Center for International Development
at Harvard University

2017

DIVERSIFICATION IN THE INDUSTRIAL SECTOR OF ALBANIA: IDENTIFYING STRATEGIC AREAS

GEORGI KLISSURSKI
BRUNO ZUCCOLO

ACKNOWLEDGEMENTS

We would like to thank Ljubica Nedelkoska for project supervision. Financial support for this research comes from the Open Society Foundations, as a part of the grant "Institutional Strengthening and Economic Diversification in Albania" granted to the Center for International Development at Harvard University.

SUMMARY

In this study, we analyzed Albania's industrial exports using the frameworks of the Product Space and Economic Complexity in order to determine which products Albania could diversify into in the near future. In particular, we identified groups of products that are technologically close to those which Albania already exports and which at the same time are technologically more sophisticated (more complex) than Albania's average exports. This analysis does not suggest that products that do not fulfill the criteria of technological proximity and product complexity should not be invested in. However, it suggests that some products may have higher chances of succeeding in Albania because of its existing technological capabilities, while also bringing about diversification towards more complex, higher value-added production.

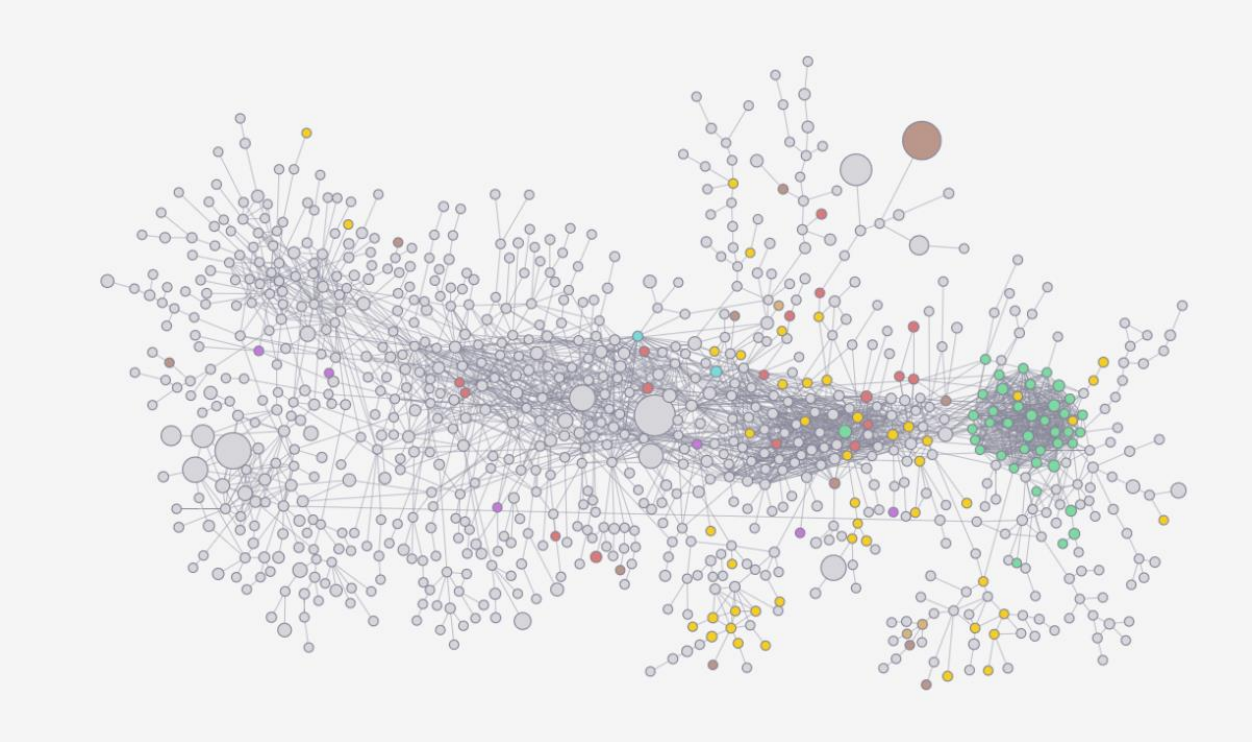
We find that the top two sectors that satisfy the criteria of being in close proximity to the existing technological capabilities in Albania, while also having relatively highly complex products, are *Plastics/Rubbers* and *Agriculture/Foodstuffs*. Within each of these sectors, we list more specific products that make for good candidates for diversification.

CURRENT CONTEXT OF ALBANIAN PRODUCTION

To achieve sustainable economic growth, countries must be able to increase not only the quantity of goods produced, but also the variety of these goods. As countries diversify into new kinds of products, they expand their production capacities and are able to produce increasingly more complex products.

Albania's economy has grown considerably in the past 20 years: the total value of its exports in 1996 was US$260 million, while in 2016 exports brought in US$2.11 billion. But while this expansion is significant, there was little expansion in the variety of goods that Albania exports. Using the Atlas of Economic Complexity, the Product Space[1] of Albania's 2016 exports can be visualized in the following manner:

Figure 1: Product Space map of Albania's exports in 2016



Source: Atlas of Economic Complexity (2016) http://atlas.cid.harvard.edu/

The Products Space shows over 900 products, grouped into 11 sectors, and the relationship between them. Each dot represents a product, and the lines show which products are closely connected. Products are closely connected if they are very often produced and exported together in different countries, suggesting that they share many similar inputs, skills, or production techniques. If two products share a connection, it should be relatively easy for countries that produce one to start producing the other, and vice versa. The farther apart two products are, the harder it is to move from producing one to the other.

[1] Hidalgo, C. A., et al. "The Product Space Conditions the Development of Nations." Science, vol. 317, no. 5837, 27 July 2007, pp. 482–487, doi:10.1126/science.1144581.

Albania significantly exports[2] 162 products out of 1,240 possible products. Most of these (69%) are gathered in three sectors:

- **Textiles, Hides, and Clothing** account for 54 products, represented in green in the Product Space. Most textile products are densely connected within a tight cluster of the Product Space, and Albania already exports most of these products. This leaves few options for continuing to expand within this sector.
- The second largest sector is **Agriculture and Foodstuffs**, with 36 exports. Shown in yellow, these products are mostly in the periphery of the Product Space and offer relatively few connections.
- **Metals** comprise another 21 products. Represented in red, these are more spread out and located in the dense center, offering relatively many options to diversify.

Another indicator of Albania's diversification is the complexity of its exported products. Products vary widely on how easy it is to produce them, but more complex products tend to also be more valuable for the exporting country. One metric of this value is the Product Complexity Index (PCI)[3] of each product. The average PCI of the products in each sector that are exported by Albania are: *Textiles*, -1.289; *Foodstuffs*, -1.047; and *Metals*, 0.635. Albania's current exports are not very complex.

It is also possible to use the Economic Complexity Index (ECI)[4] to measure how complex a country's exports are overall. When ranked by ECI, Albania is 78th in the world, with an index of -0.51. By comparison, it is behind most of its neighbors: Macedonia (51st), Greece (48th), Serbia (35th), Bosnia (38th), and Croatia (27th).

In order for Albania to grow faster and catch up to its European Union and Western Balkans neighbors, it needs to expand into new areas of production and increase the variety of products it is able to export. However, any attempt to simply produce the most complex products is bound to fail, since all the right capacities need to be present in the country before it can successfully make a product. The purpose of this analysis is to identify which sectors make the best candidates for diversification given Albania's current productive capabilities, by identifying products that are relatively complex yet also technologically close to those products Albania already exports.

[2] A country "significantly" exports a product if its share of world exports of that product is at least equal to the country's share in total world exports of all products.

[3] PCI is calculated based on how many other countries can produce the product and how diversified these other countries are. In effect, PCI captures the amount and sophistication of know-how required to produce a product. The concept of economic complexity comes from:
Hidalgo, César A., and Ricardo Hausmann. "The building blocks of economic complexity." Proceedings of the National Academy of Sciences, vol. 106, no. 26, 30 June 2009, pp. 10570–10575, doi: 10.1073/pnas.0900943106.

[4] ECI ranks countries based on how diversified and complex their export basket is. Countries that are home to a great diversity of productive know-how, particularly complex specialized know-how, are able to produce a large diversity of sophisticated products and have high ECI. Countries that produce few products and products that many other countries are able to produce have low ECI.

A PATH TO DIVERSIFICATION

Diversification, by definition, requires a country to learn to produce new things it currently does not know how to produce. This is a risk-laden process. More than a decade of research by CID finds the key element of success to diversification, and therefore sustained economic growth, is know-how. Know-how can be thought of as a tacit set of capabilities held by a team in production. It is a hard-to-acquire type of knowledge that is needed to make use of other knowledge that is embodied in technology and codes. Acquiring new know-how is a slow, high-risk process, in which countries find greatest success by moving incrementally into products of greater complexity, building from their existing base of know-how. Products vary in the amount and type of know-how they require, and local economies vary in the amount and type of knowhow they possess. By understanding what capabilities exist locally, one can analyze what additional products could be manufactured by adding relatively few new capabilities to existing know-how. Products differ in their degree of shared capabilities, which we capture by their proximity to one another in the Product Space. For example, producing a shirt and a suit (products nearby to each other in the Product Space) require similar know-how as compared to producing coffee and TV sets (far apart in the Product Space).

The lessons of the Product Space and a decade of diversification research highlight a distinct set of criteria in selecting strategic products for diversification. Specifically, high potential products for diversification in Albania will balance two characteristics:

- ***Distance to existing capabilities***: Promising products will be "nearby" existing exports in the Product Space in order to leverage existing know-how. Nearby distance is treated as a proxy for lower risk or fewer missing capabilities in moving into a new product.
- ***Complexity***: Promising products will also be more complex than those existing exports, and therefore will tend to be able to support higher productivity and wages.

Distance is considered a crucial determining factor in whether a country can feasibly export a product. Complexity, on the other hand, matters greatly for improving value creation, wages, and productivity – the key factors that lead to a wealthier economy.

Other dimensions that are traditionally contemplated in the economic complexity analysis but are not immediately relevant to Albania are opportunity gain and global market size. Opportunity gain measures how connected to other high-complexity products a given product is, as a proxy for the ease of redeploying the capabilities used in entering that product to enter a series of other strategic products. As products in Albania's product space are mostly situated in the periphery and to the right in the textiles cluster, there is considerable potential to gain opportunity from most industries other than textiles. Given Albania's relatively small population and economy, a minimum global market size for each product does not need to be considered because even small global markets will generate sizeable new demand, growth, and contribution to job creation in Albania. In refining the selection of high-potential products, opportunity gain and market size could later be considered, but the overall drivers of selection remain the two criteria described above.

In this analysis, products are ranked by using a model that puts equal weight (50 percent) on distance and complexity. The two main criteria are combined in a measure we call "strategic value"

to define a target set of strategic bets for Albanian industrial policy. Products are considered high potential if they rank in the top 150 out of the 1,078 possible products that Albania does not currently export significantly.

SECTORS WITH THE MOST POTENTIAL IN ALBANIA

Products can be ranked according to this strategic value to show some of the most promising areas for diversification. It is important to note that this ranking does not conclusively signify that one product is more promising than another. Each sector and product must still be examined individually to check what its prerequisites are and to ensure that current productive capacities are present in Albania. The purpose of the ranking is to show which sectors are the most promising overall based on economic complexity indicators.

From the list of the top 150 products, each sector has the following average rank for its products:

Table 1: Sector ranking based on average rank of individual products

Sector	***Average Rank***	***Number of Products in Top 150***
Plastics/Rubbers	34.1	12
Agriculture/Foodstuffs	67.9	24
Miscellaneous Manufacturing	73.0	6
Stone/Glass	74.0	10
Industrial Manufacturing	78.9	43
Metals	78.9	23
Wood	82.4	10
Chemicals	89.1	9
Textiles, Hides & Clothing	97.3	12
Minerals	107.0	1

Data Source: Atlas for Economic Development (2016)

Using this measure, the top two sectors to focus on are *Plastics/Rubbers* and *Agriculture/Foodstuffs*. They have the highest average ranks, indicating that they contain products that are technologically feasible while having relatively high complexity, making them strategic products for Albania. We also took these averages of rank by sector with differing sizes of lists for the top products, to ensure that these sectors had consistently higher averages regardless of how many products were selected. This methodology is detailed in the Appendix.

Plastics/Rubbers

The *Plastics and Rubbers* sector has 12 products ranked in the top 150, with an average PCI of 1.787 and an average distance of 0.847.

Table 2: Product rankings in the *Plastics/Rubbers* sector

Product	Rank	PCI	Distance
Plastic builders' ware	1	1.863	0.831
Other plastic plates, sheets etc.	6	2.067	0.844
Baths, sinks etc.	12	1.768	0.843
Other articles of vulcanized rubber	15	2.500	0.863
Packing lids	17	0.672	0.818
Plastic tubes and fittings	26	1.115	0.831
Vulcanized rubber tubes	44	2.596	0.871
Other articles of plastic	45	2.287	0.863
Vulcanized rubber plates	46	2.561	0.870
Other plates of plastics, noncellular and not reinforced	51	1.302	0.839
New pneumatic tires of rubber	66	1.229	0.840
Monofilament	80	1.478	0.849

Notes: Only products in Top 150 shown. Strategic value ranking presents the product ranking out of over 900 products, while the shading reflects a combined measure of distance to existing capabilities and complexity.
Data Source: Atlas of Economic Complexity (2016)

As Albania already exports some plastics and rubbers, its current know-how could allow it to transition to producing more complex products, such as vulcanized rubber parts, builders' ware, baths and sinks, lids, tubes, and various plastic plates and sheets, among others.

Agriculture and Foodstuffs

The *Agriculture and Foodstuffs* sector has 23 products that appear in the top 150 products, with an average PCI of 0.328 and an average distance of 0.816.

Table 3: Product rankings in the *Agriculture/Foodstuffs* sector

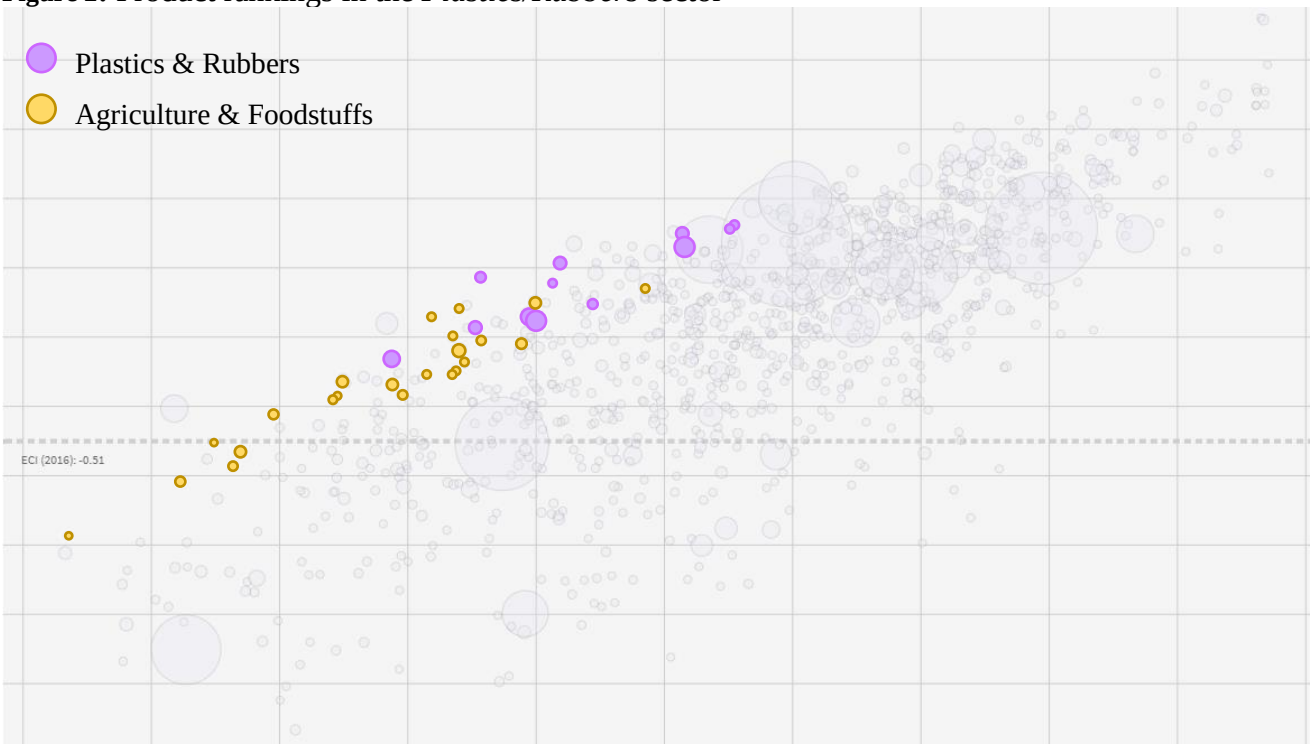
Product	Rank	PCI	Distance
Fermented milk products	5	1.291	0.824
Sausages	8	1.395	0.828
Waters, flavored or sweetened	16	0.375	0.810
Fruits and nuts, frozen	21	-0.124	0.799
Ice cream	23	0.987	0.827
Chocolates	25	1.497	0.840
Pickled fruits and vegetables	29	-0.530	0.790
Jams, jellies and marmalades	41	0.146	0.809
Confectionery sugar	47	0.093	0.808
Milk	57	0.952	0.831
Food preparations not elsewhere specified	60	0.803	0.828
Sauces and seasonings	69	0.326	0.818
Cigars and cigarettes	75	-0.659	0.794
Soups and broths	81	0.450	0.823
Wheat or meslin flour	83	-1.082	0.785
Worked cereal grains	102	0.611	0.829
Molasses	108	-1.873	0.767
Cereal foods	111	0.513	0.828
Honey	112	-0.862	0.793
Other fermented beverages	113	1.685	0.857
Other prepared or preserved meat	115	0.904	0.838
Yeasts	117	0.160	0.819
Bovine	122	0.457	0.827

Notes: Only products in Top 150 shown. Strategic value ranking presents the product ranking out of over 900 products, while the shading reflects a combined measure of distance to existing capabilities and complexity.
Data Source: Atlas of Economic Complexity (2016)

Given Albania's strong presence in this sector already, it could use its know-how to produce higher valued products for export. The most promising types of products include milk, ice cream, chocolates, jams and jellies, frozen nuts, sausages, pickled vegetables and fruits, and others.

The products from the Plastics/Rubbers and Agriculture/Foodstuffs sectors ranked in the top 150 are visualized below, in a feasibility chart, showing distance on the x-axis and product complexity on the y-axis.

Figure 2: Product rankings in the *Plastics/Rubbers* sector



Source: Atlas of Economic Complexity (2016) http://atlas.cid.harvard.edu/

APPENDIX

After ranking the products based on their strategic value, six separate analyses were done for the average rank of sectors. Each looked at the products in increasingly larger samples of the top products, in order to determine whether certain sectors were ranked highly simply due to biases in selecting arbitrary sample sizes or whether their ranking remained consistent independent of what size was selected. The results of these analyses are show in the table below, with the top-ranking sectors colored in gold, silver, and bronze in descending order.

	Sector Rank					
Sector	*Top 50*	*Top 100*	*Top 150*	*Top 200*	*Top 250*	*Top 300*
Plastics/Rubbers	3	1	1	1	1	1
Wood	2	5	7	4	2	2
Stone/Glass	8	7	4	2	4	3
Animals, Vegetables, Foodstuffs	4	4	2	3	3	4
Metals	6	2	6	6	5	5
Industrial Manufacturing	5	6	5	8	6	6
Miscellaneous	1	3	3	7	9	7
Textiles, Hides & Clothing	9	9	9	9	8	8
Minerals			10	10	10	9
Chemicals	7	8	8	5	7	10

*note: the *Miscellaneous* category is disregarded in the color-coded sector rankings, since it is a collection of products with little internal connections between them

The same information is visualized below to show the fluctuations in average ranking depending on the size of the sample used.