ECONOMIC DEVELOPMENT OF 8 LATIN AMERICAN COUNTRIES, 1950-2021: ARGENTINA, BRAZIL, CHILE, COLOMBIA, CUBA, MEXICO, PERU, AND VENEZUELA

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Abstract. We analyse the evolution of economic development in 8 Latin American countries for the period 1950-2021, including the 7 most populated countries and Cuba. The 3 top positions corresponded to Venezuela, Argentina and Cuba in 1950 and to Chile, Argentina and Mexico in year 2021. We analyse the impact of Manufacturing, Education and Indicators of Quality of Government and Freedom in the evolution of this countries. While Education is usually a necessary factor of development it is not always sufficient, and the countries require enough level of other factors, particularly need a mix of Political Stability and Freedom (economic, labour, social). In the comparison among 8 Latin American countries, the levels of the Indicator of Freedom show a very positive impact, with important increases of Production per capita in countries and periods with the highest values of Freedom, as it has happened for the period 1990-2021 with the highest values of this indicator, and the highest rates of increase of real Gross Domestic Product per capita, in Chile, Peru and Colombia. The lowest indicators of Freedom correspond to Venezuela and Cuba. Mexico has experienced a high increase for the period 1950-1980 and a slower average rate of growth for the period 1980-2021. Venezuela experienced increase for 1950-1980. decrease for 1980-1990. increase for 1990-2000 and decrease for 2000-2021. The other 6 countries have usually experienced slow growth for the period 1950-1990 and a higher increase for the period 1990-2021. We compare the general evolution of these 8 Latin American countries with World average and with China and two European countries (France and Spain). We cite several empirical studies based on panel econometric models of Latin American countries and highlight the importance of Education, Political Stability and Freedom for the increase of industrial production, economic development and quality of life in Latin America.

Keywords: Education, Development, Freedom, Evolution 1950-2021, Latin America, Manufacturing, Comparisons of Latin America with China, Europe and World average.
JEL codes: A13, I2, N16, N36, N66, O54

1. Introduction

Section 2 presents a revision of the literature on economic development of Latin American countries, with special focus on the positive effects of education, industry and quality of government.

Section 3 analyzes production per capita for the period 1950-2021 and indicators of quality of life in 8 Latin American countries and presents comparisons with World Average, China and two European countries (France and Spain). We emphasize the role of Education and Freedom as important factors to foster industrial development, with its positive impact on the development of services and other sectors.

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Section 4 presents a summary of several econometric models with panel data of Latin American countries that show the positive effects of industry on real Gross Domestic Product per capital.

Section 5 presents the main conclusions, and an Annex includes a summary of articles on Economic Development of Latin America, published by the Euro-American Association of Economic Development Studies for the period 2001-2022.

2. Literature review

In sections 2.1 and 2.2. we mention several articles published in English, or in two versions (English and Spanish), for the periods 1999-2010 and 2011-2022. In section 2.3 we mention several articles published in Spanish for the period 2001-2022 and in section 2.4 some econometric studies of economic development, based on international panel data that include Latin American countries.

2.1. Studies of the period 1999-2010

We highlight several quantitative studies regarding the effects of education, industry and other factors on economic development in Latin America.

Bernardo Kosacoff has written several interesting studies published by the United Nations Comisión for Economic Development of Latin America and the Caribbean (ECLAC/CEPAL) on the priority of industrial development for Argentina, as in the studies by Kosacoff and Ramos (1999a) in Spanish and (1999 b) in English on Industrial Policy debate. Other interesting studies have been published by Kosacoff (2007) and other publications.

Neira, Aguayo and Guisan(1999) analyze data of Education and Development in Latin American countries and the important effect of Education on Economic Development.

Guisan and Aguayo(2002) analyze the evolution of production by sector in Latin American countries for the period 1980-1999 and the relationship of Education and Trade with economic development.

Guisan and Aguayo(2005) presented, in Volumen 5-2 of this journal, an interesting study of the impact of manufacturing on economic development of Latin America. They analysed the the evolution of manufacturing in 20 Latin American and Caribbean countries for 1980-2002. They cite several interesting quantitative studies related, directly or indirectly, with industrial development in Latin American countries are the following ones:

"Canudas(2001) and Rajagopal(2005), among others, analyse the increases in productivity per worker in the case of Mexico, and Revenga(1999) has into account the effects of trade liberalization on employment and wages in Mexican manufacturing. Other studies analyse the role of education and foreign trade on industrial development, as in Guisan and Aguayo(2001) and Guisan, Aguayo and Exposito(2001).

Calderon and Serven(2004) analyse the trends in infrastructure in Latin America for the period 1980-2001, which is a key question to have into account in order to foster industrial development in this area. Guell and Richards(1998) analyse the relationship

between regional integration and intra-industry trade in Latin America for the period 1980-90.

Guasch and Spiller(1995) analyse the consequences of regulation on private sector. Some studies focus on the important inter-sector dynamics of economic growth, such in the studies by Dorte and Fiess(1999) for Ecuador, Guisan and Cardim-Barata(2003) for Brazil, and Guisan, Malacon and Exposito(2003) for Mexico, among others. Finally there are some interesting reports edited by Kosacoff(1998) Palazuelos (2001), IADB(2000), and other authors and institutions focused on Latin American development which include references to several factors related, directly or indirectly, with the increase of industrial value-added per inhabitant."

Fullerton, Sawyer and Sprinkle (2010) analyzed the intra-industry trade in Latin America and the Caribbean. They found that in most industries IIT (Intra-industry trade) is substantialy lower overall than the world average, although there may be substantial variations both by country and by industry.

For the period 2001-2010 our Association has published 100 articles in Spanish, in the journal *Estudios Económicos de Desarrollo Internaciona (EEDI)l,* which has reached one of the top position by the number of downloads per item at the international website of Economics research Ideas.Repec., among hundreds of international journals of Economics research. Some articles published in that journal were one by Canudas(2001), Guisan and Aguayo(2007) on Industry, Trade and Investment in Latin America for the period 2000-2005, among others.

Other interesting articles published in English on Latin American, in this journal AEID for the period 2001-2010 were, among others, the following ones:

Aguayo, Exposito and Lamelas (2001) estimate an econometric model of services sector and impact of tourism in Latin American countries, Bildirici(2004) on political stability and growth with an econometric analysis of Turkey, Mexico, Argentina and Brazil, for the period 1965-2004, Alvargonzalez et al(2004) on growth inequality in Latin America, Ramirez(2006) on Latin American Investment during the period 1980-2002. Rajagopal(2006) on the impact of trade liberalization in Latin American countries. Holmes(2008) on Latin American Real Exchange Rates. The article by Guisan and Cardim-Barata(2003) presents a study on the impact of Education on regional development in Brazil.

2.2. Studies of the period 2011-2022

Publications by UN Economic Commission for Latin American and Caribbean

A first group corresponds to several studies published by ECLAC/CEPAL: Several interesting studies were published by the Economic Commision for Latin America and the Caribbean or *Comisión Económica para América Latina* (in Spanish) (ECLAC/CEPAL). Several of them are the following ones:

Altomonte et al (2011) analyze the dynamics of industrial energy consumption in Latin America and their implications for sustainable development.

Ramos, Alvargonzalez and Moreno (2018). This article calculate the Theil index for income distribution in Latin American countries for the period 2004-2013 and estimate an econometric panel model to study the determinants of the level of inequality. They found a general diminution of inequality for that period and that the main variables explaining the evolution of inequality are the following ones: per capita GDP, per capita health spending, tax pressure, the poverty rate, the literaty rate and years of schooling.

Padilla and Gomes-Nogueira(2015) analyze determinants and effects of FDI outflows from Latin American countries.

Neira, Lacalle-Calderón and Portela (2016) present a study that focues on the relationship among Official Development Assitance (ODA), social capital and economic development in Latin American countries. They use "trust" to measure social capital and estimate the relationship with a panel of 18 countries over the period 2001-2010.

Luckeneder, Giljum and Krisztin(2019) employ a Spatial Durbin Model (SDM) with heteroskedasticity to provide an econometric framework to measure the impact of mining extraction.

Freire-Seoane, Lopez-Bermundez and De la Peña-Zarzuelo(2020) analyze the effects of maritime cointainer transport on economic growth in the West coast of Latin America.

Publications by the Euro-American Association of Economic Development Studies

A second group of articles published in the journal of the EAAEDS. In the Annex we include a relation of articles on Latin America published for the period 2001-2022, including, among others, the following ones:

Escobari(2011) analyze stochastic and β-convergence in Latin American Countries

Vacaflores and Kishan(2014) analyze remittances, international reserves and exchange rates in 9 Latin American countries for the period 1997-2010.

Martinez and Jareño(2014) Analyze FDI from Spain in Brazil, Argentina and Mexico.

Guisan and Aguayo(2017) analyze industrial development in Mexico and the United States, and the effects of NAFTA on the Mexican economy.

Guisan (2019) presents a report on the evolution of Manufacturing and Non-Manufacturing real production per capita for the period 2000-2015 in 22 American countries, as well the positive effects on life expectancy and other indicators.

In the Annex we present a summary of publications on Latin American in the journals of the Euro-American Association (EAAEDS) for the period 2001-2022.

Publications in English, on Latin America, by other institutions

A third group includes other studies published since year 2011 in several journals

Kosacoff (2011). published a chapter on industrial development in Argentina, in the book by Baer and Fleischer, in a book on Economies of Argentina and Brazil.

Camarero, M. et al (2013) analyze the relationship between trade openness and income in the working paper 226 of the Iberoamerica Institute for Economic Research of the university of Goettingen.

Hamaguchi, Mizyak and Correia(2014) analyze the triangle trade of the automobile sector between Japan and Latin America, analyzing empirica evidence on the vertical intra-industry trade between Japan-Brazil and Japan-Mexico.

Hoyos-Lopez(2017) analyze trade liberalization and premature deindustrializacion in Colombia in a journal of the Pan Pacific Association of Input-Output Studies.

Devlin and Pietrobelli (2018) analyze industrial policy at the subnational level in Mexico, in the working paper 2018-028 of MERIT at the UN university of Maastrich.

Gantamand and Dabos (2020) presents a panel data analyzes for the period 1990-2016 in 18 Latin America, relating trade openness and income distribution. They found a positive relationship.

2.3. Articles on Latin America, of the period 2001-2022, published in Spanish

The Euro-American Association (EAAEDS) has published for the period 2001-2010 a journal in Spanish: Estudios Economicos de Desarrollo Internacional (EEDI). which has got the top position by downloads per item at Ideas.Repec among all the World journals not published in English and top position. The journal has published 100 articles, more than 50% on Latin American countries. In the Annex we include links to the articles of this journal related with Latin American.

In the working paper EcoDev 123, by Guisan(2020), we present tables with lists of articles on Latin America published, in Spanish in the journal RSES for the period 2011-2020. This publication also includes lists and links to article con Latin American countries published for the period 2011-2020.

Here we may add some interesting articles in Spanish published in journal RSES for the period 2021-2022 as the following ones:

Herrero-Olarte and Loaiza (2021) on the analysis of structural and cojuntural policies to eradicate poverty in Ecuador

Herrero-Olarte (2022) on minimum wage, poverty and middle class in Ecuador.

Malpica-Zapata(2021) on the financial organization of enterprises of the Building Sector in Colombia during the Pandemic of Covid-19.

Moreno-Brid and Sanchez(2022) analyze the economic development of Mexico for the period 1950-2020, highlighting the positive evolution of industrial development until year 1980.

Rodriguez-Benavides et al(2022) analyzes consumption of electric energy in the federation entities of Mexico.

Guisan(2022 a) published a summary of 125 working papers of the series EcoDev, many of them related with Latin American development.

2.4. Econometric models of development with international samples

Guisan, Aguayo and Exposito(2001) present an international econometric model, including Latin American countries, which shows the positive impact that usually has

the educational level of population on moderation of high fertility rates, anse increase of investment per capital, industrial production per capita and economic development.

Guisan(2007) presented panel econometric models of 18 Latin America and other areas, measuring the impact of Industry and Foreign Trade on Development, for the period 1965-2003.

Guisan and Aguayo(2007) estimate econometric models that show the positive impact of economic development on health expenditure and education expenditures per capita.

Guisan(2021) and (2022b) estimate with a panel of 164 countries, including many Latin American countries, models relating indicators of education, political stability, quality of democracy and other ones with economic development and life satisfaction.

3. Production per capita and indicators of quality of life in 8 countries

3.1. Sources of data: Elaboration from WB, Maddison and ECLAC/CEPAL

Data of real Gross Domestic Product (GDP) per capita, for the period 1950-1998 were calculated by author, for each country, from the values published by Maddison(2000) (that were expressed at 1990 international prices), converted to 2017 international prices, applying, to that time series, the factor of conversion of year 1998.

The factor of conversion was calculated by dividing the value from World Bank (WB(2023)) in year 1998 (at prices and PPPs of year 2017), by the value published by Maddison(2000) for year 1998 (at prices and PPPs of year 1990).

Data for the period 1999-2021 were taken from WB(2023) in Dollar per capita at 2017 prices and Purchasing Power Parities (PPPs), but in the cases of Cuba and Venezuela, with unavailable data for this variable.

For these countries WB does not include the real value of year 1998, but includes rates of annual increase for Cuba 1999-2021 and for Venezuela for 1999-2014.

In the cases of Cuba and Venezuela we estimated the value of year 1998 having into account the ratios Cuba/Brazil and Venezuela/Brazil in year 1998 accordingly to Maddison(2000) and applying ratios to the value of GDP per capita of Brazil, at 2017 prices and PPPs, from World Bank for year 1998.

Data for Cuba for the period 1999-2021 were calculated applying the annual rates of increase of GDP per capita at constant prices, published by World Bank to the lagged value of this variable since 1998.

Data for Venezuela were calculated with rates of World Bank for the period 1999-2014 and with rates calculated from ECLAC(2023) data of GDP per capita in Dollars at constant prices for the period 2015-2021.

The indicators of Quality of Life were elaborated by Guisan(2021) and (2022) from international sources (WB, EIP and other ones) for the Latin American countries included in those studies, and estimating the values for Cuba en Venezuela from other sources. In this article we have added the Indicator of Freedom, from Heritage Foundations, available at Global Indicators.

3.2. GDP per capita of 8 Latin American Countries for 1950-2021

Table 1 presents the evolution of real Gross Domestic Product (GDP) per capita from 1950 to 2021 (in Dollars at 2017 prices and Parities) and Population (million) in 2021.

Table 1. Real GDP per capita (Dollars at 2017 prices and Parities), 1950-2021

	Gross Domestic Product per capita (Dollars at 2017 prices and PPPs)								Pop
	1950	**1960**	**1970**	**1980**	**1990**	**2000**	**2010**	**2021**	2021
Argentina	10407	11602	15238	17205	13590	18525	23521	21527	45.8
Brazil	3367	4703	6156	10470	9918	11529	14825	14592	214.3
Chile	5904	6675	8178	8865	9891	15416	21225	25449	19.5
Colombia	3879	4499	5574	7684	8687	9138	11890	14649	51.5
Cuba	6764	6222	5932	5344	5883	4869	7953	8589	11.2
Mexico	5680	8226	11160	15696	15181	17943	18037	19086	126.7
Peru	3898	5207	6558	7243	5090	6376	9997	12515	33.7
Venezuela	15029	19428	21494	20421	16743	19133	15410	10749	28.0
Average	6866	8320	10036	11616	10623	12866	15357	15895	530.7
China	423	648	755	1028	1791	3452	8885	17603	1412
World	3977	5234	7053	8507	9698	11108	13868	16997	7890

Source: Data elaborated by Guisan(2023) from Maddison(2000), World Bank(2023) and ECLAC/CEPAL(2023). The last column includes data of Population (million) in year 2021. Average 1950-2021 is the non-weighted average of the 8 Latin American countries of this table.

The Latin American average increased for the periods 1950-2000 and 2000-2021, but at least speed that World average. Total increase of production per capita, for 1950-2021, amounted to 9029 as the Average of 8 Latin American countries, 17180 in China and 13020 in the case of World average.

In year 1950 the Latin American average (6866) was much higher than World Average (3977). while in year 2000 was only slightly higher in Latin America ((12866) than in the World (11108) and in year 2021 was slightly lower in Latin America (15895) than in the World (16997). As we shall see in table 2, the degree of industrialization is lower than World average in many Latin American countries and this has consequences on other economic sectors.

In year 1950, the highest positions were for: Venezuela, Argentina and Cuba. In year 2021 the highest positions corresponded to Chile, Argentina and Mexico.

As pointed out by Moreno-Brid and Sanchez(1980) the great increase of Mexico for the period 1960-1980 dues due to efficient economic policies. The decade of 1980-1990 was a slight decrease and there was a recovery for 1990-2021.

Chile experienced an important increase for the period 1990-2021.

Argentina experienced a decrease for the period 1980-1990 and a recovery for 1990-2021.

Venezuela and Cuba, evolved from the top positions in 1950 to the last positions, among this group of 8 countries, in year 2021.

Venezuela experienced an increase of real GDP per capita for the period 1950-1970, a decrease for 1970-1990, a recovery for 1990-2000 and again a decrease for 2000-2021.

Cuba decreased for 1960-2000 and has experienced an increase for 2000-2021.

Table 2 presents some important indicators related with economic development and quality of life: QMH, Tyr10, Fer19, X1, X2, X4, X5, X6 and X7. Includes data of the 8 Latin American countries of this study and the non-weighted average of these countries, in comparison with a group of most developed countries of the study by Guisan(2021), and also with China and the World average.

QMH is an indicator of industrialization, Tyr indicates average years of schooling, X1 Happiness, X2 qualtiy of Government, X4 Peace, 5 Stability and X6 Freedom.

The comparison of the non-weighted average of 8 Latin American countries with World average shows slightly lower values in Latin America in QMH, X2, X4 and X6, and slightly higher values in Tyr, X1 and X6. The Latin American average is much lower than the values of these indicators in Top countries.

Table 2 Manufacturing per capita (QMH) (Dollars at 2005 prices and PPPs) and other indicators of development and quality of life

	QMH 2015	School Tyr10	Fertility Fer19	X1 Happy	X2 Voice	X4 Peace	X5 Stability	X6 Freedom	X7 Av.
Argentina	2277	10.3	2.25	5.93	4.56	5.14	5.08	5.01	4.95
Brazil	1036	6.9	1.72	6.33	4.10	3.93	4.16	5.33	4.38
Chile	1853	9.0	1.63	6.17	6.98	5.42	5.14	7.44	6.25
Colombia	1176	7.4	1.79	6.01	5.08	3.27	3.66	6.51	4.63
Cuba	1288	9.6	1.55	4.68	2.16	5.94	6.20	2.95	4.31
Mexico	2609	8.0	2.10	6.32	4.68	3.45	3.30	6.37	4.45
Peru	1294	8.4	2.23	5.84	4.52	4.92	4.42	6.65	5.11
Venezuela	1290	8.2	2.30	4.93	1.96	4.40	1.80	2.48	2.66
Average	1603	8.5	1.95	5.78	4.26	4.56	4.22	5.34	4.59
Comparisons with Top Countries, China and the World average									
Top count.	6353	11.7	1.53	7.07	8.24	6.30	7.50	8.00	7.51
China	2791	7.3	1.70	5.34	1.72	4.72	4.42	4.80	3.91
World	1798	8.1	2.40	5.35	5.00	4.80	5.00	5.00	4.95

Source: Elaborated by Guisan(2021) and (2002) from World Bank and other international statistics. Notes: Data of year 2015 for QMH15, year 2010 for Tyr10 and around years 2019-2021 for the other indicators. The last 3 rows include average of Top countries of the World (Top count.), China and the World average, for comparisons. QMH is real Valued-Added of Manufacturing per capita, expressed in Dollars at 2005 Prices and Purchasing Power Parities. Indicators X1, X2, X4, X5, X6 in decimal scale. Indicator X7 is the mean of X2, X4, X5 and X6. Tyr10 is the average number of years of schooling of adult population (+25 age). Fer19 is average of children per woman in her life. (*) X1 for Cuba calculated from the Special Report by Moreno, Brady and Ribar(2011). X1 for Venezuela was taken from Gallup (2019).

QMH is real Value-Added of Manufacturing per capita in year 2015. This variable is very important for economic development. Usually it is related with high values od the indicators Tyr, X1, X2, X4, X5 and X6 and moderate values (lower than World average) of Fertility rates. The source of data for values in Dollars at 2017 prices and Purchasing Power Parities (PPPs) was WB(2023). A comparison with other countries and areas of the World, as well as the evolution for 2005 to 2015 is presented in Guisan(2018).

Tyr10 is the average number of years of schooling per adult (+25 age) from World Government Indicators (WGI) from WB(2023).

Fer19 is the average fertility rate of year 2019, expressing the number of children per woman in her life. Its value is usually moderate in countries with high values of Tyr, although other factors may also contribute to moderation. Moderation in Fer19 is usually important to increase investment and production per capita, although other factors are also important in this regard (freedom, security for investment, low risk, peace, etc.).

X1 measures Life Satisfaction). X2 is "Voice of Citizens" one of the indicators of Government Quality, X4 measures Peace with its highest values in countries with low level of internal and external conflicts. X5 measures Political Stability and X6 Global Freedom and X7 is the average of X2, X4, X5 and X6.

The indicators X1, X2, X4, X5, X6 , are values of the period 2016-2021, and have been calculated in scale 0 to 10 (with 10 de highest quality) from the following sources:

World Bank for X2 (Voice of Citizens), and X5 (Political Stability).

WHR (UN and Gallup) for X1 (Satisfaction with Life).

IEP (Institute for Economics and Peace) for X4. First we calculated X3 converting the Indicator of Conflict of EIP to a decimal scales, and them calculating X4=10-X3 as an Indicator of Peace.

Heritage Foundation for X6. The indicator X6 (Freedom) is adapted from the Heritage Index to the decimal scale (by dividing by 10 an index that varies between 0 and 100).

The highest and the lowest positions of countries in each indicator of table 2 are as follows:

1) QMH in year 2015 was over World average only in 3 out the 8 Latin American countries of table 2 (Argentina, Chile and Mexico), which are the most developed countries of this group in year 2021. The value of QMH in the 8 Latin American countries was lower than in China and much lower than the group of Top Countries in development indicators of the study by Guisan(2022). The lowest levels of this variable in table 2 corresponded to Brazil, Colombia, Cuba, Peru and Venezuela.

2) Schooling years: The highest values of average schooling years of population aged +25 in year 2020, corresponded to Argentina, Chile and Cuba (with 9 or more). Several countries had values between 8 and less than 9: Mexico, Peru and Venezuela. The countries with the lowest number of average schooling years were Brazil and Colombia.

3) Fertility rate. All the countries moderate the Fertility rates for the period 1950-2019. In year 2019 the countries of table 2 were below World average.

4) X1=Happiness. Life Satisfaction, around year 2019, was higher than 5.5 in 6 Latin American countries of table 2, with the highest values in Brazil, Chile, Colombia and Mexico. The lowest values corresponded to Cuba and Venezuela.

5) X2=Quality of Government: The indicator Voice of Citizens is one of the most important indicators of Quality of Government. The highest values corresponded to Chile and Colombia, and the lowest to Cuba and Venezuela.

6) X4, X5, X6 (Peace, Stability and Freedom). Chile and Argentina have values of 5 or higher in the 3 indicators. In other countries there are values below 5 in Peace and Stability (Brazil, Colombia, México, Peru and Venezuela) or below 5 in Freedom (Cuba and Venezuela).

7) X7 is the mean of these 4 indicators (X2, X4, X5 and X6). The highest values of X7 correspond to Chile, Peru, Argentina and Mexico. Only Chile has a value of X7 over the World average.

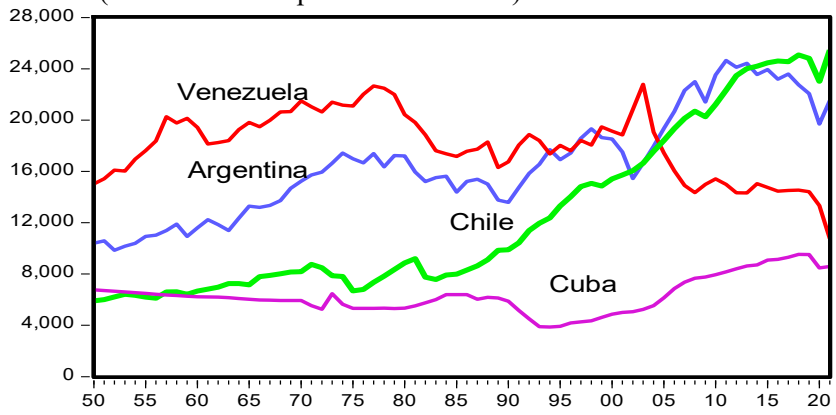
Countries with the highest levels of industrial production per capita have usually the highest levels of development. As seen in several international studies, as those cited in the bibliography. To increase industrial production per capita it is important to foster investment per capita, freedom, stability, educative level of population and other variables that contribute to development and quality of Life.

In several Latin American countries there have been important advances in some factors of development for the period 1950-2021, as an increase of Education, and Manufacturing but QMH is yet very low in comparison with the mean of Top countries. Argentina, Chile and Mexico have a value of QMH over World average but below Top countries. It is important to improve the indicators X2, X4, X5 and X6, in many cases, to get values closest to the Top countries to increase development and quality of life.

3.3. Comparison of Argentina, Chile, Cuba and Venezuela

Graph 1 shows important difference of the evolution of real GDP per capita in 4 countries.

Graph 1. Real GDP per capita of Argentina, Chile, Cuba and Venezuela
(Dollars at 2017 prices and Parities)



Source: Elaborated by Guisan(2023) from WB statistics

Chile had a low value of Production per head in year 1950 and little increase for the period 1950-1984. The increase has been high for the period 1984-2021, reaching the

value of Argentina around year 2002, and the value of Venezuela around year 2005. In year 2021 presents the highest Latin American value as seen in table 1.

Argentina experienced a decrease for the period 1970-1990. After an increase for 1990-2000, there was a new decrease for 2000-2003, a positive evolution for 2003-2012, and a new decrease for 2012-2021.

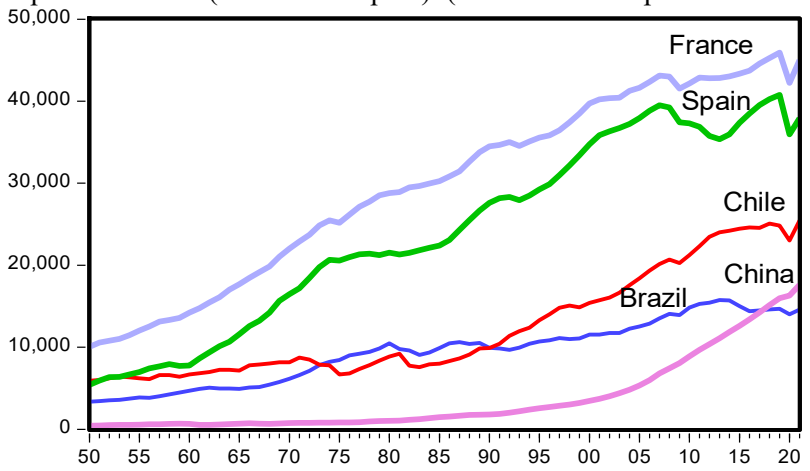
Venezuela had the highest value of Production per head in year 1950. Experienced a decrease for 1980-1990, and increase from 1990 to 2005 and a strong decrease for 2005-2007, stagnation for 2007-2019 and a new decrease in 2020-2021. The main problem has been the diminution of the Indicator of Freedom (X7) with its negative consequences for production per head and quality of life. Gallup(2019) indicates that the number of social perception of the bad evolution of development in Venezeula increased from 22% in year 2012 to 91% in year 2016.

Cuba had experienced a decrease for the period 1950-1993, followed by a small increase for 1993-2019. In spite of a level of Education relatively high, development has been difficult due to the low values of the indicators "Voice of Citizens" (X2) and Global Freedom (X6). A positive evolution of those indicators, as well as measures to guarantee foreign investment and to foster international cooperation, should be of great help to improve economic development and quality of life.

3.4. A comparison of Brazil with Chile, China and 2 European countries

Graph 2 present a comparison of Brazil with Chile and with other countries of the World: Spain, France and China.

Graph 2. Real GDP per capita of Brazil and Chile, and comparison with China and 2 European countries (France and Spain) (Dollars at 2017 prices and Parities)



Source: Elaborated by Guisan(2023) from WB statistics.

Brazil experienced an important increase for 1965-1980. If that trend would be maintained for the period 1980-2021, the actual value of Brazil would be very close to Chile. The comparison with Chile, China, France and Spain, shows that it is possible to foster development in Brazil by increasing education and industry, among other factors.

Chile experienced stagnation for 1950-1982, and an important increase for 1982-2021.

China, starting from very low values of real GDP per capita, for the period 1950-2000, experienced an important increase for 2000-2021, surpassing Brazil since year 2016. but not yet reaching the value per capita of Chile in year 2021.

Accordingly to table 2, QMH had a value, in year 2015, of 1036 in Brazil and 1853 in Chile (Dollars at prices and Parities of 2005), while the corresponding value in the other countries of graph 3.2 were: 2701 in China, 3721 in Spain and 3031 in France.

As seen in Guisan(2021) and (2022) Spain and France present relatively high values of the indicators X1 to X6 and Educational level of Population, higher than the 8 Latinamerican countries of table 2.

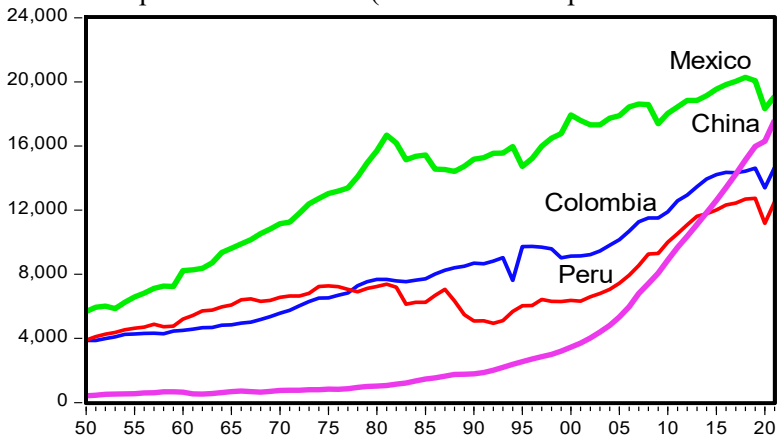
China, in spite of lower level of "Voice of Citizens" than Brazil, and similar level of average schooling have shown a higher increase of QMH and development, due to economic policies focused on industrialization.

The econometric models, like those estimated by Guisan(2022) show general positive effects of Tyr, and the indicators of quality of life on industrialization and development, although more or less active economic policies have also impact, as we may see comparing the results of China with Brazil and other countries.

3.5. A comparison of Mexico, Colombia, Peru and China

Graph 3 shows the evolution of Mexico, Colombia and Peru, in comparison with the evolution of real GDP per capita in China for the period 1950-2021.

Graph 3. Real GDP per capita of Colombia, Mexico and Peru and comparison with China (Dollars at 2017 prices and Parities)



Source: Elaborated by Guisan(2023) from WB statistics.

Mexico has experienced an increase for the period 1950-1980, stagnation and decrease for 1980-1995, and the recovery of a positive trend for 1995-2019.

Colombia has experienced little increase for the second half of the 20th century and a more positive trend for the period 2000-2021.

Peru has experienced a small increase for 1950-1980, a negative evolution for 1980-1995, a small increase for 1995-2000 and a higher positive trend for 2000-2019.

China has surpassed the values of GDP per capita of Peru and Colombia, for the period 2015-2021 and was close to the value of Mexico in 2021.

The case of industrial development in China shows that countries with a relatively high level of Education, Political Stability, Business Freedom and moderate value of Fertility rate, usually can favour the increase of investment per capita, manufacturing per capital and economic development.

It is surprising that some of the 8 Latin American countries of ths Study did not reach in year 2021 a value of real GDP per capita higher than China, in spite of their higher positions for the period 1950-2000 and similar level of Education and moderation of Fertility rates for the period 2000-2021.

Lower levels of Political Stability than China in some cases (Colombia and Peru) and lower levels than China in Business Freedom (Cuba and Venezuela), have contributed to explain a lower increase of real GDP per capita in comparison with China.

4. Econometric models of Industry and Development inf Latin American countries

Several international studies, including Latin American countries, have shown the positive impact of manufacturing on economic development. Here we cite two empirical studies with panel of Latin American countries.

Equation estimated by Guisan and Aguayo(2005)

Guisan and Aguayo(2005) analyse the evolution of Manufacturing and non Manufacturing Production per capita in 20 Latin American and Caribbean countries.

Table 3 show data of real production of manufacturing per inhabitant (QMH) in years 1980 and 2002, and the ratio between both variables.

Table 3. Real Value Added of Manufacturing per capita (QMH), 1980-2002
(dollars per inhabitant at 1995 prices and Exchange Rates)

No.	Country	1980	2002	(3)	No.	Country	1980	2002	(3)
1	Argentina	1561	1055	0.68	11	Honduras	108	122	1.12
2	Bolivia	193	152	0.79	12	Jamaica	327	288	0.88
3	Brazil	1144	874	0.76	13	Mexico	618	754	1.22
4	Chile	526	766	1.46	14	Nicaragua[1]	376	252	0.67
5	Colombia	402	311	0.77	15	Panama	248	245	0.99
6	Costa Rica	633	811	1.28	16	Paraguay	325	258	0.79
7	Dominican R.	203	346	1.70	17	Peru	429	343	0.80
8	Ecuador	334	236	0.71	18	Trinidad & Tobago	597	552	0.92
9	El Salvador	368	427	1.16	19	Uruguay	1546	910	0.59
10	Guatemala	266	199	0.75	20	Venezuela[1]	527	495	0.94

Source: Elaborated by Guisan and Aguayo(2002) from World Bank statistics.
Notes: [1] For Nicaragua and Venezuela in 2002 data are own estimations, based on the evolution during the period 1990-99 analysed by Guisan and Aguayo(2001).
The Last column is the ratio between data of years 2002 and 1980.
No. is number of alphabetical order of the countries.

We may notice little decrease of industrialization per capita for the period 1980-2002 in Argentina, Bolivia, Brazil, Colombia, Ecuador, Guatemala, Jamaica, Nicaragua, Paraguay, Peru, Trinidad and Tobago, Uruguay and Venezuela. There was an increase in the degree of industrialization in Chile (46%), Costa Rica (28%), Dominican Republic (70%), El Salvador (16%), Honduras (12%), Mexico (22%). There was almost stagnation in Panama. The highest levels of the variable in year 2002 corresponded to Argentina, Uruguay, Brazil, Costa Rica, Chile and Mexico.

The model was estimated with 20 American countries including not only Latin American countries but also Canada and the United States. It includes 2 dummy variables for special cases: Country 4 presents, (Chile) presents an additional positive increase of 1181 Dollars per capita, and country 20, (Venezuela) an addition negative variation of 884 Dollars per capita.

The estimated equation was:

$$qnmh02 = \underset{(58.4)}{1.2323}\ qnmh90 + \underset{(2.32)}{0.8091}\ (qmh02-qmh90) + \text{Effects of D4 and D20}$$

Similar results where found in other studies of Latin American, as in Guisan, Malacon and Exposito(2003) estimation for Mexico, and in Guisan and Cardim-Barata(2003) for Brazil. The latter study presents also an interesting analysis of bilateral causality between QNM and QM, by means of the Hausman test. They found that there is a significant bilateral relationship between both variables, with some degree of lagged effect of the increase in QNM on QM, while the effect of QM on QNM is contemporaneous.

Econometric model of Guisan(2007) with a panel of 18 Latin American Countries

The role of foreign trade is also important, because industrial development usually implies a high degree of openness, both to import and export, so complementary goods and services are useful for economic development as seen in Guisan, Aguayo and Exposito(2001) and other studies.

With a sample of 108 observations, corresponding to 18 Latin American countries for the period 2000-2005, was estimated a panel model with the following equations:

$$QHI = F(QHI(-1), D(MH), D(XH) \quad (1)$$

$$QHNI = F\ (QHNI(-1), D(QHI), D(MH), D(XH)) \quad (2)$$

$$MH = F(MH(-1).\ D(XH) \quad (3)$$

QHI = real industrial production per inhabitant

QHNI = real non-industrial production per inhabitant

MH = real imports per inhabitant

XH = real exports per inhabitant

and where D(MH), D(XH) and D(QHI) are the difference between the value of each of these variable between its values in period (t) and in period (t-1).

The estimated coefficients show a positive and significant effect of D(MH) on QHI, and QHNI, as well as a positive effect of D(XH) on MH, and a positive impact of D(MH) on QHNI.

The increase of QHI is very important to foster economic development, because it has a direct positive impact on QHNI, with an estimated coefficient of 0.85 per each unity of increase of QHI. Besides it has positive impact on XH and the increase of Exports contributes to finance Imports of intermediate inputs necessary for domestic production.

The study includes an interesting table with the direct and indirect effects of foreign trade on industrial, non industrial and total production per capita. For a 100 Dollars of increase, both in Exports and Imports, there was an estimated total effect of 88 Dollars in Industry, 36 in Non-Industrial sectors, and 114 Dollars in total production per capita.

5. Conclusions

From the results of table 1 we may conclude that there were important changes in the top positions among the 8 Latin American countries during the second half of the 20th century: In year 1950, the highest positions were for Venezuela, Argentina and Cuba. In year 2021 the highest positions corresponded to Chile, Argentina and Mexico.

Although there was an increase of real production per capital in the average of the 8 Latin American countries of this study, the speed of increase was lower than the average rate of increase in the World. In year 1950 the Latin American average was very high in comparison with the World, in year 2000 was very alike to the World average and in year 2021 was slightly lower than the World average. Generally a higher degree of industrialization has fostered general economic development in several countries.

Among the indicators that favor industrialization and economic development, like educational level of population (Tyr), quality of democracy (X2), and freedom (X6) we may notice that Cuba and Venezuela, in spite of a good level of Tyr, have very low values in the indicator of quality of democracy and freedom.

It is really outstanding the high increase of development and quality of life in Chile for the period 1985-2021 in comparison with Cuba. It is also remarkable the increase of development of Argentina, in comparison with Venezuela, for the period 1990-2021.

In comparison with Cuba and Venezuela, China shows a higher degree of business freedom with positive impact on economic development.

As pointed out by Moreno-Brid and Sanchez(2022), Mexico has experienced an important improvement of economic development for the period 1950-1980, from a real value of 5680 to 15696 of real GDP per capita (Dollars (at 1997 PPPs), with an increase of 10016 in 30 years (334 per year). Changes in economic policies. after 1980, with a liberalization policy without enough support to industrial development, led to a lower increase for the period 1980-2021, when real GDP per capita evolved from 15696 to 19086, what implies an increase of only 3390 in 41 years (83 per year).

It is important to foster a diminution of the gap of many Latin American countries with the average of most advanced countries of the World, particularly in the degree of industrialization: the Latin American average of QMH in table 2 was only 1603 and in the Top countries of the World was 6353. A higher degree of peace, political stability and freedom is very important to increase quality of democracy, economic development and quality of life.

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Gallup
Heritage Foundation
IEP: Institute for Economics and peace
Maddison(2021)
OECD
WB(2023). World Bank: https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.KD
WHR: World Happiness Report (United Nations and Gallup)

Annex

Annex. Latin American Studies published by the EAAEDS

The Euro-American Association of Economic Development Studies (EAAEDS) has published, for the period 2001-2023, many articles related with economic development in Latin American Countries: in English and in Spanish.

Articles in Spanish on Latin American countries

Journal EEDI was published for the period 2001-2010. It has published 100 articles free downloadable, many of then related with Latin America, available at Ideas.Repec, Dialnet and the Website https://www.usc.gal/econo met/eedi.htm. After finishin publication we have published and EEDI Report of Latin American Development for the period 2011-2020, published by Guisan(2022) in EcoDev123.

Our journal Regional and Sectoral Economic Studies(RSES) publishes articles, in English or in Spanish, related with Latin American in RSES. More information about the articles in Spanish at https://economiaydesarrollointernacional.blogspot.com

Articles in English on Latin America

In journal AEID (Applied Econometrics and International Development) we have published more than 20 articles related with specific econometric models and quantitative studies of Latin American countries, and also several articles on World development including Latin America.

In journal RSES (Regional and Sectoral Economic Studies) we have published around 58 articles related with economic development of America, almost all including several Latin American countries. Table A1 presents a summary of journal RSES by geographical areas.

Table A1. Article in English, by geographical classification, published in RSES

	America	Africa	Asia	Europa	Eurasia	World	Total
2021-2023*	5	5	2	5	2	2	21
2016-2020	17	3	9	17	6	4	56
2011-2015	21	9	6+1	55	16	1	109
2006-2010	11	7	10	35	3	5	71
2001-2005	4	1	6	12	1	-	24
Total	58	25	34	124	28	12	281

Source: Elaborated by M.C. Guisan from the Index of RSES at Ideas.Repec, or Dialnet or at https://www.usc.gal/econo met/rses.htm. Note: * The first version of this article includes articles from 2001 to the first semester of year 2023.

International Blogs of our Association with information about the articles published in our journals related with international development:
https://euroamericanassociation.blogspot.com (Blog in English on World Development)
https://economiaydesarrollointernacional.blogspot.com (Blog in Spanish on international development).