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THE ECONOMIC DEVELOPMENT AND DEMOCRACY: an analysis for latin american countries (1990-2010)

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THE ECONOMIC DEVELOPMENT AND DEMOCRACY: an analysis for latin american countries (1990-2010)
Abstract: In the last two decades, important political changes occurred in Latin America. Thus the objective of this study is to analyze the relationship between the evolution of democracy and economic development for the major economies of this region. The theoretical framework is based on Lipset (1959) which states that, among the factors in society related to political system, none is so accepted as the relation between democracy and level of economic development. The methodology used was the econometric technique of panel data with fixed effects. The results show that the evolution of GDP per capita had a role in the process of evolution of democracies in the studied countries. Thus the results of the study allow concluding that economic development increases the possibility of consolidating democracy in Latin America.
Keywords: Democracy, economic development, Latin American economies.

O DESENVOLVIMENTO ECONÔMICO E A DEMOCRACIA: uma análise para países da América Latina (1990-2010)
Resumo: Nas ultimas duas décadas importantes mudanças políticas e econômicas ocorreram na América Latina. Assim, o objetivo deste trabalho é analisar a relação existente entre a evolução da democracia e desenvolvimento econômico para as principais economias dessa região. O marco teórico se origina em Lipset (1959) o qual afirma que dentre os fatores da sociedade que se ligam ao sistema político nenhum é tão amplamente aceito quando a relação existente entre democracia e nível de desenvolvimento econômico. A metodologia usada foi à técnica econometria de dados em painel com efeito fixo. Os resultados demonstram que a evolução do PIB per capita teve um papel determinante no processo de evolução das democracias dos países estudados. Destarte os resultados do trabalho permitem concluir que o desenvolvimento econômico amplia a possibilidade de consolidação da democracia na América Latina.
Palavras-chave: Democracia, desenvolvimento econômico, economias Latino Americanas.

1 INTRODUCTION

The analysis on democracy and economic development is a highly recurrent theme in political science. According to Lipset (1959) for the more prosperous a nation is, greater are the chances of maintaining democracy. It is a common understanding in the literature that economic prosperity brings new consumer desires, and among them, aspirations for their own political benefits of democratic rule. According to Dahl (1989) these aspirations fuel and perpetuate democracy.

The main motivation of this work is to understand how the components of economic development affect the democracies of some Latin American countries during the past 20 years. It is important to highlight (although not a matter of analysis in this paper) that the countries of this region have passed in the last three decades by major political and economic transformations. They have become "[…] more democratic and liberal nations." (COUTINHO, 2006, p. 1).

The durability or maintenance of a democracy is closely linked to economic factors. According to Przeworski and other (1996), democracies have a greater durability when they are located in developed countries. According to the authors, factors such as, economic performance, wealth and income inequality are fundamental in the process of longevity of democracy. For them, poor countries (with low per capita income) can maintain a democratic regime, if they can develop themselves and reduce their inequalities.

The logic of analysis in the definition of relationships between variables follows the one presented in the works of Lipset (1959) and the Przeworski and other (1996). In this way, we present the following model:

$$D = f(E, S) \quad (1)$$

Where, D is an indicator of democracy; E is economic variables and S is social variables. Thus, economic development is measured based on economic and social performance of each country. Further, the variables and their expected relationships are defined, as well as, the econometric model to be estimated.

A Democracy Index was used as an indicator of democracy and indicators of income, economic growth, education and income equality were used as measure of development. The perception of development is associated with a set of variables to enable a clearer understanding of the quality of life of the population.

The work is divided into 4 sections, considering this Introduction as Section 1. Section 2 presents the methodology and database; Section 3 presents a discussion of the results of the estimations and descriptive ones. Section 4 presents the final considerations.

2 METHODOLOGY

In this section, the variables used in the research, as well as, the econometric model to estimate the impacts of economic development on democracy are exposed.

2.1 Econometric Technique - Panel Data

According Maddala (2003, p. 308), "[…] the term panel data refers to data sets in which there are data on the same subject over different periods of time." Therefore, it consists of combining cross-sectional data and time series data.

Hsiao (2003 apud BALTAGI, 2005) presents a list of benefits of using panel data, among which it can be highlighted: the control of individual heterogeneity, increases the amount of information about the sample, gives greater variability, reduces collinearity between variables, provides a higher degree of freedom and more efficiently.

Another important benefit of using panel data is the ability to identify and measure some effects which are not possible to verify by using time series or data of cross-sectional (BALTAGI, 2005). Thus, the panel data model captures the effect of variables that would normally be omitted in time series models or cross-section ones.

The simple model of panel data can be presented as follows:

$$Y_{it} = a + bX_{it} + u_{it} \qquad (2)$$

Where, i = 1, ..., N, are individuals, t = 1, ..., T, are periods of time.

In the equation 2 above, a and b are considered constant, i.e., equal for all subjects. Thus, the estimation of equation 2 does not take into account the heterogeneity of individuals. One can consider that heterogeneity is included in the error term; however this increases the probability of correlation between the error term and some of the regressors in the model. In other words, it increases considerably the possibility of the estimated coefficients are biased and inconsistent.

The question is how to estimate the model taking into account the heterogeneity of individuals so that we can obtain estimators that are consistent and efficient. While there are many ways[1], it will be emphasized only the fixed effect model and random effect model.

In the fixed effect model, the estimation is performed considering that heterogeneity will be captured by the constant part of the model, i.e., the constant term will differ from individual to individual:

$$Y_{it} = a_i + bX_{it} + u_{it} \qquad (3)$$

The term of the constant a_i is time-invariant and different for each individual. The effect estimation variable model is performed by introducing heterogeneity in the error term. In this case, the variable a_i is not treated as a fixed one, but as a random variable. That is;

$$a_i = a + \varepsilon_i \qquad (4)$$

Where ε_i is a time-invariant error term and different for each individual. Therefore, we can write the model of variable effect.

$$Y_{it} = a + bX_{it} + \varepsilon_i + u_{it} \qquad (5)$$

An important point in the estimation by the method of panel data is the choice of the most suitable model. That is, which model has the best estimators the fixed effect model or random effect?

The Hausman test was used to decide which the most suitable model is. The null hypothesis (H0) of the test that defines the random effect is more appropriate and the alternative hypothesis (H1) is more suitable to define the fixed effect.

The Hausman test statistic can be written as follows:

$$H = \left(\hat{b}_{fe} - \hat{b}_{re}\right)\left[Var\left(\hat{b}_{fe}\right) - Var\left(\hat{b}_{re}\right)\right]^{-1}\left(\hat{b}_{fe} - \hat{b}_{re}\right) \sim \chi_k^2 \qquad (6)$$

Where; $\hat{b}_{fe}$ and $\hat{b}_{re}$ are respectively the vectors of estimators of fixed effect and random models; k is the number of regressors.

The criteria for choosing the test:

If, H > χ_k^2 , H0 is rejected.

2.2 Database

For empirical analysis, it was built a panel with data from nine Latin American countries, eight from South America (Argentina, Bolivia, Brazil, Colombia, Chile, Paraguay, Uruguay and Venezuela) and one of North America (Mexico), in period from 1990 to 2010. The data collected were: index of democracy, GDP per capita, Gini index and illiterate population.

The democracy index represents the degree of democratic development, measured from one of two other indices that measure the level of political rights and another that measure the civil liberty. The indicator democracy ranges from 1 to 7, 1 being completely free and 7 is not free.

The GDP *per capita* (representing the average income of a country in a given period of time) and the rate of change in GDP (measured economic growth in a given period of time) are used here as indicators of the economic structure of each countries studied.

The Gini index measures the degree of income concentration, its value can theoretically vary from 0, when there is inequality (the incomes of all individuals have the same value), to 1, where inequality is

maximum (only one individual holds all income and the income of the company of all other individuals is null).

Illiterate population describes the percentage of people over 15 years of old who are not literate, i.e., the amount that people cannot read and write.

Therefore, the higher the GDP per capita and economic growth the greater will be the country's economic development. By contrast, a high GINI index and a high percentage of illiterate people reduce economic development.

The data sources[2] were Freedom House index (democracy), Economic Commission for Latin America (ECLAC) (GDP per capita and population illiterate), Organization for Economic Cooperation and Development (OECD) (Gini index) and Institute of Applied Economic Research (IPEA) (annual growth rate of GDP[3]).

2.3 Empirical Strategy

The empirical estimation strategy consists in applying the method of panel data. To obtain the results, the software STATA 10 was used. The analysis was the following: organization of data in panel form; estimation of fixed effects model, estimating the random effects model and to choose the best model the Hausman test was applied.

The variables were estimated with logarithmic specification, so the coefficients refer to the percentage changes. The estimated econometric model can be represented by the equation:

$$Ldemocracy_{it} = \beta_1 LpercapitaGDP_{it} + \beta_2 gini_{it} + \beta_3 illiterate_{it} + \beta_4 GROWTH_{it} + \mu_{it} \quad (7)$$

Where i represents the country and t represents time.

The variables, Gini and illiterate attempt to capture the impact of social structure and GDP per capita tries to capture the impact of average income and economic growth seeks to capture the performance of the economy on the democracy index. The expected relationships are:

Box 1 – Description of the variables used in the study

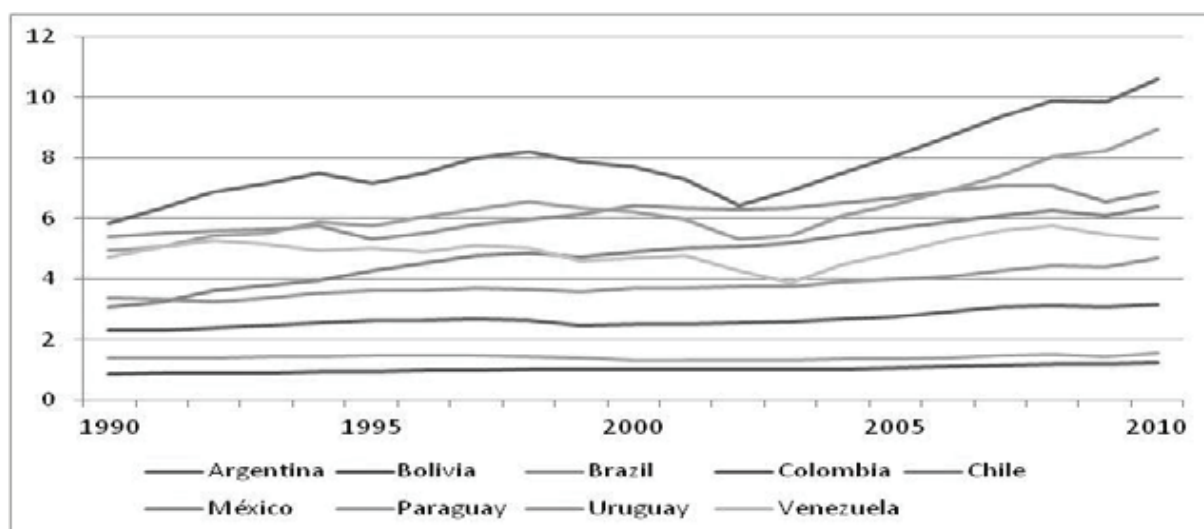| Variable	Relationship	Expected sign
GDP per capita	A high average income should increase the probability of stay and improve the quality of democracy.	Negative - Reduces the level of democracy.
Gini Index	A higher concentration of income should reduce the quality of democracy.	Positive - Increases the democracy index.
Illiterate population	A larger percentage of illiterate people should reduce the quality of democracy.	Positive - Increases the democracy index.
Economic growth	A higher growth of the economy to improve the quality of democracy, allow a democratic longevity.	Negative - Reduces the level of democracy.

Source: Authors`.

3 RESULTS

In this part of the work, the variables are analyzed descriptively, showing the evolution through time, variations and disparities between countries, noting also that the data is structured in panel, and covering the years 1990 to 2010. The results with the estimation of equation 2.5 are discussed, as well.
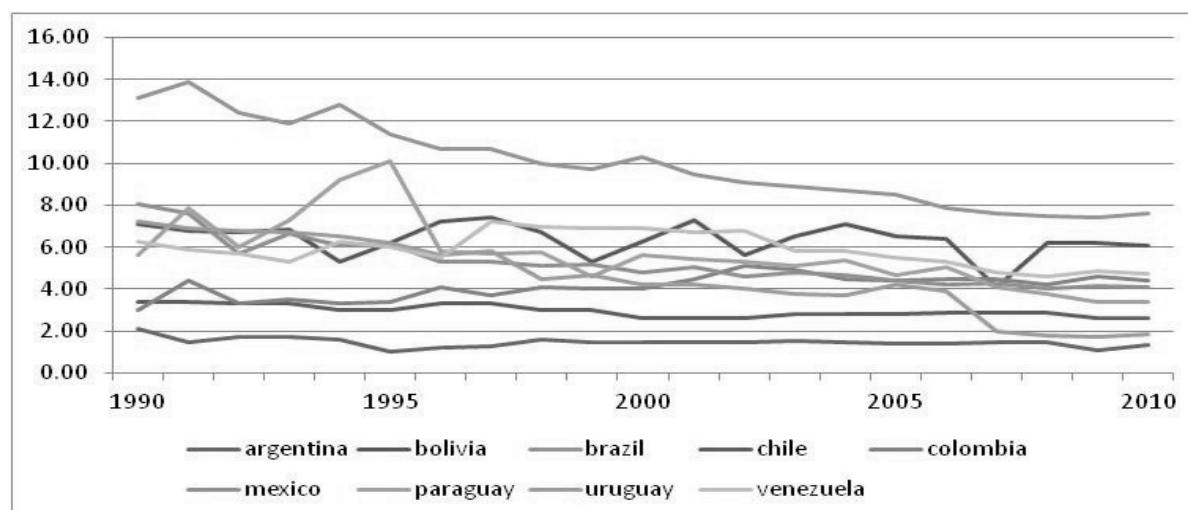
3.1 Analysis of descriptive data

The Evolution of Democracy Index in the last two decades occurred differently in the countries studied. They can be divided into two groups: one of the countries that have progressed in the sense that the indices obtained better through time, and the group of

Graphic 3 - Evolution of GDP per capita (in thousand U.S. $)

Source: Authors' calculations based on data from ECLAC.

Graphic 4 - Evolution of Urban Population Illiterate (over 15 years old) (in%)

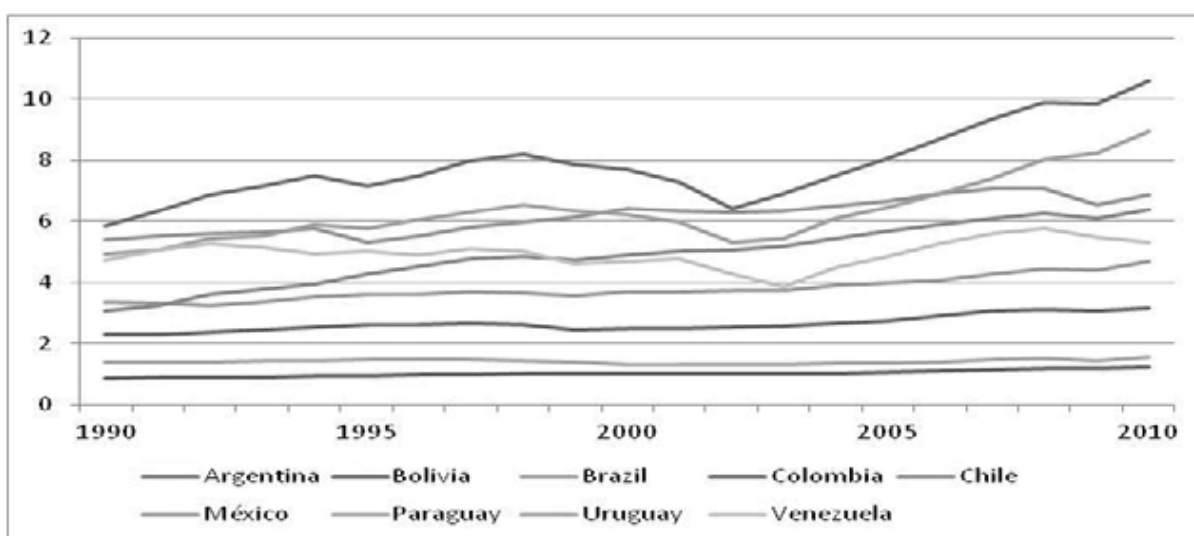**Source:** Authors' calculations based on data from ECLAC.

Table 1 below shows the descriptive statistics of all variables. It is observed that there are large fluctuations in the Gini index which has an average of 0.51 varying in a range of 0.4 to 0.6, that is, every country has a moderate degree of income concentration. The other results corroborate the information graphics showing large variations between countries. The differences between the minimum and maximum ones are very high indicating that there is significant heterogeneity among the countries studied.

Table 1 - Descriptive Statistics

Variable	Mean	Minimum	Maximum
Democracy	2.50	1.00	4.50
Per capita GDP	4700.00	869.85	10594.37
Growth Rate	0.003	-0.11	0.18
Illiterate	0.05	0.01	0.14
Gini	0.51	0.40	0.63

Source: Authors'.

Table 2 presents the correlation coefficient between the index of democracy and other variables. It is observed a linear association with moderate GDP per capita and

Graphic 3 - Evolution of GDP per capita (in thousand U.S. $)

Source: Authors' calculations based on data from ECLAC.

Graphic 4 - Evolution of Urban Population Illiterate (over 15 years old) (in%)

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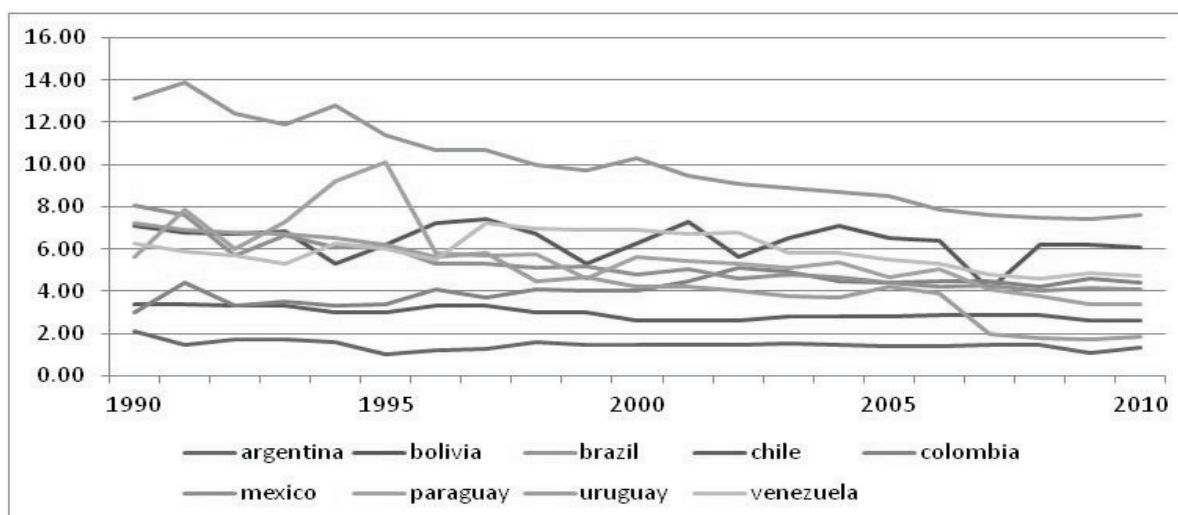
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the Gini coefficient, low linear association with the percentage of illiterate and extremely low with the growth rate of GDP.

Table 2 - Correlation Coefficient

	I Democracy
L. Democracy	1.0000
L.Per capita GDP	-0.3791
Growth Rate	-0.1029
Gini	0.2672
Illiterate	0.3191

Source: Authors'.

Although the coefficients are not high, the signs of the linear relationship are as expected, i.e., a negative relationship with GDP per capita and the growth rate and a positive relationship with the Gini coefficient and the percentage of illiterates.

3.2 Results Econometric

In **Table 3**, it is presented the results of the estimation of the model shown in Equation 2.5. In columns 2 and 3, it is presented the estimated coefficients models with fixed and random effects respectively. In column 1, it is shown the explanatory variables.

It is observed, by the Hausman test, that the model with fixed effects model is preferred to the random effects. Thus, it will be focused the observation and discussion about only the coefficients of the fixed effect model (column 2).

All coefficients (except the growth rate) had the expected sign and demonstrated to be significant from a statistical standpoint. The economic growth rate was the only variable insignificance of statistical viewpoint. Although this result contradicts the theoretical view, the empirical point of view was expected because the series have a negligible correlation. That is, the democracy index does not reflect the volatility of the growth rate of the study period.

The coefficient of the logarithm of GDP per capita captures the sensibility of democracy in relation to average incomes. Therefore, we have that a 1% change in average income reduces the rate of 0.64% on democracy. That is, a higher enrichment of the population via elevation of average income promotes an

evolution in democracy. This result suggests greater democratic stability in countries that have a higher average income.

Table 3 - Results of Estimations of Equation 3.5

Explanatory Variables	FE	RE
L.Percapita GDP	-0.6437***	-0.4417***
Growth Rate	0.1613	0.0520
Gini	3.5551***	4.1311***
Illiterate	0.7308**	0.6221
Constante	5.6015***	3.9772***
Teste Hausman Prob>chi2		0,0003
obs.	189	189
Groups	9	9
Prob>F	0,0000	0,0000
R² (within)	0,2388	0,2332

Source: Authors' calculations from the survey data. *, **, *** represents the level of significance of coefficient respectively 10%, 5% and 1%.

The coefficients of the Gini index and the illiteracy rate measures the relative variation of the index of democracy given an absolute change in the explanatory variables. In this way, the elasticity calculation gives the following results:

Table 4 - Calculation of Elasticities

Explanatory Variables	d(y)/d(x)
Illiterate	0.1829***
Gini	0.3775**

Source: Authors' calculations from the survey data. *, **, *** represents the level of significance coefficient respectively 10%, 5% and 1%.

Based on the results of the elasticities, it is noted that an increase of 1% in literacy rate increases the rate of 0.18% on democracy, i.e., it increases in the percentage of illiterate people reduces quality of democracy. Thus, countries with effective educational policies that reduce illiteracy have greater democratic stability.

In relation to Gini index, it is observed that a high degree of income concentration reduces the quality of democracy. An increase

of 1% in the Gini index increases the rate of 0.37% on democracy. Thus, the high concentration of income in Latin America has contributed negatively to the evolution of democracy and stability in the region.

4 CONCLUSION

In an incisive way, the econometric results corroborate the effects observed by correlation analysis, as well as, they confirm the relationship by preconceived theory.

A key indicator of economic development is the average income of the population and this indicator has a strong impact on democracy, lower middle income countries are more likely to establish an environment of democratic instability. Bolivia and Paraguay are among the countries studied, which have a low and constant average income throughout the period of study. So, they are more susceptible to negative shocks in their democracy.

A counterpoint to the growth of average income as a determinant of democratic development is the degree of concentration of income and literacy rate of the population. It was found that the higher the concentration of wealth is the worst indicator of democracy in the country. Therefore, the mere growth in average income is not able to maintain democratic stability.

That is, if there is growth in average income without their proper distribution among social classes that make up the society or not allowing people to have access to essential goods like education, cannot guarantee the development and/or democratic stability. Thus, policies to combat concentration of income and illiteracy have a positive impact on stability of democracy.

In the case of the countries studied, it was observed that, over the period studied, the degree of income concentration did not suffer major changes, which contributes negatively to the evolution of democracy and stability in the region.

The percentage of illiterate population has been declining sharply in all countries studied. And as it was noted, this reduction represents a positive development for democracy in the region.

Although, based on the data analyzed, it is not possible to identify an economic growth rate of relevance in determining the level of democracy, it can be underlined that economic growth (itself) is a pre-condition for improving the quality of life. Thus, the growth has a direct impact on income distribution and accessibility of people to essential goods like education.

Hence, it can be concluded that the evolution of democracy in the region is strongly influenced by economic development. That is, there is a subordination of democratic environment, the level of democratic stability toward economic development. The democratic stability permeates by binding policies to manage development. Countries with high levels of development are more likely to maintain democratic stability in their territory.

It is also important to emphasize that this work was limited to analyzing a small set of variables, and that the democratic environment suffers influences from a much larger number of variables not described in this article, such as institutional quality, rules, policies, external political and economic environment etc.. Another point to highlight is that the database is a strong restriction to the advancement of results and conclusions.

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NOTAS

[1] See Baltagi (2005) and Gujarati (2011).

[2] It is worth mentioning that the databases of the OECD
and ECLAC for the period studied did not contain the
complete series. Punctually, some observations were
estimated using the technique of geometric rate.

[3] GDP by the concept of Power Purchase Parity (PPP) at
constant prices.

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