

ECONOMIC CONVERGENCE OF THE FIRST AND SECOND MOMENT IN THE PROVINCES OF ARGENTINA*

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Abstract

The purpose of this paper is to study the inequality of income between the provinces of Argentina. The data in this paper comes from the traditionally used GDP p.c., as well as from Household survey. The analysis examines two separated but also related research areas, regional convergence and income distribution. Our results suggest that the provinces of Argentina seem to have a tendency towards the same level of income (wage convergence) and the same level of inequality.

Resumen

El objetivo de este documento es estudiar la desigualdad de ingresos entre las provincias de Argentina. Los datos empleados provienen de series del PIB per capita, así como también de encuesta de hogares. El análisis se centra en dos áreas de investigación separadas y relacionadas a la vez, la convergencia regional y la desigualdad en la distribución del ingreso. Nuestros resultados sugieren que las provincias de Argentina poseen una tendencia hacia el mismo nivel de ingreso (convergencia de ingreso) y el mismo nivel de desigualdad.

JEL Classification: O18, D33

Keywords: Argentina, regional convergence, income distribution.

1. INTRODUCTION

The purpose of this paper is to study the inequality of income between the provinces of Argentina. The data of the paper comes from the traditionally used GDP p.c., as well as from the data of the (Household survey data), which is highly reliable when it comes to quality of the data and provides a wide possibility to work with different concepts of income and its transformations. This

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allows providing the paper with comparisons according to the variables used and comparing the speed of convergence observed.

The analysis approaches two separated but also related research areas, regional convergence and income distribution and inequality. The interest on the research of differences between nations and regions has generated contributions based on the use of international data in convergence analysis. These contributions started with Barro, Sala-i-Martin (1992), Sala-i-Martin (1996a, 1996b). Regional studies with national data include various countries, among them, Persson (1997) studies the convergence through Swedish regions from 1911 to 1993, in Austria the contribution given by Palme (1995), in UK the inequality of its regions was studied by Saleheen (1996), in Finland Loikkanen (1999) used the (household survey data) to analyze the income differences between 1966-96, Cuadrado Roura (1998) regional convergence in Spain (1998) and between the European Union regions (1999), in Argentina, Elías (1992, 1995) works with Argentinian provinces 1884-1985, in Chile, Fuentes (1997, 2000) works with regions of different variables, Elías and Fuentes (1998) investigate the speed of convergence for Chile and Argentina together, Sotelsek and Marina (2000) make a comparative analysis between Spain and Argentina for the period 1970-1993 using variables of product as well as income and analysing the convergence of the first and second moment.

The analysis done in this research differs from others since for the first time the data from the (household survey data) is used. This gives the possibility of a richer study of the differences between regions. Also the microeconomic data allows to improve the convergence analysis with that of the inequality between and in the regions of Argentina. Once the levels of inequality are found, the search of the possible determinants of inequality and their relation to the level of income takes place. In this field we can mention the following studies about the distribution of income such as Atkinson *et al.* 1995, Atkinson 1998, Jenkins 1995, Milanovic (1999), Elías (1999), among others.

Some evidences of the economic convergence of the provinces of Argentina are shown considering the average level of the GDP pc, income per capita, the level of inequality in income distribution (second moment) and the relation between them.

In order to extend the analysis it was decided to consider an alternative measure. Besides the information given by the GDP and the income per capita, a well-being index (based in five reference indicators) was created and also related with the level of income inequality.

This article is organized in the following way: In section 2 data about growth and inequality in Argentina and the world are presented. In section 3 we analyze the empirical evidence for the first and second moment. In section 4 determinants of inequality in the provinces of Argentina are discussed. In section 5 inequality and growth are related. Finally we present some of the conclusion of the result obtained.

2. THE DATA

In figure A, we see how in the year 1986 the province with larger GDP p.c. contained 22 times the one with smaller geographic GDP. Although during the

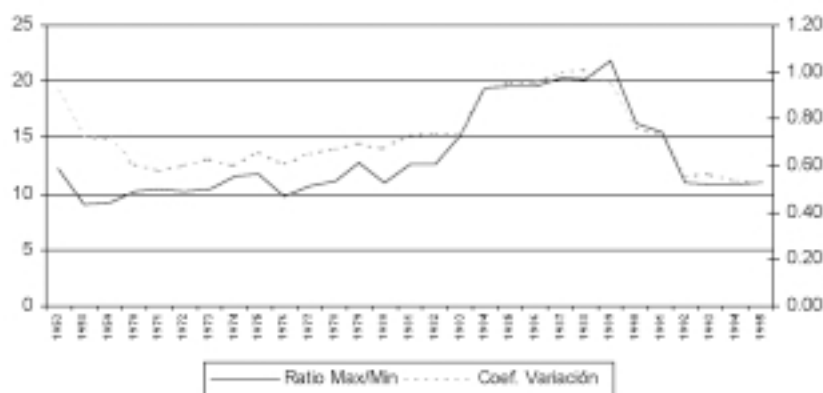
period of time in which the data is available we see that the ratio¹ between the province with larger and the one with smaller GDP was generally above 10 times. The situation turned even more critic between 1983 and 1991 where the ratio was above 15 times.

In the same way the coefficient of variation, in the same figure, confirms the increasing inequality from 1953 until 1989 and from 1989 until 1995 we can see a significant improvement. The proper functioning of some economic institutions possibly assists this.

The coefficient of variation fluctuates around the value of 0.60, increasing from 1984 to 1992, to then return to its initial value.

This increase in the coefficient of variation is attributed to the industrial promotion programs that affected the provinces of San Luis and Tierra del Fuego in this period (Utrera and Koroch, 1998). If these are excluded, the value of the coefficient of variation is stable with a value close to 0.60.

FIGURE A
COEFFICIENT OF VARIATION AND RATIO MAX/MIN PER CAPITA

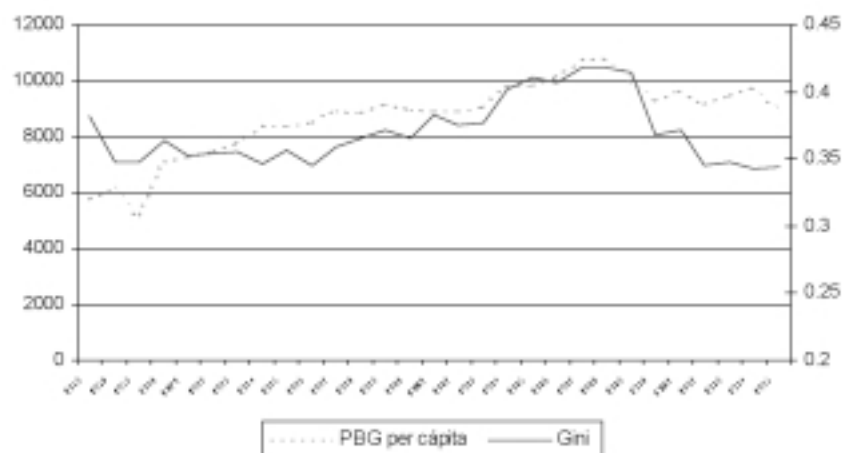


In Figure B, we see that even though during the period of 1953-1989 the average GDP per capita of Argentina experienced a constant growth. The larger wealth obtained increased the level of inequality measured by the Gini² index. On the other hand, in the period in which the product deteriorated between 1989 and 1995, the inequality decreased. This indicates, observing the data, that the smallest wealth produced the smallest inequality (Garrido *et al.*, 2000).

¹ This ratio was calculated in the following way $r_i = \frac{Max(GDP_i)}{Min(GDP_i)}$.

² The Gini index, was calculated using the formula $G_i = \frac{1}{2n^2\mu} \sum_{i=1}^n \sum_{j=1}^n |y_i - y_j|$. "On Economic Inequality", Sen, pag. 31.

FIGURE B
GEOGRAPHIC PRODUCT. GINI INDEX



In Table 1 we present some data that show inequality in Argentina. Among these we find the Coefficient of Gini (GINI), individual wages (WINDI), government expenditures per capita, and the years of schooling of the working force (SCH). Means and standard deviation and coefficient of variation for the period 84-98. Milanovic (1999).

TABLE 1³
INEQUALITY IN THE PROVINCES OF ARGENTINA

	W Indi 84	W Indi 98	Gini 84	Gini 98	Gasto P.	Sch 84
Prom	8097.9	6322.0	39.9	43.4	126.231	9
Desv. Est.	1786.5	1233.7	3.3	2.6	189.250	0.49
Coef. Var.	0.221	0.195	0.082	0.060	0.667	0.05
Max.	12546.9	9641.5	48.0	47.0	592.0	10.3
Min.	5776.8	5086.9	32.0	37.0	60.0	8.0

Table 2 describes inequality in Argentina and the World through the Coefficient of Gini and other measures of inequality. (Benabou, 1996)

³ The individual wages were obtained from the EPH for 25 clusters that represent 22 provinces and are expressed in pesos with prices of 1996.

TABLE 2
THE INEQUALITY IN THE WORLD COMPARED TO ARGENTINA

		Mean				
		Gini	Q1	Q3+Q4	Q5	Q5/Q1
1980	World	37.47	6.52	37.56	44.73	8.31
1990	World	38.28	6.43	37.24	45.47	8.46
1980	Arg	40.00	5.56	36.31	47.16	8.58
1990	Arg	43.60	5.11	35.40	49.63	10.01

		Std. Deviation				
1980	World	8.33	1.5	2.97	5.97	3.73
1990	World	7.79	1.58	3.52	6.66	3.82
1980	Arg	3.20	0.81	1.26	2.40	1.69
1990	Arg	2.70	0.90	1.96	3.81	2.13

Source: The data for Argentina is self elaborated, while the data for the World includes seven main regions (Latin America, sub Saharan Africa, Middle East and North Africa, East Asia/Pacific, South Asia, OECD and High Income, Eastern Europe).

In general terms, an increase in the inequality of Argentina during 84-98 (Table 1) is observed and the levels of income inequality are larger in Argentina than in the rest of the world (Table 2).

When analyzing the quintiles and the relation that exists between the values for Argentina and for the world, we observe a larger gap between the fifth quintile and the first, showing an amplification of this around 1990.

3. CONVERGENCE IN THE FIRST AND SECOND MOMENT

In this section we present the convergence of the income per capita in the first and second moment. The first moment in the distribution of income equals an estimate of the traditional convergence (calculating the beta convergence between regions or countries, Barro and Sala-i-Martin, 1996). The Solow neo-classic model of growth generates implications of convergence in the economic level between countries and regions. This convergence is conditional and can be limited to subgroups (convergence within the subgroup) but not between them. This convergence appears in reality as an adjustment process of the difference between the current value of the income per capita and the long-term final value. Benabou presents a possibility of convergence in the level of inequality, called the convergence of the second moment. That way for the empirical analysis we use Benabou's thesis: Countries with equal fundamentals

should have equal level of inequality. Although there isn't a formal model for the analysis of convergence in the second moment Benabou's⁴ work is also used to make and estimate of the convergence in superior moments for the provinces of Argentina. To achieve that, we can make the same standard test about the convergence in moment one: return the rates of the initial level of the independent variable and analyze if the evolution of the dispersion decreases over time. Individual income, household income and household income p.c. of the EPH are taken as variables of analysis.

In this research we work with the combination of convergence and inequality through the incomes taken from the EPH (individual income, household income and household income p.c.)

3.1. Convergence of the first moment

A significant level of inequality characterizes the development of the provinces of Argentina. From the work of Barro and Sala i Martin some economists have made efforts in analysing the process of convergence, in particular for Argentina, but there is almost no process of convergence between the provinces and the pattern of growth is unequal. In previous works (Elias, 1992) took as a variable of analysis the GDP per capita and per worker in each province. The results show that absolute convergence doesn't exist and when using the equation conditioned by the variables that could affect the steady state, the speed of convergence did not improve for most of the variables included in the analysis, with the exception of the level of education and the government expenditures per capita that were slightly improving. On the other hand, the speed of absolute convergence as well as conditional between the Provinces of Argentina was smaller than the speed obtained in an international level. (Barro-Sala, 1996).

The different studies that analyze the not conditional case beta refuse the hypothesis of convergence. In Marina (1998) the results of the absolute convergence (GDP p/c) for the period 70-94 show a value of beta equal to 0,8% and not significant, these results were confirmed by a pioneer study made by Elías (1995) for the period 1884-1985.

The larger speed of convergence is found for the period 1984-1994 with a value of beta of 1,8. But we find more significant the partial analysis through the different sub-periods since even if the beta value is very low, the convergence between the regions improves substantially from 1984 according to what can be observed in Table 3. In this exercise carried out for Argentina we make estimates using the different variables and sources of data with the purpose of comparing the values obtained in previous studies.

The equation for the convergence is:

$$\frac{(\ln Y_{T_f} - \ln Y_{T_i})}{t} = a - \left(\frac{1 - e^{-\beta t}}{t}\right) \ln Y_{T_i} + u$$

⁴ Roland Benabou (1996). Inequality and Growth, New York University, Dept of Economics and NBER.

Where Y represents the GDP per capita, t is the period of time under study, T_i is the initial year, T_f is the final year, a is a constant⁵ y β is the speed of convergence.

Table 3 shows the results of the regression of the convergence for the GDP p.c., the value of beta is less than the speed of regional convergence expected by the literature(2%) for which the hypothesis of convergence could be refused. When searching the conditions of the convergence we worked with variables considered in the empirical literature. In the table we present results of B-convergence conditioned by the level of literacy, tuition for elementary school and highschool and the government expenditure per capita. Significant improvements were found when determined by the level of literacy in the periods 1959-94 and 1984-94 and by the government expenditures during 1884-1953.

TABLE 3
ABSOLUTE AND CONDITIONAL CONVERGENCE OF GDP P.C.
IN THE REGIONS OF ARGENTINA

Año	PCIAS	B-ABSOL.	B- Literacy	B- El.school	B-High School	B- Gov. Exp
1884-1953	15	0.004	0.005			0.028
1884-1994	15	0.0002				
1953-1994	24	0.011	0.015*			0.016
1959-1994	24	0.008	0.027*	0.016*	0.016*	0.009
1970-1994	24	0.008	0.014*	0.008		0.009
1984-1994	24	0.018	0.048*	0.006	0.025	0.016

Source: Self-elaboration. The variables marked with (*) were significant with 5%, (**) implies a degree of significance of 10%.

However these results undertake modifications when beta convergence is estimated using other dependent variables. Table 4 shows the results of the convergence regression for different variables: beta improves (in significance as well as in speed) when the household income (3%) and the wages (2,8%) are used, compared to the GDP indicator that shows a low convergence value. (Sotelsek y Marina 2000)

⁵ This constant is referred to as (fixed effects), which are usually ignored. Mancha (1999), Bosh y Aroca (1999).

TABLE 4
ABSOLUTE CONVERGENCE OF THE GDP P.C.,
HOUSEHOLD INCOME P.C. AND WAGES

Variables	Period	Beta (%)	R ² Adj.
G.D.P. p.c.	1979-91	1.1	0.02
	1984-94	1.8*	0.15
Household Income	1984-98	3*	0.14
Household Income pc	1984-98	1	0.03
Wages (w)	1984-98	2.8*	0.25

Source: Self elaborated.

The literature provides various reasons for the existence of the differences among the economies, human capital, innovation capacity, institutions, factor limitations, markets and social environment, which are elements of the convergence process. To estimate conditional convergence two additional variables have been used: the levels of education through the Barro-Lee index and the regional government expenditure per capita.

The level of education of the work force to each of the clusters was obtained from the number of schooling years.

Table 5 shows that the speed of convergence conditioned by the years of schooling of the work force is not modified. The estimates of beta for the public expenditure increase the speed in 40% for the individual and family income. When considering the household income per capita the speed increases a 100%. This last result leads to think that the public sector plays an important role in the redistribution of income.

TABLE 5
CONDITIONAL CONVERGENCE OF THE GDP PER CAPITA,
HOUSEHOLD INCOME P.C. AND WAGES

Variables	Period	BetaIBL(%)	BetaGP (%)	R ² Adj	
		(1)	(2)	(1)	(2)
G.D.P. pc	1970-95				
	1984-94	0.03	0.07*	-0.1	-0.1
Household Income	1984-98	2.4**	4**	0.13	0.22
Household Income pc	1984-98	1.2	2**	0.11	0.10
Wages (w)	1984-98	2.6*	3.9*	0.27	0.3

Source: Self elaborated.

(1) Barro-Lee ⁶ Index (2) Government Expenditure.

⁶ Barro, R. y Lee, J. "International comparisons of educational attainment" 1960-1985. Harvard University, 1992. It is calculated by: $q(L) = \sum h_j * A_j$; where h is the proportion of the people over 25 years old for which the j -ésimo is the largest level of schooling obtained and A is the time in years del j -ésimo level of schooling. (8 years = elementary; 5 years = highschool and 5 years = university).

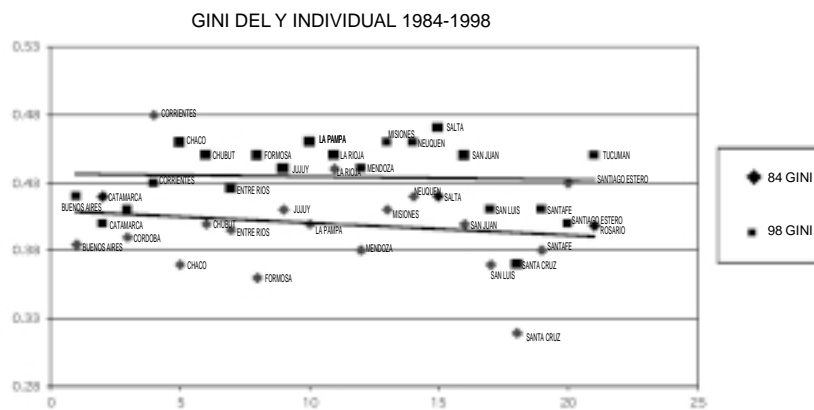
The extension of the theoretical framework to the analysis of the behaviour of growth through adjacent economic areas such as regions or provinces has not been very explored. Models developed in other theoretical contexts indicate that a very important role in the pattern of convergence can be the geographic position, especially with respect to proximity of relevant markets. However, none of these factors is able by itself to explain the dispersion of the growth rates.

3.2. The convergence in the second moment

In this section the convergence of the second moment is analyzed, in other words, the convergence of inequality.

The coefficient of Gini for 25 clusters that represent 25 provinces of Argentina were obtained for this analysis.

GRAPH 1
GINI OF THE INDIVIDUAL INCOME 1984-1988



In the graph 1 we observe an upward movement of the coefficients which indicates the level of equality in Argentina deteriorates. To analyze whether the provinces converge in inequality, the Δ GINI of the period 84-98 and the Gini of the initial year (1984) were regressed.

$$\Delta \text{GINI} = C + \gamma \text{GINI inicial} + \phi Zi^7$$

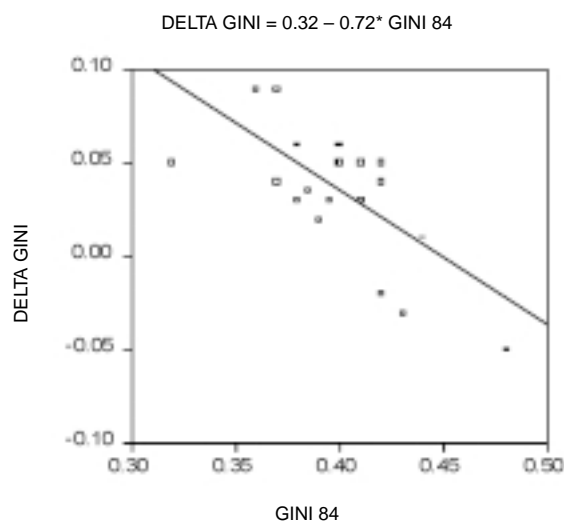
⁷ The same analysis was made with the growth rates of the Gini, measures of inequality such as the index of Theil, the ratio of Q5/Q1 and others were used. The results are similar to those presented.

TABLE 6
RESULTS OF THE SECOND MOMENT

	Gini initial	R ²
ΔGINI i	(-0.72)*	0.34
ΔGINI Household	(-0.57)*	0.38
ΔGINI HouseholdPC	(-0.40)*	0.31

In the three cases analyzed the initial coefficients present a proper sign and are significant. According to these results we can assure that there is evidence towards the hypothesis of convergence as it can be appreciated in Graph 2.

GRAPH 2
DELTA GINI (1984.1998) AND COEFFICIENT OF INITIAL GINI (INDIVIDUAL INCOME)



We conclude that for low levels of the coefficient of Gini, the growth (delta gini) was larger than in the cases of higher levels, which indicates a convergence to more elevated levels of inequality. There is evidence for the hypothesis of convergence (sigma), the variation coefficient of the Gini index is low and decreases over time (See Table1).

Conditional convergence of the inequality

As we see in Table 6.1 the values of convergence and significance for the individual income are similar to those obtained for the case of absolute conver-

gence. In the case of family income per capita the situation is also similar but the coefficients of the conditions are not significant.

TABLE 6.1
CONDITIONAL CONVERGENCE OF THE SECOND MOMENT

	Absolute	Schooling	Public Exp.
Individual	(-0.72)*	(-0.65)*	(-0.75)*
Household	(-0.57)*	(-0.55)*	(-0.58)*
Household p.c.	(-0.40)*	(-0.37)*	(-0.41)*

Relation between the convergence of the first and second moment.

In order to find the degree of relation between both moments we conditioned the equation of convergence (first moment) by the level of initial Gini and the modified equation of convergence (second moment) by the initial level of income.

First Moment:

$$(\ln Y_{98} - \ln Y_{84}) / t = a - \left(\frac{1 - e^{-\beta T}}{t} \right) \ln Y_{84} + \phi GINI_{84}$$

TABLE 7
RELATION BETWEEN FIRST AND SECOND MOMENT

	Coef. B- Cond.	ϕ (Coeff Gini 84)	R ²
Rate Individual Inc.	0.029*	(-0.079)	0.25
Rate Household Inc.	0.024	(-0.022)	0.21
Rate Household Pc Inc	0.014	(-0.022)	(-0.013)

Table 7 shows that the income coefficient does not vary when conditioning the equation by the level of inequality (Gini). The coefficients ϕ present negative signs and are not significant.

Second Moment:

$$\Delta GINI = C + \gamma \text{ initial GINI} + \phi Y_{84}$$

TABLE 8
RELATION BETWEEN FIRST AND SECOND MOMENT

	Coef. γ (Cond)	Coef. ϕ	R ²
Delta Gini Indi	(-0.73)*	(-0.02)*	0.27
Delta Gini Fliar	(-0.58)*	(-0.04)	0.4
Delta Gini Fliar Pc	(-0.50)*	(-0.03)	0.36

The Gini coefficients do not vary when conditioned by the level of income, except in the case of the household income. The coefficients of income are negative and are significant only for individual income.

4. DETERMINANTS OF INEQUALITY IN ARGENTINA

In the area of labor economy (also called microeconomic approach) the necessity to generate theoretical models has recently been considered. These models would explain the conduct of the relative wages between skilled and not skilled people and more generals to explain the structure of the wages by level of qualification. The conduct of these wages is related directly to inequality. The relative wage has taken a role similar to the index of inequality used before (Elias 1999).

When understanding the difference between the provinces of Argentina, there are two relevant factors according to the empirical evidence (De Gregorio and Lee, 1999), the returns of education (measured at different levels) and the differences by gender. With this purpose the differences of the returns of education were analyzed using as a database the EPH (wages of elementary, highschool and university).

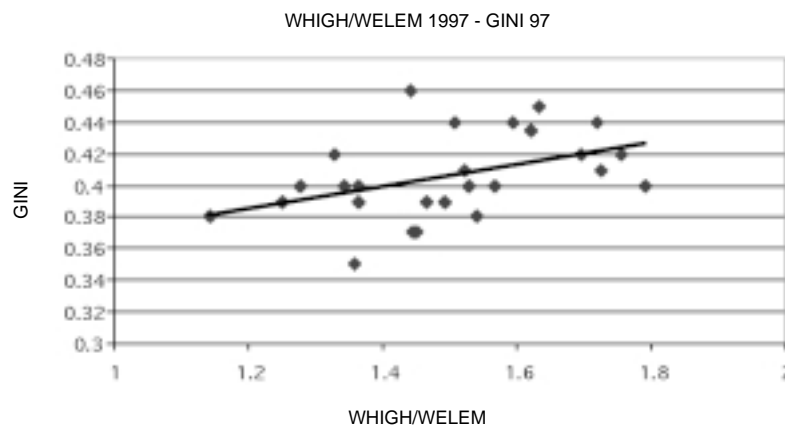
TABLE 9
WAGE PER LEVEL OF EDUCATION. INEQUALITY INDEX

	Whigh/ Welem	Wuni/ Whigh	Gini Elementary	Gini Univers.	Gini W Tot.	Theil W Tot.	Theil W Tot.
Average	1.487	1.947	0.338	0.408	0.407	0.316	0.301
Std. Dev.	0.167	0.379	0.049	0.035	0.027	0.048	0.045
Coef. Var.	0.112	0.195	0.145	0.086	0.066	0.152	0.149
Max.	1.791	2.923	0.450	0.465	0.460	0.420	0.390
Min.	1.144	1.229	0.210	0.320	0.350	0.230	0.220

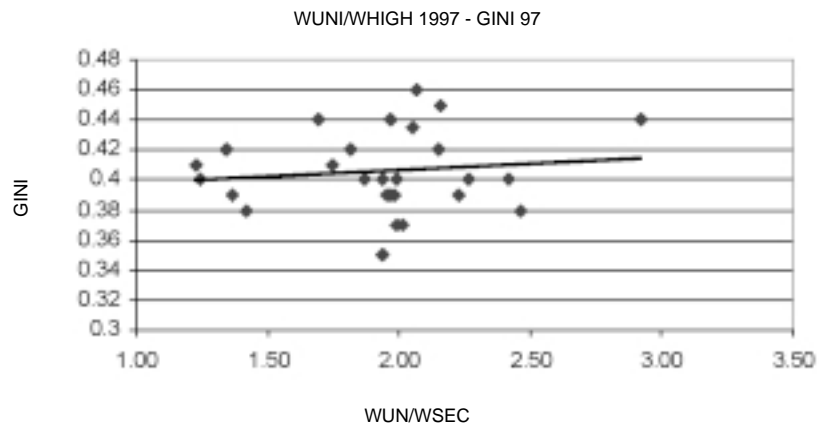
The ratio between the wage of highschool level education and elementary level is 1.50. The wage increases 50% when it reaches a superior level of education.

We also see that the ratio between university and highschool wage is 1.95 so the increase in wage for those with university education is of 100% larger with respect to those with a highschool level.

GRAPH 3
RELATION BETWEEN THE RATIO OF THE ELEMENTARY HIGH SCHOOL WAGES AND INEQUALITY



GRAPH 4
RELATION BETWEEN THE RATIO OF THE HIGH SCHOOL - UNIVERSITY WAGES AND INEQUALITY



With the purpose of studying the inequality within the groups analyzed we obtained the index of Gini for the wages of the elementary school and university education. It turns out that there is a larger level of inequality in the university educated group, with a coefficient of Gini 20% times larger than the one related with elementary school educated.

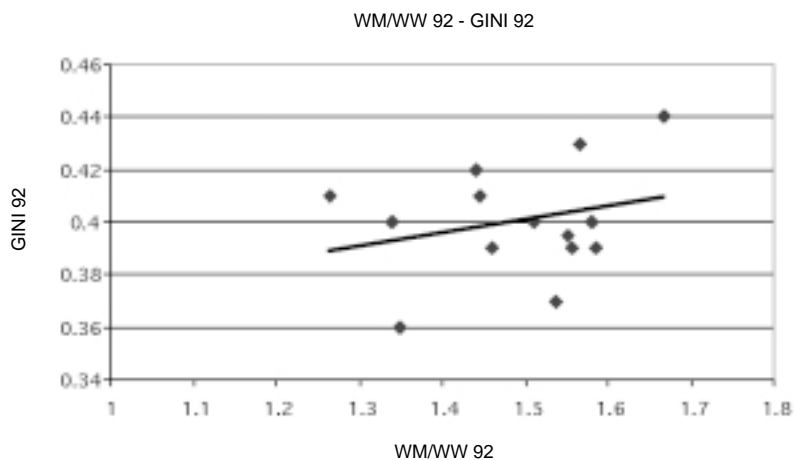
The results of the relation among the wages of men (WH) and women (WM) show that for the two years analyzed there is a difference of 50% in behalf of the men. Analyzing the differences by gender and level of education, the difference is of 60% for an elementary school level and of a 100% for the university level in the year 1997 in behalf of the men, as it can be seen in Table 9.

We observe an increasing relation more significant for the case of the ratio elementary- highschool than university - highschool.

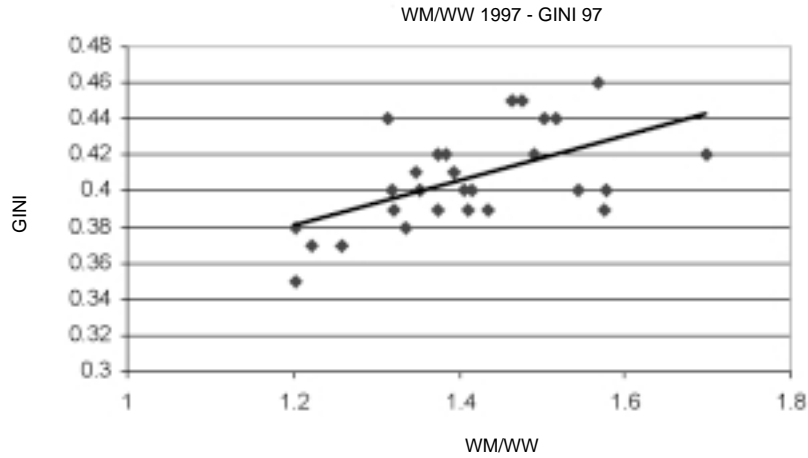
TABLE 10
RATIOS OF OHE WAGES BETWEEN GENDERS

	WM/WW 92	WM/WW 97
Media	1.48	1.41
D. std.	0.12	0.12
C. var.	0.08	0.09
Max.	1.67	1.70
Min.	1.27	1.20

GRAPH 5
RELATION OF THE RATIO BETWEEN W OF MEN AND WOMEN
AND INEQUALITY. 1992



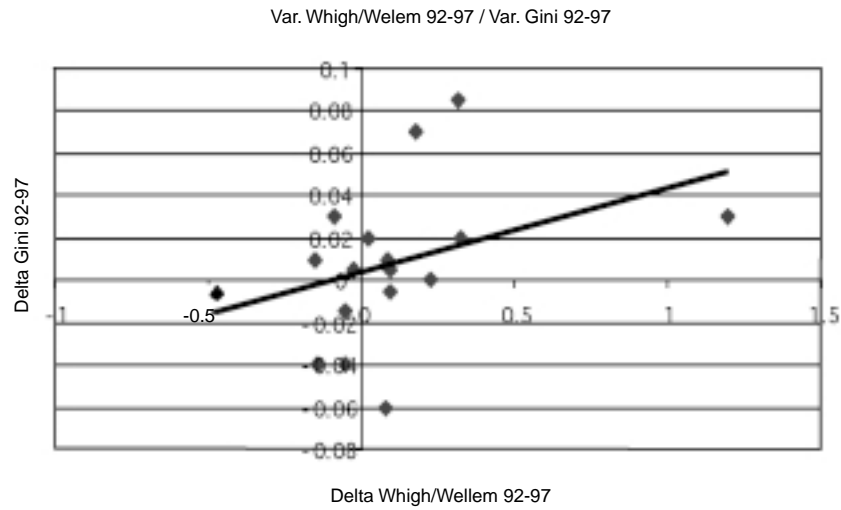
GRAPH 6
RELATION OF THE RATIO BETWEEN W OF MEN AND
WOMEN AND INEQUALITY - 1997



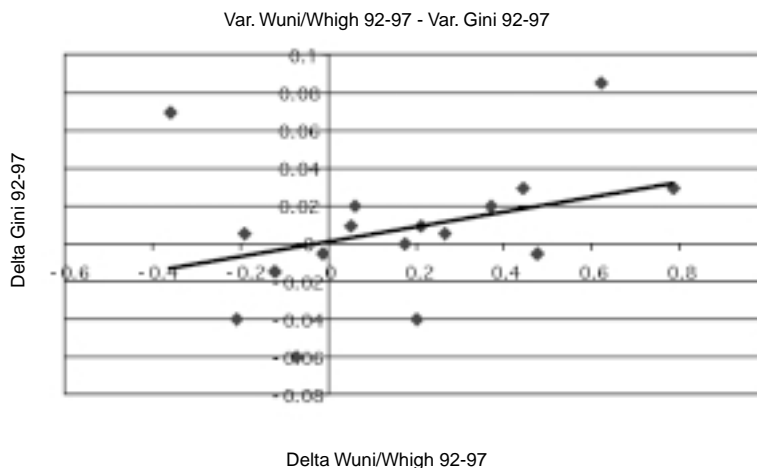
An increasing relation is presented in the two years analyzed being more significant in 1997.

This indicates that there is a positive relation between the increase of ratios and the increase of inequality.

GRAPH 7
RELATION BETWEEN THE VARIATION OF RATIOS OF THE WAGES
PER LEVEL OF EDUCATION. HIGH SCHOOL- ELEMENTARY AND
THE VARIATION OF INEQUALITY



GRAPH 8
 RELATION BETWEEN THE VARIATION OF RATIOS OF THE WAGES
 PER LEVEL OF EDUCATION. UNIVERSITY - HIGHSCHOOL AND
 THE VARIATION OF INEQUALITY



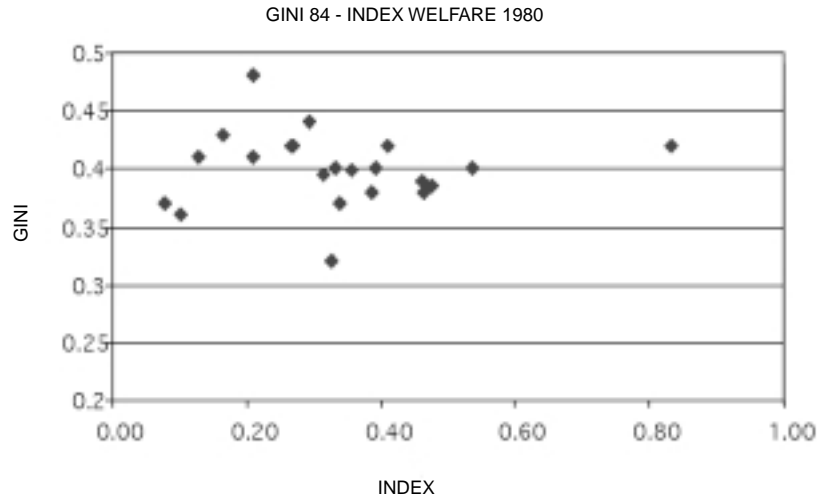
It becomes interesting to study the relation between the changes made among the wages of the different levels of education and the changes in level of inequality in the period of 1992-97. Graphs 7 and 8 show that the relation is positive for the ratio highschool-elementary and university-highschool, which indicates that the larger the ratio is, the greater level of inequality we observe (1992-97).

5. INEQUALITY AND WELFARE

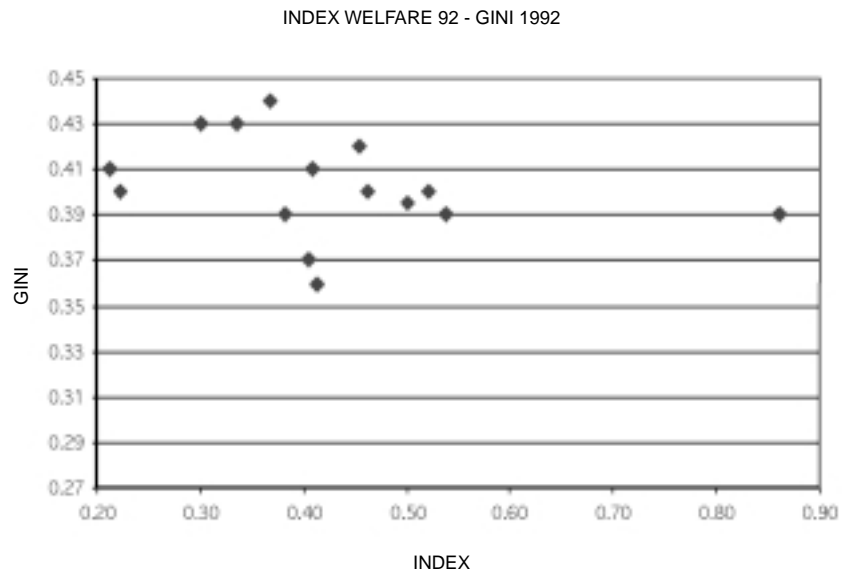
Finally, we elaborate an index of social welfare (ranked from 0 to 1) in order to analyze the relation between welfare and inequality. This index measures the development of the provinces of Argentina (as it gets closer to 1, it indicates a larger development). The index is formed by education indicators (people with average education), housing, health(hospitals and doctors) and access to information (newspapers).

Graph 9 shows the relation between development and equity: in this case for 1980 we see that there is low significant relation between the level of development and the degree of inequity: as the index of development grows the coefficient of Gini increases. However, this tendency can be modify following the inverted U shape form with values of the index close to 0,30. The analysis for 1992 (Graph 10) does not have many differences with respect to Graph 9, in the latter we can observe that there is a change in the inflexion point, close to 0,40. On the other hand, the relation presents a soft form of U inverted, which indicates that the significant variations of the index of development do not show variations in the degree of equity.

GRAPH 9
RELATION BETWEEN THE INDEX OF SOCIAL
WELFARE AND INEQUALITY 1980



GRAPH 10
RELATION BETWEEN THE INDEX OF SOCIAL
WELFARE AND INEQUALITY 1992



6. CONCLUSIONS

We proceed at this point to make conclusions based on the results shown throughout the paper:

- a) About the convergence of the first moment, there is favourable evidence with respect to the hypothesis of absolute convergence for the individual and household income. While in the case of the convergence of the second moment the results indicate convergence for the three types of income. In other words, the provinces of Argentina seem to have a tendency towards the same level of income (wage convergence) and the same level of inequality. The results also indicate that the dispersion of wages and inequality are reduced over time.
- b) With respect to the relation between convergence of the first and second moment we conclude that the coefficient of the initial values do not change. The coefficients, which relate both moments, have negative sign and are not significant. This explains that the inequality of income is not influenced by the level of initial income and that these levels of income are also not related with inequality.
- c) We finally analyzed the relation between some determinants and inequality. The tendency lines show a weak reaction between the determinants and inequality: the larger the level of the ratio, the larger inequality. It is concluded that if we study the determinants that can explain the inequality in the provinces of Argentina, not only the difference of the levels of education but also the difference in gender do not seem to influence the levels of inequality, even though their relation is positive.
- d) It can be confirmed that there is not a clear correlation between equality and development with respect to the index of social welfare. The plotted graph that forms a figure of a soft inverted U shape establishes that the ranks of variation of inequality are reduced when compared to the changes in the well-being indicators. However, the Graph 9 and 10 show an inflexion point that is obviously significant considering the curve of Kuznets.

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