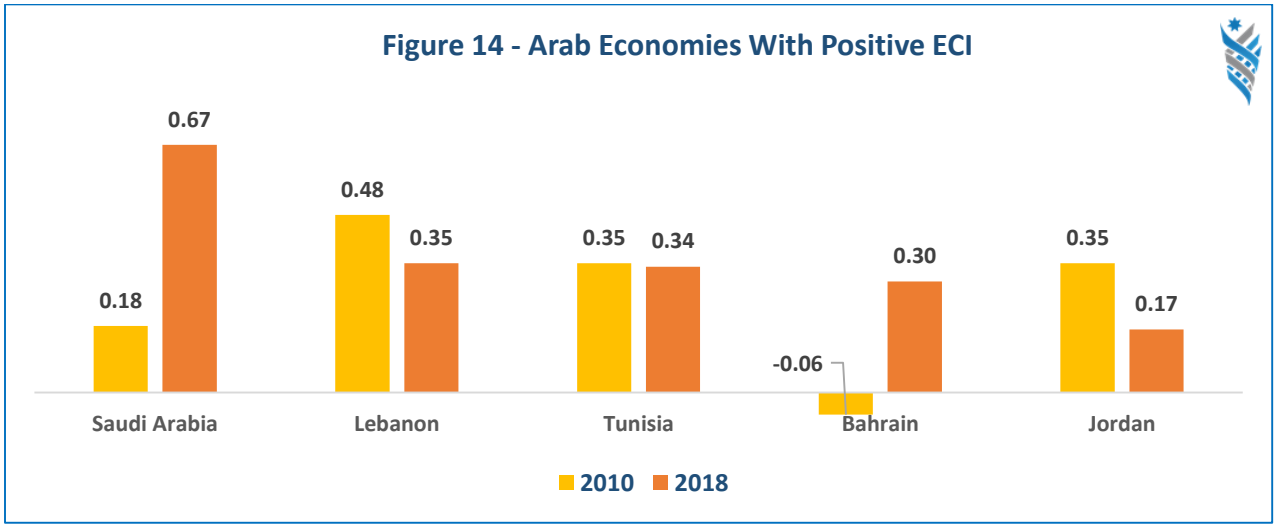


c) It is unfortunate to note that Jordan's ECI has come down from +0.35 in 2010 to +0.17 in 2018. This deterioration is reflected in the ranking of the economy (51st in 2018). The reasons for this decline will be discussed below.



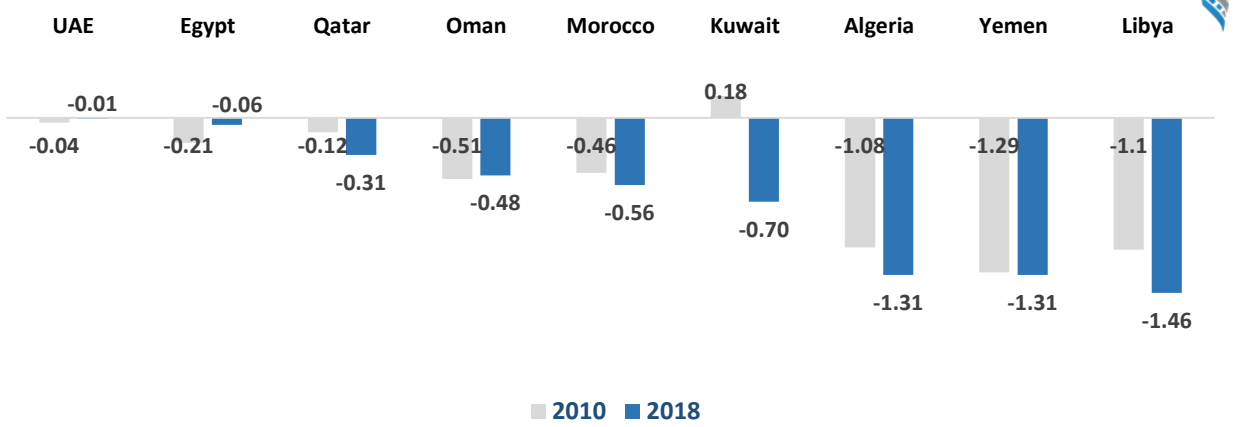


d) The Saudi Arabian and Bahraini economies reflect positive improvements in their ECI scores during the period 2010-2018. The improved ECI of Saudi Arabia is largely due to the reduction in ratio of crude petroleum exports to total exports, and the increase in the ratio of refined petroleum oils to total exports.



e) While the Egyptian economy's ECI improved from -0.21 in 2010 to -0.06 in 2018, it is the Libyan economy, for obvious reasons, that witnessed the largest deterioration.

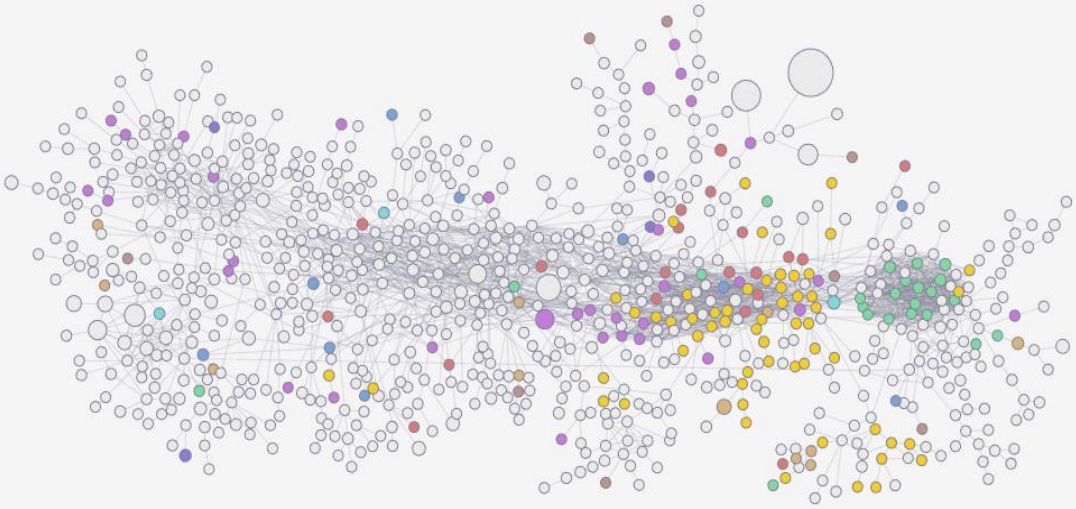
Figure 15 - Arab Economies With Negative ECI



f) The deterioration of Jordan's ECI becomes easy to explain if one looks at the 2010 and 2018 products spaces, and at the HS4[1] (1 digit sector level) and HS4 (4 digit sector level) compositions of exports.

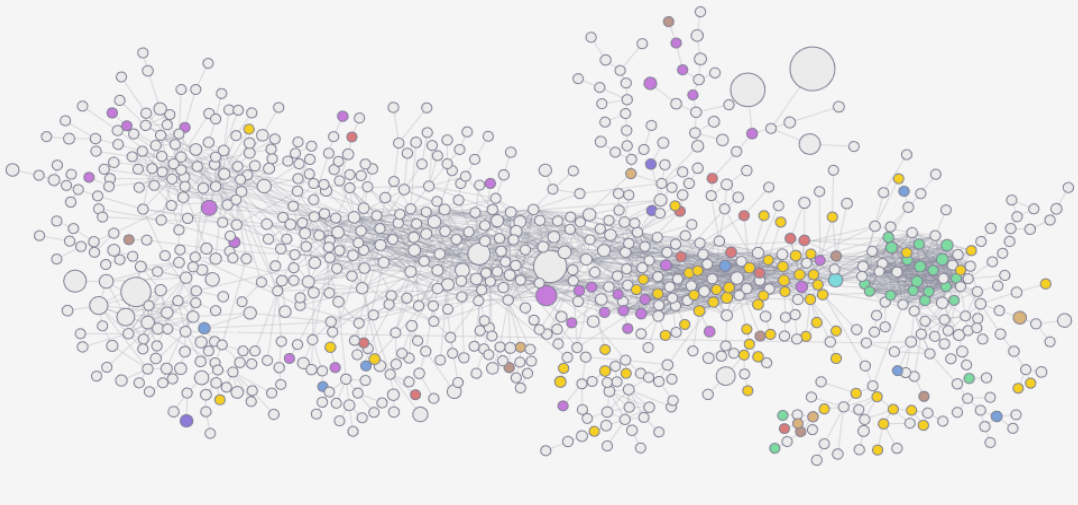
First, on average, the 2010 product space contains more circles than the 2018 space.

Figure 16 - Jordan's Product Space in 2010 (HS4 / 1 Digit Level)



[1] The Harmonized System (HS) of tariff nomenclature is an internationally standardized system of names and numbers to classify traded products.

Figure 17 - Jordan's Product Space in 2018 (HS4 / 1 Digit Level)



Second, based on the product classification HS4 (1 digit sector level), the main change in Jordan's trading performance is the relative increase in the exports of textiles.

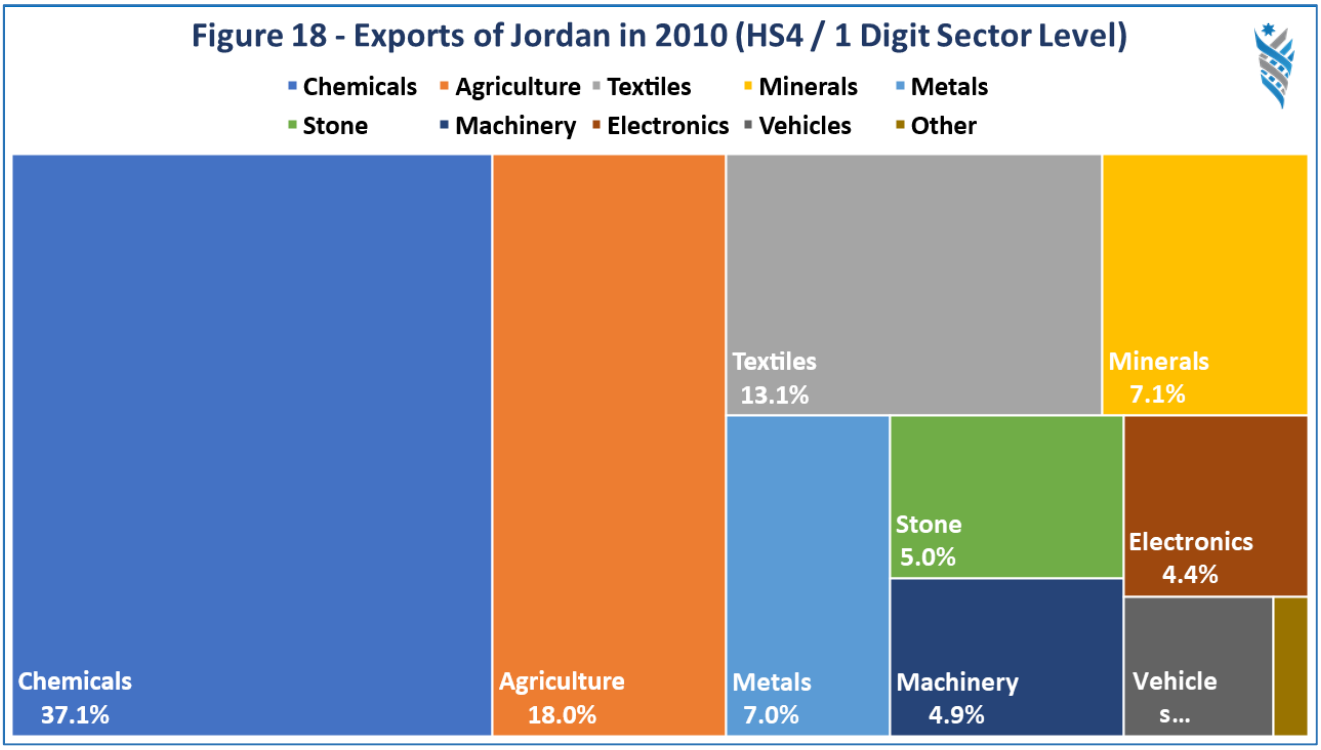


Figure 18 - Exports of Jordan in 2010 (HS4 / 1 Digit Sector Level)
Chemicals
Agriculture
Textiles
Minerals
Metals
Stone
Machinery
Electronics
Vehicles
Other
Chemicals 37.1%
Agriculture 18.0%
Textiles 13.1%
Minerals 7.1%
Metals 7.0%
Stone 5.0%
Machinery 4.9%
Electronics 4.4%
Vehicle s...

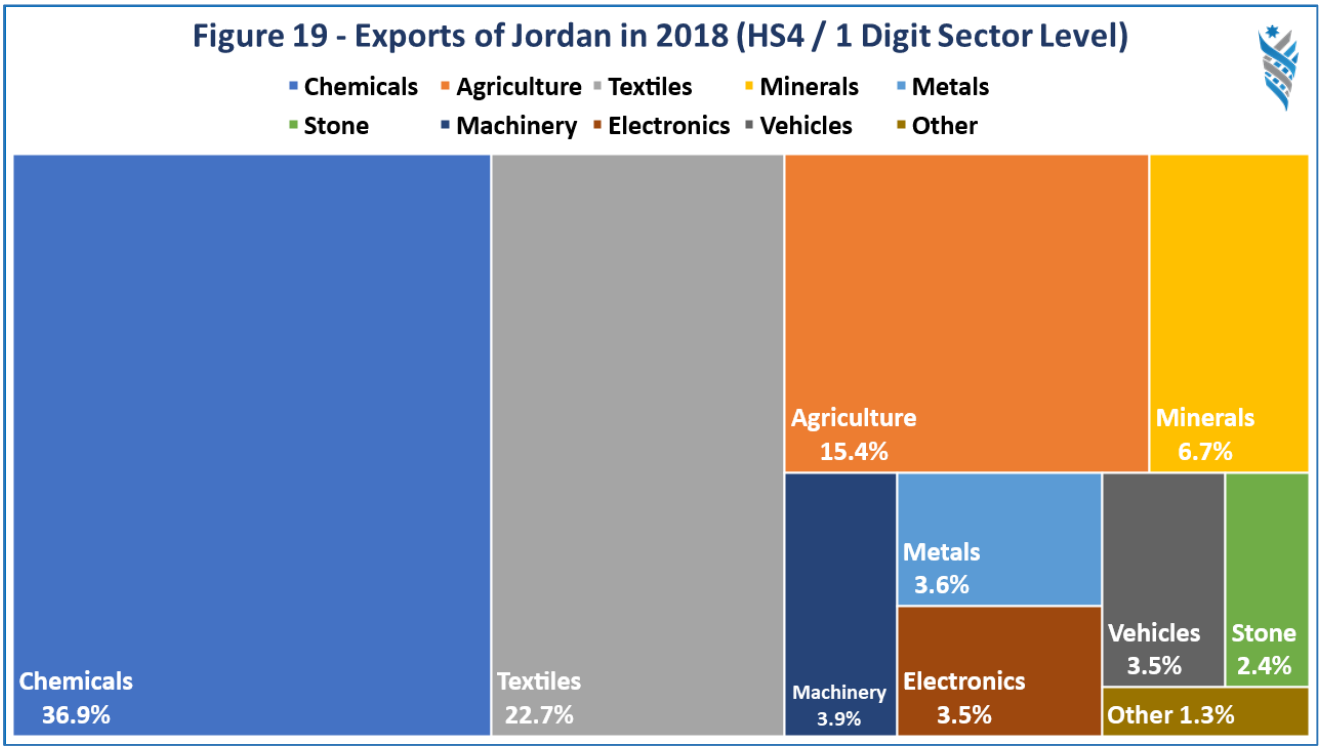


Figure 19 - Exports of Jordan in 2018 (HS4 / 1 Digit Sector Level)
Chemicals
Agriculture
Textiles
Minerals
Metals
Stone
Machinery
Electronics
Vehicles
Other
Chemicals 36.9%
Textiles 22.7%
Agriculture 15.4%
Minerals 6.7%
Machinery 3.9%
Metals 3.6%
Electronics 3.5%
Vehicles 3.5%
Stone 2.4%
Other 1.3%

Third, based on the product classification HS4 (4 digit sector level), Jordan's 2010 and 2018 main chemical exports are potassic fertilizers, medicaments (packaged), phosphoric acid, mixed fertilizers, chlorides, bromides, and Iodides, etc., medicaments (not packaged), and Serums and Vaccines.

On average, the changes in the complexity of these products, and the change in each product's exported ratio to the total, have not been to the advantage of Jordan's ECI.

- The complexity of potassic fertilizers decreased from +0.221 in 2010 to -0.711 in 2018.
- The complexity of medicaments (packaged) decreased from +0.805 in 2010 to +0.783 in 2018.
- The complexity of phosphoric acid decreased from +0.347 in 2010 to -0.517 in 2018.
- The complexity of mixed fertilizers decreased from -0.634 in 2010 to -0.821 in 2018.
- The complexity of chlorides, bromides, iodides, etc. decreased from +0.598 to +0.422.
- The complexity of medicaments (not packaged) decreased from +0.0299 in 2010 to +0.511 in 2017.

Figure 20 - Jordan's 2010 Chemical Exports:

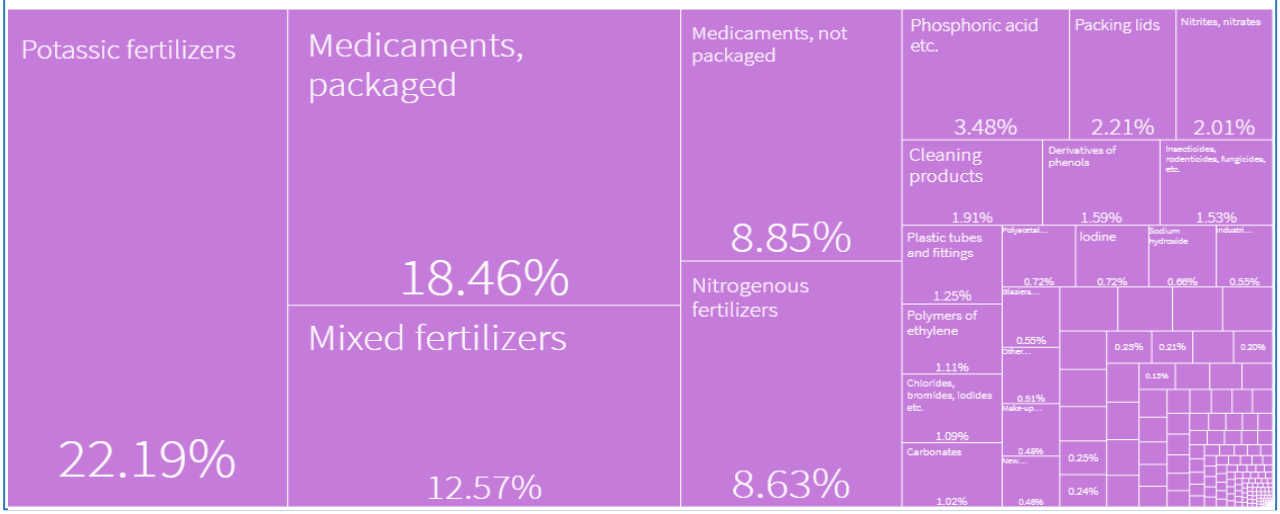
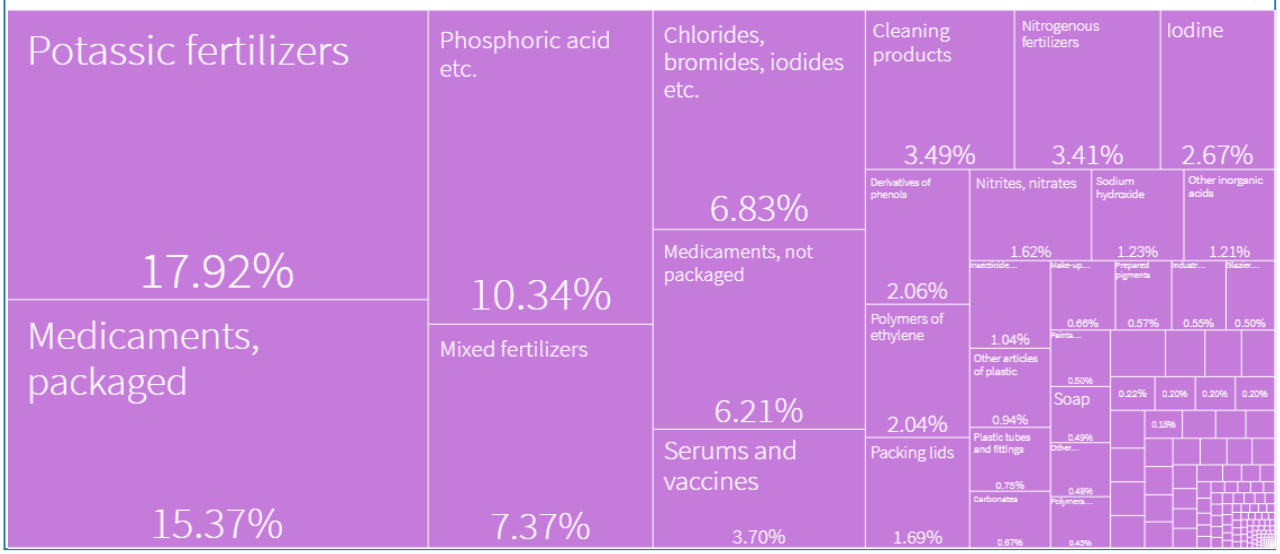


Figure 21 - Jordan's 2018 Chemical Exports:



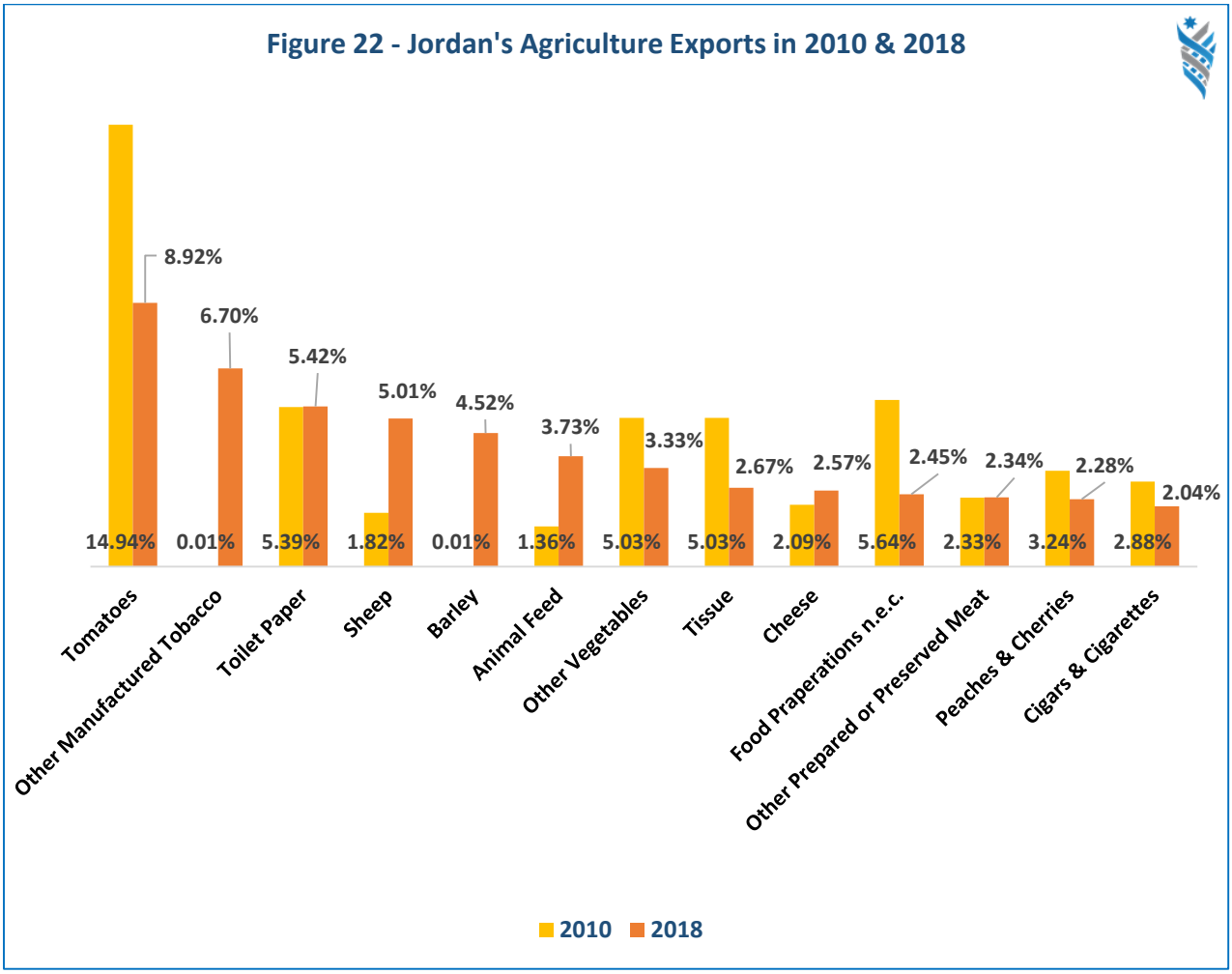
Fourth, based on the product classification HS4 (4 digit sector level), Jordan's 2010 and 2018 main agriculture exports are tomatoes, other manufactured tobacco, toilet paper, sheep, barley, animal feed, other vegetables, tissues, and others.

On average, the changes in the complexity of these products, and the change in each product's exported ratio to the total, have not been to the advantage of Jordan's ECI.

- The complexity of tomatoes decreased from -0.998 in 2010 to -1.53 in 2018.

- The complexity of other manufactured tobacco decreases from -0.339 in 2010 to -0.625 in 2018.
- The complexity of toilet paper increased marginally from -0.0188 in 2010 to +0.115 in 2018.
- The complexity of sheep decreased from -1.50 in 2010 to -1.52 in 2018.
- The complexity of barley decreased from +0.29 in 2010 to -0.228 in 2018.
- The complexity of animal feed decreased from -0.484 in 2010 to -0.576 in 2018.
- The complexity of other vegetables decreased from -1.37 in 2010 to -1.41 in 2018.
- The complexity of tissue increased from -0.414 in 2010 to -0.373 in 2018.

Figure 22 - Jordan's Agriculture Exports in 2010 & 2018



Fifth, based on the product classification HS4 (4 digit sector level), Jordan's 2010 and 2017 main textile exports are other garments knit, sweaters, pullovers, sweatshirts, etc., knit, women's suits and pants, women's suits, knit, men's suits knit t-shirts, knot, men's suits and pants.

On average, the changes in the complexity of these products, and the change in each product's exported ratio to the total, have not been to the advantage of Jordan's ECI.

- The complexity of sweaters, pullovers, sweatshirts etc., knit increased from -1.58 in 2010 to -1.40 in 2018.
- The complexity of women's suits and pants increased from -1.16 in 2010 to -1.14 in 2018.
- The complexity of men's suits, knit decreased from -1.23 in 2010 to -1.45 in 2018.
- The complexity of women's suits, knit increased from -1.16 in 2010 to -1.14 in 2018.
- The complexity of men's suits and pants decreased from -1.23 in 2010 to -1.27 in 2018.
- The complexity of other garments, knit decreased from -1.32 in 2000 to -1.38 in 2017.
- The complexity of men's shirts, knit increased from -1.27 in 2010 to -1.38 in 2018.
- The complexity of other garments increased from -1.29 in 2010 to -1.22 in 2018.
- The complexity of t-shirts, knit decreased from -1.27 in 2010 to -1.38 in 2018.

Figure 23 - Jordan's 2010 Textile Exports:

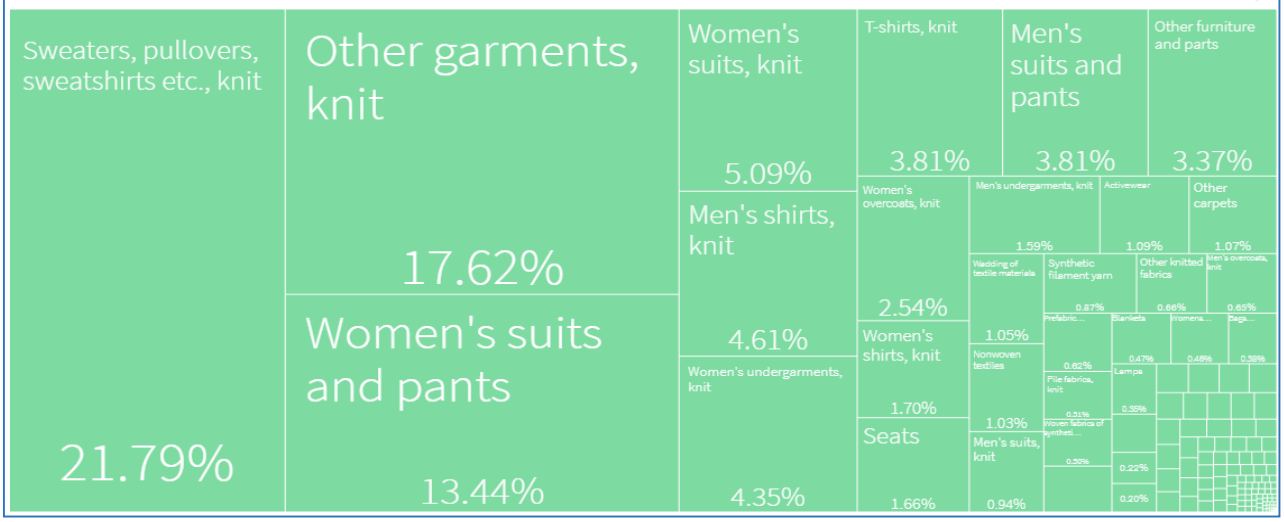
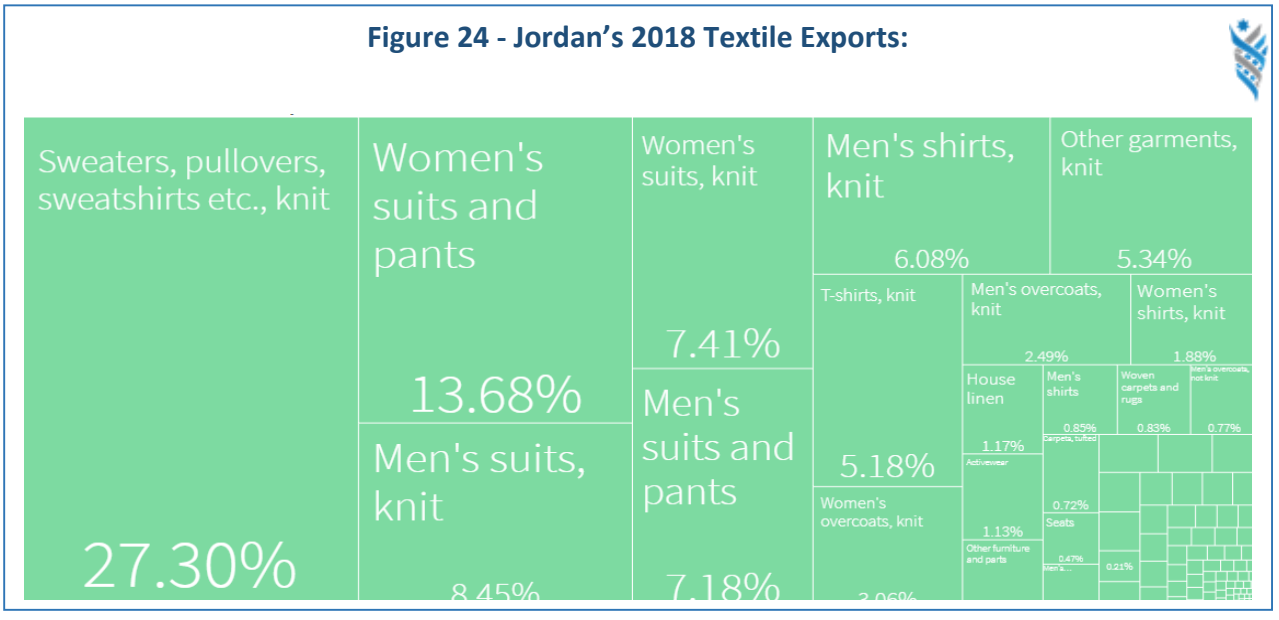


Figure 24 - Jordan's 2018 Textile Exports:



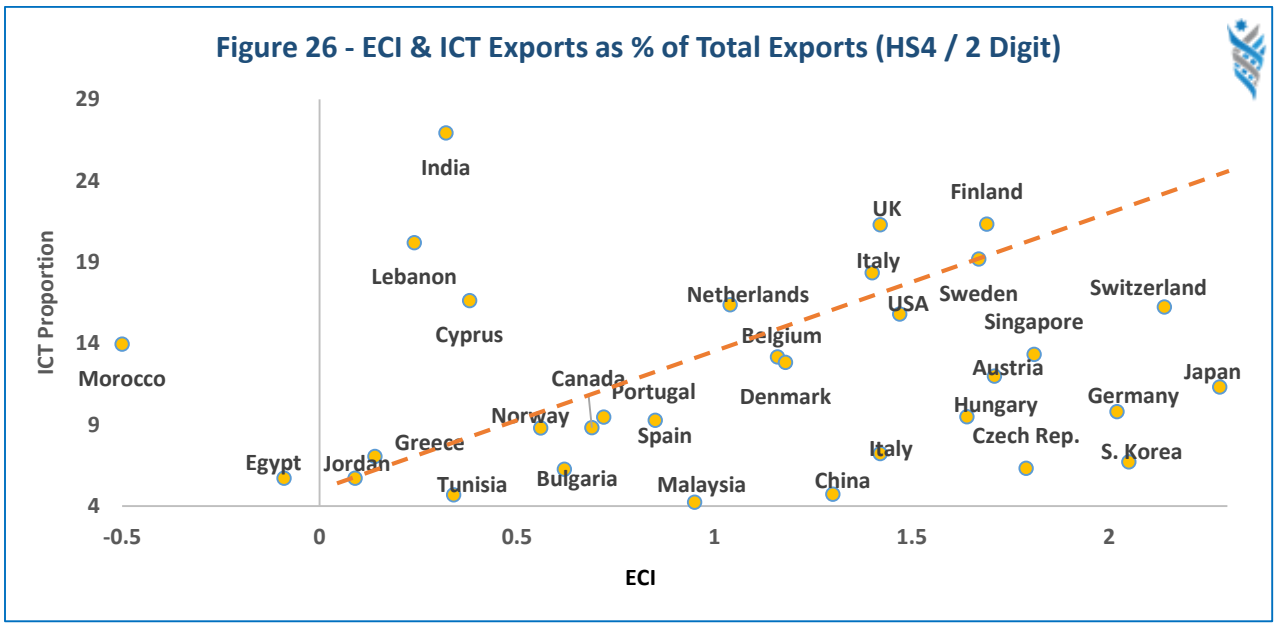
5. The Jordanian Economy & ECI: What Options are Available?

To grow in a sustainable fashion, Jordan cannot go on making more of the same. Compared to 2010, the Jordanian economy has become less complex. In 2010 and 2018, the economy's ECI was equal to +0.35 and +0.17 respectively. This worsening complexity is the result of a lack of diversification of exports, exporting much of the same goods that have, on average, negative complexity scores.

To move forward, Jordan must use its existing know how and take advantage of any available opportunities to diversify its production and exports. Jordan needs to move gradually into "ever-expanding set" of new and more sophisticated products. **WHAT TO DO?**

First, within the context of the ECI, it is useful to note that its calculation does not take into consideration the services sector per se. This is why, on average, it is interesting to observe that:

1. The relationship between ECI scores and Information and Communication Technology (ICT) exports as a proportion of total exports is positive. Countries with high ICT exports tend to score high on the ECI. The product complexity index of ICT is equal to +0.308. Relevant stakeholders should examine this sector, and where possible, promote its growth in Jordan's basket of exports.



2. It does not help the promotion of Jordan's ECI and rank when 27.3% of the economy's national exports emanate from textiles and accessories. Even more unfortunate, is the fact that most of these exported goods go to the USA. After all, the ECI score for the textile goods is equal to -1.42.

Second, Jordan is a small country. To grow by diversifying into new products of increasing complexity, any policy should maintain a balance between, distance and complexity.

On a scale of zero to five, Jordan's ability to enter into a new product, is “very high” if the new product requires related capabilities to existing products. A new product with zero score (five) implies that Jordan is unlikely (likely) to succeed in producing and exporting it.

On a scale of zero to five, Jordan can increase its’ ECI, if and only if, the economy produces products with a score close to or equal to five. Such products require high knowhow diversity to produce them. Complexity promotes sustainable economic growth.

Based on the database of the Harvard Team, we listed those products that have a score 3.0 and above on the distance dimension and a score of 2.5 and above on the complexity dimension.

Based on these guiding principles, the top 50 products relevant Jordanian stakeholders to consider moving into their production fall under 3 groups: **First Shortest Distance Group / 8 commodities. Second Shortest Distance Group / 22 commodities. Third Shortest Distance Group / 20 commodities.**

First Shortest Commodities	Distance	Complexity	Global Size ($ Billion)
1. Structures & their Parts, of Iron or Steel	4.5	3	48.0
2. Plastic Builders' Ware	4.5	2.5	11.7
3. Other Plates of Plastics, Non-Cellular & Not	4.5	3	58.3
4. Other Printed Matter:	4.5	3.5	10.7
5. Other Furniture & Parts:	4.5	3	86.2
6. Other Plastic Plates, Sheets ,etc.:	4.5	3.5	26.8
7. Stoppers, Caps & Lids of Metal:	4.5	3	6.7
8. Polymers of Propylene	4.5	2.5	45.2
Second Shortest Distance Group	**Distance**	**Complexity**	**Global Size ($ Billion)**
9. Articles of Cement, of Concrete or of Artificial Stone	4	3	9.8
10. Aluminum Structures (bridges, towers, etc.)	4	3	13.0
11. Hot Rolled Bars of Iron	4	2.5	12.9
12. Ferro cerium & Other Pyrophoric Alloys	4	3	0.305
13. Baths, Sinks etc.	4	3.5	4.6
14. Other Cast Articles of Iron & Steel	4	3	7.3
15. Parts for Use With Electric Generators	4	3	14.8
16. Other Uncoated Paper & Paperboard	4	3	14.8
17. Flat-Rolled Iron	4	3	52.5
18. Dairy Machinery	4	3.5	2.1
19. Glass Fibers	4	3.5	12.6
20. Machinery for Working Minerals	4	3	16.3
21. Asbestos-Cement or Cellulose-Fiber Cement	4	3	1.3
22. Railway Track Fixtures	4	3.5	1.0
23. Other Articles of Vulcanized Rubber	4	3.5	27.4
24. Cellulose Wadding, Coated	4	3.5	19.4
25. Electric Heaters	4	3.5	47.6
26. Finishing Agents	4	3	4.8
27. Multiple-Wall Insulating Glass	4	4	1.9
28. Newspapers, Journals & Periodicals	4	4	3.5
29. Perfumes	4	3	18.4
30. Copper Bars, Rods & Profiles	4	3.5	6.1
Third Shortest Distance Group	**Distance**	**Complexity**	**Global Size ($ Billion)**
31. Wire etc. Used for Welding	3.5	3.5	3.5
32. Machinery for Soil Preparation or Cultivation	3.5	3.5	8.1
33. Other Parts for Machines & Appliances	3.5	4	2.7
34. Whey	3.5	3.5	4.2
35. Pig & Poultry Fat	3.5	3	0.549
36. Trailers & Semi-Trailers	3.5	3.5	28.9

37. Other Articles of Iron or Steel	3.5	4	50.8
38. Central Heating Boilers	3.5	4.5	7.1
39. Aluminum Plates > 0.2 mm	3.5	3.5	35.0
40. Harvesting or Agricultural Machinery	3.5	4	20.9
41. Industrial Furnaces	3.5	4	4.7
42. Parts for Use with Hoists & Excavation Machinery	3.5	4	56.2
43. Mineral Wools & Insulating Materials	3.5	3.5	4.8
44. Other Articles of Aluminum	3.5	3.5	17.7
45. Cars	3	4.5	751.0
46. Parts of Electrical Apparatus	3	4	34.8
47. Machinery for Making Printing Components	3	4	1.6
48. Centrifuges	3	4.5	66.9
49. Other Lifting Machinery	3	4.5	32.4
50. Nonwoven Textiles	3	4.5	15.8

This list of products constitute a road map that can help in identifying the industrial priorities for Jordan, in order to improve Jordan's score on the economic complexity index.

6. In a Nutshell

To grow in a sustainable fashion, Jordan cannot go on making more of the same. All relevant stakeholders should positively adopt the concept of economic complexity and work on increasing the ranking of the national economy on the ECI. **To do so, the JSF recommends two approaches:**

1. **Short Run Approach:** Focus groups / meetings for the recommended product groups should be formed to explore ways and means to start making some of them.
2. **Long Run Approach:** Understanding what makes some economies more complex than others is critical. Indeed, this is important in the design and implementation of effective policies towards increasing complexity. The available literature reports points out a myriad of factors.

Investment: Investment increases the capital stock of economies. Public and private investments in infrastructural projects (i.e. education, energy, airports, etc.) improves in economic diversity.

Investment in Human Capital: Human capital increases people's knowledge, capacity and productivity.

Foreign Direct Investment (FDI): Multinational enterprises spend more on research and development (R&D) activities. Indeed, they have a greater tendency to develop new products than domestic firms can. By facilitating technology transfer, know how, work practices, and by providing superior machineries, FDI promotes economic complexity.

Institutional Environment: Increasing institutional quality encourages the development of the private sector development. Private sector enterprises flourish when they operate in transparent environments. For example, corruption, political instability, and government ineffectiveness raise the cost of doing business and risk of investment.

Financial Development: More developed financial systems that intermediate a larger amount of resources between savers and investors improve the monitoring and screening of investments, and ultimately improves the efficient allocation of funds among alternative investment projects.

IN SUM, these factors warrant objective evaluation, and remedial measures be implemented to enhance their overall contribution to **"economic complexity".**

7. Appendix A:

First Shortest Commodities
1. Structures & their Parts, of Iron or Steel
HS 6-Digit Products: 730810, 730820, 730830, 730840, 730890.
2. Plastic Builders' Ware
HS 6-Digit Products: 392510,392520, 392530, 392590.
3. Other Plates of Plastics, Non-Cellular & Not Reinforced
HS 6-Digit Products: 392010, 392020, 392030, 392041, 392042, 392051, 392059, 392061, 392062, 392063, 392069, 392071, 392072, 392073, 392079, 392091, 392092, 392093, 392094, 392099.
4. Other Printed Matter
HS 6-Digit Products: 491110, 491191, 491199.
5. Other Furniture & Parts
HS 6-Digit Products: 940310, 940320, 940330, 940340, 940350, 940360, 940370, 940380, 940390.
6. Other Plastic Plates, Sheets ,etc.
HS 6-Digit Products: 392111, 392112, 392113, 392114, 392119, 392190.
7. Stoppers, Caps & Lids of Metal
HS 6-Digit Products: 830910, 830990.
8. Polymers of Propylene
HS 6-Digit Products: 390210, 390220, 390230, 390290.

Second Shortest Distance Group
9. Articles of Cement, of Concrete or of Artificial Stone
HS 6-Digit Products: 681011, 681019, 681020, 681091, 681099.
10. Aluminum Structures (bridges, towers, etc.)
HS 6-Digit Products: 761010, 761090.
11. Hot Rolled Bars of Iron
HS 6-Digit Products: 721310, 721320, 721331, 721339, 721341, 721349, 721350.
12. Ferro cerium & Other Pyrophoric Alloys
HS 6-Digit Products: 360610, 360690.
13. Baths, Sinks etc.
HS 6-Digit Products: 392210, 392290.
14. Other Cast Articles of Iron & Steel
HS 6-Digit Products: 732510, 732591, 732599.
15. Parts for Use With Electric Generators
HS 6-Digit Products: 850300.
16. Other Uncoated Paper & Paperboard
HS 6-Digit Products: 480510, 480521, 480522, 480523, 480529, 480530, 480540, 480550, 480560, 480570, 480580.
17. Flat-Rolled Iron
HS 6-Digit Products: 720811, 720812, 720813, 720814, 720821, 720822, 720823, 720824, 720831, 720833, 720834, 720835, 720841, 720842, 720843,720844, 720745, 720890.
18. Dairy Machinery
HS 6-Digit Products: 843410, 743420, 843490.

19. Glass Fibers
HS 6-Digit Products: 701910, 701920, 701932, 701939, 701990.
20. Machinery for Working Minerals
HS 6-Digit Products: 847410, 847420, 847431, 847432, 847439, 847480, 847490.
21. Asbestos-Cement or Cellulose-Fiber Cement
HS 6-Digit Products: 681110, 681120, 681130, 681190.
22. Railway Track Fixtures
HS 6-Digit Products: 860800.
23. Other Articles of Vulcanized Rubber
HS 6-Digit Products: 401610, 401691, 401692, 401694, 401695, 401699.
24. Cellulose Wadding, Coated
HS 6-Digit Products: 481110, 481121, 481129, 481131, 481139, 481140, 481190.
25. Electric Heaters
HS 6-Digit Products: 851610, 851621, 851629, 851631, 851632, 851633, 851640, 851650,851660, 851671, 851672, 851679, 851680, 851690.
26. Finishing Agents
HS 6-Digit Products: 380910, 380991, 380992, 380993, 380999**.**
27. Multiple-Wall Insulating Glass
HS 6-Digit Products: 700800.
28. Newspapers, Journals & Periodicals
HS 6-Digit Products: 490210, 490290.
29. Perfumes
HS 6-Digit Products: 330300.
30. Copper Bars, Rods & Profiles
HS 6-Digit Products: 740710, 740721, 740722, 740729.

Third Shortest Distance Group
31. Wire etc. Used for Welding
HS 6-Digit Products: 831110, 831120, 831130, 831190.
32. Machinery for Soil Preparation or Cultivation
HS 6-Digit Products: 843210, 843221, 843229, 843230, 843240, 843280, 843290.
33. Other Parts for Machines & Appliances
HS 6-Digit Products: 903300.
34. Whey
HS 6-Digit Products: 040410, 040490.
35. Pig & Poultry Fat
HS 6-Digit Products: 020900.
36. Trailers & Semi-Trailers
HS 6-Digit Products: 871610, 871620, 871631, 871639, 871640, 871680, 871690.
37. Other Articles of Iron or Steel
HS 6-Digit Products: 732611, 732619, 732620, 732690.
38. Central Heating Boilers
HS 6-Digit Products: 840310, 840390.
39. Aluminum Plates > 0.2 mm
HS 6-Digit Products: 760611, 760612, 760691, 760692.

40. Harvesting or Agricultural Machinery
843311, 843319, 843320, 843330, 843340, 843351, 843352, 843353, 843359, 843360, 843390.
41. Industrial Furnaces
HS 6-Digit Products: 841710, 841720, 841780, 841790.
42. Parts for Use with Hoists & Excavation Machinery
HS 6-Digit Products: 843110, 843120, 843131, 843139, 843141, 843142, 843142, 843143, 843149.
43. Mineral Wools & Insulating Materials
HS 6-Digit Products: 680610, 680620, 680690.
44. Other Articles of Aluminum
HS 6-Digit Products: 761610, 761690.
45. Cars
HS 6-Digit Products: 870310, 870321, 870322, 870323, 870324, 870331, 870332, 870333, 870390.
46. Parts of Electrical Apparatus
HS 6-Digit Products: 853810, 853890.
47. Machinery for Making Printing Components
HS 6-Digit Products: 844210, 844220, 844230, 844240, 844250.
48. Centrifuges
HS 6-Digit Products: 842111, 842112, 842119, 842121, 842122, 842123, 842129, 842131, 842139, 842191, 842199.
49. Other Lifting Machinery
HS 6-Digit Products: 842810, 842820, 842831, 842832, 842833, 842839, 842840, 842850, 842860.
50. Nonwoven Textiles
HS 6-Digit Products: 560300.

منتدى الاستراتيجيات الأردني
JORDAN STRATEGY FORUM

Tel: +962 6566 6476 Fax: +962 6566 6376
info@jsf.org www.jsf.org
/JordanStrategyForumJSF @JSFJordan