



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

**The industrialization challenges of the LAC region in
achieving the Sustainable Development Goal 9 and an
Inclusive and Sustainable Industrial Development (ISID)**

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Janeiro, 2016

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Introduction

Prior to the dawn of the Industrial Revolution, the world was a very different place to live. The scientific method was still not consolidated and the pace of innovation was slow. Knowledge was barely shared among nations, food and clothing were mainly produced locally and international trade was practically inexistent. During the last two centuries this scenario changed, and now we face a completely new society.

As a result of the Industrial Revolution, the World got in an era of unparalleled economic growth that is in process until today. The structural transformation brought by Industrial Revolution has strong impacts on development, creating jobs, stimulating competition, facilitating international trade and encouraging different uses of natural resources.

The United Nations recognizes the essentiality of the manufacture sector to reduce poverty and included it in the Global Goals for 2030, the goal number 9, that is, “Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation”. History also confirms that the countries that found a solid way out poverty did it through strong economic growth drove by industry. The latest cases were in East Asia, where countries, like Korea and China, managed to create vigorous industrial parks that not only boomed their economies, but also improved the lives of their citizens, with the establishment of decent employment.

Meanwhile, Latin America and Caribbean countries, that in the 70s had their industries as good or even better than those of Asia, were left behind, and keep on being, mainly, agriculture exporter countries. Brazil, for example, in the 70s had a bigger industrial park than South Korea, Malaysia and Thailand together, in 2012 was representing just 15% when compared to them¹.

But what might be the political economic facts that conduced these two regions into opposed paths? This essay will defend the substantial importance of the industry in promoting development, discussing the challenges of LAC region in achieving a sustainable and resilient infrastructure to support economic growth and social development, by making a comparative analysis with cases of success from East Asia.

¹Pierro Salama, “Globalización Comercial: deseindustrialización prematura em América Latina e industrialización en Asia”, Comércio Exterior, Vol. 62.(2012): 35.

Reduce poverty through productive activities

In September 2000 leaders from all over the world gathered in New York at the headquarters of the United Nations to discuss the problems of the humanity and to set the Millennium Goals. The goal number 1 was to eradicate poverty and hunger. Exactly 15 years later, leaders gathered in New York again to deliberate once more about the problems of the world, that are not so different after all. The new Global Goals for 2030 has a lot of similarities with the previous one, the goal number one, for example, is one more time to fight poverty.

However, differently from the former MDG, the new agenda not only proposes to fight against poverty, it also proposes a solid way to get out of it, and that is through the goal number 9. If in the 90s, there was an underestimate about the importance of the industry, today it seems like people are convinced of the relevance of industrialization. The call of the European Commission “For a European Industrial Renaissance” in January 2014, confirms the awareness that Europe’s economy cannot prosper anymore without a robust industrial base².

The same is valid for other regions of the world and, by placing the construction of infrastructure to promote industrialization and innovation as a Global Goal, the United Nations not only recognizes the priority of industry, but also observes that it cannot “magically appear”, rather, it lays on strategic policies.

Studies of the United Nations Industrial Development Institute (UNIDO) indicates that countries with developed industrial parks have better income distribution, education opportunities, gender equality, health and even nutrition.³ UNIDO is the institution that claims for the “reduction of poverty through productive activities”, pointing out that industry gives the bases for entrepreneurship, business investments and stimulates technological advances, improving human skills and creating skilled jobs. Quoting Li Yong (UNIDO’s Director General), “In fact, there is not a single country in the World that has reached a high stage of economic and social development without having developed an advanced industrial sector”⁴.

² Li Yong, “Inclusive and sustainable industrial development: creating shared prosperity , safeguarding the environment”, UNIDO(2014):8.

³ Li Yong and A.L. Abdul Azeez Reprint, “OPINION: Towards an Inclusive and Sustainable Future for Industrial Development”, Inter Press Service News Agency (2014), <<http://www.ipsnews.net/2014/10/opinion-towards-an-inclusive-and-sustainable-future-for-industrial-development/>>.

⁴ Li Yong, “Inclusive and sustainable industrial development: creating shared prosperity, safeguarding the environment”, UNIDO (2014):2.

Historical evidence shows that political institutions play a decisive role in constructing the bases to support resilient economic development. Fukuyama points property rights, rule of law, and basic political order as the seedbeds to progress, and these seedbeds don't just show up, they are established through institutions: "There has been a broad recognition among economists in recent years that institutions matter: poor countries are poor not because they lack resources, but because they lack effective political institutions". (2011:14)

The State plays a key role in regulating and facilitating the maturation of the private sector, and more than that, it's the State, not the market, that has the duty of ensuring that economic growth provides opportunities for poor people to be employed in the productive activities. In other words, the public sector should promote the environment for the private sector to prosper in an inclusive and sustainable way.

The strategic effort of the government to encourage the growth of the manufacturing sector, the so called, Industrial Policy, was strongly implemented in the East Asian countries that managed to construct powerful industry. In the LAC region, on the other hand, industrial policy went out of fashion in the 1980s, when the countries of the region decided to adopt excessively neo-liberal policies, that proved not to be so efficient, after all.

What the Asians have to teach us

Back in the 70s, the industrial park of most of the East Asian countries didn't have a lot of advantages when compared with the LAC region. Today, four decades later, we've seen the Korean industry becoming one of the most sophisticated and competitive centers of the world. Taiwan also managed to develop into a high tech industrial park, while the label "Made in China" became a notable presence in our purchases, and if a couple of years ago this label was just on cheap products, now is also noted in cars, computers and cellphones.

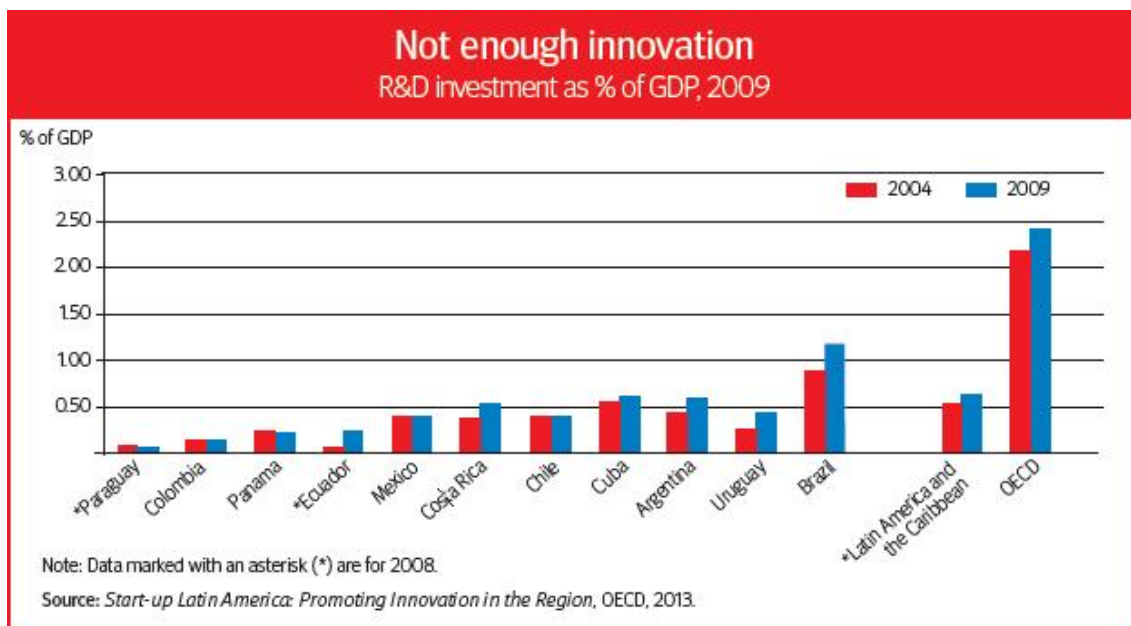
But what have the Asians done? What can they teach us? Why did Korea production evolved from iron to steel and subsequently to cars and micro technology and Malaysia managed to turn its woods into furniture, while LAC countries continued to produce and export much more iron ore, wood pulp and other commodities? Well, there are a lot of political and economic factors that, if not truly explain, at least give us an idea of how those two regions ended up reaching opposite paths. Let's start our analysis of those factors with this table extracted (with few adjustments) from the work of Cimoli, Dosi and Stiglitz (2008: 6):

East Asia	Latin America
Expansion of the educational system, with high proportion of engineering studies	Deterioration of the educational system, with proportionally less engineering studies
Rapid growth of scientific and technical activities within enterprises, in particular R & D	Slow growth, stagnation or decline in R & D and learning activities within enterprises
Gradual integration of design production, marketing and research activities within companies	The R & D weakness and lack of business marketing, especially in foreign markets
Development of strong infrastructure of science and technology	Weak infrastructure for science and technology
Strong influence of Japanese management model and network organization	Persistent influence of outdated management models
High levels of investment	Lower levels of investment, in general
Heavy investment in advanced telecommunications	Slow development of modern telecommunication
Strong electronics industry and rapid growth and high exports	Weak electronics industry and low exports
Specialization patterns favoring in general goods with high income elasticity	Specialization in low-elasticity goods
Increasing participation in international networks and technology agreements	Low participation in international technology networks
Sophisticated political efforts aiming the promotion of technological learning under schemes of protection to domestic markets	Migration from strictly protected regime to a "wild market system" with little incentive to learning
Relatively egalitarian income distribution	Increasingly uneven income distribution

This table exposes a lot of the key elements for the triumph of the industrial policy in East Asia: education, R& D, strong endeavors to develop 'high tech' products, vigorous investment in infrastructure, sophisticated management models, all led by serious political efforts with tactics of protection to the national products.

Specific skills, engineering and complex technologies are pre requirements to advance into higher stages of production, and those pre requirements can only be reached with a lot of investment in education and R&D. And, as we can see in the graphic bellow, the LAC region is quite poor with regard to financing R&D, while countries like Korea and Japan expends around 4% and 3% of their GDPs, respectively, in R & D⁵, LAC countries hardly ever reach the 1%.

⁵OECD," Main Science and Technology Indicators Database",2014/1.



1 Extracted from: "Innovation in Latin America", OECD Observer, No 296 Q3 (2013), <http://www.oecdobserver.org/news/fullstory.php/aid/4231/Innovation_in_Latin_America.html>

In order to develop strong and innovative industry, LAC region must make a lot of effort to improve its investments in R&D. This kind of investment is generally led by the public sector in partnership with the universities and they must come with productive goals to be reached. More productive universities should receive more incentives, this system would set a meritocratic environment, with less space for waste of public money.

The richest Brazilian entrepreneur, Jorge Paulo Lemann, is well aware of the effectiveness of meritocracy in improving production: the regular wages of the employees of his companies are relatively low, nevertheless, it will grow according to their efficiency in achieving their appointed goals. Another insight of this entrepreneur is about learning with who already know it. Why should one waste a lot of time trying to develop processes, if it was already developed by others? Innovation is great and important, but to learn the techniques that have already proved to be efficient is simpler.⁶

China, noticeably, shares with Lemann's view about learning with who knows it better. China's catching up plan combined absorption of foreign knowledge, through reverse engineering technology with selective foreign investment, importation of complete factories from Russia and western countries and vigorous state investment in

⁶Cristiane Correa, "Sonho Grande: Como Jorge Paulo Lemann, Marcel Telles e Beto Sicupira revolucionaram o capitalismo brasileiro e conquistaram o mundo", *Sextante* (2013):61, 62.

infrastructure and R&D. Less than three decades later, the country managed to evolve from imitation to innovation⁷.

China also had its strategy oriented by Catalogs with strict directions for the foreign investments, that were categorized as priority, restricted and prohibited. Besides, the government also demanded counterparts of the investor countries, with exchange of technologies.⁸ These counterparts demands that were used by China coincide with the Global Goal number 17, that is, “The partnerships for the goals”, among the targets of this goal is to “Enhance North-South, South-South and triangular regional and international cooperation on the access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms [...]”. UNIDO also strongly recommends knowledge exchange and technology transfer to implement ISID.⁹

LAC countries, on the other hand, when incorporated the multinational enterprises in its market, did it with no restrictions and no requirements of technological transfers, leaving the local enterprises at the mercy of the “invisible hands” of the market¹⁰. As both China’s history and the United Nations recommendations indicates, the learning of technologies through international cooperation is an efficient process, so it is highly recommendable for the LAC region to make use of this strategy.

Another tool of Industrial Policy that was heavily implemented in East Asia were the polemic tariffs. Ha-Joo Chang (2006: 69,70,74) is a staunch defender of its usage in nascent industries, the author makes a historical analysis, mentioning a lot of cases, like Taiwan that discouraged the importation of goods that would compete with the national products and the Korean’s car brand, Hyundai, that today is worldwide known for its high quality products, but in its infancy was a laughingstock. And it was through active governmental interventions, like tariffs and subsidies, that Hyundai managed to develop to a worldly respected brand.

Chang is not the only one who, emphatically, claims for the public polices, M. Cimoli, G. Dosi and J. E. Stiglitz (2008:11), also defend it combined with the formulation of proper political economic environment for the process of knowledge accumulation: “The idea that a Toyota, a Samsung, a Tata, an Embraer can just

⁷ IEDI-Instituto de Estudos para o desenvolvimento industrial, “Indústria e Política Industrial no Brasil e em outros países”(2011):58.

⁸Ignacio Godinho Delgado, “Política Industrial na China, na Índia e no Brasil: legados, dilemas de coordenação e perspectivas”, IPEA,(2015):11,12.

⁹ Li Yong, “Inclusive and sustainable industrial development: creating shared prosperity, safeguarding the environment”, UNIDO, (2014):12.

¹⁰Ignacio Godinho Delgado, “Política Industrial na China, na Índia e no Brasil: legados, dilemas de coordenação e perspectivas”, IPEA(2015):13.

naturally spring up out of a multitude of peasants, just due, again, to the ‘magic of the market’, is a fairy tale that few ought to be ready to believe”. (M. Cimoli, G. Dosi and J. E. Stiglitz, 2008:3).

All of these enterprises quoted by the authors were vigorously helped by the government of their respective countries during their infancy periods. Embraer, for example, the only high-value-added industry that compete internationally from Latin America, was established in 1969 (prior to the neoliberal wave in the region), with heavy State influence, through the Brazilian Ministry of Aeronautics. The authorities didn’t spare efforts to build such a high-tech industry, in a country with such a poor infrastructure, and their first step was the construction of an aeronautical engineering school and research center, that was going to become the Brazilian Technological Institute of Aeronautic. Subsidies, purchases from the government, taxes incentive and financing were substantial for the establishment of this enterprise, that in its beginning was a partially State-owned company.¹¹

Thus, in sum, Industrial Policy intent to promote the structures necessary for industrial evolution, and to achieve it, there are some major ways for the State to act: as a regulator, imposing tariffs, taxes incentives and subsidies; as a financier, assigning public and private resources to industrial projects; as a producer, through the State-owned companies and as a consumer, assuring a market for strategic industries.¹²

And each of those ways of Industrial policies were present, more or less intensely, in all historically examined cases of Industrial success. Therefore LAC region should make use of it to ensure the development of its manufactures. But it is necessary to point out that, as M. Cimoli, G. Dosi and J. E. Stiglitz (2008:10) remembers, “they require compatible macro policies, regarding exchange rates, taxation, fiscal policies, public investment, governance of the labor market, income distribution”.

Consistent macroeconomic policies aiming the development of the manufacturing sector must be implemented in the region, combined with a lot of investment in tangible infrastructure, that is still very poor in LAC countries. The transportation, for example- a key factor to gain competitiveness, due to its influence in the costs of productions- is feeble in the subcontinent, with very poor integration among the countries and a lot of waste of money because of the poor roads. Waterways and railways, more efficient ways of transportation, are underused in the region.

¹¹ Maria Cecília Spina, “As origens da Embraer”, *Tempo Social* (2005):287,288.

¹² UNIDO, “Informe sobre el Desarrollo Industrial 2013 -La creación sostenida de empleo: el rol de la industria manufacturera y el cambio estructural” (2013, p.26 apud Syrquin 2007, p. 49).

The authorities of the LAC region have a lot of work to be done to achieve ISID and their Industrial Strategies must take into account not just the reality of the current international context, but also the reality of our region. And more than that, the implementation of the Industrial Policies, must use a meritocratic system: the State cannot just support the national industries without the imposition of conditions related to performance. There must be goals to be reached related to productivity.

And lastly, but not less important: the government must know when to stop! Industrial policies, with rare exceptions, are simply not meant to last forever. At some point the industries will have to face the challenges of the market by their own and it is very important to have a good timing for that: not to stop too soon, when the company is still not ready to work by themselves, but also not too late so that the companies don't end up excessively dependent on the State's help.

The environment challenge

In June 1972 Stockholm hosted the first International Conference to discuss the impacts of the human beings in the environment. During the event, delegations from Brazil, China and India accused the developed countries of using the environment as a mere excuse to try to keep them as subordinates. The environment issue was seen as an impediment for improving their standards of living: their real pollution was not the oceans or the air, but rather their starving population.¹³

Using this logic, China, chose to advance its industry, with little concern about the nature. Without disregarding the economic benefits it brought to the country, that choice came with a huge price. The air pollution, to name just one example, is a serious problem in the country and it's related to the ominous rising of cases of lung cancer and cardiovascular illnesses.¹⁴

But this is not just a Chinese problem, the truth is that no country in the world has already managed to fully handle the environmental issue. Another truth is that we don't get to choose between industrialization or sustainability anymore, it is vital to find original ways to make them work together, and this is the greatest challenge of our time: to reach economic development, safe guarding the environment.

¹³ Margaret Keck and Kathryn Sikkink, "Activists beyond borders: advocacy networks in international politics", Cornell University Press (1998):124.

¹⁴ Jonathan Watts, "Air pollution could become China's biggest health threat, expert warns", The Guardian,(2012),<<http://www.theguardian.com/environment/2012/mar/16/air-pollution-biggestthreat-china>>

The LAC region should make efforts to turn this challenge into an opportunity to become a world reference in green technology. The region that is home to the world's richest forest, the Amazon, could use its natural resources to find innovative ways to develop sustainable industries, through heavy investments in R&D. Brazil's largest manufacturer of cosmetics, Natura, is already a pioneer in using this concept of Sustainable Industry. This enterprise not only represents Brazilian's biodiversity through its products, but also does it with strong commitment to the environment and, as a recognition of Natura's serious work, the company just got the United Nations Top Environment Award: Champion of the Earth.¹⁵

As a region with strong solar incidence, LAC countries could also try to discover cheaper ways to develop Solar Energy, and become a world leader in the use of this clean and renewable energy, along with hydropower, that is already widely used in the region.

It is important to note that, nowadays, it is not just the development of 'high tech' products that matter, the way you are producing it also matters a lot, the countries that manage to create green technology, will make a great leap forward, and LAC region should make efforts to excel in this matter, to become a reference in Green Industry.

Conclusion

By the facts here exposed, it is concluded that Industrial Development is a key factor when it comes to social and economic progress, so it is worth it for the LAC region to concentrate efforts to achieve that. And, as the analysis of the countries that managed to accomplish the foundation of strong industries suggests, Industrial Policy is an indispensable element for this achievement.

The State has a fundamental role as regulator, financier, and even consumer for the industries that are in their initial periods. International Cooperation, through knowledge exchange and technology transfer is another crucial component for industrial development. And all those incentives must be accompanied with compatible macroeconomic policies, a lot of investment in infrastructure and, specially, R&D.

It is also important to point out that all of those strategies must be applied within a meritocratic system, including conditions related to performance. And finally, LAC countries should endeavor to accomplish the development of strong industries through

¹⁵ "Largest Brazilian Cosmetics Manufacturer Recognized with United Nations Top Environmental Award", UNEP NEWSCENTRE, (2015)
<<http://www.unep.org/newscentre/Default.aspx?DocumentID=26844&ArticleID=35424>>

the boost of green technology, since no progress will be real, if it doesn't take into account the high-priority of the environment.

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