DECOMPOSITION OF INTENSIVE AGGREGATE DEMAND AND REGIONAL INEQUALITY IN LATIN AMERICA

Evânio Mascarenhas Paulo[1]
Osmar Tomaz de Sousa[2]

ABSTRACT

This paper presents an empirical analysis on inequality in Latin America in the period from 2000 to 2014, using concentration measures and decomposition by components of aggregate demand. In the period as a whole, there was a -4.4% decrease in intracontinental intensive product inequality, indicating that the process of convergence between product by efficiency units of the Latin American countries is quite slow, given the long period. As for the decomposition, the study shows that the demand components linked to foreign trade have a dominant position in reducing inequality. Thus, the results offer little support for the neoclassical growth model – the income of the poorest countries did not grow faster than the income of the richest countries.

Keywords: Latin America; Structural Inequality; Aggregate Demand; Southern Common Market; Pacific Alliance.

JEL: O11, N16, O47

ABSTRATO

Este artigo apresenta uma análise empírica sobre a desigualdade na América Latina no período de 2000 a 2014, utilizando medidas de concentração e decomposição por componentes da demanda agregada. No período como um todo, houve uma redução de -4,4% na desigualdade de produto intensivo intracontinental, indicando que o processo de convergência entre produto por unidades de eficiência dos países da América Latina é bastante lento, dado o longo período. Quanto à decomposição, o estudo mostra que os componentes da demanda ligados ao comércio exterior têm posição dominante na redução da desigualdade. Assim, os resultados oferecem pouco apoio ao modelo de crescimento neoclássico - a renda dos países mais pobres não cresceu mais rapidamente do que a renda dos países mais ricos.

Palavras-chave: América Latina; Desigualdade Estrutural; Demanda agregada; Mercado Comum do Sul; Aliança do Pacífico.

[1] Doutorando do Programa de Pós-graduação em Economia – PPGE da Pontifícia Universidade Católica do Rio Grande do Sul – PUCRS; Email: evanio_paulo@hotmail.com

[2] Professor Doutor do Programa de Pós-graduação em Economia – PPGE da Pontifícia Universidade Católica do Rio Grande do Sul – PUCRS; Email: osmar.souza@pucrs.br

1 INTRODUCTION

The functional relationship between structural inequality and the process of economic and social integration and development in Latin America are phenomena of a complex nature whose connection sources can provide a valuable tool for organizing and planning integration, which in turn, when properly explained and applied in the form of common development actions, can strengthen the process of regional integration in Latin America, but above all, make it more solid, durable and especially inclusive.

The structural inequality understood here refers to the differences between the countries of the region in terms of magnitude of production, size and rate of population growth and technological stage. A deep asymmetry of these components can counteract and obstruct the process of integration and development of this region through the difficulties inherent to the coexistence of economies of dual systems within the same organization.

The studies to be developed from the ideas contained in this essay intend to create, through the analysis of aggregate demand decomposition, an algorithm that can be used as a parameter to measure the magnitude of the structural inequality between the Latin American countries and thus provide a dimension of the challenges to the continent's balanced integration. In order to analyze the aggregate demand decomposition and its effects by sources on the structural inequality among the countries of Latin America, we intend to develop and apply a calculation proposal to measure the coefficient of structural inequality per unit of labor efficiency from the results presented in Lerman; Yitzhaki, (1985), López-Feldman; Mora; Taylor, (2007) and An; Ortes (2009).

These studies have proposed a specific approach for the decomposition of inequality indexes by source, which allows the measurement and analysis of the marginal effects of various sources on total inequality. The study proposed here intends to develop the results contained in this set of research to measure and decompose the structural inequality of Latin American nations, using as a parameter the composition and participation of the aggregate income of each country in the total aggregate income of Latin America, in terms of unit of labor efficiency. Thus, we intend to create an algorithm that allows the dimensioning of existing asymmetries between the larger and smaller economies in the region.

Additionally, we intend to develop, based on the studies cited above, the decomposition of this algorithm of structural inequality by component of the aggregate demand. This would

allow us to understand how patterns of consumption, investment structure, public spending behavior and foreign trade relations influence (if they influence) the structural inequality of the different Latin American countries. And thus we will have a clearer picture of the challenges of balancing regional integration.

Therefore, the development of the study proposed here would contribute to the studies on regional integration by analyzing the specific case of Latin America, offering a perception of the framework of inequality between the economies of the region and its sub-regional spaces, through their decomposition by components of the aggregate demand, the dimensioning and contribution of each component in this framework, guiding regional integration actions.

Thus, this essay is divided as follows: in addition to this introduction, section two presents a brief theoretical framework that places the research in its most essential points and where the conceptual framework of the elements of this research is presented. In the following section, the construction and decomposition aspects of the inequality algorithm are presented. The following sections present the main conclusions, followed by their final comments.

2. FROM THE ORIGINS OF INTEGRATION TO CONTRADICTIONS OF REGIONAL EXPERIENCES IN LATIN AMERICA

The threshold of integrationist thinking in Latin America finds its origins in the attempt of a heterodox interpretation of underdevelopment, shared by the countries of the region. This awakening of ideals of cooperation was strongly marked by ECLAC readings and notions about the mode of operation of structures in the Latin American periphery. Another element that marked the model of regional integration in Latin America were the strategies to overcome this underdevelopment. These strategies were marked by the attempt to accommodate in forced industrialization by import substitution the actions to overcome the continental underdevelopment.

For this reason, as Braga (2002, p. 6) states, considering regional economic dynamics, dictated by industrialization through import substitution, “economic integration was seen [...] as an important part in this dynamic”, since the intensification of trade would play a double role in that it would contribute to industrialization and also create more efficient industrial organizations. This process, as the author points out, was “built from the use of economies of

scale in production, made possible by the expansion of markets and by the advantages of specialization".

The process of regional integration in Latin America is marked by several initiatives and circumscribed in multiple facets that lead to the enormous fragility of the geopolitical relations between the countries, with divergences ranging from ideological issues to frontier conflicts, environmental legislation, agrarian issues, among others. These same integration efforts have consolidated and advanced in the formation of organizations of geopolitical cooperation in Latin America, that is, transnational political entities with a minimum unity and organized institutional framework based on common principles and macro objectives in international relations and commercial and economic cooperation.

On the South American experience, for example, and its correlations with other similar arrangements in the continent and elsewhere, Messias (2009, p. 4) states that:

> Considering the basic characteristics of its initial format and its current development, this regional arrangement model is the only project on this scale that seeks to reproduce in its general aspects the European experience, in which the greatest ambition of its member states has always been to combine the maximum of economic integration with a macro-political concertation of a transnational nature.

The lack of regional territory convergence with different levels of economic development is one of the main challenges to the economic, social and geopolitical integration contained in the proposals of supranational cooperation agreements, as in the case of USAN. This difficulty is due to the diffuse and confusing rules by which the benefits of integration and cooperation would be shared among the different territories that it proposes to integrate. Pereira (1997, p. 7), in his studies on economic integration and regional differences for the European Union, points out that "it is possible to sustain, based on historical experiences and theoretical arguments [...] that economic integration could benefit essentially the already evolved territories, emphasizing the superiority of their level of economic development over backward territories".

This emphasis on the idea of superiority of developed territories over those still under development is because the benefits of integration can be redistributed in favor of the richer territories that generally have more attractive competitive advantages and a more organized institutional environment,[3] which reinforces regional inequalities and constraints the

[3] This unequal distribution of the gains from economic integration is a consequence of the formation of economies of scale, competitive difficulties of the least developed countries and agglomerative tendencies manifested in labor and capital movements that tend to be redistributed in favor of the countries regionally more developed.

convergence of development patterns with structural imbalances, which in turn hamper integration, culminating in the failure/delay of actions in this direction.

No single integration region can be considered to have a fully integrated economy as long as significant disparities persist between the living standards and development of the constituent regions. In this sense, Pereira (1997, p. 7) points out again that:

> This statement shows the dual problem that many less developed regions face: lower per capita income and productivity growth rates that are inadequate to reduce regional disparities. Lower per capita incomes alone would not give rise to concerns if a higher rate of growth were to act in order to reduce regional disparities. Likewise, lower than average growth rates would not be considered undesirable if the region had higher per capita incomes than average.

From these considerations on per capita income, one can understand how they can help to understand income differentials between different spaces and that the greater these differences, the greater the integration effort of the regions in question. Another important assertion has to do with how the sources of per capita income levels can influence these differences, namely that per capita income is formed by the sum of several other sources of income. Thus, understanding how each of them influences the per capita income differences between regions can be a great aid to the planning of actions aimed at integration.

Thus, the existence of economic-structural dissymmetry would, in and of itself, be an important difficulty for the solid and balanced integration of the continent. However, contradictory interests and internal disputes over power and influence create less well-articulated regional experiences with inefficient institutionalism that present additional difficulties to this process. Latin America currently has two institutional arrangements for economic, commercial, and political cooperation – Mercosur, which currently covers five countries (Argentina, Brazil, Paraguay, Uruguay, and more recently Venezuela), and in a framework in which they have been agreed upon and operated, the most important mechanisms regulating the configuration of a broad and diversified set of cooperative relations, and the recent Alliance of the Pacific, which brings together countries such as Chile, Colombia, Mexico, Peru and Costa Rica – which has undergone a fortification in its institutional structure and includes objectives such as free trade and integration with a clear orientation towards Asia, according to (MESSIAS, 2009).

The objectives of integration and cooperation are common to both models. However, Fiori and Padula (2016, p. 539) observe contradictions between these proposals that transform South America, and more broadly Latin America, “into a space of competition between two

projects of economic integration, and of political hegemony: that of the Mercosur, led by Brazil and Argentina, and of the Alliance of the Pacific, bringing together Colombia, Peru and Chile, alongside Mexico, and supported by the United States".

Furthermore, Messias (2009, p. 10) says: "The asymmetries of power and economic development within Mercosur itself and Latin America are more pronounced, and they are now the main cause of their fragility. And this is reflected not only in terms of indicators such as disparities between national domestic products or the average incomes of their populations, "regional differences are also expressed in political, social and ideological crises that weaken and delay actions of integration and regional cooperation. Another factor associated with the difficulty of forming a process of solid integration of institutions in the region is the configuration of international geopolitical power relations such as the US presence in countries like Chile, Colombia and Peru and more discontented members of Mercosur like Paraguay and Uruguay, hindering the more rapid and effective consolidation of continental integration.

In addition to the formation of sub-regional economic and trade blocs such as Mercosur and the Pacific Alliance, the articulations of bureaucratic bodies at higher scales should be noted, with the formation of supranational bodies such as the structuring and consolidation of the Union of South American Nations (USAN) and also the older Latin American Integration Association (LAIA), that have contributed to the construction of initiatives for the integration and affirmation, even if little established, of a Latin American unity and sub-regional spaces. However, as we point out later in the results section, the multiple differences between countries in the region present a major challenge to the formation of these structures. Here is the importance of this research, clarifying some points about the dimensioning of some of these hiatus.

For this reason, the accounting of aggregate demand, in the modality proposed in this research, and its component decomposition, would help us understand the distribution and configuration of the total demand structures of the commercial production of goods and services in Latin America, which would provide, in turn, a panorama of the configuration of regional inequalities and contradictions and, therefore, a dimension of the efforts to the integration of the continent and its subspaces.

3. FROM CONCEPTUAL ASPECTS TO METHODOLOGICAL STRUCTURE

As noted in the previous section, understanding of the composition and distribution of per capita income can provide an indication of the structural disparities between the economies of Latin America. Therefore, this section seeks to form a passive concept of operationalization of aggregate per capita income and indicate an algorithm for its decomposition by its sources. This effort starts with the equation of the basic identity of aggregate demand, which can provide a good parameter for this purpose. Thus, our analysis starts with the following equation:

$$Y = C + I + G + X - M \qquad \textit{Eq. 01}$$

Where Y corresponds to total aggregate income in Latin America; C represents aggregate consumption; I represents the total gross capital formation; G represents government expenditure and X are the exports, and finally, M are the imports. One problem is immediately posed: the simple composition and comparison of the aggregate demand of the different Latin American economies is not sufficient to discriminate the structural differences between the countries since the absolute magnitude of each economy says nothing about productivity and efficiency, which would require a relativized approach.

A more efficient model would be its version in terms of unit of labor efficiency as described in Solow (1957). This version of aggregate demand relativizes the effects of the magnitude of economies and ponders aggregate demand in terms of population size, knowing that the population grows at a rate of population growth n such that, by normalization, population size in the period of 0 to 1, we have that: $L(t) = e^{nt}$ is the population size at date t. This parameter was obtained from the growth rate of the population actually occupied in each country. In addition, aggregate demand is also weighted by the technological level of countries, where the technology stage grows at a rate g and, once again, such that $A(0) = 1$, the level of technology at time t is given by: $A(t) = e^{gt}$. This parameter was obtained from the growth rate of total factor productivity. Thus, equation 1, when divided by population size and technological stock in each period would have the following format:

$$y = c + i + g + x - m \qquad \textit{Eq. 02}$$

Where each element of equation 2 corresponds to its congener of equation 1, only now in terms of unity of labor efficiency. Thus, the distribution of aggregate demand formation per unit of

labor efficiency would provide an operational and relativized parameter with which to measure the structural differentials of the economies of Latin America and analyze its Gross Domestic Product according to the technological stock and population of each country.

Since aggregate demand in Latin America is the sum of the aggregate demand of each country in the region, a concentration algorithm can be obtained based on the specific methodologies of income distribution. In this case, total income would correspond to the total aggregate demand per unit of labor efficiency in Latin America. Thus, suppose that X_i is the aggregate demand of the i-th country in a total of n countries and that aggregate demand per unit of labor efficiency is ordered in a way that $X_1 \leq X_2 \leq ... \leq X_n$. Since the mean is given by $\mu = \frac{1}{n}\sum_{n=1}^{n} X_i$ and adding the countries of the poorest to the i-th position in the series, the cumulative proportion of countries will be $p_i = i/n$ and their cumulative proportion of aggregate demand per unit of labor efficiency will be $\Phi = \frac{1}{n\mu}\sum_{j=1}^{i} X_j$. The index of concentration, called here the Structural Inequality Index (SDI), is defined as:

$$SDI = 1/n \sum_{n=1}^{n-1} (P_i - \Phi_i) \qquad \textit{Eq. 03}$$

This indicator, as well as those indicators of traditional income inequality, varies between 0 and 1, being therefore the case where 0 would correspond to a situation where the level of aggregate demand per unit of labor efficiency of all Latin American countries would be the same; and 1 would be the case where only one country would respond for the total formation of aggregate demand in Latin America. This coefficient associates the area between the Lorenz curve and the line of perfect equality, so that the larger this area – the more elongated the inequality curve – the greater the observed inequality.

In addition, since aggregate demand per unit of labor efficiency is a direct sum of consumption, investment, public expenditures and net exports, it is possible through the decomposition analysis, developed in the results of Lerman; Yitzhaki, (1985), López-Feldman; Mora; Taylor, (2007) and An; Ortes (2009) to decompose the marginal effects of each component of aggregate demand on the Structural Inequality Index. Thus, it would be possible to understand how an increase in consumption per unit of labor efficiency would impact the inequality between the countries of the continent or how the patterns of investment affect this inequality and in turn regional integration.

Thus, a decomposition algorithm could be obtained through the basic derivation of the Structural Inequality Index of aggregate demand for Latin America. The formula for the mean difference of the inequality index is given by:

Eq. 04

$$A = \int_a^b F(y)\,[1 - F(y)]\,dy$$

Assuming that y represents total aggregate demand per unit of labor efficiency, a the product per capita of the poorest country, b the per capita product of the richest country and F the cumulative distribution of aggregate demand. Using integration by parts, with $u = F(y)\,[1 - F(y)]$ and $v = y$, we have:

Eq. 05

$$A = \int_a^b y\,[F(y) - 1/2]\,f(y)dy$$

By transforming the variables, defining $y\,(F)$ as the inverse function of $F\,(y)$, we obtain:

$$A = 2\int_0^1 y(F)(F - 1/2)\,dF \qquad \textit{Eq. 06}$$

Note that F is a function evenly distributed between $[0, 1]$ whose mean is 0.5. Thus, we can write equation 6 like this:

Eq. 07

$$A = 2\mathrm{cov}\,[y, F(y)]$$

Dividing (4) by the average aggregate demand per unit of labor efficiency, m, we will have the conventional Gini coefficient commonly associated with the income distribution analysis. Suppose, further, that $y_1, \ldots, y_k$ represents the components of aggregate demand. Then, using the property of covariance and $y = \sum_{k-1}^{k} y_k$, we can write:

$$A = 2\sum_{k=1}^{k} \mathrm{cov}[y_k, F] \qquad \textit{Eq. 08}$$

Where $cov\,[y_k, F]$ is the covariance of the aggregate demand component k with the cumulative distribution of the total aggregate demand. Dividing (5) by m (obtaining the relative Gini) and multiplying and dividing each component k by $cov\,[y_k, F_k]$ and by m_k we have the decomposition by aggregate demand components:

Eq. 09

$$IDF = \sum_{k=1}^{K} \left[\frac{\mathrm{cov}\,(y_k, F)}{\mathrm{cov}\,(y_k, F_k)}\right]\left[\frac{2\,\mathrm{cov}\,(y_k, F_k)}{m_k}\right]\left[\frac{m_k}{m}\right]$$

From where we rewrite:

Eq. 10

$$FII = \sum_{k=1}^{K} S_k G_k R_k$$

Where R_k is the correlation of the concentration between the component k of the aggregate demand and the total aggregate demand, G_k is the relative concentration of the component k and S_k is the share of the component in total aggregate demand. These are parameters with which we can define the types of progress and regress of the sources on the concentration of income.

On the component concentration correlation, k, Lerman and Yitzhaki (1985, p. 152) say that:

> The Gini correlation (R) has properties similar to Pearson's and the rank correlations. Like both, the Gini correlations ranges between -1 and +1, but will take on more extreme values then Pearson's. A monotonically increasing (decreasing) function will yield a value of + 1 (- 1). Thus, R will equal 1 (- 1) when an income source is an increase (decrease) functions of total income. When the income source is a constant, then R equal to 0 implying that the source' share of Gini is equal to 0. As such component raise their share total income, overall inequality will fall.

In addition, the study of decomposition of any inequality index can provide an explanation of how a change in a particular component of aggregate demand, as in this case, affects the level of total inequality. Thus, consider a change in some component of the aggregate demand, k, equal to ey_k is close to 1. From (7), we can derive an expression for partial derivative of the total structural inequality with respect to the percentage change, e, and in source k that will be, therefore: *Eq. 11*

$$\partial FII / \partial e_k = S_k (R_k G_k - FII)$$

Thus, the advantage of this methodology would be to understand how a percentage change in levels of consumption, investments, public sector expenditures and net exports affect the structural inequality among Latin American countries, thus providing a perception of how aggregate demand distribution by source and between the countries of the continent impact the structural differences between them.

Finally, the data refer to a set of selected Latin American countries,[4] for which the series of Gross Domestic Product and components of aggregate demand compiled by the Penn World Table were used, according to the suggestions of Gomes; Pessôa; Veloso (2003).

4. FROM THE ACCOUNTING OF THE AGGREGATE DEMAND TO INEQUALITY MEASURES

In the table below, we find the coefficients of inequality between Latin American countries in terms of unit efficiency for the years 2000 and 2014, as well as their respective robustness statistics, by which we can infer that the results are consistent with the statistical point of view. In the period as a whole, there was a decrease of 4.4% in intracontinental intensive product inequality, signaling that the process of convergence between product by efficiency units of the Latin American countries is quite slow. This empirical result is corroborated by the findings of Dobson and Ramlogan (2002), who show that there is no evidence of a narrowing of income dispersion between countries in the 1990s. As for the most recent context of the first decade of this century, studies with Dabús; Delbianco; Zinni (2014) also show that there is no evidence of absolute or even conditional convergence in Latin America.

Table 1
Latin America – inequality on intensive product – 2000/2014

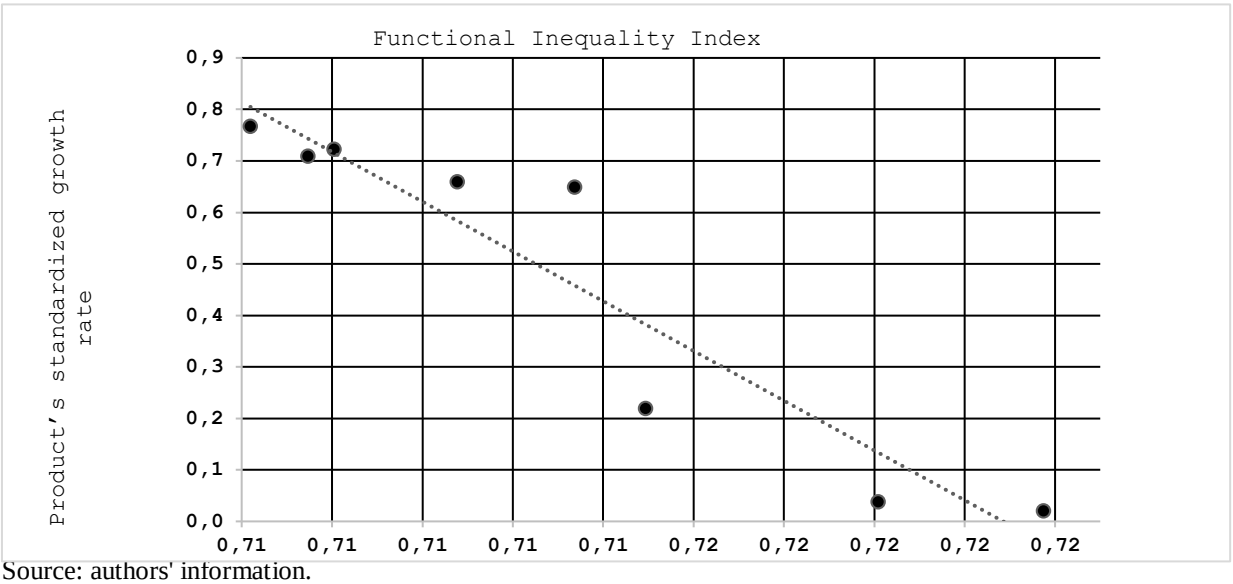
Statistic/Year	Inequality Index	Standard Error	Statistic t	p-value
2000	0.2697	0.03	7.99	0.0000
2001	0.2668	0.03	7.84	0.0000
2002	0.3529	0.09	3.73	0.0014
2003	0.2882	0.04	7.06	0.0000
2004	0.2717	0.03	7.78	0.0000
2005	0.2819	0.04	6.84	0.0000
2006	0.2986	0.05	6.15	0.0000
2007	0.2768	0.04	6.82	0.0000
2008	0.3074	0.06	5.09	0.0001
2009	0.2406	0.03	8.14	0.0000
2010	0.2868	0.05	5.50	0.0000
2011	0.2609	0.04	5.96	0.0000
2012	0.2533	0.04	6.58	0.0000
2013	0.2585	0.04	7.37	0.0000
2014	0.2579	0.03	7.52	0.0000

[4] Argentina, Bolivia, Brazil, Barbados, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Peru, Paraguay, Trinidad and Tobago, Uruguay, Venezuela. The main selection criterion for the countries was the presence of a series of complete data that could be analyzed.

Source: authors' information.

These studies address the problem in terms of per capita product, however, the results found by this test show that signs of non-convergence also appear in terms of product per unit of efficiency. Thus, technological progress in Latin American countries did not appear to have materially affected intraregional inequality for the period considered. Therefore, there is no evidence of alignment in relation to regional average behavior also in terms of effective product. In addition, Latin American intraregional asymmetries still profoundly mark the countries of the region, with their structural inequality superior to other blocks of countries where integration initiatives are underway.

However, inequality among Latin American countries seems to have a strong sensitivity to the growth rate, especially for the period 2000-2008, as can be seen in the figure below, which shows an inverse relationship between the economic growth rate and structural inequality. Thus, the period of greatest growth at the beginning of this century has effectively contributed to a reduction of regional inequality, as can be seen in these data. However, this relationship is not strongly characterized in the period 2009-2014. The intensification of the financial crisis of the end of 2008 and the low growth, followed by a greater volatility of the product that marks this phase of the economy of Latin America, inaugurates a period of deepening of the inequality, interrupted only in 2012 (table 1). For this reason, as described by Dobson and Ramlogan (2002), the results offer little support for the neoclassical growth model – the income of the poorest countries did not grow faster than the incomes of the richest.



Source: authors' information.

Figure 1: Latin America - Regional inequality against rate of product growth.

Table 2 shows the plots of each component of the intensive aggregate demand in the total product per capita. On the intensive aggregate consumption there was a slight increase of 0.9% of this source in the formation of the total product, same trend of the public expenditures per unit of labor efficiency, that increased its participation in about 1%. As for intensive investments, there was a slight reduction of this component in the total aggregate demand from 22.7% to 22.6%. However, the greatest variations occurred in the foreign trade components of the aggregate demand. Something that draws attention is the loss of participation of the intensive exports whose reduction was of 5.8% during this period, in contrast to the imports that increased their participation in the formation of intensive aggregate demand in about 4%. This indicates a shift in Latin American foreign trade patterns with a tendency for trade balances to deteriorate, given the greater effectiveness of imports in terms of their ability to increase their share of aggregate product in the countries surveyed. As will be shown later, Latin American foreign trade behavior patterns will be decisive in explaining the structures that mark regional inequality.

Table 2
Latin America – participation of components on the intensive product – 2000/2014

Source/Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Consumption	0.71	0.72	0.72	0.70	0.70	0.69	0.66	0.68	0.67	0.72	0.67	0.68	0.71	0.71	0.68
Investment	0.19	0.20	0.18	0.20	0.20	0.22	0.22	0.23	0.24	0.20	0.21	0.24	0.24	0.23	0.23
Expenditures	0.16	0.17	0.15	0.15	0.14	0.14	0.13	0.14	0.14	0.16	0.16	0.16	0.16	0.15	0.16
Exports	0.20	0.19	0.18	0.21	0.24	0.26	0.31	0.27	0.29	0.21	0.24	0.27	0.24	0.23	0.22
Imports	-0.26	-0.29	-0.23	-0.25	-0.28	-0.31	-0.32	-0.31	-0.34	-0.29	-0.29	-0.35	-0.34	-0.32	-0.29
Total [∑]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Source: authors' data.

The data contained in Table 3 allow us to typify aggregate demand components in relation to their role in the evolution of structural inequality in Latin America. In addition, according to the chosen decomposition method, aggregate demand components whose concentration ratio is higher than the inequality index for the total intensive product (shown in the last line of table 3) are classified as regressive, in other words, contribute to inequality. Complementarily, those relations of concentration of which the components of the intensive demand are smaller than the index of total inequality make it possible to classify the corresponding components as progressive, thus contributing to the reduction of inequality.

As for consumption, investment, and public sector expenditures, these sources alternate their relationship between progress and regress over the period, that is, they both help to reduce inequality and contribute to its increase. On the other hand, intensive exports are always regressive, and as far as imports are concerned, they appear to be heavily regressive at the beginning of the period, as well as exports, and gradually become progressive over the years under analysis. Once again, this information helps to reinforce the idea that foreign trade patterns tend to contribute to a deepening of intra-regional inequalities in Latin America, whether due to the different capacities and patterns of competitiveness of the countries in foreign trade and/or that these components are more volatile in aggregate demand formation.

Thus, this tendency to deepen the inequalities must be somehow neutralized by the other components of the basic identity of the national income of Latin American countries. This is something that the evidence seems to indicate, given the trajectory of reduction of the intracontinental inequality index, but in a rather asymmetric way and only partially, since the index presents a certain oscillation and a modest reduction throughout the period (Table 1). However, the volatile and regressive behavior of Latin American foreign trade certainly delays this tendency towards convergence and reduction of inequalities, hindering the prospects, at least in the short term, of a corresponding response of the actions towards promotion of regional integration. In a way, this result complements the findings in studies such as Dobson and Ramlogan (2010), Dabús, Delbianco and Zinni (2014) and many others that show that there is no convergence in Latin America, in the sense that this lack of convergence seems to be strongly linked to regional patterns of foreign trade. Of course, these data need to be analyzed in a more detailed and atomized way.

Table 3
Latin America – concentration of comsponents in the intensive product – 2000/2014

Source/Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Consumption	0.28	0.27	0.35	0.26	0.24	0.22	0.22	0.21	0.24	0.22	0.21	0.18	0.19	0.19	0.21
Investment	0.25	0.25	0.27	0.28	0.28	0.33	0.30	0.27	0.29	0.23	0.29	0.25	0.26	0.26	0.27
Expenditures	0.29	0.34	0.35	0.32	0.29	0.29	0.30	0.27	0.31	0.29	0.30	0.27	0.23	0.23	0.23
Exports	0.37	0.35	0.42	0.49	0.47	0.51	0.55	0.49	0.49	0.35	0.44	0.43	0.32	0.32	0.27
Imports	0.38	0.37	0.32	0.38	0.39	0.38	0.39	0.31	0.31	0.30	0.24	0.23	0.16	0.14	0.14
FII	0.27	0.25	0.23	0.25	0.25	0.26	0.27	0.27	0.28	0.24	0.24	0.25	0.26	0.26	0.25

Source: authors' data.

Finally, this stage ends with Table 4, that decomposes the variation of the inequality – $\Delta G = -0.017$ – in the period by each aggregate demand factor and by the effect composition and concentration effect. In addition, by composition effect, we understand that that occurs when there is a change in the proportions of the component in the total effective product (Table 2), and by concentration effect, the contribution of the reduction of inequality of the component between the countries. As a first observation, we note that the concentration effect represents 112.71% of all variation, and the composition effect represents -12.71%. Here we have already noted that the latter's relevance to the reduction of inequality is smaller, in modulus, in relation to the concentration effect, because gross changes in the patterns of participation of the components in aggregate intensive demand are not fully identified, which causes the composition effect to be smaller. Therefore, the impact of the concentration effect is expected to be lower, as is indeed observed. In addition, since exports and imports correspond to the largest variations in the Latin American aggregate demand of the period (Table 2), these two components have a greater weight on the composition effect, with the remaining components in the aggregate demand more stable and, therefore, with a lower composition effect.

First, intensive consumption – a component with greater participation in aggregate demand in Latin America – and government spending had a net contribution towards reducing the inequality of 429.48% and 82.73% respectively, it should be noted that these sources are of the progressive type. However, consumption reduced its share of effective aggregate demand – which contributes to increasing inequality through the composition effect by 5%. In addition, this effect was more than compensated by the reduction of inequality in this specific source – a reduction of 21.6% according to the table 2 – which resulted in a dominant concentration effect of 434.48% and led to the net effect presented. With regard to public spending, there was no change in the share of this source in the regional intensive aggregate demand that results in zero composition effect. However, the reduction of -5.6% in the inequality of a progressive source resulted in a reduction of total inequality.

Intensive investments contributed to increase total inequality by 37.29%. However, its composition effect at 1.51% contributed to reducing inequality, since it is a progressive source that increased its share in Latin American intensive income. Nonetheless, once again, the concentration effect was dominant and, as the distribution of intensive investment worsened among the countries of the region, this led to an increase in total inequality. Therefore, this

result shows that policies that promote investments, with a balanced distribution, have a significant impact on the reduction of regional asymmetries.

Thus, as intensive investment patterns tend to converge, which is not happening among Latin American countries, inequality tends to decline more sharply given its progressiveness. In the case of Latin America, further studies should be carried out to identify the pattern of inequality in regional intensive investment. Here it can only be said that it increased by 12.0%, however, the paths taken to reach this reduction are not perceived in this essay and can have many causes, such as being motivated by the reduction of investment capacity of the poorest countries relative to richer countries, or by the more intense loss of this investment capacity by the richer countries, motivated by the recent crises that many of the main countries of the continent face, something that seems to better explain the Latin American context, however, these relations are not detailed in this essay.

Table 4
Latin America – decomposition of inequality by components of the intensive product – 2000/2014

Period	Source Aggregate Demand	Effect Composition	Effect Concentration	Total Effect
2000-2014	*Consumption*	-5.00	434.48	429.48
	Investment	1.51	-38.80	-37.29
	Expenditures	0.00	82.73	82.73
	Exports	-8.25	183.81	175.56
	Imports	-0.97	-549.51	-550.48
	Total	**-12.71**	**112.71**	**100.00**

Source: authors' data.

Next, in our analysis, we will arrive at the case of intensive exports whose total contribution on inequality was 175.56% in order to reduce it. However, since exports are a regressive source, as previously mentioned, and increase their share in the effective product, their concentration is in the sense of increasing inequality. On the other hand, the concentration effect is positive, since the concentration of this source reduced by 18.1%, contributing to the reduction of total inequality. Finally, intensive imports are the component of aggregate demand that has contributed most to increasing inequality and promoting divergent incomes in the region. Both their composition effect (-0.97%) and concentration effect (-549.51%) are in the sense of increasing inequality and this one also has the greatest total effect, in module, among the components of the intensive aggregate demand.

Thus, different trade capacities and different patterns of competitiveness tend to increase regional inequality, whereas when these patterns become more symmetrical, convergence tends to make itself felt more intense and to occur at a faster rate. Thus, the hypothesis of non-convergence put forward in the literature seems to be linked to the continent's foreign trade patterns, especially imports, which contributes heavily to increasing regional inequalities, as already demonstrated. In addition, the path to desirable convergence would certainly entail trade policy actions in these countries. However, the best scenario would be the promotion of a balanced trade, in which the lower income countries tend to increase their capacity and effective competitiveness at a faster rate than the rich ones, to increase their protagonism and dynamism in foreign trade, which allows convergence at a higher level of trade and per capita income. The contrary, when the richest countries of the continent lose competitiveness and capacity, would not be desirable, since in this case convergence would also tend to exist, but in a lower pattern of trade and per capita product.

Thus, intensive trade balances of countries tend to contribute to the increase of regional inequality, and in an even more volatile way, since these sources are traditionally the ones with greater volatility in aggregate demand. With an additional note, this effect of foreign trade on inequality is partially offset by the other components of aggregate demand, in addition to the effect of the improvement in the distribution of intensive exports. Thus, the paths leading to greater or lesser regional inequality are defined, in the components of greater instability (imports and exports), however, they are partially compensated by those with greater stability, with public consumption and expenditures to play some central role in these paths that in general still allow a reduction in inequality, but are insufficient to characterize a deep convergence project.

5. AN EXTENSION OF THE RESULTS OF LATIN AMERICAN SUBSPACES

The results treated in this section address the analyzes for selected regional subspaces. The aim, then, is to observe how the inequality plot is configured in regionalized integration spaces and confront them with the results for the general Latin American case. It begins with the estimates of the decomposition of the inequality variation for the Southern Common Market, a consolidated integration initiative in the region. For this subspace, the variation of the inequality index was $\Delta G = -0.0661$ which corresponds to a reduction of 28.2%, according to

table 2 of appendix A1: 11. It is noteworthy, therefore, that the result of reducing inequality is much more intense among the Mercosur countries – Argentina, Brazil, Paraguay, Uruguay and Venezuela – than for Latin America as a whole. Thus, the convergence to a more symmetric pattern of income per unit of efficiency between them is much more intense and rapid than in the general case. This result corroborates those found by Camarero; Flowers; Tamarit (2003) who identified a process of convergence of per capita income among the Mercosur countries.

Table 4
Southern Common Market – decomposition of inequality by components of the intensive product – 2000 /2014

Period	Source Aggregate Demand	Effect Composition	Effect Concentration	Total Effect
2000-2014	*Consumption*	-0.41	63.79	63.38
	Investment	-0.47	18.08	17.61
	Expenditures	-2.65	-14.17	-16.82
	Exports	1.12	-10.50	-9.37
	Imports	5.98	39.22	45.21
	Total	**3.58**	**96.42**	**100.00**

Source: authors' data.

On the breakdown of inequality variation, as in the case of Latin America, consumption and foreign trade, especially imports, played a more prominent role in reducing sub-regional inequalities in Mercosur. However, one important difference appears in the influence of foreign trade on inequality. In the case of Mercosur, imports contributed to reducing the asymmetries, unlike Latin America[5]. This is because imports were a progressive source, in the case of Mercosur (see appendix A1: 11), and there was a reduction in the concentration index of this source. Thus, both its composition and concentration effects were positive.

Table 5
Pacific Alliance – decomposition of inequality by components of the intensive product – 2000/2014

Period	Source Aggregate Demand	Effect Composition	Effect Concentration	Total Effect
2000-2014	*Consumption*	1.28	18.66	19.93
	Investment	-1.60	72.35	70.74
	Expenditures	0.09	-1.69	-1.59
	Exports	6.90	-4.33	2.57

[5] It may be important to emphasize that the methodology does not establish relations of conditionalities between inequality and the sources of aggregate demand. If a source contributes to reducing or increasing inequality, this depends only on the variation of the share of the source of the total income and the variation of the index of concentration of the source, without, therefore, functional relation with the inequality.

	Imports	2.29	6.06	8.35
	Total	**8.95**	**91.05**	**100.00**

Source: authors' data.

The results found in Table 5 refer to the case of the Pacific Alliance countries – Chile, Peru, Costa Rica, Mexico and Colombia. Among these countries, the inequality index decreased by 11.1%. In addition, on the decomposition of the inequality index, as in previous cases, consumption plays a prominent role. However, intensive investments were the component of aggregate demand with greater weight on the reduction of inequality. The consolidation of this source has contributed progressively to this, as can be seen in Appendix A1: 22.

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APPENDIX A1:11

Table 1
Southern Common Market – aggregate demand share of each component 2000/2014

Source/Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Consumption	0.64	0.67	0.66	0.65	0.65	0.64	0.67	0.67	0.65	0.70	0.63	0.65	0.67	0.66	0.65
Investment	0.19	0.19	0.15	0.16	0.19	0.18	0.20	0.21	0.23	0.19	0.21	0.22	0.21	0.21	0.20
Expenditures	0.15	0.14	0.13	0.13	0.12	0.11	0.11	0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.15
Exports	0.17	0.15	0.15	0.17	0.18	0.22	0.20	0.19	0.22	0.16	0.20	0.21	0.19	0.19	0.17
Imports	-0.14	-0.14	-0.09	-0.11	-0.13	-0.15	-0.19	-0.19	-0.21	-0.18	-0.17	-0.20	-0.20	-0.19	-0.17
Total	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

Source: authors' data.

Table 2
Southern Common Market – reasons for concentration of each component and inequality 2000/2014

Source/Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Consumption	0.25	0.25	0.43	0.23	0.14	0.09	0.08	0.14	0.17	0.20	0.24	0.11	0.18	0.17	0.19
Investment	0.23	0.18	0.32	0.21	0.13	0.16	0.13	0.18	0.25	0.16	0.28	0.15	0.14	0.12	0.12
Expenditures	0.18	0.21	0.37	0.20	0.09	0.15	0.07	0.11	0.21	0.16	0.27	0.11	0.09	0.10	0.10
Exports	0.17	0.10	0.35	0.18	0.11	0.39	0.18	0.17	0.36	0.10	0.37	0.24	0.10	0.11	0.06
Imports	0.15	0.09	0.21	0.22	0.05	0.05	-0.07	-0.02	0.04	0.02	0.05	-0.04	0.03	-0.04	0.03
Total	0.23	0.23	0.41	0.21	0.14	0.18	0.14	0.18	0.26	0.20	0.31	0.18	0.17	0.18	0.17

Source: authors' data.

APPENDIX A1:22

Table 1
Pacific Alliance – aggregate demand share of each component 2000/2014

Source/Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Consumption	0.68	0.68	0.70	0.70	0.69	0.67	0.65	0.65	0.67	0.66	0.65	0.65	0.66	0.66	0.61
Investment	0.20	0.20	0.21	0.21	0.21	0.22	0.23	0.23	0.25	0.20	0.22	0.23	0.24	0.23	0.20
Expenditures	0.14	0.13	0.13	0.13	0.12	0.12	0.12	0.13	0.14	0.15	0.16	0.17	0.16	0.16	0.16
Exports	0.22	0.21	0.21	0.20	0.23	0.25	0.28	0.27	0.24	0.22	0.24	0.25	0.25	0.24	0.26
Imports	-0.24	-0.23	-0.25	-0.24	-0.25	-0.26	-0.28	-0.28	-0.30	-0.24	-0.28	-0.30	-0.31	-0.30	-0.24
Total	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

Source: authors' data.

Table 2
Pacific Alliance – reasons for concentration of each component and inequality 2000/2014

Source/Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Consumption	0.16	0.17	0.18	0.15	0.22	0.19	0.22	0.18	0.13	0.13	0.15	0.12	0.15	0.15	0.15
Investment	0.26	0.26	0.21	0.17	0.24	0.26	0.26	0.20	0.13	0.18	0.17	0.15	0.21	0.17	0.15
Expenditures	0.17	0.18	0.21	0.18	0.23	0.18	0.21	0.19	0.18	0.18	0.22	0.21	0.21	0.20	0.21
Exports	0.27	0.31	0.31	0.28	0.33	0.34	0.39	0.34	0.23	0.29	0.26	0.20	0.26	0.26	0.24
Imports	0.25	0.26	0.28	0.26	0.31	0.30	0.30	0.26	0.21	0.25	0.24	0.13	0.25	0.23	0.26
Total	0.18	0.20	0.19	0.16	0.23	0.22	0.25	0.20	0.14	0.16	0.16	0.16	0.17	0.16	0.16

Source: authors' data.