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Migratory Movements And Regional Convergence In Spain.

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40TH CONGRESS OF THE EUROPEAN REGIONAL SCIENCE ASSOCIATION
29 AUGUST – 1 SEPTEMBER 2000 IN BARCELONA.

MIGRATORY MOVEMENTS AND REGIONAL CONVERGENCE IN SPAIN.

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ABSTRACT

The paper shows that regional migration in Spain has been an important source of convergence in gross domestic product (GDP) per capita as well as in gross personal disposable income (GPDI) per capita. The estimation of an interregional net migration equation with panel data for the period 1968-1996, indicates that the increase in the unemployment rate and the reduce in the employment growth in host regions are two important factors when explaining the exhaustion of net migratory movements and therefore the exhaustion of the convergence process. An implication of this analysis is that reduction of the unemployment rate together with employment growth, in Spain and in the European Union, could be an important mechanism to reducing regional disparities because it makes easy the mobility of factors between economic spaces with great income differences.

1.- INTRODUCTION.

This paper studies the relationship between interregional migratory movements and regional disparities in Spain. In previous studies (Raymond y García-Greciano 1996 y 1999) we have shown that the distribution of population between regions was an important mechanisms of convergence in gross domestic product per capita. In Spain, during the 1960s and 1970s, population migrated from poor regions to rich regions. These high migratory movements denote the rich regions as “received” regions of population because their net migratory flows were positive and the poor regions as “expelled” regions of population because their net migratory flows were negative. Additionally, the net migratory movements stopped in the late 1970s, basically, due to the increase in the unemployment rate and the less employment creation in host regions. This situation in the labor market caused the exhaustion of net migratory movements and therefore the exhaustion of the convergence process.

In this study we focus on measuring the income regional disparities using an estimation of the gross personal disposable income per capita in purchasing power which better captured the purchasing capacity in each region measured by the relative consumer prices. The paper is organized as follow. In section 2, we show the differences of sigma convergence in gross domestic product (GDP) per capita versus gross personal disposable income (GPDI) per capita in purchasing power (PP). In section 3, we study the importance of the distribution of population over the Spanish regions to explain the process of sigma convergence in GPDI per capita in PP. In section 4, we present the results of the estimation of an interregional net migration equation with panel data for the period 1968-1996, with the differences in GPDI per capita in PP and the unemployment rate and the growth of employment in host regions as explanatory variables. The results indicate that the changes in the labor market which capture the less possibilities of finding a job, is an important factor when explaining the exhaustion of net migratory movements and therefore the exhaustion of the convergence process. In section 5, we set forth our conclusions.

2.- CONVERGENCE IN GROSS DOMESTIC PRODUCT PER CAPITA VERSUS GROSS PERSONAL DISPOSABLE INCOME PER CAPITA IN PURCHASING POWER.

Several works have studied regional disparities in Spain and since the middle of 1990's much more have investigated the process of convergence in their different concepts. These works normally focused on some production indicator as the GDP per capita or labor productivity. Nevertheless, when we considered an income indicator as the Gross Personal Disposable Income (GPDI) per capita we observe that the regional disparities are less than when we considered the GDP per capita, due to the redistributive effect of the public sector (Raymond and García-Greciano, 1996).

In this section we focus on a new variable that consider the importance of the different regional level prices. In effect, rich regions have higher level prices than poor ones and to consider these differences may us to approximate to the purchasing capacity in each region. To measuring this concept we have computed the Gross Personal Disposable Income (GPDI) per capita in Purchasing Power (PP), that is the GPDI per capita deflated by the consumer relative price index. The data for the GPDI per capita are taken from the Banco Bilbao-Vizcaya Foundation's publication *Renta Nacional de España y su Distribución Provincial. Serie Homogenea. Años 1955 a 1993 y avances 1994 a 1997* ("National Income of Spain and Its Provincial Distribution. Homogeneous Series. 1955 to 1993 years and 1994 to 1997 advance years"), which reports provincial and regional incomes at two year intervals between 1955 and 1997. In addition, we have estimated the consumer relative price index taken the relative level prices at 1989 (source of data from Lorente 1992) and the consumer price index (source of data from National Institute of Statistics)¹.

In order to measure the regional disparities of the GPDI per capita in PP we have computed the so called sigma convergence of the logarithm of this variable². Figure 1 shows this result together with the sigma convergence of the logarithm of the GDP per capita and the sigma convergence of the logarithm of the GPDI per capita for comparative purpose. The GDP per capita is deflated by the added value deflator and the GPDI per capita is deflated by the consumer price index without considering relative prices.

As Figure 1 shows, regional disparities depend on the measured variable. First, in terms of GDP per capita, it is well known the existence of a period of rapid convergence in Spain (1955 to 1979) followed by a period during which the level of inequality remains essentially constant (1979 to 1997). In terms of GPDI per capita and GPDI per capita in PP the tendency is the same with a break in 1979. Nevertheless, when we compare convergence in terms of GDP per capita and in terms of GPDI per capita in PP, regional disparities are reduced for two reasons. First, because of the redistributive effect of the public sector that means that rich regions pay more direct taxes, net of transference, than poor ones. Second, because of the different price levels that means that rich regions have higher prices than poor ones. The first effect is shown when we compare GDP per capita with GPDI per capita, and the second one is shown when we compare GPDI per capita with GPDI per capita in PP.

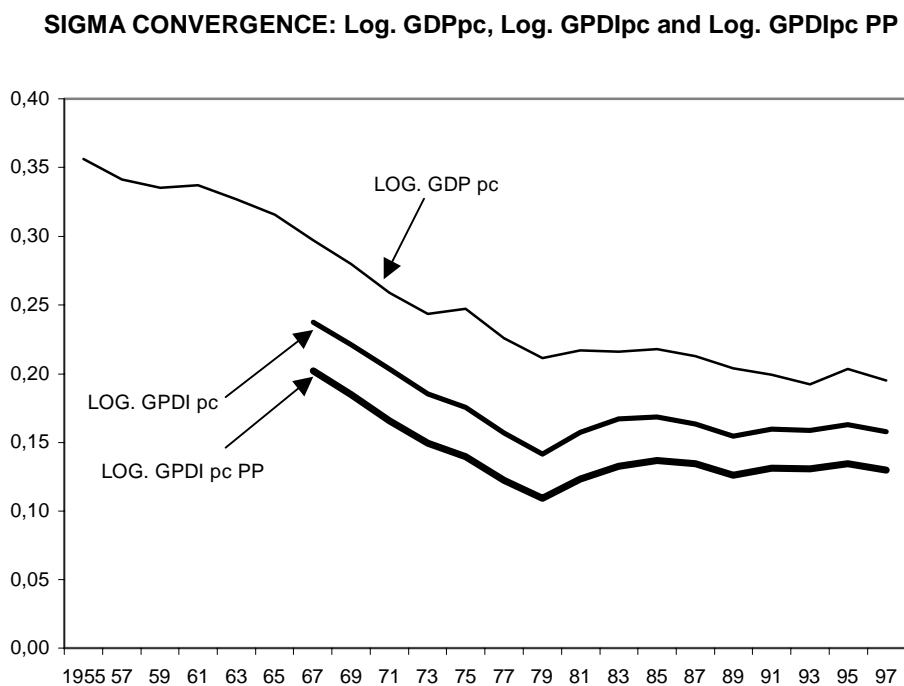


FIGURE 1: Sigma Convergence for the Spanish Regions, 1955 to 1997: Gross Domestic Product per capita, Gross Personal Disposable Income per capita and Gross Personal Disposable Income per capita in Purchasing Power.

If we understand regional income disparities as a concept of purchasing capacity of their population rather than a concept of productive capacity, we have to measure it considering the GPDI per capita in PP. The next question to answer is for what reason the convergence process in GPDI per capita in PP was stopped abruptly in 1979.

3.- CONVERGENCE IN GROSS PERSONAL DISPOSABLE INCOME IN PURCHASING POWER VERSUS GROSS PERSONAL DISPOSABLE INCOME PER CAPITA IN PURCHASING POWER.

In García-Greciano and Raymond (1999) it was shown that in Spain there is not convergence but divergence in terms of GDP (without dividing by population). It means that rich regions increase their relative weight in the total GDP and poor regions decrease it. Therefore, the explanation offered to the observed convergence process in GDP per capita is the loss of relative population in the poor regions and the increase in the relative population in the rich ones caused by the migratory movements from poor to rich regions.

If we compute the standard deviation of the logarithm of the GPDI in PP (without dividing by population) we get a similar result (see Figure 2), that is there is no convergence in personal disposable income. That means that the relative weight of rich regions over the total in terms of personal disposable income remains essentially constant. Comparing this result with the convergence process observed in terms of GPDI per capita in PP from 1967 to 1979, we have to look again at the change of relative population to understand this phenomenon.

In effect, making a decomposition of the variance of the logarithm of the GPDI in PP into the variance of the logarithm of the GPDI per capita in PP, the variance of the logarithm of population and the covariance of these two components (see annex 1), we get that, between 1967 and 1979, the variance of the logarithm of the GPDI per capita in PP reduce 0,03 points and the variance of the logarithm of population increase 0,03 points. On the other hand, between 1979 and 1997, the variance of the logarithm of the

GPDI per capita in PP and the variance of the logarithm of population remains essentially constant. It means that the convergence process observed in GPDI per capita in PP from 1967 to 1979 is due to the divergence in Spanish population.

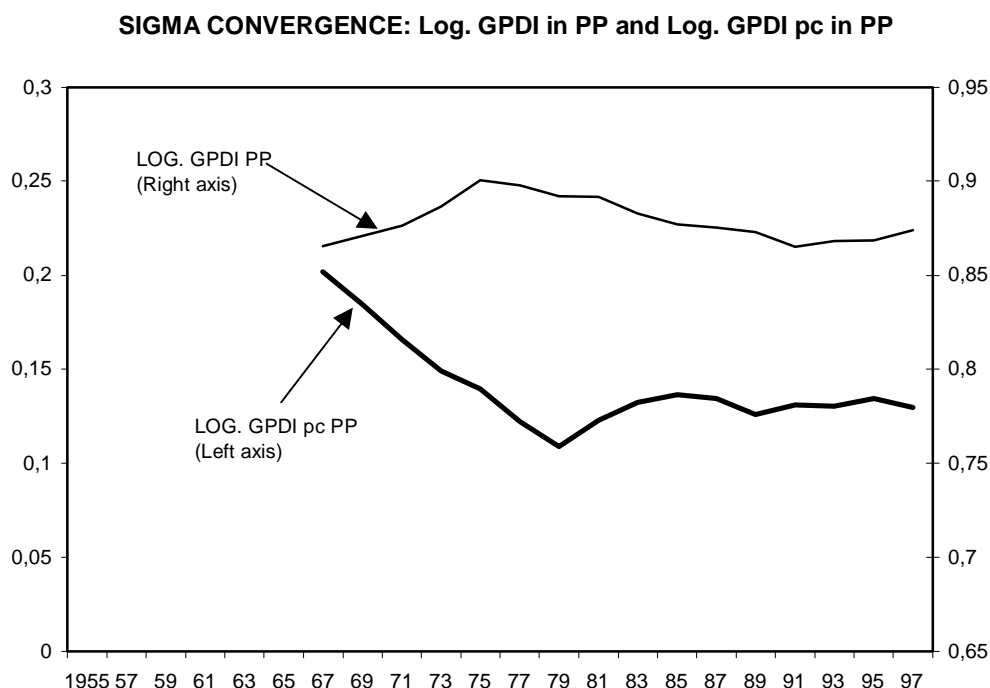


FIGURE 2: Sigma Convergence for the Spanish Regions, 1967 to 1997: Gross Personal Disposable Income in Purchasing Power and Gross Personal Disposable Income per capita in Purchasing Power.

4.- CONVERGENCE AND MIGRATORY MOVEMENTS.

As has already been shown, the Spanish population is distributed more heterogeneous over the Spanish territory. The change in relative population during the 1960s and 1970s is due to the migratory movements from poor to rich regions. To study the migratory movements we have taken data from the National Institute of Statistics' publication *Migrations*, which reports permanent residence variations of total population from 1962 to 1997.

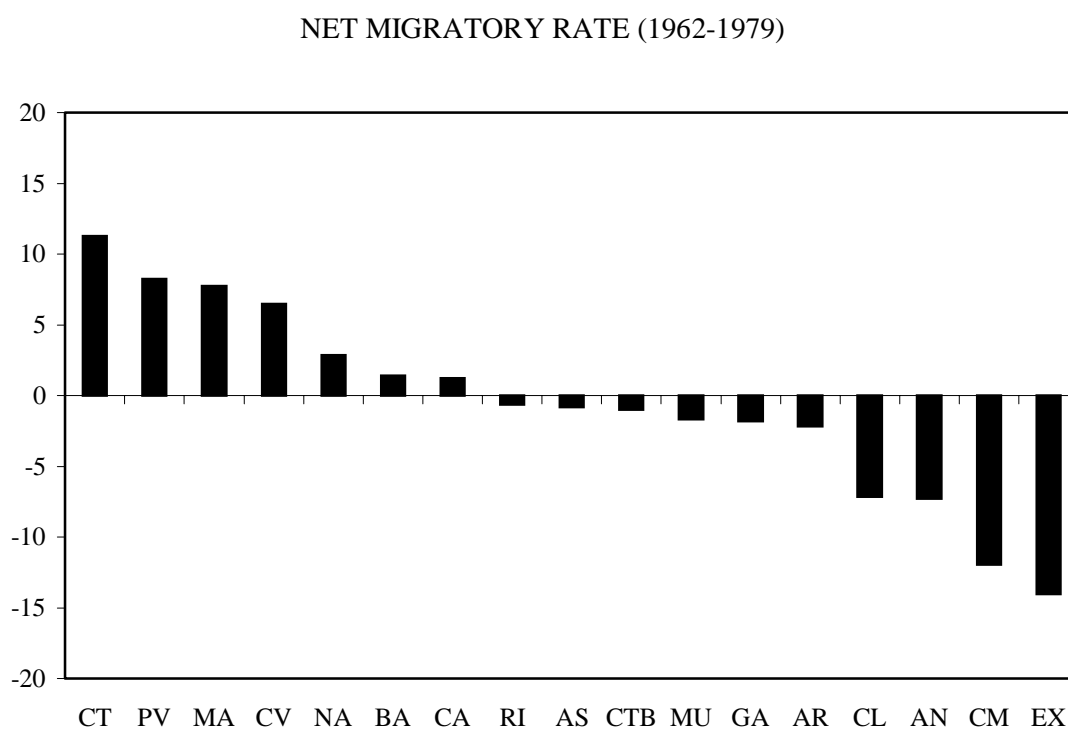
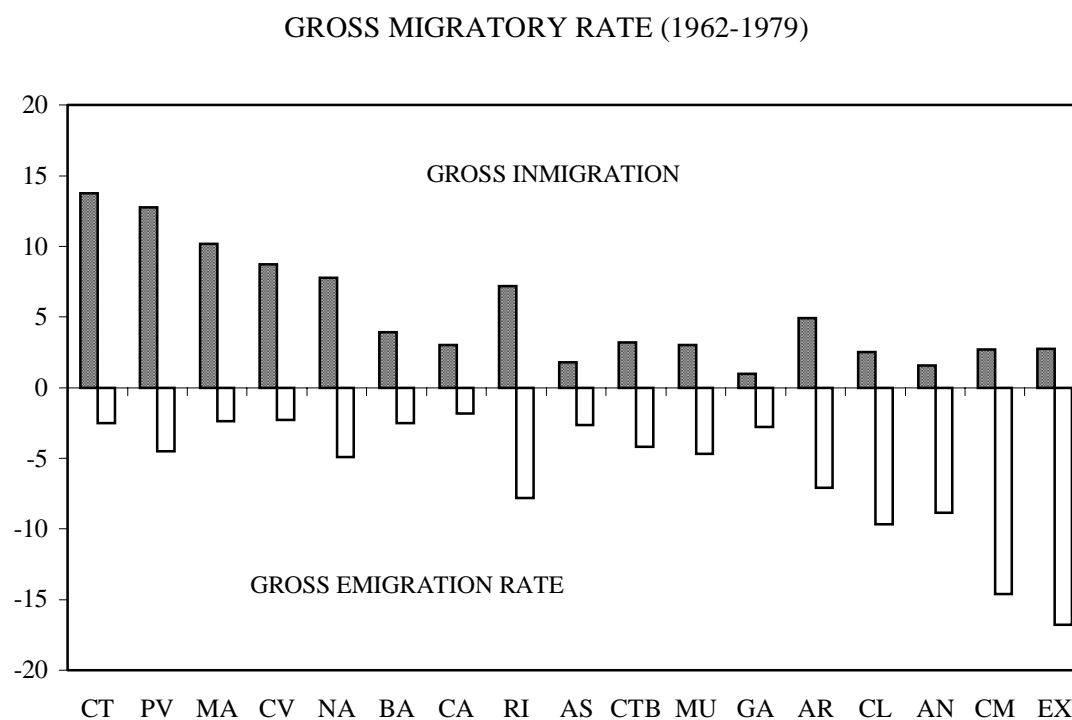


FIGURE 3: Gross Migratory Rate and Net Migratory Rate, 1962 to 1979. CT: Catalonia, PV: Basque Country, MA: Madrid, CV: Valencia Community, NA: Navarra, BA: Balearic Island, CA: Canary Island, RI: Rioja, AS: Asturias, CTB: Cantabria, MU: Murcia, GA: Galicia, AR: Aragón, CL: Castile and León, AN: Andalusia, CM: Castile-La Mancha, EX: Extremadura.

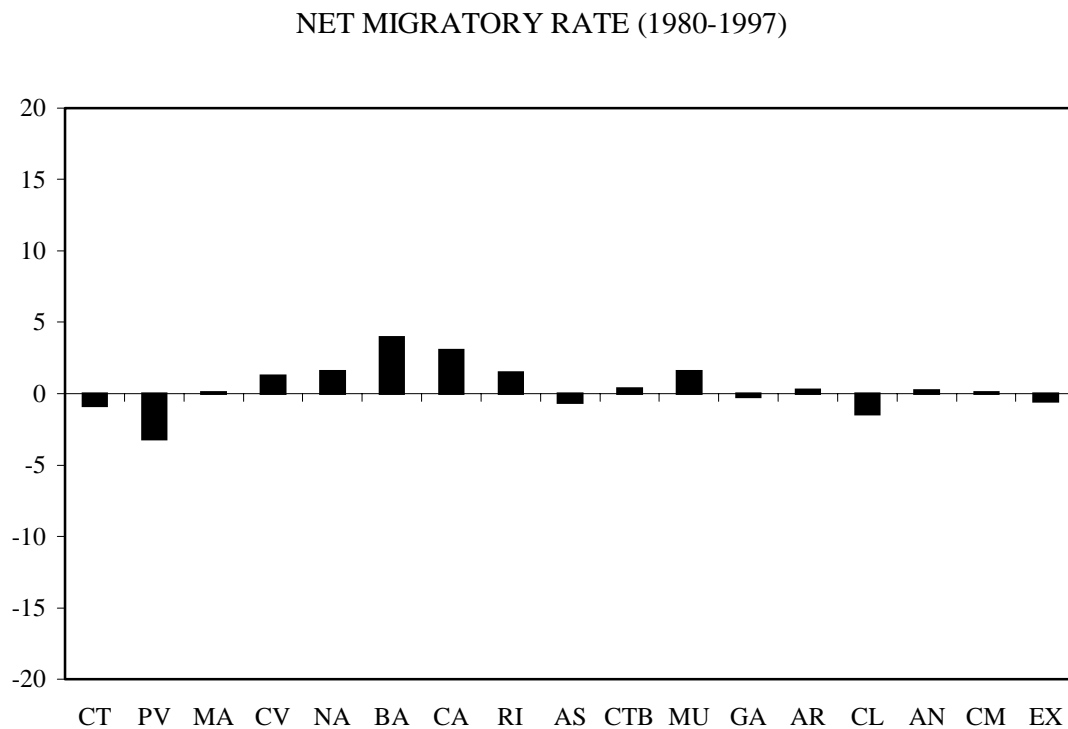
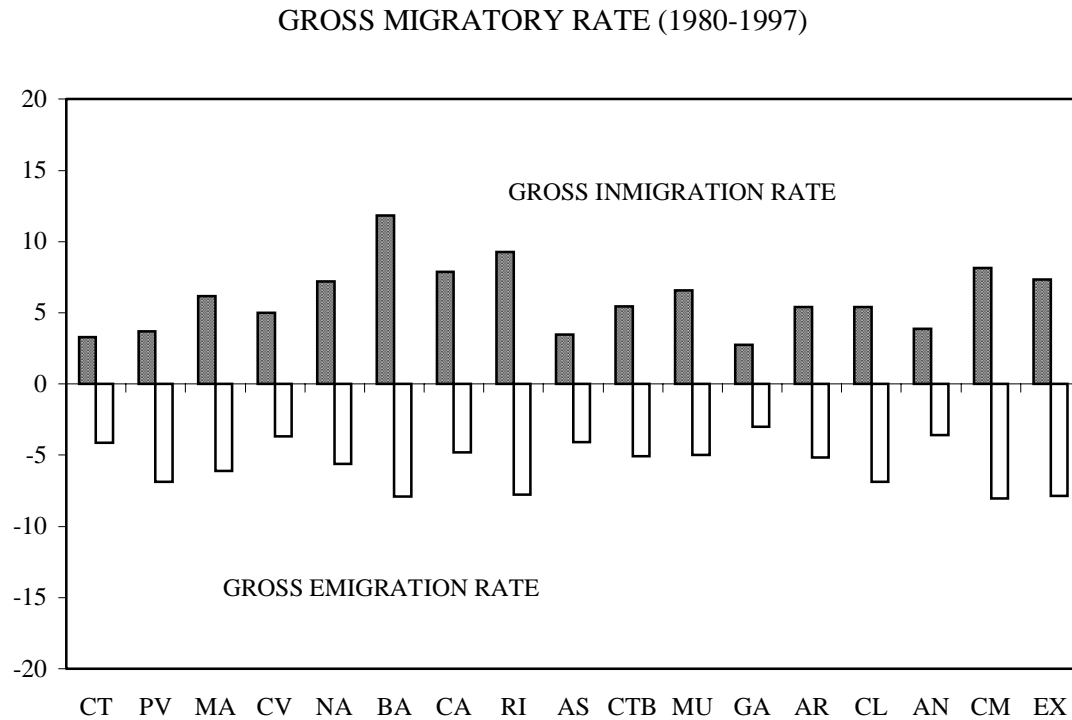


FIGURE 4: Gross Migratory Rate and Net Migratory Rate, 1980 to 1997. CT: Catalonia, PV: Basque Country, MA: Madrid, CV: Valencia Community, NA: Navarra, BA: Balearic Island, CA: Canary Island, RI: Rioja, AS: Asturias, CTB: Cantabria, MU: Murcia, GA: Galicia, AR: Aragón, CL: Castile and León, AN: Andalusia, CM: Castile-La Mancha, EX: Extremadura.

We have computed the gross immigration rate at time t as the total enters minus the total outs into a region divided by population in the previous year. The gross emigration rate at time t is the total outs minus the total enters into a region divided by population in the previous year. Finally, the net migration rate is the gross immigration rate minus the gross emigration rate. If the net migration rate is positive it is a “received” region of population, otherwise it is a “expelled” region of population.

The results of these calculations are shown in figures 3 and 4. During the period of convergence, from 1962 to 1979, we observe that the rich regions (Catalonia, Basque Country and Madrid) are “received” regions of population and the poor regions (Extremadura, Castile-La Mancha, Andalusia and Castile-León) are “expelled” regions of population. On the other hand, during the period of no-convergence, from 1980 to 1997, the net migration rate is very low and there is not “received” regions of population neither “expelled” regions of population.

Nevertheless, we have to study now why the net migratory movements have stopped in the late 1970s. Some empirical studies have investigated the determinants of migratory movements in Spain (see De la Fuente 1999 for a review of the literature). The answer offered here is that the less opportunities of employment, captured by the high unemployment rate and the less employment creation in host regions, together with a reduction in welfare differentials between regions are two important factors when explaining the exhaustion of net migratory movements.

We estimate an equation with panel data similar to García-Greciano and Raymond (1999) in which the dependent variable is the net migration rate from region “ i ” to region “ j ”. We compute the net migration rate from region “ i ” to region “ j ” (RNM_{ij}) as the net migration flows from region “ i ” to region “ j ” divided by population in the source region³. Note that the interregional net migratory flows are from each region (17) to the rest of regions (16) and that the flow from “ i ” to “ j ” is the same but with opposite sign that from “ j ” to “ i ”, so we have 136 net migratory flows –superior part of the diagonal elements of the matrix–.

The explanatory variables are the follow. First, 136 specific individual effects that allow us to capture specific components to each pair of regions and constant over time, such as distance between “i” and “j” or culture affinities or barriers. Second, the welfare differentials between “j” and “i”. The hypothesis is that population migrates looking for an increase in welfare levels. As a proxy of welfare differentials we have computed the difference of the logarithm of the GPDI per capita in PP between “j” and “i”. The GPDI per capita in PP is the same constructed as in the previous section. This variable captures not only the personal income differences in purchasing capacity but also the different prices between regions. Finally, the probability of finding a job that is approximated by the unemployment rate and the growth of employment in host regions. These two variables measure the opportunities of employment because when the unemployment rate increases in the host regions together with less employment growth, it supposes to stop the migratory flows. The source of data of the labor market variables is from Banco Bilbao-Vizcaya Foundation.

Table 1 shows the results of the estimation of the migratory equation using a panel consisting of the 136 bilateral flows and 15 years, which report 2.040 observations. We have 15 years, from 1968 to 1996 two year intervals, because the first data of GPDI is at 1967. The lagged values of the independent variables are due to solve simultaneity problems, so the migrant evaluates previous conditions before migrate. In order to estimate the 136 fixed effects we have postulated the model in derivations from temporal means. Additionally, two t-statistic test are reported, the t-statistic in parenthesis and the White heteroscedasticity consistent t-statistic in brackets.

The results confirm that wide welfare differences generate migratory movements from poor to rich regions when the probability of finding a job in the host region is high. Nevertheless, when the opportunities of finding a job in the host regions are reduced, because the unemployment rate increases and the growth of employment decreases, then the net migratory movements are stopped.

INTERREGIONAL NET MIGRATION RATE AND EXPLANATORY EFFECTS.

$$\begin{aligned}
 \text{RMN}(i,j)_t = & \alpha_{ij} + 0.54 (\text{Ln Yd}_{j,t-1} - \text{Ln Yd}_{i,t-1}) - 2.24 U_{j,t-1} + 6.72 \Delta \text{Ln E}_{j,t-1} + \varepsilon_{ij,t} \\
 & (3.98) \qquad \qquad \qquad (13.23) \qquad \qquad (7.31) \\
 & [4.58] \qquad \qquad \qquad [12.85] \qquad \qquad [7.37]
 \end{aligned}$$

Number of observations = 2.040
Standard Error = 0.4922

Where,

$\text{RMN}(i,j)_t$ is the net migratory rate from region “i” to region “j” at time “t”.

α_{ij} are 136 specific individual effects of migration between “i” and “j”.

$\text{Ln Yd}_{j,t-1}$ is the logarithm of the GPDI per capita in PP in region “j” at time “t-1”.

$\text{Ln Yd}_{i,t-1}$ is the logarithm of the GPDI per capita in PP in region “i” at time “t-1”.

$U_{j,t-1}$ is the unemployment rate in host region “j” at time “t-1”.

$\Delta \text{Ln E}_{j,t-1}$ is the logarithm of the employment growth in host region “j” at time “t-1”.

TABLE 1: Interregional Net Migration Rate Equation and Explanatory Effects, 1968 to 1996.

5.- CONCLUSION.

This paper focus on the relationship between regional disparities in Spain and migratory movements as one important source of convergence. When we study convergence in gross personal disposable income per capita in purchasing power, regional disparities are considerable reduced due to the redistributive effect of public sector and to the different level prices between regions. Nevertheless, the convergence process observed in GPDI per capita in PP stops in 1979, according to the stagnation convergence process in GDP per capita.

Examination of the data allows us to confirm that the main source of the observed convergence process in GPDI per capita in PP is the divergence in relative population. During the 1960's and 1970's Spanish population migrates from poor to rich regions according to the transfer of employment from agriculture to other sectors –industry or services- (see Raymond and García-Greciano 1994 or Cuadrado, García-Greciano and Raymond 1999). On the other hand, the exhaustion of the convergence process in GPDI per capita in PP has been accompanied by the cessation of net migratory movements from poor to rich regions. The stagnation of net migratory movements is due among other reasons to the less possibilities of finding a job in host regions. An estimation of a interregional net migratory equation confirms that, when welfare differences are reduced, the rapid increase in the unemployment rate together with less employment growth in host regions are two important factors to explain the interruption of net migratory movements and therefore the interruption of the convergence process.

An implication of this analysis is that the reduction of the unemployment rate together with employment growth, in Spain and in the European Union, could be an important mechanism to reducing regional disparities because it makes easy the mobility of factors among economic spaces with great income differences.

ANNEX 1

DECOMPOSITION OF THE VARIANCE OF THE LOGARITHM OF THE GPDI IN PURCHASING POWER

	VAR Log. GPDI PP	VAR Log: POP	VAR Log. GPDI pc PP	2*COVA
1967	0,749	0,770	0,041	-0,061
1969	0,759	0,777	0,034	-0,053
1971	0,768	0,784	0,027	-0,044
1973	0,786	0,790	0,022	-0,025
1975	0,811	0,796	0,019	-0,003
1977	0,806	0,802	0,015	-0,010
1979	0,796	0,802	0,012	-0,018
1981	0,795	0,798	0,015	-0,018
1983	0,780	0,796	0,018	-0,034
1985	0,769	0,797	0,019	-0,046
1987	0,766	0,797	0,018	-0,049
1989	0,762	0,797	0,016	-0,051
1991	0,749	0,797	0,017	-0,065
1993	0,754	0,798	0,017	-0,061
1995	0,754	0,800	0,018	-0,063
1997	0,764	0,801	0,017	-0,054
Dif (1967-1979)	0,047	0,032	-0,029	0,043
Dif (1979-1997)	-0,032	-0,001	0,005	-0,036

ANNEX 1: Decomposition of the variance of the logarithm of the GPDI in PP, 1967 to 1997.

$$\text{VAR (Ln GPDI PP)} = \text{VAR (Ln POP)} + \text{VAR (Ln GPDI pc PP)} + 2 * \text{COVA (Ln POP, Ln GPDI pc PP)}$$

NOTES.

¹ Taken the regional relative price levels at 1989 from Lorente 1992 we have applied the rate of growth of the regional consumer price index (CPI) from the National Institute of Statistics (INE) since 1978. Before 1978, the INE does not offer regional CPI but offer the CPI for the capital of province and the CPI for the total of Spain. We have pondered each capital of province by the weigh of the province in their region and we have corrected each region by the weigh of the region in the total of Spain. So we get the regional relative consumer price index from 1955 to 1997.

² We compute the sigma convergence as the standard deviation of the logarithm of the GPDI per capita in PP, but instead of the mean of the regions we compute the total of Spanish economy, which is equivalent to a weighted mean of the regional GPDI per capita in PP.

³ The selection of source and host regions are made considering the sing of the net flow in the period 1962-1979. Considering the full period the results were very similar.

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