INCOME MOBILITY: A CHARACTERIZATION IN ARGENTINA USING ARCHETYPES

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Abstract

The aim of this note is to analyze some characteristics about the income mobility problem present in Argentina during the last decade of the last century. In order to reach this goal we propose the concept of archetypes to identify an average economic agent in pseudo-data panel. This identification lets us follow the archetypes through the time and using stochastic kernels we study the dynamic distribution of three archetypes classes: Demographics, Sectors and Human Capital. The main result of this empiric analyzes shows that the Human Capital archetype exhibits the lowest mobility.

Resumen

Este artículo pretende analizar algunas de las características de los problemas de movilidad de ingresos de Argentina durante la última década del siglo pasado. Se propone utilizar el concepto de arquetipo para identificar al agente económico promedio. Esta identificación permite seguir a los arquetipos en el tiempo y usar kernels *estocásticos para analizar la dinámica de la distribución de tres clases de arquetipos: demográficos, sectoriales y de capital humano. Los resultados empíricos sugieren que los arquetipos por capital humano presenten los menores grados de movilidad.*

Keywords: *Archetypes, Income Distribution, Argentina.*

JEL Classification: D33.

1. Introduction

Governments affect the income distribution through multiple mechanisms to produce a redistribution of the wealth in the country. Historically the European governments had realized greater redistribution than in U.S. using both, direct and indirect mediums.

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    In the literature, it is often claimed that if a democratic government does redistributions, these are related to the fact that the population supports these programs. In other words, redistribution calls votes; this is typically the case of European countries.

    Nevertheless, the US society seems to be less willingness for the participation of the governments in the development of redistribution programs. This idea is supported by the presence of higher income mobility.

    In the very beginning, poor people will agree with redistribution but as soon as they left their poor state and become richer these preferences will change. So, as in societies with high mobility, the poor of today become the rich of tomorrow, the former will not be for supporting the weight of redistributive schemes.

    Basically the mobility in a distribution determines the preference over redistribution that the society has.

    Of course, there is a threshold, which determines when the level of inequality becomes a serious social problem. Further of this threshold the net losers, after the redistribution could feel the inequality as a social hazard. This could produce serious social conflicts with risks for the property rights.

    Alesina et al (2001), argue that if we have two societies A and B, A can be considered as having higher welfare than B, even with higher inequality if its mobility is higher than in the society B.

    In society A, earners change position periodically, while in B earners occupied the same position in the earnings hierarchy year after year. Note that in both cases, the cross section distributions of earnings have the same structure over time, so a snapshot picture of the earnings distribution in a given year will show the same inequality of earnings.

    In other words, if it is true that the US has higher mobility than Europe, meaning that people have more opportunities of changing their position in the income distribution, the inequality should affect less the utility of the average US citizen.

    Thus, the inequality does not affect the utility of the economic agents but does affect the probability of staying in a given social state.

    On the other hand, Salverda et al. work on income mobility, wage inequality in European countries (France, Germany, Netherlands and United Kingdom), relative to U.S. The authors conclude that the stereotype of rigidity in Europe is not confirmed.

    All the European economies, but France, show higher mobility, measured as the capacity of workers of escaping from lower wages, than U.S.

    In this work we are concerned with the description of the mobility of income in Argentina. The approach that we choose is to study how agents or archetypes of economic agents, described by a set of characteristic, have been evolving during the last 10 years of the 20th century.

    We will not follow the evolution of any particular individual but the average income of an archetype determined for some attributes that we keep fixed through time. An archetype represents a set of individuals who have common characteristics.

    We can not analyze if the first slot they happen to occupy handicaps these archetypes, but we can study how trajectories can differ according to factors as education, sex, etc.

Thus instead of following the income of Mr. Gomez (say, a graduate in computer science) has been changing during this period, we will track the income of the average graduate in computer science that lives in the province of Salta.

In the following section we describe an archetype and the concept of archetype class and how we calculate its income. Next we explain how we follow the dynamic distribution of these archetype classes. Results of applying our method for the Argentine case are showed and finally we finish with some conclusions and reflexions for future work.

2. ARCHETYPE CLASS AND ARCHETYPES

Pseudo panel data has some problems when the researcher wants to study dynamics. The most relevant point is the lack of an identifier that allows following an economic agent through his intertemporal evolution.

To solve that issue we will work with pseudo identifications or archetypes of the economic agents. This identification comes from common attributes or characteristics that agents have (such as sex, age, occupation, etc.)

Given a set A of all the attributes that are collected in a survey or database D, we will use the following definition.

Definition: an *archetype class* is defined as the partition that the subset of attributes $a \in A$ makes over the data base D. An archetype is an instance of an archetype class[1].

Thus, a demographic archetype class could be determined for the set of attributes (Urban, Sex, Age) and an instance of the demographic archetype could be $s_i = (Salta, Female, <24)$

An archetype class applied on the database D divides it in disjoint subsets. Thus, for instances if we select two attributes, and the first attribute has two different values and the second three, as result of applying this archetype class we will obtain six disjoint subsets or archetypes $S=\{s_1,..., s_6\}$.

Following the example, the demographic archetype class divides the database D in subsets or archetypes. Each one of these archetypes includes a number of individuals from D. As we are interested in studying the income mobility of each archetype we consider the income average of each archetype. In every case in order to have a well characterization of the archetype is important that the number of elements in s_i are big enough.

Archetypes represent intermediate concepts among the individuals and the aggregative concept of the representative agent. To explain the evolution of these intermediate concepts is simpler than individual components. In other hand is easier to aggregate archetype in order to explain the evolution of macroeconomic variables.

Archetype help us to answer questions like, How did the income of teachers in Salta evolved related to the income of the CEO's in Buenos Aires?, How the income of a graduate worker in Mendoza has changed related to the income graduate of non graduate workers in Cordoba?, How the income of women in Formosa has changed compared to the income of men in Neuquen?

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[1]   The concept of archetype is related to the cohort.

It is important to emphasize that when we focus on the mobility between archetypes in an archetype class, we left open the chance that we will not have higher mobility between archetypes but within archetypes could be high mobility.

The archetypes allows us to take particular characteristics of the individuals and study them in order to understand how those characteristics are related to inequality and finally to approximate the mobility.

3. DYNAMIC DISTRIBUTION OF ARCHETYPES

Given the archetype class we propose to study the evolution of the income of the archetype using Markov chain.

Following Quah (1993) we study how the income of an archetype relative to the mean of the archetype class, evolve during a given period of time.

The result of the analysis is resumed in five figures. The first two show the distribution for the initial year and the distribution for the final year. These distributions show the shape of the distribution in the extreme of the period under study.

Given these distributions we want to study what is the dynamic underneath the transition between these extreme distributions. The transitional dynamic is described for the estimated stochastic kernel.

The stochastic kernel shows how the transition among different position in the income distribution is produced but it does not inform us about how many transition are realized among the different positions in the distribution. Thus, we complement the stochastic kernel with information about the density of where the transitions are carried on.

If the stochastic kernel shows high probability in the main diagonal this is an indicator of low mobility in that particular archetype class. In other hand if the density of the kernel is not concentrated over the main diagonal we would say that the mobility is higher.

Given the stochastic kernel estimated is possible to obtain information about the long run distribution of income calculating, if possible, the ergodic distribution.

To simplify the information from the stochastic kernel we discretize the information such to present the data as transitional matrix with five states or quintiles. Over these transitional matrix we obtain the first mean pass matrixes.

4. THE CASE OF ARGENTINA

We worked over data running since 1990 to 1999 from the Household Survey in Argentina.

The selection of the attributes which form the archetype class were chosen according to the economic sense that we wanted to express and constrained it to have enough number of individuals in every archetype.

Thus we focus on three different classes: Demographic, Industrial Sectors and Education.

The definition of the attributes for the classes is given by,

– Demographic class: Urban city, sex and years according to the following groups; Less than 25, between 25 and 34, between 35 and 64 and finally older than 65 years.
– Industrial sector class: Urban city and Industrial Sector.
– Education class: Urban city and Education attainment according to the following four groups. Without education, primary, high school and graduate or higher.

En each class we include the attribute urban city because we consider that in Argentina the city is a relevant institutional factor. As we consider that in Argentina the city is a relevant institutional factor, this attribute will be included en each class.

For every class we will study the dynamic distribution of average income for the archetypes during the period 1990 until 1999.

4.1. Demographic archetype class

As we can see in Figure D1 the shape of the demographic archetype class is similar at the beginning and at the end of the period 1990 to 1999. Both are unimodal and they are concentrated to the left side of the national mean with a long right tail.

FIGURE D1
DEMOGRAPHIC ARCHETYPE DISTRIBUTION. 1990 Y 1999
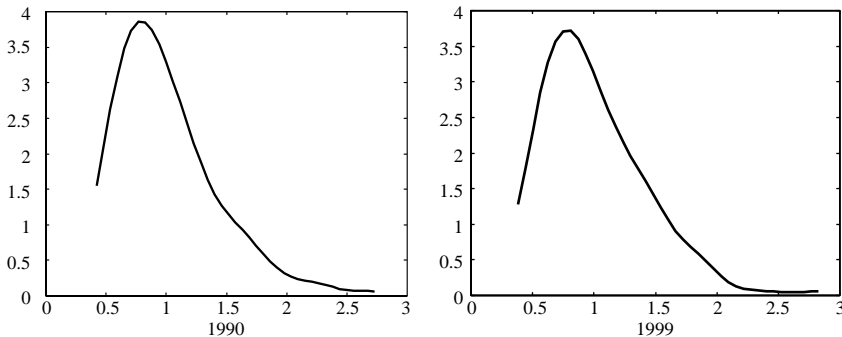
We analyze the composition of the first and the tenth decil in both estimated distribution according to the attributes in the demographic class.

As is resumed in Table 1, in 1990 100% of the first decil is composed by female archetypes where 50% belong to the youngest group and the other 50% to the oldest group. There is not urban city with higher presence in this year.

On the other hand, in 1999 the first decil is composed by 75% females archetypes and the 100% are archetypes that belong to the youngest archetypes. As in the 90's there is no urban city with relevant presence.

While in 1990 the tenth decil was composed by 17% of individual among 25 and 35 years old the same decil in 1999 show that 35% are individuals among 25 and 35 years old. This change in composition could be explained for the effect of the Technological Revolution given by the structural economy reform

TABLE 1
FIRST AND TENTH DECIL COMPOSITION ACCORDING TO ATTRIBUTES
IN DEMOGRAPHIC CLASS

	First Decil		Tenth Decil	
	1990	1999	1990	1999
Years Old	50% (<25) 50% (>65)	100% (<25)	50% (35<y<65) 33% (>65) 17% (25<y<35)	55% (35<y<65) 10% (>65) 35% (25<y<35)
Sex (% Fem)	100%	75%	8%	25%
Urban City*	-	-	-	-

* There is no relevant classification in the urban city.

carried on by Argentina during this period, where the new technology demand for new knowledge and skills are usually faster acquired by young individuals.

The complete dynamic distribution is shown in Figure D2.

FIGURE D2
TRANSITIONS AND CONCENTRATION DURING THE PERIOD 1990 TO 1999
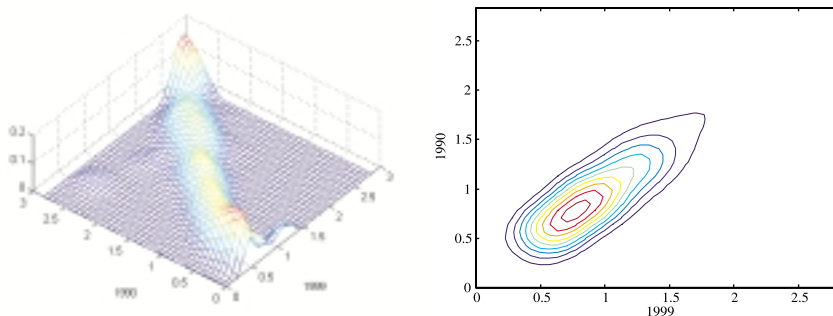
The stochastic kernel estimated shows a higher concentration through the main diagonal, which is an indicator of a low number of transitions occurring during the period in the demographic class. The contour graph shows that the higher number of transitions occurred among 0.5 and 1.5 times the national mean income.

As we can see from the figure D3 the long run distribution keeps the same shape of the 90 and 99 distribution.

FIGURE D3
LONG RUN DISTRIBUTION FOR DEMOGRAPHIC CLASS. 1990 TO 1999
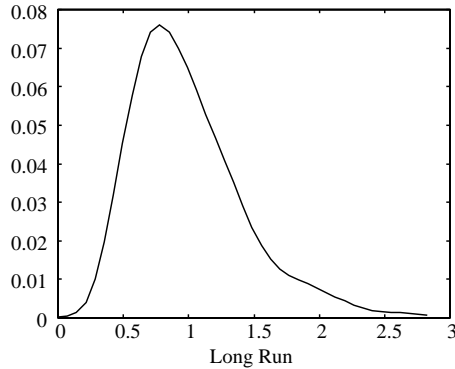
4.2. Education archetype class

The distribution for the initial and final year for this archetype class exhibit bimodality with picks registered in the similar points in both distributions. The pick with higher concentration appears about 0.6 the national income mean and the second pick with lower density appears in 1.4 the national mean. (See Figure E1)

This bimodality in the distribution is an indicator that the education level is a determinant in the group formation in the society.

FIGURE E1
DISTRIBUTION OF EDUCATION ARCHETYPE CLASS. YEARS 1990 AND 1999
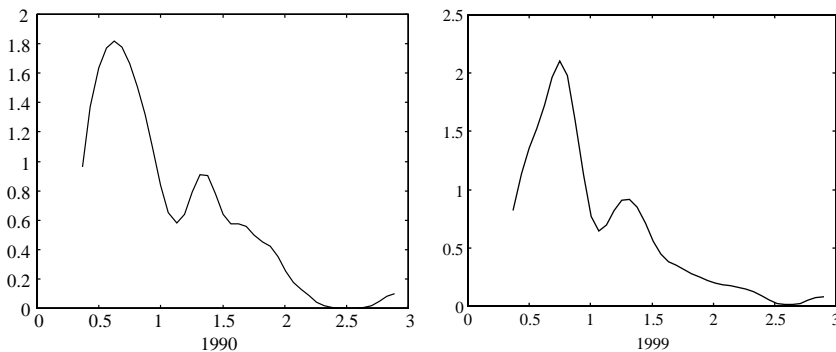
As with the demographic archetype class we resume in the table 2 the composition of the first and tenth decil for both years.

TABLE 2

FIRST AND TENTH DECIL COMPOSITION ACCORDING TO EDUCATION
ARCHETYPE CLASS

	First Decil		Tenth Decil	
	1990	1999	1990	1999
Education*	100% (Group 1)	100% (Group 1)	100% (Group 4)	90% (Group 4) 10% (Group 3)
Urban City	-	-	-	-

* Group 1 without education, Group 2 primary, Group 3 high school, Group 4 graduate or higher.

In all the cases there is no relevant concentration for any Urban City in both deciles.

FIGURE E2

TRANSITION AND DENSITY FOR THE EDUCATION ARCHETYPE CLASS
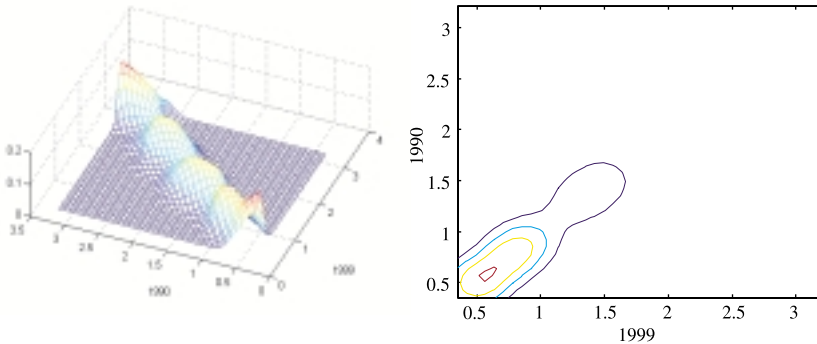
The stochastic kernel estimated in Figure E2 shows the transitional dynamic in this class. The transitions are concentrated in four groups which suggest that even when there are transitions within educational groups the transitions between groups are harder.

In other hand, the contour graph shows that the greater number of transitions are carried on below 1.5 times the national mean income.

The long run distribution confirms the bimodality already observed in the 90 and 99 distributions.

FIGURE E3
LONG RUN DISTRIBUTION FOR THE EDUCATION
ARCHETYPE CLASS, 1990 TO 1999
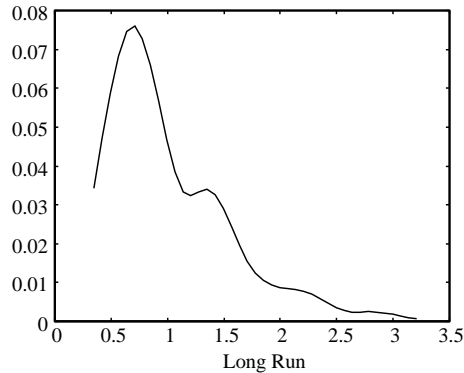
4.3. Economic sectors archetype class

This archetype class shows a higher concentration over the national average income. We can infer from this fact that the inequality doesn't come from the differences among economic sectors in the Argentine case. This claim is based on the idea that there are not remarkable differences between the average incomes among the economic sectors.

As we have already emphasized beside the shape of the distribution we are interested in, specific characteristics of the mobility behind this shape.
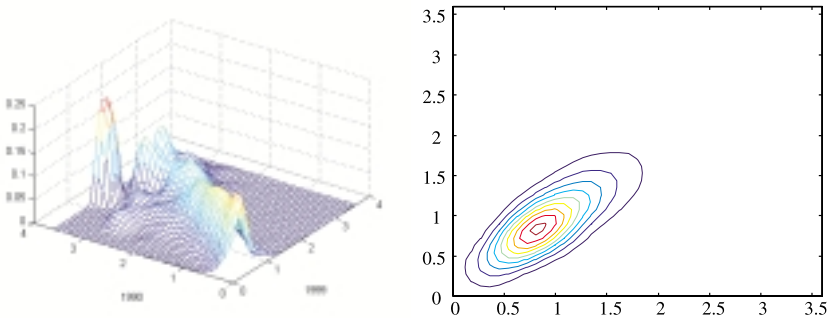
FIGURE S1
DISTRIBUTION OF ECONOMIC SECTOR ARCHETYPE CLASS. 1990 TO 1999
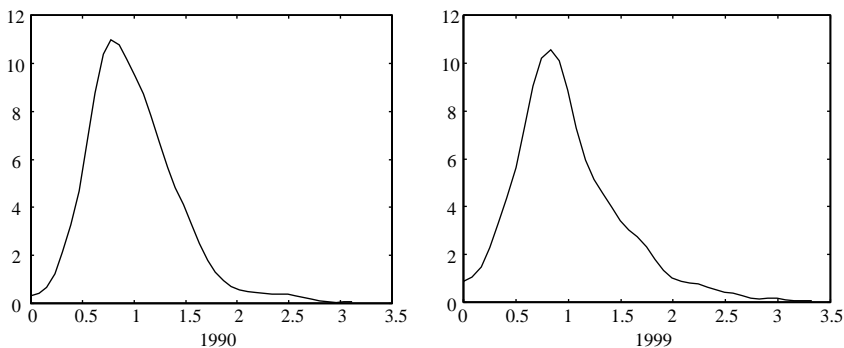
If we focused on the composition of the first decil in the 90 we have that 60% of the archetype in that decil come from the sector of domestic services. In other hand the superior decil does not show any sector with higher participation such to induce any relevant result.

In 99 the composition of the lowest and highest decil do not change qualitatively compared to the 90.

FIGURE S2

TRANSITIONS AND DENSITY FOR ECONOMIC SECTORS CLASS ARCHETYPE

The estimated stochastic kernel of Figure S2 shows higher mobility than in the previous classes. As it is visible there are a great number of transitions outside of the main diagonal. It is relevant to emphasize that these transitions have been taken place from higher level of incomes to lower ones.

FIGURE S3

LONG RUN DISTRIBUTION OF THE ECONOMIC SECTOR
ARCHETYPE CLASS, 1990 TO 1999
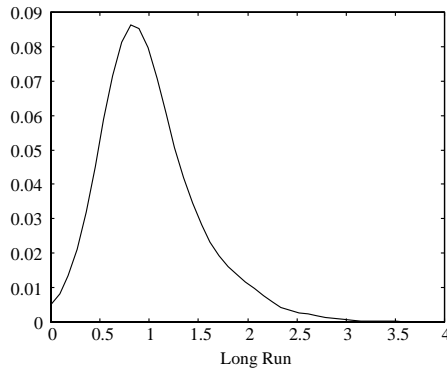
As in the previous cases the long distribution preserves the shape of the initial and final distribution.

Comparing archetypes

In order to simplify the comparison among different classes of archetype, we discretized the estimated stochastic kernel and calculated the mean time until the first pass from the transition matrix.

Tables D1, E1 and S1 show the transition matrix for each of the archetype class. We use five quintiles to show the matrix.

TABLE D1
TRANSITION MATRIX FOR DEMOGRAPHIC ARCHETYPE CLASS

		Quintiles period t+1 (%)				
		1	2	3	4	5
Quintiles period t	1	45.3	48.6	5.8	0.0	0.3
	2	12.3	73.6	13.9	0.1	0.1
	3	0.2	22.1	65.7	11.9	0.2
	4	0.0	1.0	26.9	61.6	10.5
	5	1.9	4.2	2.6	24.8	66.4

TABLE E1
TRANSITION MATRIX FOR EDUCATION ARCHETYPE CLASS

		Quintiles period t+1 (%)				
		1	2	3	4	5
Quintiles period t	1	85.9	14.2	0.0	0.0	0.0
	2	21.7	60.1	18.0	0.2	0.0
	3	0.0	31.3	53.5	15.2	0.0
	4	0.0	0.7	23.5	66.1	9.8
	5	0.0	0.0	0.4	15.6	84.1

TABLE S1
TRANSITION MATRIX FOR ECONOMICS SECTORS ARCHETYPE CLASS

		Quintiles period t+1 (%)				
		1	2	3	4	5
Quintiles period t	1	74.4	24.9	0.5	0.1	0.0
	2	14.5	71.5	13.2	0.7	0.0
	3	1.6	32.7	53.7	10.7	1.2
	4	1.6	14.3	36.9	40.1	7.1
	5	0.5	16.9	35.6	37.4	9.7

A very simple and direct measure of mobility come from calculate the mean of the transition probabilities allocated in the main diagonal of these matrixes; higher this value, higher should be the lack of mobility of the particular class.

According to this rule, the education class shows the lower mobility with the 69%, followed by the demographic class with 62% and finally the economic sector class with 49%.

The lower mobility in the education class is an indicator about how strong is the education attainment in Argentina as a determinant of the income inequality.

To check this result we can see in the first mean pass time matrixes in tables D2, E2 y S2, the confirmation of our results.

TABLE D2
TIME UNTIL THE FIRST PASS IN DEMOGRAPHIC ARCHETYPE

		Quintiles period t+1				
		1	2	3	4	5
Quintiles period t	1	10	3	9	31	91
	2	15	2	8	30	90
	3	22	7	3	22	83
	4	25	10	5	8	63
	5	25	11	8	10	25

TABLE E2
TIME UNTIL THE FIRST PASS IN EDUCATIONAL ARCHETYPE

		Quintiles period t+1				
		1	2	3	4	5
Quintiles period t	1	2	7	21	55	150
	2	10	4	14	48	143
	3	16	6	6	34	130
	4	23	13	7	10	95
	5	29	19	13	7	16

TABLE S2
TIME UNTIL THE FIRST PASS IN SECTOR ARCHETYPE

		Quintiles period t+1				
		1	2	3	4	5
Quintiles period t	1	3	4	15	49	207
	2	10	2	11	46	204
	3	12	3	6	37	194
	4	13	4	5	24	176
	5	13	4	6	24	171

As we can observe the first time mean pass are low in the first quintile showing that there exist persistence inequality along the distribution of income. In other words, it takes a long time for archetype to move from one quintile toward a higher one.

In all the analyses that we did the cost, measure in years, of climb in the distribution is higher than the cost of fall from higher quintile toward lowers one.

5. CONCLUSION

The aim of this note was to get from the household survey available in Argentina during the 90's some results about the characteristic of the mobility during that period.

Particularly, given that the available data are not data panel we proposed the utilization of archetypes to analyze the mobility according to different economic characteristics.

The lack of mobility and the presence of shape distribution with bimodalities in the education archetype class point out how important is education attainment in the Argentinean case as an income inequality determinant.

In the economic sector class we found that even when the distribution keep the same shape during the period there was an increasing mobility from archetypes with higher incomes toward lower income during the last decade.

Demographic characteristics seem to be not very helpful when we have to explain why we have income inequality. This result is obtained from the lower values in the first mean average pass and in the change of composition of the archetypes produced during the last decade.

The results encourage us to work toward different directions in order to improve our research.

From the economic side we are looking forward for constructing a consistent framework where we could interpret the result that we get from this dynamic analysis.

From the econometric point of view we have to work in order to understand which are the implications of using Markov chains and the assumptions about the stationarity of distribution that we had to do.

APPENDIX
URBAN CITIES FROM THE EPH.

1990

Gran Bs. As; Gran La Plata; B. Blanca; Gran Rosario; Misiones; Gran Mendoza; Corrientes; Neuquén; SS Jujuy y Palpalá; Jujuy; Río Gallegos; Gran Catamarca; Salta; San Luis; Gran San Juan; S.M. Tucumán; Santa. Rosa.

1991

Gran Bs. As.; Gran La Plata; Gran Mendoza; Gran Córdoba; Neuquen; SS Jujuy y Palpalá; Río Gallegos; Salta; S.M. Tucumán; Santa. Rosa.

1992

Gran Bs. As.; Gran La Plata. Prov. Bs As.; Santa Fe y Sto. Tomé; Paraná; C. Rivadavia; Gran Córdoba; Neuquén; Resistencia; SS Jujuy y Palpalá; Río Gallegos; Salta; San Luis; Gran San Juan; Santa. Rosa; T. Fuego.

1993

Gran Bs. As.; Gran La Plata; Gran Rosario; Santa Fe y Sto. Tomé; Paraná; C. Rivadavia; Gran Mendoza; Gran Córdoba; Neuquén; SS Jujuy y Palpalá; Río Gallegos; Gran Catamarca; Salta; San Luis; S.M. Tucumán; Santa Rosa; T. Fuego.

1994

Gran Bs. As.; Gran La Plata; Gran Rosario; Santa Fe y Sto. Tomé; Paraná; G. Resistencia; C. Rivadavia; Gran Mendoza; Corrientes; Gran Córdoba; Neuquén; Resistencia; SS Jujuy y Palpalá; Río Gallegos; Gran Catamarca; Salta; La Rioja; San Luis; Gran San Juan; S.M. Tucumán; Santa Rosa; T. Fuego.

1995

Gran La Plata; B. Blanca; Gran Rosario; Santa Fe y Sto. Tomé; Paraná; G. Resistencia; C. Rivadavia; Gran Mendoza; Corrientes; Gran Córdoba; Neuquén; Resistencia; SS Jujuy y Palpalá; Río Gallegos; Gran Catamarca; Salta; San Luis; Gran San Juan; S.M. Tucumán; Santa. Rosa; T. Fuego.

1996

Gran Bs. As; Gran La Plata; B. Blanca; Gran Rosario; Santa Fe y Sto. Tomé; Paraná; G. Resistencia; C. Rivadavia; Gran Mendoza; Corrientes; Concordia; Formosa; Neuquén; Río Gallegos; Gran Catamarca; Salta; La Rioja; Gran San Juan; S.M. Tucumán; Santa. Rosa; T. Fuego; Mar Plata; Río Cuarto.

1997

Gran Bs. As; Gran La Plata; B. Blanca; Gran Rosario; Santa Fe y Sto. Tomé; Paraná; Misiones; G. Resistencia; C. Rivadavia; Gran Mendoza; Corrientes; Gran Córdoba; Formosa; Neuquén; Resistencia; SS Jujuy y Palpalá; Río Gallegos; Gran Catamarca; Salta; La Rioja; San Luis; Gran San Juan; S.M. Tucumán; Santa. Rosa; T. Fuego; Río Cuarto.

1998

Resistencia; Gran La Plata; B. Blanca; Gran Rosario; Santa Fe y Sto. Tomé; Paraná; G. Resistencia; C. Rivadavia; Gran Mendoza; Corrientes; Gran Córdoba; Concordia; Formosa; Neuquén; Resistencia; SS Jujuy y Palpalá; Río Gallegos; Gran Catamarca; Salta; La Rioja; San Luis; Gran San Juan; S.M. Tucumán; Santa. Rosa; T. Fuego; Mar Plata; Río Cuarto; B. Blanca.

1999

Gran La Plata; Gran Rosario; Santa Fe y Sto. Tomé; Paraná; G. Resistencia; C. Rivadavia; Chubut; Gran Mendoza; Corrientes; Gran Córdoba; Concordia; Formosa; Neuquén; Resistencia; SS Jujuy y Palpalá; Río Gallegos; Gran Catamarca; Salta; La Rioja; San Luis; Gran San Juan; S.M. Tucumán; Santa Rosa; T. Fuego; Ciudad Bs. As.; Part. Gran Bs. As.; Mar Plata. Bs. As.; Río Cuarto.

REFERENCES

Alesina, A., Di Tella, R., Mac Culloch, R. (2001). "Inequality and Happiness: Are Europeans and Americans Different?". *NBER, Working Papers N:* 8198.

Alesina, A., Rodrick, R. (1994). "Redistributive politics and Economics growth" *Quarterly Journal of Economics.* 109(2), 465-490.

Aramburu, A., Busso, M. (2000). "Instituciones y Reformas del Estado". *Cuadernos de Economía.* N° 48.

Brambilla, I., Porto, G., Posadas, J. (1998). "Desarrollo, crecimiento regional y política económica. Causas y efectos de la concentración de la actividad económica". *Cuadernos de Economía.* N° 35.

De Flood, M.C., Harriague, MM., Gasparini, L., Vélez, B. (1994). *El gasto público social y su impacto redistributivo.* Secretaría de programación económica, PROYECTO ARG/93/029. Buenos Aires.

De Gregorio, J., Jong Wha Lee (1999). "Education and Income Distribution: New Evidence from Cross-country Data", *Development Discussion Paper*s Harvard. Nº 714.

Gasparini, L. (2000). "Determinantes de la Desigualdad en la Distribución del Ingreso". *Cuadernos de Economía.* N° 54.

Gasparini, L. (2000). "El impacto distributivo del gasto público en sectores sociales en la Provincia de Buenos Aires". *Cuadernos de Economía.* N° 50.

Gasparini, L., Marchionni, M., Escudero, W. (2000). "La distribución del ingreso en Argentina y en la Provincia de Buenos Aires". *Cuadernos de Economía.* N° 49.

Greene (1999). *Econometric Analyses.* Mc Graw Hill.

Marina, A., Sotelsek, D. (2000). "Convergencia del primero y segundo momento. Una Comparación España–Argentina". *Convergencia e integración económica*. Editorial Pirámide.

Milanovic, B. (1997). "A Simple Way to Calculate The Gini Coefficient and some Implications", *World Bank.*

Milanovic, B. (1999). "True World Income Distribution, 1988 and 1993: first calculations based on households surveys alone", *Twelfth World Congress of the International Economic Association. NBER, Working Papers N:* 4798.

Quah, Danny T. (1993). "Galton´s fallacy and tests of the convergence hypothesis", The Scandinavian Journal of Economics, Vol. 95, N° 4.

Quah, Danny T. (1996a). "Empirics of economic growth and convergence", European Economic Review, Vol. 40, N° 6, June.

Quah, Danny T. (1996b). "Twin peaks: growth and convergence in models of distribution dynamics", The Economic Journal, Vol. 106, N° 437, July.

Quah, Danny T. (1997a). "Empirics for growth and distribution: stratification, polarization, and convergence clubs", Discussion Paper N° 324, Centre for Economic Performance, January.

Saiegh, S. Y. Tommasi (1999). "Why is Argentina"s Fiscal Federal System so Inefficient? Entering into the Laberynth", en Journal of Applied Economics, Vol. II, N° 1.

Salverda, W., Bazen, S. and Gregory, M. (2001). "The European-American Employment Gap, Wage Inequality, Earnings Mobility and Skill: A study for France, Germany, the Netherlands, the United Kingdom and the United States." Lower.