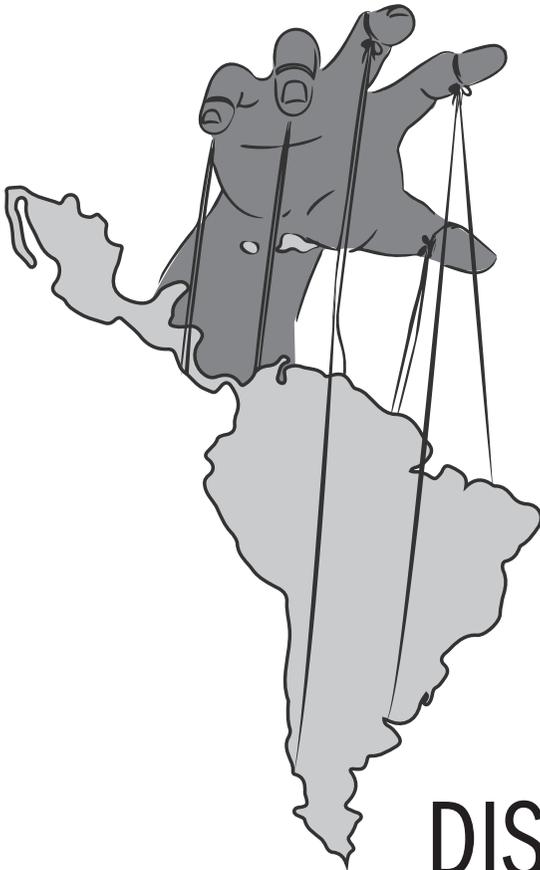


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Regional Opportunities: Identifying Promising Local Industries to Improve Argentina's Economic Complexity

Gonzalo Huertas and Fernando Irarrázaval

Gonzalo Huertas works at the Peterson Institute for International Economics in Washington, DC, where he conducts macroeconomic research with Senior Fellow Olivier Blanchard. He holds a Master's in Public Administration in International Development (MPA-ID) from Harvard Kennedy School, and a Master's in International Economics from the University of Buenos Aires. His recent projects have focused on debt sustainability, exchange rate volatility in Latin America, and fiscal rules in the eurozone.

Fernando Irarrázaval works at the Data Team of Enveritas in NYC. Previously he was a consultant for the World Bank and worked at the MIT Poverty Action engaging with Latin American policymakers to inform social program design with scientific evidence. Fernando holds an MPA/ID from the Harvard Kennedy School of Government and a Bachelor's degree in Industrial Engineering and Software Engineering from the Pontificia Universidad Católica de Chile.

INTRODUCTION: THE POLICY CONTEXT

This research document applies the Economic Complexity framework, developed by Hausmann and Hidalgo,¹ to identify key sectors that would further the economic sophistication of Argentina's geographic regions. In addition, we complement the standard Economic Complexity framework by also considering the likelihood that these activities will develop into competitive industries.

Argentina's competitiveness has traditionally been concentrated within a few primary goods. This primarized export basket, composed mostly of agricultural and mining commodities, lies at the heart of the country's economic volatility and procyclicality.

While there have been attempts to break free of this commodity dependence, none of them have been successful. Traditional industrial policy in Argentina ran into the same import substitution limitations and foreign currency shortages that brought an end to other, similar experiments in the region.

Argentina is currently transitioning away from protectionism and opening up to trade and foreign investment. Since 2015, the government has signaled a political desire to move towards openness, global integration, and fiscal consolidation, with significant advances being made in terms of removing energy price distortions, returning to capital markets, and unifying the exchange rate.

There is a growing need to detect new areas of competitiveness where Argentina can reallocate the many workers who will be displaced by the government's move towards trade liberalization. Indeed, as import restrictions are relaxed, some of the most sizable economic activities in terms of employment—especially textiles and shoemaking—will be unable to compete with imports from countries with a strong comparative advantage in those industries, such as Bangladesh and Vietnam.

Although the competitive agricultural sector is growing quickly thanks to the removal of export duties since 2015, government officials are aware of the potential

danger of an overreliance on agricultural goods, especially in a context of lower commodity prices, decelerating demand in China, and rising interest rates in the United States.

This research document, then, sets out to discover which industries and sectors have the potential to develop competitively and bolster Argentina's economic sophistication. It is structured as follows:

- Section 1 provides a (very) brief explanation of the country's export primarization.
- Section 2 explains why diversifying into more complex activities could become an important contributor to economic growth.
- Section 3 provides a regional snapshot of Argentina's economic complexity, detailing its regional differences and the challenges faced by firms in different geographic locations.
- Section 4 features a short description of our methodology, explaining how each activity's degree of sophistication and potential competitiveness puts it higher or lower on the list of opportunities.
- Section 5 presents our results: we identify several key activities with relatively high economic complexity and diversification potential, for each of Argentina's geographic regions.
- Section 6 concludes and provides some ideas as to how governments should (and should not) foster these economic opportunities.

1. A SNAPSHOT OF ARGENTINA'S PRIMARIZED EXPORT BASKET

Argentine comparative advantage has traditionally been associated with agricultural and mining commodities. In 1990, 52.6 percent of exports were composed of natural resources (excluding energy); in 2000, this share was 40 percent, and by 2007 it was back to 54.5 percent.²

The country's sales to the world have also been historically concentrated on a

handful of goods. Half of exports in 1993 were composed of just 12 products (soya oil cake, wheat, petroleum oil, leather, and others). In 2000, 12 products continued to provide one out of every two dollars of Argentine exports—and most of them were the same goods as in the 1990s, with the exception of the rise of the automotive industry.³

During the 21st century, this trend has become even more pronounced: By 2016, 54.5 percent of Argentine exports originated in the natural resources sector, and the total number of goods composing 50 percent of the export basket had fallen to just 10, with soya oil cake, maize, and soya bean oil topping the list. The Asia-driven commodity boom of the early 2000s, and its associated shifts in terms of trade, was a significant contributor to the intensification of export concentration.⁴

Countries whose production is concentrated in relatively few, unsophisticated goods tend to display lower incomes per capita. The absence of elaborate productive networks, which are essential to know-how diffusion and the exploration of new areas of entrepreneurial activity, weighs down on economic growth.⁵

2. THE BENEFITS OF DIVERSIFYING INTO COMPLEX INDUSTRIES

Developing the capabilities needed for diversification into new industries increases a country's productive potential, paving the way for the development of more complex, unique products. Any given good process requires a certain set of capabilities to be produced. Hausmann and Hidalgo (2010) have shown that the production of most products requires the combination of a large number of different technical capabilities, and, hence, that the returns to the accumulation of new capabilities is exponential.⁶ Furthermore, because only a few countries have the necessary requirements to engage in the most sophisticated industries, complex

goods and services are provided only by relatively few global players. Complexity allows nations to move into less competitive, more profitable markets.

Diversifying into complex goods can boost economic growth. Recent research has shown that what a country chooses to export has an impact on its development in the future: certain goods have higher associated productivity levels than others, which suggests that the choice of a pattern of specialization can be an important determinant of a country's growth path.⁷

In the case of Argentina, diversifying away from agricultural commodities and into more complex industries is a priority. Some of the goods that are most strongly associated with low-income patterns of specialization, such as vegetable products, cloves, and live mules, are worryingly in line with the Argentine export structure.

In addition, export diversification can mitigate output volatility arising from trade openness. The new Argentine government has decided to pursue a much more outward-oriented growth strategy than its predecessor. While global integration carries obvious benefits—such as access to frontier technology and high-quality intermediate inputs—it also may expose the adopting country to exogenous shocks, hence increasing output volatility. Export diversification can act as an alleviating force to reduce this volatility (just as portfolio diversification can lower risk exposure when two assets are imperfectly correlated).⁸

More specifically, diversification can lower the extent to which a country's terms of trade are subjected to upward and downward swings. This is especially important for Argentina, given its agriculturally dependent, primarized export basket.

There exists a significant number of feasible goods into which Argentina could diversify. These are products whose requirements are close to the country's

current productive capabilities, have a significant level of economic complexity, and would open up the potential for the further development of other sophisticated goods.

3. ARGENTINA'S ECONOMIC COMPLEXITY IS LOW AND HETEROGENEOUS

Argentina's economic complexity is low, both by world frontier standards and given what would be expected for its GDP per capita. The country ranks 54th out of 123 countries as measured by the Economic Complexity Index. It stands behind Brazil, Mexico, and Spain—but its productive matrix is still more complex than that of Chile, Bolivia, Paraguay, and Venezuela.

“Economic complexity” refers to an economy's total accumulation of productive knowledge. More complex societies are able to produce more diverse and sophisticated goods. For example, the production of corn is relatively simple, which explains why so many countries can do it. In contrast, the creation of superconductors requires an elaborate network of inputs and know-how, which only a handful of nations have managed to develop.

Low economic complexity can be a drag on economic growth. The reason is that most basic industries are not conducive to the accumulation of know-how, due to their limited interconnectedness with other sectors, which in turn hinders diversification opportunities.

At the local level, Argentina's provinces have very different levels of economic complexity. Buenos Aires and the “Centro” region are relatively more advanced—approximately comparable to New Zealand and Egypt, respectively—while the northern and southern areas of the country lag significantly behind, with complexity levels closer to Bangladesh and Peru (see Figure 1).

A review of each region's most complex exports, from the set of goods that

they sell competitively in world markets, reveals that:

- Buenos Aires (both the province and the city) exports relatively more complex items such as polyamides, inorganic acid esters, photographic plates and film, lubricating preparations, mechanical appliances, and enzymes.
- The Centro (Córdoba, Santa Fe, and Entre Ríos) also displays relatively more sophisticated production, with competitive complex exports including piston engines, rolling machines, prepared cultures, enzymes, vehicle parts, plant and laboratory equipment, and synthetic rubber.
- Nuevo Cuyo (La Rioja, Mendoza, San Juan, and San Luis) is quite heterogeneous, mainly due to the differences between the more sophisticated San Luis and the less developed La Rioja. Some of the region's main complex export goods are compound

stabilizers for rubber and plastics, metal sheeting joints (i.e. gaskets), pumps for liquids, refractory cements, and concretes.

- The NOA (Catamarca, Jujuy, Salta, Santiago del Estero, and Tucumán) displays a somewhat lower level of complexity, with key exports comprised of vehicle parts, chlorides, glycerol and general machinery parts, but also mineral materials, paper, and malt extract.
- Patagonia (Chubut, La Pampa, Neuquén, Río Negro, Tierra del Fuego, and Santa Cruz) lags behind, with key complex exports including bird skins and feathers, aluminum articles, lupulin, fermented beverages, glycerol, meat, organic solvents, and, uniquely, satellites (only in Río Negro).
- The NEA (Chaco, Corrientes, Formosa, and Misiones) also displays a low overall level of economic complexity. Its most sophisticated sales to the world include heterocyclic compounds, gas generators, paper, cellulose fibers, and wood panels.

Figure 1: Economic Complexity Index, by Province



Note: The ECI ranges from -2 (Nigeria) to 2.5 (Japan).

Source: Authors' calculations, based on CID (2018) and Ministry of Production of Argentina (2018).¹⁰

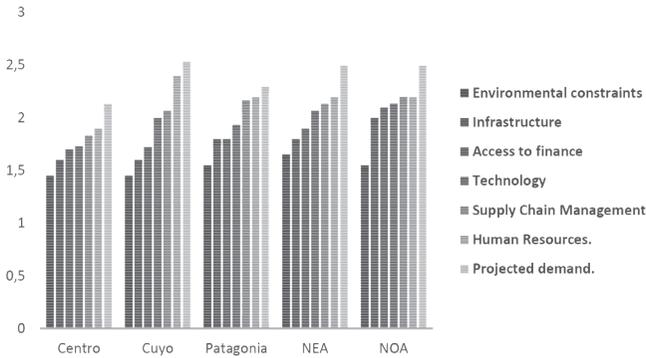
Language is important here: we are listing the most economically complex goods that each region exports competitively. By “competitively” we mean items that a region sells in higher proportion than the rest of the world.

Many of the structural constraints to productive development appear to be similar across geographic regions. Recent research from CEPAL concluded that Argentina's various regions share similar priorities in terms of which constraints need to be overcome to foster private activity (see Figure 2, below).¹¹

In particular, seven categories of constraints to production were evaluated: environmental concerns, infrastructure, access to finance, technology, supply chain management, human resources, and projected demand. These were indexed on a scale from zero (no relevance) to 3 (maximum priority).

The incidence level for constraint categories is similar across regions, which

Figure 2: Constraints to Productive Development, by Region



Note: CEPAL includes La Pampa in the Centro region, rather than Patagonia as we do.

Source: Authors' aggregation based on data and results from CEPAL (2017).¹²

suggests that industry-specific challenges are more important in explaining Argentina's complexity heterogeneity than region-specific limitations. While projected demand (international, regional, and national), the availability of human resources, and supply chain management knowledge are consistently identified as key issues, most regions share similar problems.

4. IDENTIFYING THE MOST PROMISING ACTIVITIES FOR DIVERSIFICATION

Accomplishing the structural transformation needed to diversify Argentine exports into more complex sectors requires active policy decisions on two fronts: first, deciding which activities to foster, and second, establishing policies to facilitate Argentine competitiveness in these priority sectors. This section briefly summarizes the Hausmann-Hidalgo methodology for choosing which activities to diversify into, while Sections 5 and 6 provide results and policy recommendations for the Argentine case.

The choice of which economic activities to promote depends on three key factors:

1. The probability of successfully developing that activity given the country's current

capabilities. This is calculated by observing similar countries' experiences with the good in question, and identifying how many of them managed to become competitive exporters of the good in the past.

2. The estimated nationwide economic complexity gain associated with expanding that specific activity: in a nutshell, determining whether the good in question is economically complex or not, and whether it is associated with the productive capabilities of high-income countries or low-income countries.

3. The number and types of other goods that become easier to produce if the given activity is successfully developed. In other words, how many productive "doors" would be opened by expanding this possible activity.

The cornerstone of this document's research strategy is the Product Space framework, as introduced by Hausmann, Hidalgo et al. (2014).¹³ The Product Space is a tool that quantifies the relationships in production between different goods, providing an assessment of how likely it is that countries with certain industries might successfully expand to similar, neighboring activities. Based on this framework, it is possible to calculate, first, what Argentina's current productive capacity is, and second, the activities that, if developed,

would provide the country with a higher complexity gain. In turn, the desirability of developing these industries should be assessed by considering the probability that the country will be able to develop them successfully.

Figure 3, below, summarizes this methodology. The first criterion is represented by the probability of diversifying into an industry, and the second and third criteria are represented by the box labeled Opportunity Gain.

SECTION 5. REGIONAL ACTIVITIES WITH HIGH DIVERSIFICATION POTENTIAL

This section presents those goods and sectors that hold the highest potential gains for Argentina’s development. Using the Product Space methodology described in the previous section, key activities are prioritized according to which would contribute the most to the national capability set, expanding the potential for diversifying into higher productivity activities, if the country were to turn them into competitive industries.

The top activities with higher diversification potential are mostly bundled within sectors such as chemical products, agricultural machinery, lubricating preparations, medical instruments, mineral wools, and animal farming. This is unsurprising, as successful diversification requires that countries move from one established

competitive activity to another that uses similar factor inputs.

Goods and sectors with high potential are identified at the regional level: that is, promising industries are defined depending on whether they would enhance their own regions’ economic complexity—for example, agricultural machinery in the NOA (North East of Argentina) region. The way to select these activities depends on the current productive capacities of these province groups, which, as has been stated, is significantly heterogeneous.

Ten promising activities are identified for each region. In total, they comprise 29 different sectors. An important caveat is that these results should not be interpreted to mean that Argentina’s development efforts should be focused narrowly on these specific goods alone—rather, these findings highlight entire subsectors that may be of strategic importance. For example, forklift trucks are identified as a sizable opportunity for complexity gains, but similar equipment-handling machinery may also be viable and should not be brushed aside as irrelevant.

6. CONCLUDING REMARKS

The presented results suggest that diversifying into selected regional industries may boost Argentina’s economic complexity.

Figure 3: Production Selection Methodology

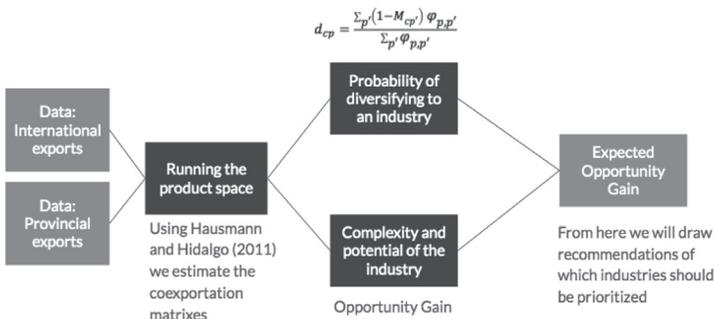


Table 1: Top three activities by region

Activity	Sector
NEA (Chaco, Corrientes, Formosa, and Misiones)	
Chocolate and cocoa foods.	Cocoa.
Aluminum structures and parts of structures (i.e. bridge-sections, roofs, roofing frameworks, doors and windows and their frames).	Aluminium.
Parts for trailers and semi-trailers (not mechanically propelled).	Vehicle parts.
NOA (Catamarca, Jujuy, Salta, Santiago del Estero, and Tucumán)	
Harvesting/threshing machinery, and machines for handling agricultural produce.	Agricultural machinery.
Medicaments for therapeutic or prophylactic uses (i.e.. antibiotics, penicillin, hormones, alkaloids).	Pharmaceutical products.
Paints and varnishes.	Tanning extracts, dyes, paints, putty, and other coloring mastics.
Nuevo Cuyo (La Rioja, Mendoza, San Juan, and San Luis)	
Piston engines.	Piston engines.
Lubricating preparations (i.e. cutting-oil, anti-rust, anti-corrosion, mould release preparations).	Lubricating, polishing, or scouring preparations.
Air pumps, vacuum pumps, and air/gas compressors.	Air pumps and air compressors.
Patagonia (Chubut, La Pampa, Neuquén, Rio Negro, Santa Cruz, Tierra del Fuego)	
Chocolate and cocoa foods.	Cocoa.
Vulcanized rubber conveyor and transmission belts.	Rubber.
Plastic plates, sheets, film, foil, and strip.	Plastics.
Centro (Córdoba, Entre Ríos, and Santa Fe)	
Laboratory reagents.	Chemical products.
Chemical products related to binders for foundry moulds or cores.	Chemical products.
Gaskets and similar joints of metal sheeting and mechanical seals.	Parts for industrial machinery and equipment.

Source: Own calculations, based on data from Center for International Development (2018) and the Ministry of Production of Argentina (2018).

This does not mean that the government should engage in traditional industrial policy by granting fiscal privileges to these strategic activities, as has been done in the past. Traditional forms of export-promotion industrial policy consisted of “picking winners”—usually in the manufacturing industries—which were granted financial incentives and competition protection in order to help them expand.

The right policies to promote complex diversification are those that identify and solve the domestic constraints that are holding back the development of local activities. A helpful starting point for policymakers may be to ask: “Why hasn’t the private sector expanded to these industries already?” The government would then provide assistance by jointly identifying missing inputs that the private sector may not be able to efficiently provide,

in a context of, for example, coordination failures.

To identify and overcome the domestic constraints to these activities, the government needs to engage in a discovery exercise with representatives from these activities’ producers. Whether the problem is inadequate access to finance, excessive regulation, or the absence of necessary human capital, governments should establish forms of communication with producers from these key economic activities, in order to pinpoint the most immediate areas for reform.

NOTES

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³Center for International Development at Harvard University, "Atlas of Economic Complexity."

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⁵Ricardo Hausmann et al., *The Atlas of Economic Complexity: Mapping Paths to Prosperity* (Cambridge, Massachusetts: MIT Press, 2014).

⁶Ricardo Hausmann and César Hidalgo, "Country Diversification, Product Ubiquity, and Economic Divergence," Center for International Development at Harvard University Working Paper no. 201 (October 2010), <https://growthlab.cid.harvard.edu/files/growthlab/files/201.pdf>.

⁷Ricardo Hausmann et al., "What You Export Matters," Kennedy School of Government Working Paper no. RWP05-063, October 2006.

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¹¹Comisión Económica para América Latina y el Caribe (CEPAL), *Territorio, infraestructura y economía en la Argentina: Restricciones al crecimiento de distintos complejos productivos* (Santiago, Chile: United Nations, 2017).

¹²CEPAL, *Territorio, infraestructura y economía en la Argentina*.

¹³Hausmann et al., *The Atlas of Economic Complexity*.