Tecnológico de Monterrey

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

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Executive Summary

How can Latin American and the Caribbean states reach such ambitious goals as those set in the post-2015 development agenda in 15 years?

This is the main question in this essay, specially talking about the Ninth Sustainable Development Goal and Inclusive and Sustainable Industrial Development.

Industry and Manufacturing have accounted for a great number of employment creation in LAC countries for the last decades and it can still do more under international new goals and expectatives.

In Latin America and the Caribbean, economic differences make their chances of achieving this initiatives to greater or lower. For low-income nations, like those in the Caribbean and Central America (except for Costa Rica), there is a special opportunity to develop, while for South America and Mexico, the challenge is different.
How to achieve ISID-SDG9 for the LAC region is discussed in the next pages, following an introduction.

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Introduction

2015 was called by the United Nations the "Year of Action", and it has proved to be worthy of that nomination for during this year there were many events shifting the international path of development. Adopted by 195 United Nations member parties in September 2015, the 17 Sustainable Development Goals (SDG's) focus on a global effort for a more sustainable future. Among these goals are included: creating access to free high-quality education, to good and accessible water and energy services, to a better sanitation, to alimentary security and to an overall more sustainable ways of economic growth.

This last one is exemplified in the Ninth SDG: "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation"[1] The Inclusive Sustainable Industrial Development (ISID) initiative was adopted by the United Nations Industrial Development Organization (UNIDO) and reinforced in the Lima Declaration[2]. ISID points out that in order to diminish poverty, a strong employment-creating industrial development is needed. It also includes aspects as emissions/GDP and Manufacturing Value Added (MVA)-see Annex 1.

UNIDO works on creating shared prosperity, advancing economic competitiveness and safeguarding the environment. UNIDO's involvement in the SDG realization must be acknowledged. Specially, its support for sustainability and environmental protection is to be worth of mentioning in such special dates following the adoption of a global climate change agreement in Paris.

All the signing Parties of the SDG's and specially those UNIDO members who adopted the Lima Declaration, are committing to huge, yet not impossible, goals. The industrialized world will go under a process of de-carbonization during the following years, while developing countries will start adopting their industries to sustainability demands. Specially, countries on Latin America have submitted competitive and compromising agendas for sustainable development.

The Caribbean for its part, has had an increasing economic integration these last years and its nations are considering sustainable development policies as the first impacts of climate change are seen in this vulnerable region.

Because of these and much more, talking about Latin America and the Caribbean region, under a sustainability and inclusiveness line, has never been so necessary. Moreover the role played by industry in these two ambits is dominant and taking in count

[1] UN

[2] Lima Declaration: Towards inclusive and sustainable industrial development, 2013

that the LAC region is some of the most dynamic economic zones, a further exciting discussion is worthwhile.

In order to make a sound proposal of action toward SDG9 and ISID achievement we need to understand the dynamics of LAC region as well as its challenges, under the sustainability and inclusiveness scope.

Understanding LAC dynamics

Latin America and the Caribbean region is composed by seven Central, 12 South American and 14 Caribbean states, and Mexico. Furthermore, there are other dependent states: Puerto Rico and the Virgin Islands (US), Guadalupe y Martinica, French Guiana (France), the Dutch Antilles, Aruba (Nethterlands), and Anguila, Caiman Islands, British Virgin Islands, Montserrat, Turcas, Caicos, Southern Georgian Islands and the Falkland Islands (UK).

The most practiced industries in LAC region are tourism and services, textile and wearing accessories production, mining and petroleum and natural gas extraction. These diverse set of economic activities are the pillars of the region's development. Some are more important than others depending on the country.

LAC's average *percapita* GDP is $11, 846 USD[3]. LAC's average Human Development Index (HDI)[4] is 0.7205 which, measured from 0 to 1, refers to "the mean of human development dimensions such as: a healthy life, being knowledgeable and having a decent standard living conditions".[5] This data shows us that the predominant socioeconomic environment in the LAC region is a developing country one, with slow growth and a tendency to fall or stagnate.[6] It is important to note that HDI has the highest growing rate for the LAC region worldwide-see Annex 2.

Further discussion include the sub-regional highest and lowest values as well as a brief description of those countries' economic life.

The lowest LAC region *percapita* GDP value accounts for Central America, with $6 846 USD. This is due to the population concentrated within the seven nations and the decent GDP values of such nations. Costa Rica is the country with the highest value: $12 600 USD; it is the most important Central American commercializing nation for the United

[3] According to 2012 data compiled in the World Almanque 2014 (all GDP values in this essay are given in 2012 USD)

[4] World Almanaque 2014

[5] United Nations: http://hdr.undp.org/en/content/human-development-index-hdi

[6] UNIDO (2015) *Industrial Development Report 2016*

States. By contrast, Nicaragua has the least share of US commercializing CA nations as well as the sub-region's lowest *percapita* GDP with $1 730 USD.

For HDI values the maximums and minimums are those of Panama (0.78) and Guatemala (0.581), respectively. For Panama it is important to note its recent achievements on the social sector: it has the lowest unemployment rates in this sub-region, poverty diminished from 34% in 2008 to 27% in 2012. Investments in national industry have been effective in this country as it has experienced an inclusive growth. In the other hand, despite being the second more commercializing nation with the US, the growing trend for Guatemala has been not as socially inclusive as in Costa Rica for example. In Guatemala, poverty and malnutrition are suffered by near 6700 children under 18 years old.[7]

For the Caribbean region, *percapita* GDP is $14 4765 USD. It relies on tourism as its main economic activity. Some island states also benefit from agriculture and enforce cooperation within the region with trade facilities (the Caricom Single Market Economy will be discussed later); while others, highly indebted, are among the poorest nations of the continent. We have to remember that among Caribbean nations are some of the youngest independent nations in the world, representing both, a reason for a slow development, and an opportunity of adopting inclusive and sustainable practices in their slow-growing economies.

The Bahamas reaches the region's maximum with $31 300, while Haiti reaches its minimum with a $1 300 value; the poorest nation in the continent, Haiti, has a great disparity; focusing on industry, labor laws are a major concern as many informal activities exists, there is no regulation in time of work nor of an standard minimum wage[8]. Haiti also accounts for the Caribbean lowest HDI (0.456). Barbados's situation though apparently good (highest HDI: 0.825), started to worsen as unemployment grew from 7.4% in 2007 to 12% in 2013.

The Cuban case requires a lot more discussion as it has just overcame its greatest impediment for development a year ago by formalizing its international relationships. Its economy relies on tourism; it will take no further discussion in this essay.

[7] World Almanaque 2014

[8] US Trade Representative Tenth Report to Congress on the Operation of the Caribbean Basin Economic Recovery Act

For South American[9] nations we can deepen the analysis. South America's *percapita* GDP is $11 700 USD, the middle value of the three set sub-regions; yet it is a more complex and economically dynamic sub-region than the other two and due to its extension it needs a more sophisticated trading system. Chile accounts for a remarkable $18 400 USD *percapita* GDP, while Paraguay for a low value of $3 757 USD.

HDI values are overall higher for South America. Not surprisingly, Chile strikes again with 0.819 and Guyana, in the counterpart, accounts for 0.636, South America's lowest HDI. The reasons for this low value in Guyana is the strong total external debt of $1.4 billion USD which is half of its GDP; economic activities' gain are oriented to debt payment, some of which is to be payed to Venezuela's funding initiative *Petrocaribe*, which is mentioned later.

Inclusive and Sustainable Industries

Central America's case is especially important, as it is composed by Developing and emerging industrial economies (DEIE's). Its main industrial activity is textile manufacturing. With a low-tech, high-labor activity like this one, CA can put as its biggest goal the entrance to Global Value Chains. What this means, is that there is a unique opportunity for Central American nations to orient its economy towards economic growth under ISID.

Inclusiveness and industry are correlated as explained by UNIDO-see Annex 3. An intensive-labor industry such as textile is the ideal star point fur an inclusive and sustainable industrial development; CA industry should try not to overspecialize its workers to do not break the employment scheme.

Furthermore, this region presents one of the most rapid increase in Manufacturing Value Added. The Caribbean Basin Economy Recovery Act (CBERA) was born with the Central American aim to reach international markets with their products.

Travel and Tourism are the Caribbean economic pillars. It may not seem an industrial activity, but in reality it is. Due to its nature, tourism is a varied stakeholder sector; directly or indirectly, many sectors are involved in this activity: travel, food, shopping, accommodation and events sectors; in other words, from cuisines and fashion brands to retailing and car manufacturing groups, many industries take part in a country's plan of tourism development and therefore can be regulated by the government under a

[9] Though geographically mistaken, Mexico is included in this category due to its fair resemblance with most South American socioeconomic environments.

sustainable and inclusive vision.

Thus, tourism is an employment generation activity that could help reduce poverty in the region due to the low requirements of employment. Yet, an efficient policy system on tourism makes foreign investment attractive, for clients and for hotel chains. Paradise-like scenarios make of the Caribbean one of the most tourist-attractive destines. Plus, tourism is well recognized as an economy empowerment activity, contributing for a nation's overall economic growth.

A complex economic activity such as tourism, involves public-private investment and conjoint action between governments and investors. In this regard, the more communication exists between these sectors and governments, the more productive this activity will be. The World Travel and Tourism Council (WTTC)[10] recommends the creation of a public-private sector consultative body on tourism in order to obtain the best economic gains without compromising the touristic environment. A new task has been set up for Caribbean states: sustainable tourism, which will be discussed later.

More developed nations have recognized the importance of Travel and Tourism industry and have changed their policies on this sector. As a case, Chile created a National Tourism Organisation, which includes industry associations and government organisations; the immediate result was the creation of VisitChile. Mexico Tourism Cabinet for example, set six action lines for tourism, innovation and sustainability are two of them. Plus, it divides the sector in categories: ecotourism, adventure, cultural, beach, luxury, sport and health tourism; as a result there is a client-centered investment.

For economically stronger nations the story is different: major concerns are environmental impact, an obsolete juridical and political regulation for 21st century technology issues (digital rights), and a stagnated innovation system. Some outstanding industrial activities are the extraction of minerals, oil and natural gas extraction, textile and food production. South America's great industrial capacity comes from its numerous water, agricultural and fossil fuel resources. Home of the world's leading car-manufacturing and mining industries, its share in international markets is enormous.

Brazil is the most important car-manufacturer while Chile is mining leader. The roles of Peru and Mexico in the energy sector are leading the region; for example, Mexico's energetic reform allows private sector to exploit its oil resources, injecting a great amount of foreign investment in the country; its recent success on the third round of *licitaciones* of

[10] In its 2015 report "Governing National Tourism Policy"

oil-exploitation areas to private enterprises, is to be recognized, which sold all areas and some buyers were Mexican corporations. Peru's actions for the environment are discussed later.

As a region prepared and responsible for LAC region's most advanced technological systems, "innovation should be the engine for development", words of Alicia Bárcena, director of the Economic Commission for Latin America and the Caribbean. One great innovation in industry is ICT (information and communication technologies) as it makes possible a cleaner, more productive and faster manufacturing; i.e. it is a tool to achieve SDG9. Bárcena pointed out "we must overcome the internet of consumption with the internet of production".[11] Applied to the textile manufacturing industry, ITC could boost production in a sustainable manner. This subject is explained later.

ICT could include make new technologies possible for industrial processes, as some of its tools are: Cyber-Physical Systems, Industrial Internet of Things, system of production technology, data analysis and cloud computing, 3-D printing, robotics and augmented reality devices. Its impact could be in areas such as: remote monitoring of physical processes, real-time communication, process improvement, customer-centered production, distributed manufacturing, and circular packaging where components are returned to the production line instead of wasted[12].

As SDG9 includes "…to foster innovation", the efforts in investment for Research and Development (R&D) is crucial for this zone. There is an overall low percentage of GDP invested in R&D, with some exceptions like Brazil (+1.5%)-see Annex 4. The task for South American states is to collaborate with the academic sector and invest in project-funding focused on innovation. Finally, in order to avoid jobs' lost, South American innovations should focus on products, rather than in process-innovation.

Adopting regional cohesion

Another aspect that is necessary for LAC's achievement of SDG9 and ISID is that of multilateralism. There are many partnerships in the region, such as: *Alianza del Pacífico*[13],

[11] CEPAL news article available at: http://www.cepal.org/es/comunicados/alicia-barcena-la-innovacion-debe-ser-motor-desarrollo-economico-social

[12] GeSI: *#SMARTer2030: ICT Solutions for 21st Century Challenges* (2015)

[13] *Alianza del Pacífico* member states are: Chile, Colombia, México and Perú, Costa Rica and Panama are possible members

Caribbean Community[14], Economic Commission for Latin America and the Caribbean[15], Caribbean and Latin-American States Community[16], Central America and the Dominican Republic Free Trade Agreement (DR-CAFTA)[17], MERCOSUR[18] and the Organization of Eastern Caribbean States[19]. MERCOSUR and the *Alianza del Pacífico* pretend to work conjointly as claimed by MERCOSUR.[20] As can be seen, Cuba is not part of any of this economic entities; as has been mentioned earlier, it is a special case.

This is a relevant aspect for South-South and Triangular cooperation, as it is included in the Lima Declaration[21] as part of UNIDO intentions of regional integration. Furthermore, this type of cooperation is a better-oriented one, as donors and beneficiaries are all within the same region; Brazil understands the developmental challenges of Bolivia better than the United States (or another North donator) does.

In fact, Brazil as well as Argentina, Chile and Venezuela are the most recognized Southern contributors in the LAC region, providing technical assistance to other developing countries in areas such as: agriculture, agro-processing, ICT, biofuel production, health and human rights, natural resources and the environment, energy, modernisation of state and decentralization, public policy and social development, international relations and regional integration, and stimulating productive capacity.[22]

Project finance is led by organizations such as the Bank of the South, Caribbean Development Bank (CDB or Caribank) and Venezuela's *Petrocaribe*. Other international organizations also provide aid, such as the International Monetary Fund (IMF) and the World Bank. These organizations aim to achieve regional integration, reducing nations' asymmetries in the region and providing financing for development. Bolivia's pipelines are being financed since 2007 by the Bank of the South as the country wanted to double its hydrocarbon production capacity at the time.

Social action is also part of the beneficial share by these organizations, for example, Caribank set the Basic Needs Trust Fund in 1979 which until now has reached two million

[14] CARICOM members are all Caribbean states except for Cuba
[15] CEPAL member states are 44, all 33 from the LAC region
[16] CELAC member states are all 33 from the LAC region
[17] DR-CAFTA member states are Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, the Dominican Republic and the United States.
[18] MERCOSUR member states are: Argentina, Bolivia, Brasil, Paraguay, Uruguay and Venezuela.
[19] OECS member states are: Anguilla, Antigua & Barbuda, British Virgin Islands, Commonwealth of Dominica, St. Kitts and Nevis, Grenada, Montserrat, Saint Lucia and St. Vincent & the Grenadines.
[20] 38th achieved goal of MERCOSUR in 2015: *Comunicado conjunto de las Presidentas y los Presidentes de los Estados Partes del MERCOSUR y Estados Asociados*
[21] 15th numeral
[22] *Trends in South-South and triangular development cooperation*. ECOSOC 2008

people with its poverty reduction program. *Petrocaribe* helped finance Haiti's reconstruction after the 2010 earthquake; today, the country still owes this organization and is far from payment as its fragile economy is sustained by international aid.

According to the Lima Declaration by UNIDO, Least Developed Countries (LDC) are a priority[23]. In this regard, financing for development should focus on infrastructure projects for LDC within the region (Haiti, Guatemala, and Nicaragua). In order to improve their people living conditions, such projects are more productive than social aid funding. A strong business environment must prevail so that infrastructure project funding become sound for investors.

I would like to acknowledge Caricom's actions, as they really seem to improve under a sustainability scope: its Single Market Economy (CSME) aims to transform its members' agricultural sector through trade integration; its Private Sector Development Programme (PSDP) focuses on industrial competitiveness; and, strong collaboration with OECS for the benefit of LDC's.

Finally, the issue of access to statistics and information about economic growth must be addressed. As the OECD and ECOSOC[24] point out, there is an important role for governments to share data that could allow this institutions' specialists to foresee new clusters in the region and to collaborate for its nations' sustainable development and economic growth.

Safeguarding the environment

Environmental issues for the LAC region mainly rely on CO_2 emissions and resources availability. LAC's average CO_2 emissions (in millions of tons) is 69.5368mt[25], leading the way Mexico and Brazil, with 416.91mt 387.66mt, respectively. Naturally, mid-technology activities like mining and oil extraction are the most pollutant. This can be seen in the ecological footprint, which measures environmental impact (in global hectare), being the highest LAC values those of Uruguay (5.08gha), Mexico (3.3gha) and Chile (3.24gha); while bio-capacity (also measured in gha) and refers to biologically productive land areas,

[23] 22nd numeral
[24] ECOSOC (2008) *Trends in South-South and triangular development cooperation* / OECD (2011) *Perspectivas Económicas de América Latina 2012: Transformación del Estado para el Desarrollo*

[25] Information about most Caribbean nations is not included due to lack of information

being the highest that one of Bolivia (18.38gha) followed by Paraguay (10.92gha) and Uruguay (10.03gha).[26] Resilient is a key term for ISID and for all SDGs (not only the ninth).

For Central America, a lot can be said about the agricultural sector and environment. Specially, looking for the implementation of ISID, there are some areas of study that could innovate the sector, such as: biotechnology and biofuel production. Nevertheless, for each of them, there are some disadvantages that need to be included in further scientific research before using this technologies in a national development plan.

For CA's textile sector, ISID should focus on waste policies and in less amount, in efficiency of processes; this type of industries are among the most pollutants as it inputs huge amounts of energy and water, and outputs hazardous chemicals. Thus, textile industry is responsible for a great amount of greenhouse gases emission.

The most important international trade agreement in the region, DR-CAFTA, includes environmental protection in its 17th Chapter and it set the Environmental Protection Agreement (ACA). Nevertheless it relies on "voluntary mechanisms" for protection of the environment and do not oblige its members to adopt measures on this subject.

Caribbean commitment should be made especially to the protection of the environment in order to maintain its tourist-attractive beauty. The previously talked Chilean and Mexican tourism advances include an environmental category in their development plans; plus, ministries of environment are included in their tourism councils. This is a signal that governments are conscious of environmental impacts of tourism. A lesson to be learned by Caribbean states: inclusive and sustainable industrial development focused on tourism can be a successful initiative in their states.

In the multilateral ambit for the Caribbean, OECS, through its Environment and Sustainable Development branch, works on actions such as the endorsement of the Eastern Caribbean Regional Ocean Policy and the establishment of an Energy Sector Regional Framework.[27]

Disaster action plans are also needed in the region as constant hurricanes harm Central American and the Caribbean fragile economies; for example, 2010 Hurricane Tomas affected Barbados, Saint Lucia and St. Vincet & the Grenadines with no more than a USD $500 million damage. Meteorological phenomena like this one, may augment in variability and intensity with time in the region, due increasing global temperatures. Thus,

[26] World Almanaque 2014
[27] OECSSEC Annual Progress Report 2012-2013

creating the necessity of Central America and the Caribbean recognition as vulnerable zones to climate change and acting on low-carbon economic development beyond COP21 negotiations.

For South America, Peru's huge commitments on clean-energy investment and its designation of the world's biggest protected area (Sierra del Divisor), shows the country's great commitments for the environment. On the counterpart, some of the world's worst environmental disasters are attributed to some LA nations. Mexico's PEMEX 2010 oil spill in the Mexican Gulf was a world-alarming situation as it deteriorated marine life. Despite being some of the most inclusive countries in Latin America, Chile still needs to go a long sustainable growing path. Mining disasters have taken place in Copiacó; some disasters are attributed to Samarco mining enterprise.

Negligence is not the only cause for these disasters, but inaccurate and inconsistent technical supervision of this massive industrial complexes. Political regulations are urgently necessary as well as quality-certifications under global standards. Leadership in Energy and Environmental Design (LEED) certification is given to industries with sustainable practices; an example in LA is Unilever plant in Cuernavaca, Mexico.

More policy advances in LA industry should focus on innovation. South America fostering of innovation in industry can be highly beneficial for the environment. Previously talked *smart manufacturing* can contribute to lessen environmental impact in many ways: from 2.7 Gt to 12.08 Gt of CO2 emissions, 4.2 billion MWh and 81 billion of water liters saved.[28]

[28] Global estimated values by GeSI: *#SMARTer2030: ICT Solutions for 21st Century Challenges* (2015)

Conclusion

Clearly, a more inclusive and multi sectorial approach must be given by LAC countries to issues regarding sustainable development policies: industrial, environmental and competitiveness policies in order to enter and remain in international markets and diversified Global Value Chains. Furthermore, states should have a responsible fund’s usage and try to increase their efforts for achieving international cooperation in infrastructure-related projects.

For the Central American region, there can be a greater opportunity for ISID achievement due to its growing industry. Yet, the Caribbean and South America should focus on their own areas of action: sustainable and better regulated tourism and regional cooperation, and product innovations and industrial improvements focused on sustainability.

It is not to believe that SDG’s (and SDG9) are far-reaching goals, out of LAC governments’ capacity. The region’s new structural reforms must focus on inclusiveness, innovation and sustainability.

Studies in the LAC region should commit in finding a synergy between economic growth, social inclusiveness and environmental protection; in other words to ISID-SDG9 achievement.

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Appendix

Annexes:

ISID can be conceptualized using the following equation:

$$\overbrace{\frac{(Mwage\_equality)^{*}\, Mwage \times Memp}{MVA}}^{\boxed{\text{Inclusive industrial development}}} \times \overbrace{\frac{MVA}{MCO_2\, emission}}^{\boxed{\text{Sustainable industrial development}}} = \overbrace{\frac{(Mwage\_equality)^{*}\, Mwage \times Memp}{MCO_2\, emission}}^{\boxed{\text{Inclusive and sustainable industrial development}}}$$

Note: M is manufacturing.

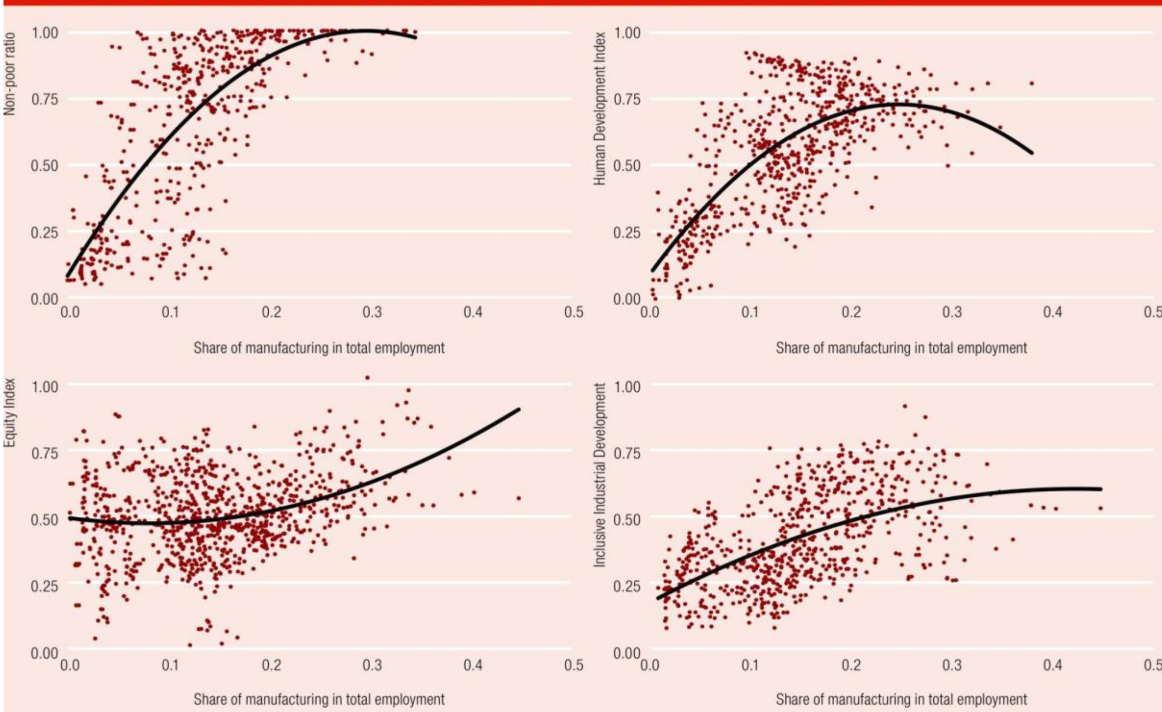
1. ISID's components: UNIDO (2015) *Industrial Development Report 2016*

Figure 15
Main trends in social inclusiveness indicators, by developing region, 1980–2014

Note: Regional values are calculated as unweighted averages over countries with available data for the whole period. Developing countries are countries that in 1990 were not high income according to the World Bank's definition (see Annex A1, Table A1.2). Within these countries are four groups based on location: Africa (including the Middle East), Asia (excluding the former Union of Soviet Socialist Republics [USSR] and the Middle East), Eastern Europe (including the former USSR) and Latin America. Five-year averages are used to maximize the number of observations and minimize the potential effects of extreme years.
Source: Lavopa (2015).

2. HDI Growth in Latin America: UNIDO (2015) *Industrial Development Report 2016*

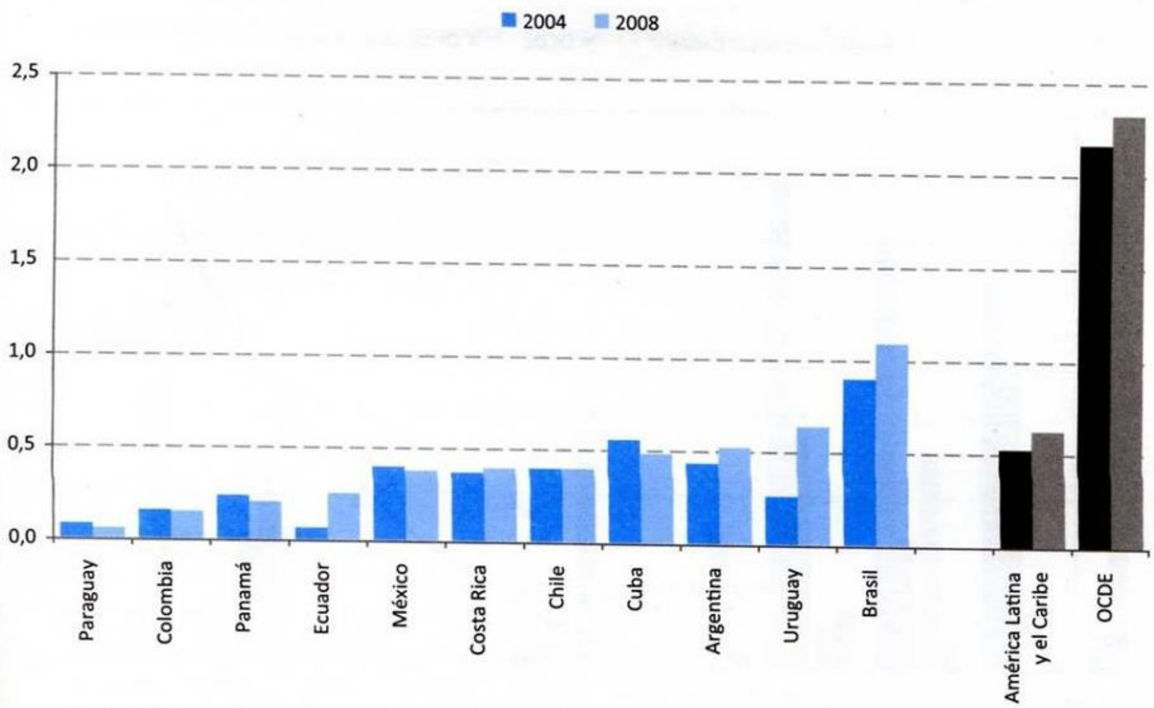
Figure 16
Inclusiveness indices by share of manufacturing in total employment, 1970–2010



Note: Sample of almost 100 countries. Each dot represents the average values of each country for a 5-year subperiod. In all cases, a quadratic trend is also included in the figures to indicate the general trend of inclusiveness.
Source: Lavopa (2015).

3. UNIDO (2015) *Industrial Development Report 2016*

Gráfico 6.2. América Latina y el Caribe y la OCDE (países seleccionados): inversión en investigación y desarrollo como proporción del PIB, 2004-2008
(En porcentajes)



Fuente: Elaboración propia con base en datos de la Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura (UNESCO), véase [http://www.uis.unesco.org/pages/default.aspx] Red de Indicadores de Ciencia y Tecnología Iberoamericana e Interamericana (RICYT), véase [http://ricyt.org], y Organización de Cooperación y Desarrollo Económicos (OCDE), véase [http://stats.oecd.org/index.aspx].
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