

**MEDIUM-SIZED CITIES AND INCOME CONCENTRATION IN PARANÁ: the inverted curve of Kuznets**

**CIDADES MÉDIAS E CONCENTRAÇÃO DE RENDA NO PARANÁ: a curva invertida de Kuznets**

Augusta Pelinski Raiher<sup>1</sup>  
Emerson Martins Hilgemberg<sup>2</sup>  
Cleise Tupich Hilgemberg<sup>3</sup>  
Adirson Maciel de Freitas Junior<sup>4</sup>  
Pedro Henrique Batista de Barros<sup>5</sup>

**ABSTRACT**

This article investigates the relationship between inequality and economic growth of the mid-sized municipalities of Paraná. For this, it checks for convergence of income distribution and the applicability of the Kuznets hypothesis for these counties in 1991, 2000 and 2010. This study used the methodology applied by Andrade and Serra (2001), who considered midsize municipalities those with a population between 50 and 500 thousand in 2010. To analyze the convergence and the Kuznets hypothesis, econometric panel data estimates were prepared. The main results indicate that in the midsize municipalities of Paraná there are no evidence of a convergence process of income distribution. In the other hand, the Kuznets hypothesis is confirmed. Therefore, the distribution of income and economic growth are related in time following the shape of an inverted "U".

**Keywords:** Convergence. Kuznets hypothesis. Income distribution. Paraná.

**RESUMO**

Este artigo investiga a relação entre desigualdade e o crescimento econômico dos municípios de porte médio do Paraná. Para isso, verifica-se a existência de convergência da distribuição da renda e a aplicabilidade da hipótese de Kuznets para esses municípios nos anos de 1991, 2000 e 2010. Este trabalho utilizou a metodologia aplicada por Andrade e Serra (2001), que consideraram como municípios de porte médio aqueles que apresentaram uma população entre 50 e 500 mil habitantes no ano de 2010. Para a análise da convergência e da hipótese de Kuznets, estimativas econométricas em dados de painel foram elaboradas. Os principais resultados indicam que nos municípios de porte médio do Paraná há evidência de um processo de convergência da distribuição de renda, além do que a hipótese de Kuznets se confirma, na qual afirma que a distribuição de renda e o crescimento relacionam-se no tempo seguindo o formato de um "U" invertido.

**Palavras-chave:** Convergência. Hipótese de Kuznets. Distribuição de renda. Paraná.

---

<sup>1</sup> Professora do Programa de Pós-Graduação Stricto Sensu em Economia Universidade Estadual de Ponta Grossa. E-mail: [apelinski@gmail.com](mailto:apelinski@gmail.com)

<sup>2</sup> Professor do Programa de Pós-Graduação Stricto Sensu em Economia da Universidade Estadual de Ponta Grossa. E-mail: [ehilgemberg@gmail.com](mailto:ehilgemberg@gmail.com)

<sup>3</sup> Professora do Programa de Pós-Graduação Stricto Sensu em Economia da Universidade Estadual de Ponta Grossa. E-mail: [cleise@uepg.br](mailto:cleise@uepg.br)

<sup>4</sup> Universidade Estadual de Ponta Grossa. E-mail: [adirson52@gmail.com](mailto:adirson52@gmail.com)

<sup>5</sup> Universidade Estadual de Ponta Grossa. E-mail: [batistahpedro@gmail.com](mailto:batistahpedro@gmail.com)

## INTRODUÇÃO

Until the 1990s, productive activities were concentrated in large centers. In these places, economies of agglomerations increasingly attracted industries, jobs, skilled labor, among others. However, as the concentration process intensified, a number of diseconomies emerged. Since the 1990s, with the advancement of transport and communications, potential urban centers have emerged, presenting not only economies of agglomerations but also a low incidence of diseconomies, inducing a large flow of investment and population.

Medium-sized municipalities, in turn, presented as characteristics many important elements for the localization of larger scale productive activities (such as infrastructure, potential market), which surpassed those of small urban centers. At the same time, had low diseconomies of agglomeration, becoming urban centers without the disadvantages of large metropolises (SERRA, 1998).

In fact, a migratory process then tended to occur in favor of those cities from the 1990s. However, the population attraction does not necessarily lead to an improvement of well-being for the whole society. In Kuznets' (1955) arguments, the intensification of economic growth, with migration, concomitantly brings about an increase in income inequalities. In a second moment, when the population adapts to this new reality, the economic growth continues along with a diminution of these inequalities.

Therefore, the economic dynamics of a region and the relationship between income inequality and economic growth is in an inverted "U"-shape (KUZNETS, 1955). This hypothesis is not unanimous in the literature as indicated by Ravallion, (1995), Deininger and Squire, (1996). Therefore, in order to improve the empirical verification of this hypothesis, Barro (2000) subdivides the space to be analyzed according to the level of development of each economy, obtaining different results for each level of wealth. That is, considering the differences between the developed and developing economies of the same space of analysis, not necessarily all tend to compose a single Kuznets curve.

Linhares et al. (2012), using the same principle of Barro (2000), validated the hypothesis of Kuznets for the richer states of Brazil, but there is no empirical evidence for the poorer regions of the country.

In this article, the aim is to analyse the applicability of the Kuznets (1955) hypothesis to the medium-sized municipalities of the state of Paraná. Therefore, the subdivision of the space is done intuitively according to the different levels of development of the municipalities, so focusing in the approach developed by Barro (2000) and Linhares et al (2012). At the same time, assessing the relationship between economic growth and income inequality in medium-sized municipalities is important because, when becoming a hub, with intensification of productive agglomeration, it may not be possible to generate welfare for whole society.

Thus, this article aims to study the relationship between inequality and income with a data panel set, considering the medium size municipalities of Paraná. More specifically, the convergence of the income distribution is evaluated, along with the analysis of the Kuznets (1955) hypothesis for these municipalities, considering the years of 1991, 2000 and 2010.

For this, the article is divided into four sections, besides this one. The second presents a brief discussion about the development and growth of Paraná. A brief review of the Kuznets model and methodological procedures make up the third section. The analysis of the convergence of income and the verification of the relationship between inequality and income for Paraná, ending with the main considerations

## **DEVELOPMENT AND ECONOMIC GROWTH IN PARANÁ**

Since the beginning of the 21st century, the economy of Paraná had changes in its productive base that led to many effects on the economy, social dynamics and spatial configuration of cities (HERSEN et al., 2010).

According to the authors, the most significant changes occurred in the agricultural sector, in the development of agroindustrial plants, highlighting industrial branches with a high technological component that drove the generation of both product and employment in the State in this period. (HERSEN et al., 2010)

In this sense, Lima et al. (2014, p. 26) argue that the regional economic growth of Paraná is due to the expansion and increase of the basic activities and, consequently, the demand for products that it offers outside the region. Still according to the authors, based on the integration with other regions, Paraná began to present a real income growth, maintaining the dynamics of the base activities and the diffusion of this dynamism to other productive branches, either on the demand side of inputs or by the complementary demand for goods and services (LIMA et al., 2014).

Dubiel and Rahier (2013) also argue that at the end of the 20th century large investments were attracted to the industrial sector of Paraná, which gave the formation to the automobile pole in the metropolitan region of Curitiba. The agribusiness modernization also led to the expansion of the complex paper and timber industries in addition to the development of the mechanical industrial sector and mechatronics.

In this context, the Paraná state became the 5th biggest GDP in Brazil (IBGE, 2012). However, even achieving considerable growth, "the largest economies in the state are concentrated in some points, mainly in the Metropolitan Region of Curitiba (especially São José dos Pinhais, Araucária and Curitiba, municipalities with greater representation in the GDP due to the industrial dynamism). Londrina and Maringá also stand out in the agroindustry - and Foz do Iguaçu in the production of electric energy "(Dubiel and Rahier, 2013-page 7). Hersen et al. (2010) add these arguments that:

"In the Metropolitan Region of Curitiba, the attraction, through a governmental mechanism, of large automobile manufacturers and, consequently, related companies put in ascendancy activities with greater technological content and economic dynamism. In the interior of the State, the Paraná agroindustry continues as a factor of sustentation of great part of the economic activity. For this reason, the Paraná has maintained positive rates of economic growth in the last decades. (HERSEN et al., 2010, p.67)

Although the arguments point to a considerable economic growth in Paraná, many municipalities have not achieved the same performance as the state. This imply that growth and economic development occur in an unequal manner, what could intensify economic and social inequalities.

In this paper, we try to understand how this economic growth relationship occurs in the medium-sized municipalities of the State using Kuznets (1955) hypothesis as described in the next section.

## METHODOLOGICAL PROCEDURES

In order to reach the objectives, we opted to use the inverted "U" hypothesis or "Kuznets curve" that is applied in studies that attempt to establish a relation between income inequality and economic growth.

In this sense, Farias et al. (2011, p.29) use this instrument, arguing that both the theoretical and empirical investigation of the Kuznets curve "are composed of studies with significantly divergent results regarding the acceptance or not of this hypothesis", because there are divergent interpretations when it refers to the increase of inequality in the initial periods of growth. Some authors claim that this is due to the absolute reduction of the average income in the poorest segment of the population. Others argue that the inequality increase due to lower income growth rate of the poorest when compared to the richest in the early stages of economic growth.

Thus, Kuznets (1955, 1982) bases in his study that income inequality increases in the initial stages of growth until reaching a point of maximum, represented by a certain level of income per capita, after it begins to decrease, given the development of the economy.

Moreover, according to the Kuznets (1955, 1982), the process occurs due to the migration of the population from a primary sector to an urban sector that is richer, more developed, more unequal than the primary one. Initially this process promote an increase in inequality until income per capita reaches a certain level and from there the inequality stabilizes. After reaching this point, there will be a continuous downward trend as per capita income continues to grow.

Authors such as Jacinto and Tejada (2004); Ahluwalia (1976); Robinson (1976); Farias et al. (2011), point out three lines of investigation of the Kuznets hypothesis: first, the dualist models that refer to the relationship between inequality and growth in two sectors, one traditional - agricultural - and one more dynamic – industrial. Second, the growth model imply the distributive issues of growth theories, highlighting the Solow Theory - which presupposes homogeneous agents, being composed of the neoclassical production function with constant returns of scale and an equation of capital accumulation. The third line refers to the social models that admit "the existence of a causal relationship between the political decisions of the voters - regarding programs that provide immediate assistance to their needs - and the link between initial inequality and income distribution" (FARIAS et al., 2011, p.31).

Therefore, the applications of these lines used of several indices of concentration and inequality allied to several methods of estimation.

We then chose the first line of investigation for the Kuznets hypothesis observing the relationship between inequality and growth in medium-sized municipalities for the state of Paraná.

In this sense, it is worth noting that there is no consensus on what medium-sized municipalities would be. However, authors such as Beltrão Sposito (2004) affirm that its definition is given by its intrinsic characteristics, as the main one being the demographic size. It is important to emphasize that the medium-sized municipalities

are analyzed here, and the concept of "middle cities" is not necessarily used, which is significantly more comprehensive<sup>6</sup>.

Using the methodology applied by Andrade and Serra (2001), medium-sized municipalities were considered as those with a population between 50 and 500 thousand inhabitants in the year 2010. In fact, the survey as a whole involved the years of 1991, 2000 and 2010, but it was chosen to classify the municipalities of Paraná using the population of this last year in order to capture the effects enunciated by Kuznets between income concentration and economic growth.

Specifically, the Andrade and Serra (2001) argues that at the beginning of economic growth there is an intensification of income inequalities. Therefore, by taking the 2010 ranking, many municipalities were not yet considered medium-sized in 1991 and could potentially be at the beginning of the promotion of its economic dynamism, being able to prove (or not) such hypothesis.

Thus, when hierarchizing the municipalities of Paraná, 30 were classified as medium sized, 02 as large and 367 as small. In the specific case of the medium-sized ones, they included: Almirante Tamandaré, Apucarana, Arapongas, Araucária, Cambé, Campo Largo, Campo Mourão, Cascavel, Castro, Cianorte, Colombo, Rio Grande Farm, Foz do Iguaçu, Francisco Beltrão, Guarapuava, Irati, Maringá, Paranaguá, Paranaíba, Pato Branco, Pinhais, Piraquara, Ponta Grossa, Rolândia, São José dos Pinhais, Sarandi, Telemaco Borba, Toledo, Umuarama, União da Vitória.

In the first part of the analysis, we try to distinguish characteristics - in terms of population, economic growth (GDP - at 2000 prices) and contraction of income (Gini and Theil coefficient) of small, medium and large municipalities. For this, the mean of these variables was calculated, with data obtained from Ipardes and Ipeadata. Next, the analysis is focused only on municipalities with a population between 50 and 500 thousand inhabitants.

The Kuznets' (1955) hypothesis stats that a rise in income concentration at the beginning of economic dynamism, but this inequality is mitigate in a second moment, he then evaluated how the income distribution between these municipalities is behaving over time. For this, two econometric models were estimated, testing the hypothesis of convergence regarding income distribution, using the panel data methodology. When any tendency of convergence (conditioned or unconditioned) is observed, all municipalities are expected to obtain, at some point in time, the same level of income distribution, even if they start this process at different times.

Thus, the econometric model considered was (1), which captures the relationship between the growth rate of the income distribution and the initial income distribution of each medium-sized municipality in 1991, 2000 and 2010, highlighting that the convergence hypothesis is confirmed when a negative relation between these variables is obtained. It should be noted that the variable used to represent the income distribution in the first estimate was "one" minus the Gini coefficient, and in the second it was "one" minus the Theil coefficient. Finally, two models were estimated, with distinct proxies about income distribution, in order to corroborate the results found.

$$\frac{1}{T} \ln \left( \frac{DR_{it}}{DR_{i,0}} \right) = \beta_1 + \beta_2 \ln(DR_{i,0}) + u_i \quad (1)$$

---

<sup>6</sup> Beltrão Sposito (2004) emphasizes that the "medium cities" would be only those of middle-sized ones that play intermediate and / or regional roles within the urban network. Therefore, not every medium-sized municipality can be characterized as "medium city".

where  $T$  refers to the time interval (1991, 2000 and 2010),  $DR$  is the measure of income distribution;  $0$  refers to the initial period,  $t$  at the end and  $i$  represents the  $i$ -th cross-sectional unit (medium-sized municipality of Paraná).

The convergence estimates were obtained using the econometric panel data technique (considering robust standard errors), in the form of random effects, as determined by the Hausman test (Table 3). The first estimation include temporal dummies, while the second, these variables were not included. For the determination of which is better to represent the phenomena, the Wald test was used, in which the null hypothesis is that the time dummies are not jointly significant (Table 3).

After the convergence analysis, we tested the inverted U-hypothesis between income concentration and economic growth enunciated by Kuznets (1955). For this, two new econometric models were estimated (2), distinguishing them by the proxies about the concentration of income that were used: in the first the Gini coefficient was used and in the second, the Theil coefficient.

$$D_{it} = \alpha + \beta_1 Y_{it} + \beta_2 Y_{it}^2 + \varepsilon_{it} \quad (2)$$

where:  $D$  is the measure of inequality;  $Y$  is per capita income;  $Y^2$  is the per capita income squared,  $t$  is the time indicator (1991, 2000 and 2010) and  $i$  refers to medium-sized municipalities.

On estimation (2), the panel data (using robust standard errors) was used by random effect estimation (Hausman test - Table4), not including temporal dummies in any of the regressions (Wald test - Table4).

The next section presents the results and main points for discussion about medium-sized municipalities.

## RESULTS AND DISCUSSIONS

The search for economic growth is the goal of all regions. However, not necessarily a greater economic dynamism raises the well-being of the entire population. The concentration of income prevents a greater range of agents from benefiting from economic growth, creating and / or fostering a "periphery" within the "center". In this sense, in order for the results of economic growth to effectively promote development in the region, it is to obtain an improvement in the distribution of income.

At the same time, when analyzing the composition of regional spaces, we can observe the formation of points in which there is an intensification of economic dynamism.

In general, it is the medium-sized municipalities that concentrate such dynamism. In fact, before the 1990s, industrialization took place especially in the metropolises, given the proximity to the consumer centers and the labor force. However, with the increase in transport and communications, smaller municipalities - especially in the medium-sized ones - have become increasingly important, becoming the main destination of employment, industry and work.

These municipalities exert an influence on smaller ones, and also play a role of "complementarity" of the metropolises, presenting external economies larger than the former and, in many cases, even larger ones, as they do not yet incur high external diseconomies (PEREIRA, 1977).

Therefore, its benefits - such as labor concentration, consumer market, economies of scale, not so high land costs, lower demand for financial resources to

solve housing problems and their extensions, among others - tend to boost the pace of economic growth presented by these municipalities.

However, as the economic growth of a region intensifies, there is a population attraction, which is not necessarily accompanied by increased employment and public services (SANTOS, 2003).

In this sense, inequality can intensify concomitantly with the economic dynamism generated. Therefore, it is important to analyze if the economic growth intensification in medium-sized municipalities, especially those in Paraná, occurred along with a deterioration of the income distribution or if there was a reversal of this concentration (second time described by Kuznets).

Table 1 shows the evolution of per capita GDP, population and income concentration indicators (Gini and Theil) for all municipalities in Paraná, subdivided into small (367), medium (30) and large (2). We can observed that, independently of the classification, all, on average, improved their dynamism, noting that small ones had the lowest GDP per capita growth rate between 1991 and 2010 (29% for the small ones, 33% for the middle and 40% for large ones).

These municipalities, in terms of population, had an emptying (-15%), justified by the economic dynamism not so intense that it presented. At the same time, medium-sized municipalities had the highest rates of attraction of the population (34%), evidencing the phenomenon described by other authors regarding the dynamization of such spaces, especially after the 1990s.

**Table 1:** Average population, per capita GDP (R\$, from 2000), and concentration indicators for the municipalities of Paraná - 1991, 2000 and 2010

Variable	Year	Population of Municipalities		
		Less than 50 thousand	Between 50 and 200 thousand	More than 200 thousand
Population	1991	13668	97813	852568
	2000	11223	113675	1017190
	2010	11567	131367	1129304
Gini	1991	0,54	0,52	0,56
	2000	0,54	0,53	0,58
	2010	0,46	0,47	0,53
Theil	1991	0,52	0,48	0,55
	2000	0,52	0,50	0,62
	2010	0,39	0,39	0,51
Per capita GDP	1991	4853	7346	7970
	2000	4548	7859	9271
	2010	6238	9752	11138

Source: Ipardes and Ipeadata, with data worked by the research

Regarding the concentration of income, it presented an improvement, less or equal to the small municipalities, but with a much lower index than the large municipalities. On the one hand, the population attraction, stimulated by the income development of these medium-sized municipalities, provides a more intense labour supply, benefiting the productive activity, consequently resulting in less bargaining power for the worker, not benefiting increase. Therefore, it would be justifiable if, to

some extent, the concentration coefficients of medium-sized municipalities were larger than those of small size.

However, the information contained in Table 1 shows that these medium-sized municipalities arrived in 2010 with a concentration index equal to or very close to that of small ones, which is extremely important because there is a rise in economic dynamics, with significant rates in terms of population growth, and at the same time, income inequality is decreasing.

Thus, analysing the descriptive statistics only of the municipalities classified in 2010 as medium sized, the improvement on economic aspects is again emphasized, not increasing the maximum value observed, but increasing the minimum value, demonstrating that it is becoming more economic dynamism among these municipalities. At the same time, population growth intensified especially in some areas, with an increase in the minimum value, but not as significant as the increase in the maximum value, with a high standard deviation. However, this indicates that some of these municipalities had a greater population attraction, which, according to Singer (1980), is directly linked to the economic opportunities. However, it is important to note that all thirty municipalities analysed have increased their population.

In addition, in terms of income concentration, the indices show a sharp drop, decreasing the discrepancy among medium-sized municipalities, making them more similar in terms of income distribution (Table 2).

**Table 2:** Descriptive statistics for selected variables - medium-sized municipalities of Paraná - 1991, 2000 and 2010

Variables	Maximum	Minimum	Standard deviation	Average
Population 1991	240292	43776	56344	97813
Population 2000	288653	48522	71262	113675
Population 2010	357077	52735	82869	131367
Gini Coefficient 1991	0,68	0,40	0,07	0,52
Gini Coefficient 2000	0,63	0,41	0,05	0,53
Gini Coefficient 2010	0,55	0,35	0,04	0,47
Theil coefficient 1991	0,83	0,27	0,13	0,48
Theil coefficient 200	0,73	0,29	0,10	0,50
Theil coefficient 2010	0,54	0,22	0,08	0,39
GDP per capita 1991	48142	2136	8482	7346
GDP per capita 2000	41315	2186	7272	7859
GDP per capita 2010	46338	2621	8458	9752

Source: Iperdes and Ipeadata, with data from the research

The spatial distributions of the Gini coefficient of 1991 and 2000 are shown in Figures 1a and 1b, and in Figure 1c is the growth rate of the concentration. With the exception of only two municipalities (Pinhais and Almirante Tamandaré), all others decreased their income concentration, with falls of up to 25% in the period from 1991 to 2010. More than this, it is possible to observe that many of the medium cities that had a high Gini coefficient presented the lowest growth rates. In other words, they had the highest rates of Gini decrease in the period, indicating a process of convergence regarding the distribution of income among these municipalities.

In order to effectively analyse the convergence of the income distribution among these medium-sized municipalities of Paraná, two econometric models were estimated, whose dependent variable corresponded to the logarithm of the growth rate of the income distribution and the explanatory variable was the logarithm of the initial income distribution (Table 3). In the first estimate, the income distribution was represented by "one" minus the Gini coefficient, and in the second, by "one" minus the coefficient of Theil. As a corollary, we identified a convergence process for the income distribution among these municipalities, since the coefficient of the initial distribution in both estimates came with the negative and significant signal at level of 5%.

That is, those municipalities that had a low-income distribution in the initial period tended to have a high growth rate of that distribution in the following period; while those with a high initial income distribution tended to have a rate of improvement in terms of their less intense income distribution in the following period.

Table 3: Estimation of the convergence of the income distribution among the municipalities of medium size of the Parana - 1991,2000 and 2010

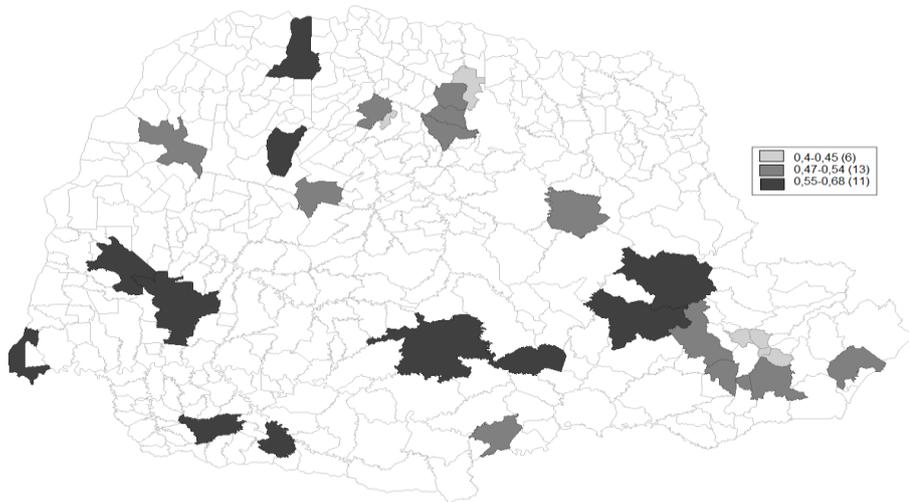
Dependent variable	Constant	Ln (1- initial Gini coefficient)
Ln (1- coefficient de Gini)	0,48 (0,009) *	-0,62 (0,13) *
Hausman:0,005 Wald: 3,91*		
	Constant	Ln (1- initial Gini coefficient)
LN (1- coefficient de Theil)	0,002 (0,007)	-0,94 (0,06) *
Hausman: 3,06 Wald: 2,82		

Source: Search Result

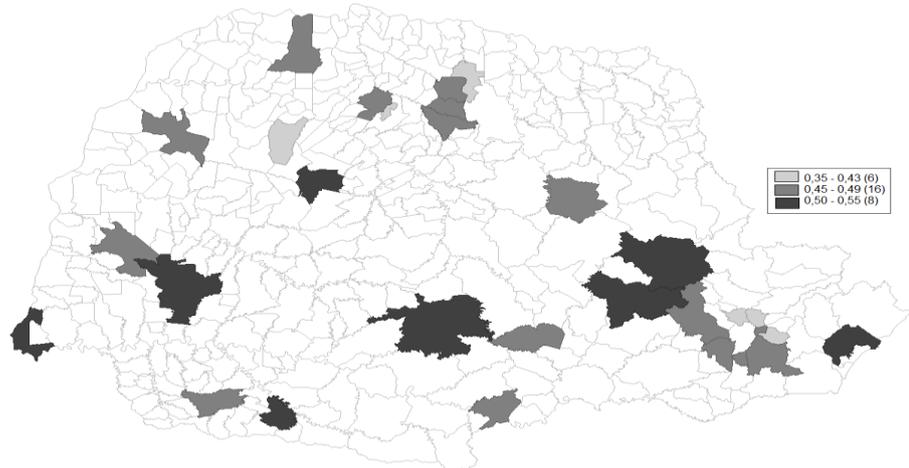
Note: \* significant at a significance level of 5%. In the first estimate, it used time dummies, since the Wald test rejected the null hypothesis and in the second, since the null hypothesis was not rejected, then no temporal dummies were used. Both estimates were randomized, since the Hausman test did not reject the null hypothesis.

Figure 1: Gini coefficient between the medium-sized municipalities of Paraná - 1991, 2010 and growth rate 1991/2010 (%)

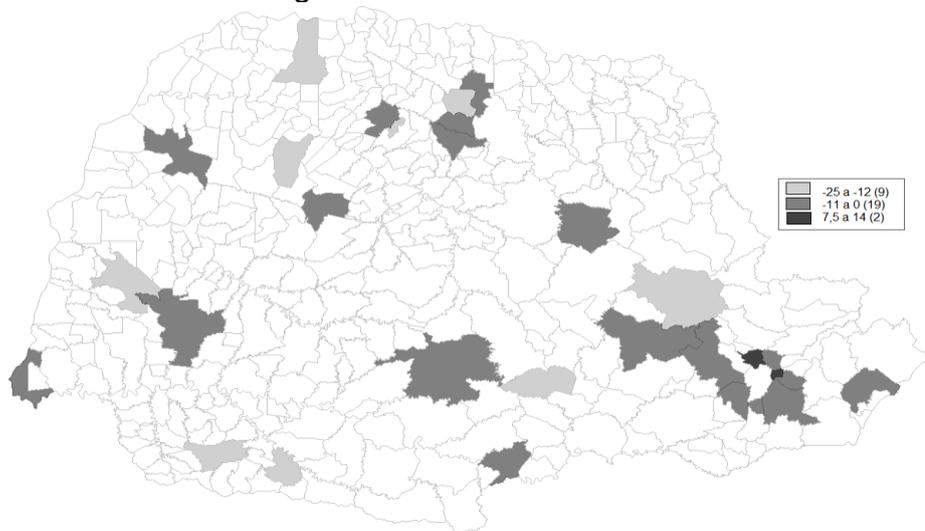
A – Gini 1991



B- Gini 2010



C- growth rate of the Gini coefficient from 1991 to 2010



Source: Search Result

Therefore, a more homogenous and more egalitarian distribution of income among these medium-sized municipalities in the state of Paraná is occurring. This indicates that, if Kuznets's (1955) hypothesis were actually verified, then, part of these municipalities would tend to be in that second moment enunciated by Kuznets, in which, the increase of the economic growth would be accompanied by an improvement in the distribution of income (or, in other reduction of income concentration).

Thus, in order to identify if the Kuznets (1955) hypothesis is applied among medium-sized municipalities in the state of Paraná, two regressions were estimated, in which this hypothesis was confirmed (Table 4). As the sign of the coefficient that accompanies the GDP came positive and significant, and then the square GDP was negative and significant at a level of significance of 5%, then the relationship between income concentration and economic growth occurs in an inverted "U" shape. That is, at the beginning of economic growth there is an intensification of inequality, however, in a second moment this inequality tends to decrease with the continuation of the fomentation of economic growth.

As Table 3 shows, there is a trend of convergence in terms of income distribution, and the Kuznets (1955) hypothesis applies in the medium-sized municipalities of Paraná (Table 4). Then, the trend is that part of these spaces are already in the second moment described by Kuznets (1955), with economic growth leading to a reduction in the income inequalities.

Table 4: Estimates of the hypothesis of Kuznets - municipalities of medium size in Paraná - 1991,2000 and 2010

Dependent variable	Constant	Per capita GDP	GDP per capita squared
Gini Index	0,47 (0,01)*	0,006 (0,0003)*	-0,000001 (0,0000005)*
Hausman: 4,03 Wald: 1,0			
Theil Index	0,41 (0,03)*	0,009 (0,004)*	-0,000002 (0,000009)*
Hausman: 3,94 Wald: 0,4			

Source: Search Result

Note: \* significant at a significance level of 5%. In none of the estimates were time dummies used, since the Wald test did not reject the null hypothesis. Both estimates were randomly driven, since in the Hausman test did not reject the null hypothesis.

What would be the explanation for such a phenomenon? In Kuznets's (1955) arguments, the transfer of labor, with the migration to the urban centers - in the case of this study, for medium-sized municipalities, more economically dynamic than the neighboring municipalities - would tend to increase the supply of labor reducing their bargaining power, with a higher salary level for the more skilled workforce. Then, in this first moment, the production would rise, with the retraction of the remuneration of the not so specialized labor. Secondly, this migrant labor force tends to adapt, performing better-qualified functions, raising the supply of skilled labor, generating pressure on the salaries of these more qualified professionals, retracting that value.

Concomitantly with the drop-in demand for skilled workers, the demand for low-skilled workers rises, especially due to the expansion of the economy and the decrease in the supply of low-skilled labour, which has, in part, specialized. These two phenomena would then tend to reduce income inequality, coupled with an advance in the region's economic growth.

Therefore, since medium-sized municipalities, especially after the 1990s, had a high economic dynamism, with centripetal forces attracting the workforce of other municipalities, it is possible that this distinction was first made in the remuneration of the labour force. In the same arguments of Kuznets (1955), this difference has been reduced and is still reducing with the own advance of the economic growth, according to the obtained results.

## 1. FINAL CONSIDERATIONS

This article sought to verify the relationship between income inequality and economic growth from a panel of data considering the medium size municipalities of Paraná. More specifically, the convergence of the income distribution, combined with the analysis of the applicability of the Kuznets (1955) hypothesis, are evaluated for these municipalities, considering the years of 1991, 2000 and 2010.

All municipalities - independent of their size - have improved (on average) their economic dynamism. However, the medium size, besides having a high economic performance, also presented a very intense migratory flow, with a homogenization of the income between them.

This trend in decreasing discrepancies among medium-sized municipalities, denoting a convergence of the income distribution, accompanied by the Kuznets hypothesis, allows us to infer that these points in the Paraná area are being able to grow economically and, at the same time, provide certain distribution of resources.

In fact, a more homogenous and more egalitarian distribution of income among these medium-sized municipalities in the state of Paraná is occurring. This is important given that these spaces have become points of attraction for productive activity and also for labor. Thus, the intensification of economic growth together with the improvement of the distribution of resources implies, consequently, an improvement in the well-being of the population.

There are few studies conducted with the purpose of understanding the dynamics of economic growth and its relation with income distribution in the state of Paraná. Therefore, as a recommendation, other studies can be carried out for periods after 2010, which seek to verify if these medium-sized municipalities are still showing economic growth concomitantly with a decrease in income inequality.

## REFERENCES

ANDRADE, Thompson; SERRA, Rodrigo Valente. "Análise do desempenho produtivo dos centros urbanos brasileiros no período 1975/2000" In: ANDRADE, Thompson; SERRA, Rodrigo Valente. **Cidades médias brasileiras**. Rio de Janeiro: IPEA, 2001, p. 79-127.

BARRO, R. J. Inequality and growth in a panel of countries. **Journal of economic growth**, v. 5, p. 5-32, 2000.

BELTRÃO SPOSITO, M. E. **O chão em pedaços**: Urbanização, economia e cidades no Estado de São Paulo. UNESP, Presidente Prudente, 2004 (Livre Docência).

DEININGER, K.; SQUIRE, L. A new data set measuring income inequality. **World Bank economic review**, v. 10, p. 565-591, 1996.

DUBIEL, S.A.; RAHIER, A.P. **Desenvolvimento econômico dos municípios do Paraná: evolução e determinantes. Informe Gepec**, Toledo, v. 17, n. 2, p. 6-22, jul/dez. 2013.

FARIAS, T.A. et al.; A teoria do U invertido: um teste empírico da hipótese de Kuznets para a relação entre crescimento econômico e desigualdade de renda no Brasil (1976-2007). **Revista de Economia Mackenzie**, v.8, n.1, p.26-51, 2011.

HERSEN, A.; LIMA, J.F.; SANTOS, A.; LIMA, C.: As fontes do crescimento econômico das cidades médias do Estado do Paraná. **Revista de História Econômica & Economia Regional Aplicada** – Vol. 5 Nº 8 Jan-Jun 2010.

JACINTO, P.A.; TEJADA, C.A. Desigualdade de renda e crescimento econômico nos municípios da Região Nordeste do Brasil: o que os dados têm a dizer? In: **Encontro Nacional de Economia**, 32, 2004, Paraíba. Anais Paraíba: Conselho Regional de Economia e Conselho Federal de Economia, 2004.

KUZNETS, S. Economic Growth and Income Inequality. **The American Economic Review**, vol. 45, no. 1, pp. 1–28, 1955.

KUZNETS, S. **Crescimento Econômico Moderno**. Rio de Janeiro: Abril Cultural, 1982.

LIMA, J.F.; KLEIN, C.F.; PIFFER, M.; RIPPEL, R.; OLIVEIRA, T.C.: **Notas sobre o ritmo de crescimento econômico das regiões paranaenses**. Revista Economia & Tecnologia (RET) Vol. 10(2), p. 25-32, Abr/Jun 2014

LINHARES, F.; FERREIRA, R.; IRFFI, G.; MACEDO, C. A hipótese de Kuznets e mudanças na relação entre desigualdade e crescimento de renda no Brasil. **Pesquisa e Planejamento Econômico**, v. 42, n. 3, dez. 2012.

PEREIRA, W. K. R. **Cidades médias: uma opção no desenvolvimento urbano**. Brasília, DF: Universidade de Brasília, Departamento de Economia, 1977 (Dissertação de Mestrado em Economia).

RAVALLION, M. A. Growth and poverty: evidence for developing countries in the 1980s. **Economics letters**, n. 48, v. 3, p. 411-417, 1995.

ROBINSON, S. A note on the U hypothesis relating income inequality and economic development. **American Economic Review**, v.66, n.3, 1976.

SANTOS, Milton. **Economia espacial: críticas e alternativas**. São Paulo: Edusp, 2003.

SERRA, R. V. **Cidades médias brasileiras: um recente retrato econômico e populacional**. Rio de Janeiro: Universidade Federal do Rio de Janeiro, Instituto de Pesquisa e Planejamento Urbano e Regional, 1998 (Dissertação de Mestrado em Planejamento Urbano e Regional).

SINGER, P. Migrações internas: considerações teóricas sobre seu estudo. In: MOURA, H. A. de (Coord.). **Migração interna: textos selecionados**. Fortaleza:

Banco do Nordeste do Brasil - BNB, Escritório Técnico de Estudos Econômicos do Nordeste, 1980. t. 1, p. 211-244. (Estudos econômicos e sociais, 4).