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Does Immigration Contribute to Convergence Among Regional Labour Markets?

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DOES IMMIGRATION CONTRIBUTE TO CONVERGENCE AMONG REGIONAL LABOUR MARKETS IN SPAIN?

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ABSTRACT

Foreign immigration is still a recent phenomenon in Spain, but its magnitude and growth has been extraordinarily important during recent years. According to the available data (Foreigners Official Register), foreign residents officially registered have increased by 700 percent between 1991 and 2005 that is, from around 360.000 to more than 2.7 million people.

It is generally accepted that immigrants may have, according to their magnitude, important effects on labour markets of the destination countries. Firstly, because immigrants form a rather different population group, due to their personal and labour characteristics when compared with the domestic population. So, immigrants may constitute a potential factor in changing the dynamics of the domestic labour markets. On the other hand, in the Spanish case, the immigrant population is characterized by displaying an unequal territorial distribution, with remarkable regional differences in terms of immigration rates and aggregate figures.

On the basis of these ideas, the aim of the paper is to analyse to what extent the massive immigration flows to Spain in recent years have modified the parameters of regional labour markets, contributing or not to change the regional differences of the main characteristics of the domestic markets.

KEY WORDS: Immigration, Regions, Convergence, Labour markets

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1. Introduction.

Contrary to what has happened in other countries, the reception of immigrants in Spain has been particularly fast. This has led to the immigrant population reaching noticeably relevant levels within the total population in a short time. While foreigners residing in Spain in 1991, with residence permits, were no more than 360 thousand, according to data from the Ministry of Labour and Social Affairs (MTAS), at 31st December 2005 this figure had reached 2.7 million people. In the last 14 years the number of foreigners has increased more than 700%⁴, an evolution that has led to an immigrant population in 2005 of something more than 6% of the total population. In addition, this migratory process has been particularly intense in recent years, accelerating most noticeably since the year 2000. From this year on the increase in residence permits has reached 205%. Of course, these data only take into account the official or legal immigrant population. Outside these figures there is another immigrant population without papers which, in Spain, is estimated at around more than a million people. Therefore, when considering this group the aforementioned figures could be even greater.

In addition to its size, immigration is relevant for its possible effects, positive and/or negative, on the labour market of the receiving country. These affect more specifically the permanent or transitory contribution of labour patterns, which are different from those of the national workforce (Chiswick, 1978), the labour opportunities of native workers (Borjas, 1994, 1999, 2003; Friedberg and Hunt, 1995), the introduction of a "disciplining effect" on the reserve wage of the native-born workers, reducing their possible power as *insiders* (Dolado, 2001) and their preferential allocation to low income posts (Thurow, 1976, Piore, 1979), among others.

The immigrant population presents strong differences compared to the native workforce with regard to its labour characteristics (Izquierdo, 2003; Cuadrado, Iglesias and Llorente, 2006, to illustrate the Spanish case). So, notably different parameters can be observed in relation to the labour market (rates of activity, occupation and unemployment), their working conditions (activity sector, work occupation, type of contract, type of working day, labour situation, etc) and even their work dynamics (greater presence in flows of entry to and exit from unemployment, for example⁵).

Finally, the immigrant population, far from being homogeneously distributed throughout the country, presents geographic patterns of very unequal location. The first theoretical models attributed the migration decisions to the different salaries existing between the origin and destination of migration (Raimon, 1962). So the unequal territorial distribution of the immigrants in the destination country should reflect the wage differences between different regions, explaining that the foreign population established its residence in the regions with higher wages. The literature also notes, from perspectives of analysis based on search models, that the existence of opportunities of employment in the place of destination (Harris and Todaro, 1970) should also be a relevant explanatory variable. According to this, immigrants should locate especially in those regions with higher rates of employment or with more active labour market. Later, the models based on the theory of Human Capital explain the decisions of migration on the basis of comparison of costs (transport, psychological,

⁴ A more detailed description of this process can be found in Cuadrado, Iglesias and Llorente (2006).

⁵ In Cuadrado, Iglesias and Llorente (2006) these conclusions can be found in detail.

cultural) and benefits (increase of income in the country of destination conditioned by the probability of obtaining a job) associated to displacement (Sjaastad, 1962), so that the immigrants will move to those regions where the benefits (or the difference between costs and benefits) are greatest. In these processes of comparison, individuals can also value the existence of ethnic networks or previous concentrations of immigrants of the same nationality or culture, as this fact will reduce the costs and also perhaps increase the benefits of migration (Boyd, 1989, Massey, 1990). The implication is that immigrant populations tend to concentrate geographically.

According to the data of the National Institute of Statistics (INE) for the year 2005, in Spain the different regions show marked differences in their rates of immigration. The greatest presence of immigrants is in the Balearics IIs., where practically 16% of the resident population is foreign. This is followed by Madrid, Murcia and the Community of Valencia with between 12 and 13 per cent. On the contrary, in Galicia, Extremadura and Asturias the resident foreign population does not reach 3%.

This paper aims to analyse the extent to which the arrival of immigrants in Spain and their uneven regional distribution can be contributing to a modification of the existing labour differences among Spanish regions, thus constituting a relevant factor in the explanation of regional convergence patterns. For this purpose, in section 2 a description of the principal labour differences existing among Spanish regions is offered and an opinion is given on whether a convergence patterns exists among them, on the basis of a beta-convergence calculation. Later (section 3), the importance of immigration in Spanish regions will be analysed and the different work patterns that immigrants present according to their place of origin and in the region in which they are. Using this analytical framework, in section 4 we determine what the contribution of the immigrants is to existing labour differences in Spanish regions. Firstly, a breakdown of the evolution of the active employed and unemployed population is made by various effects, determining in this way what the contribution of the immigrant population is and its composition in this evolution. Then, a series of virtual scenarios on the evolution of regional labour markets is built from this breakdown, determine the evolution of the basic regional working populations once the effect induced by immigration has been discounted. Finally, we re-estimate regional convergence in labour terms, having discounted the induced effect of the immigrants. Using this strategy, the importance of the effects induced by immigration can be checked. The paper finishes with section 5 showing the main conclusions reached and evaluating if the arrival of immigrants has in effect contributed to the increase or decrease of the differences existing in regional labour markets.

Most of the data used come from the Survey of Active Population (EPA, 'Encuesta de Población Activa') relative to the second quarter of the period between 1987 and 2005 and refer to the active employed or unemployed population broken down by regions and the immigrants country of origin. Additionally, data from the 'Anuarios de Extranjería' (Foreigners Official annual reports) of the MTAS are used and the 'Padrón Municipal de Habitantes' (Municipal Population Census) elaborated by the INE. This paper, data on immigrants refer to the population that appears in the statistics. For this reason the results obtained should be taken with caution as a large number of immigrants exist who do not normally appear in the official statistics.

2. Labour heterogeneity in Spanish regions and its evolution in the period 1987 to 2004.

In Spain, the heterogeneity of regional labour markets is notably high. This fact is illustrated in figures 1-3 where the different basic labour rates by regions are compared to national averages.

In terms of rate of activity, with the average rate at 57%, Madrid, Catalonia and Navarre show rates of activity of 61 to 62%. On the contrary, Asturias limits the value of this rate to values of 48% and Extremadura is no higher than 51%.

From the employment rate perspective, the differences are somewhat more enlarged, above all in relation to the least favoured regions. Thus, while Madrid, Catalonia and Navarre have rates of occupation of about 57% (the national average is 52%), Extremadura and Asturias are the regions with the lowest employment rates, 43 to 44%, nearly 10 percentage points below national average.

Finally, the differences in terms of unemployment rates are even more notable. Six regions have unemployment levels higher than the average and 10 regions have unemployment rates below. The differences are particularly high for Extremadura (15%), Andalusia (13%) and the Canaries (10.5%). On the contrary, the lowest levels of unemployment can be seen in Aragón, Madrid and Navarra with rates below 6%.

Figure 1. Rates of activity by regions and comparison with the national average. 4th. Quarter, 2005. Source: EPA. (INE)

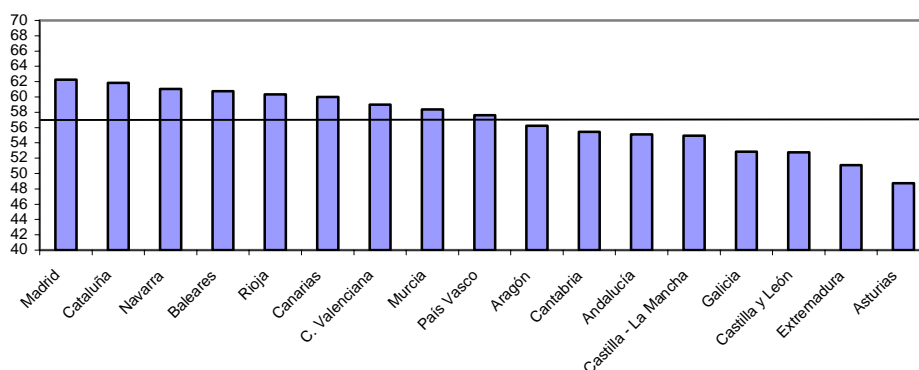


Figure 2. Rates of employment by regions and comparison with the national average. 4th. Quarter 2005. Source: EPA (INE).

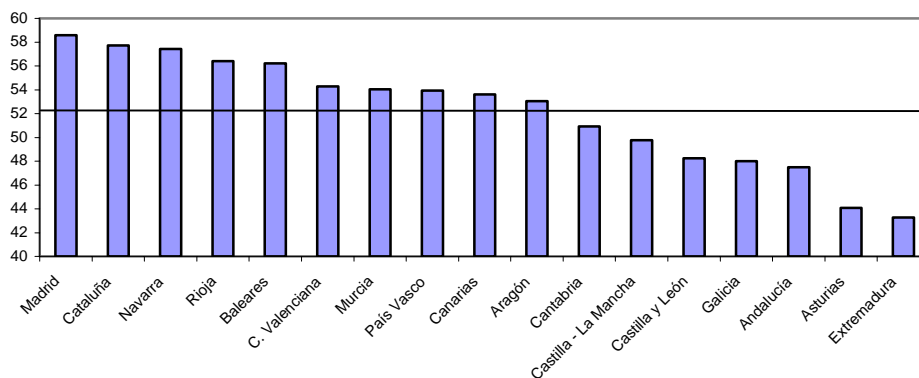
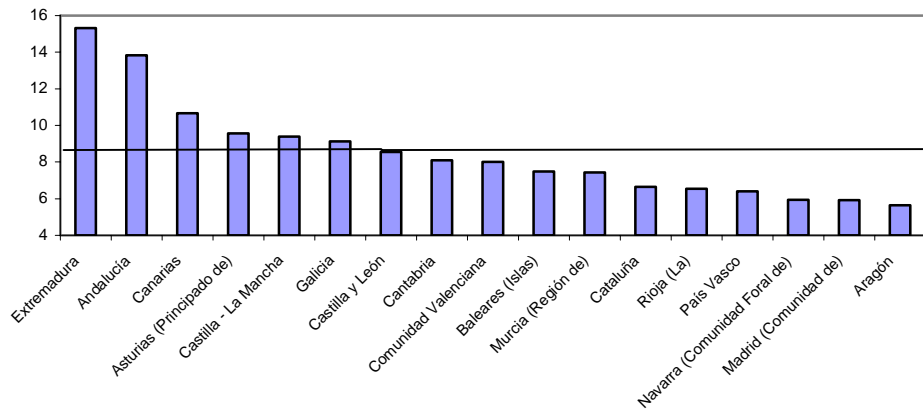
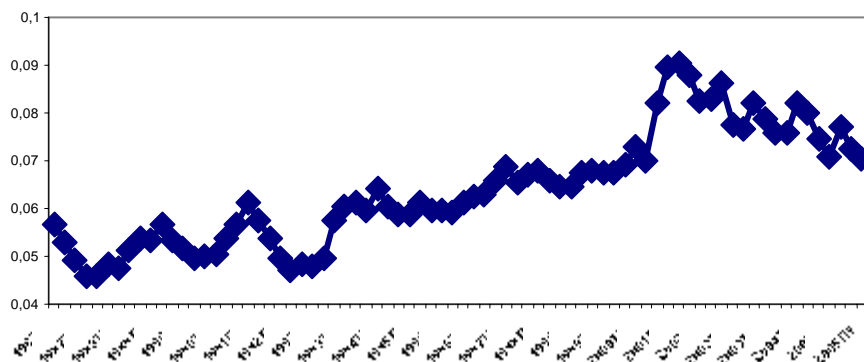


Figure 3. Rates of unemployment by regions and comparison with the national average, 4th. Quarter 2005. Source: EPA (INE).



To quantify these differences and to compare and monitor them over the time, a regional variation coefficient has been calculated from the aforementioned rates. The results are shown in Figures 4 to 6⁶. From them it can be deduced that regional labour markets present notable differences especially in terms of unemployment rates. The differences in the rates of activity and occupation, although important, are smaller. On the other hand, the three rates show a fairly similar evolution pattern. There was an increase in the labour differences between regions until the year 2000, in the rates of occupation and unemployment, which in the case of the rate of activity continued until the third quarter of the year 2001. From then on, the coefficients of variation show a clear inflection in their evolution beginning with at least a moderate reduction in the regional variability of activity, occupation and unemployment.

Figure 4. Evolution of the coefficient of variation of the rate of activity for regions 1987-2005. Source: EPA (INE).



⁶ The coefficient of variation is defined as the quotient between the standard deviation of the series and its average value. The change in the definition of unemployment in 2001 and the new methodology introduced in 2005 impose on the EPA a rupture of the principal labour rates (activity rate and rate of unemployment) which, however, should not be an influence in the regional distribution of these rates.

Figure 5. Evolution of the coefficient of variation of the rate of unemployment for regions 1987- 2005. Source: EPA (INE).

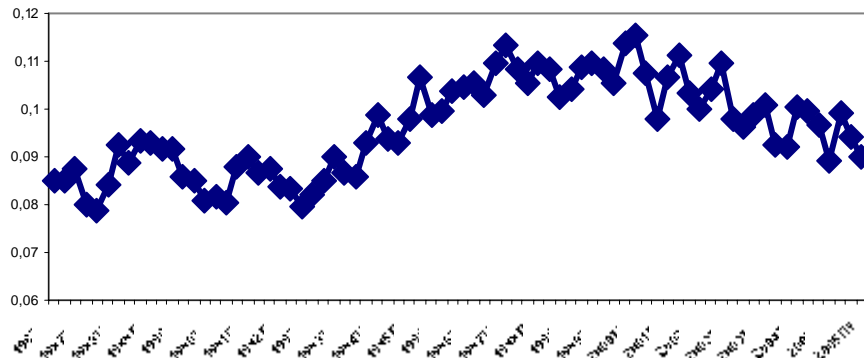
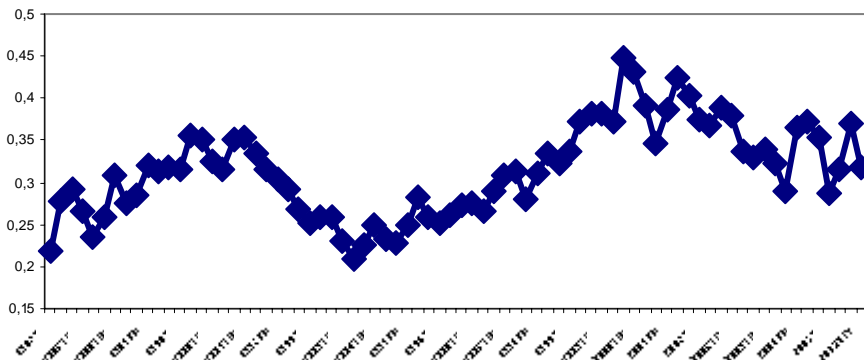


Figure 6. Evolution of the coefficient of variation of the unemployment rate for regions 1987- 2005. Source: EPA (INE).



To give greater support to the aforementioned conclusions, we have estimated the equations of convergence or beta-convergence on the evolution of the rate of activity, employment and unemployment.

$$\Delta \ln Rate_{t,t-1} = \alpha_0 + \alpha_1 \ln Rate_{t-1} \quad (1)$$

This permits us to determine whether regions with highest labour rates at the beginning of the period have managed to close the gap with the others reducing the existing differential (so, in the case of the existence of convergence coefficient α_1 should be negative)⁸.

⁷ From this equation we can deduce a measure of approximation through the estimation of the rate of convergence (β) towards a stationary situation as follows: $\alpha_1 = (1 - e^{-\beta t})$ and of the time by reducing the existing differential by half:

$$t^* = \frac{\ln 2}{\beta}$$

See: Barro, R. J. y Sala i Martín (1991) and (Sala i Martín, 1994).

⁸ This affirmation is valid for the case of the rate of activity and employment but not for the rate of unemployment. In this case, the convergence or approximation between the regions is defined as the

Table 1. Regressions of Convergence⁹.
Source: Author's figures based on EPA (INE).

	Rate of activity		
	1987-00	2000-05	1987-05
Initial level	-0,119 (-0,453)	0,017 (-0,002)	-0,175 (-0,556)
Constant	0,013 (0,511)	0,017 (0,170)	0,815 (0,661)
R ²	0,013	0,001	0,020
	Employment rate		
	1987-00	2000-05	1987-05
Initial level	-0,329 (-1,396)	-0,178 (-2,890)**	-0,101 (-0,402)
Constant	1,426 (1,678)	0,793 (3,366)**	0,508 (0,546)
R ²	0,115	0,357	0,010
Speed of convergence		0,008	
Time necessary for halving the differential.		88 (quarters) 22 (years)	
	Unemployment rate		
	1987-00	2000-05	1987-05
Initial level	0,224 (0,645)	-0,412 (-6,387)**	-0,017 (-0,026)
Constant	-1,110 (1,090)	0,729 (4,520)**	-0,017 (-1,081)
R ²	0,027	0,731	0,072
Speed of convergente.		0,016	
Time necessary for halving the differential.		42 (quarters) 11 (years)	

Number of observations: 17.

The values of the t- student appear in brackets.

** Significant with a probability of 95 %.

Table 1 shows the results reached. Most of them indicate that the existence of convergence cannot be concluded as most of the coefficients are not significant. However, for the period 2000-2005 the hypothesis of convergence is significant both for the rate of employment and the rate of unemployment, in both cases reaching robust and significant results. As we can see in section 3, this period corresponds to an intense growth of migratory flows towards the Spanish labour market. Our objective is to determine to what degree the two issues are linked¹⁰.

For those periods for which significant results have been obtained, the rate of convergence among the Spanish regions has been calculated and an estimation was made of the number of periods (quarters or years) which would be necessary for reducing the existing regional difference by half. The results obtained show that the speed of approximation is not very high in the case of the employment rate, but is high

reduction of the rates of unemployment in those regions with greater unemployment at the beginning of the period.

⁹ Although the methodological changes in the EPA affect the time series of the activity, employment and unemployment, in the calculation of these regression we maintain the hypothesis that the changes affect the different Spanish regions in a similar way, and therefore they are not relevant for the analysis of regional dispersion or regional convergence.

¹⁰ For approximately the same period, 2000-2004, the Bank of Spain (Boletín Económico, October 2005) reaches similar results in the case of unemployment rates. In the case of employment rates, their analysis also obtains similar but not significant results. Regarding the European case, regional convergence of unemployment is still low, with persist and high regional disparities (Llorente, R. 2004).

in the rate of unemployment. In the first case, approximately 22 years would be necessary for halving the disparities, but in the second case, only 11 years.

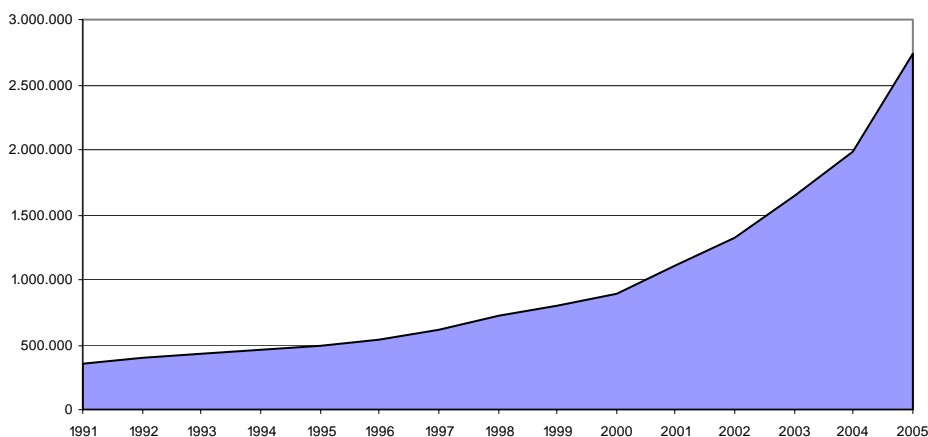
3. The foreign population resident in Spain and its regions.

As it was previously stated, the growing immigration that is taking place in Spain is not distributed uniformly among the Spanish regions. At the same time, different labour patterns are detected within the immigrant population depending on their origin. These two facts lead us to think that the labour effects introduced by immigration could be substantially different at regional level. In this section we will analyse the regional distribution of migration as well as its different labour characteristics. For this, we will firstly introduce the issues from an aggregate perspective (3.1) and follow on by introducing the regional detail (3.2).

3.1. Immigration and its labour characteristics: an aggregate analysis.

Figure 7 shows the evolution of the number of foreigners with residence permits residing in Spain. In little more than 10 years, the number of immigrants has multiplied by five. The growth of the foreign population has taken place above all since 1994, but reaches its greatest intensity after the year 2000.

Figure 7- Evolution of the number of resident foreigners in Spain with residence permit. Source: Foreigners Annual Report. MTAS.



However, we should differentiate between two different types of immigration, on the basis of its economic and non-economic character. Our analysis is centred on the former, as this is more relevant for the analysis of immigration. To define the economic immigrant population, the country of origin is used as a criterion thereby establishing that economic immigrants are those originating in a less developed country¹¹. According to the data corresponding to the second quarter of 2005, the rate of migration of an economic character reached 6.29 per cent of the total population, a surprising

¹¹ The origins considered for the immigrant population of economic character are the rest of Europe (European countries with the exception of EU-15), Africa, Central America and the Caribbean, South America and others (Asia, Oceania and Stateless people). This classification is based on data from the EPA. Therefore, it is not possible to determine in greater detail those countries with less development.

figure taking into account the starting point: hardly 1 percent in the second quarter of 1999.

In addition, the immigrants show different work patterns depending on their origin. Table 2 shows these differences in relation to the principal labour rates. Analysing the data of 2005, it is concluded that immigrants coming from the rest of Europe and South America are those who obtain best labour results: higher rate of activity and employment and lower rates of unemployment. The immigrants coming from Asia, North America, Central America and the Caribbean and South America show uneven labour results. Finally, immigrants originating in Africa show the worst results: lowest rate of activity and employment and quite high rates of unemployment. This pattern persists throughout the period in the case of Central America and of the Caribbean, South America and Africa.

Table 2. Rates of activity, unemployment and employment of economic immigrants by origin. Source: author's figures from EPA (INE) data.

	Activity rate			Unemployment rate			Employment rate		
	2 tri. 2000	2 tri. 2005	Crec.	2 tri. 2000	2 tri. 2005	Crec.	2 tri. 2000	2 tri. 2005	Crec.
Rest of Europe	72,82	83,28	10,46	14,56	10,12	-4,44	62,22	74,85	12,64
África	65,13	69,94	4,81	24,87	20,71	-4,17	48,93	55,46	6,53
North America	71,25	50,39	-20,86	14,26	1,66	-12,61	61,09	49,56	-11,53
Central America and Caribbean	73,71	69,86	-3,85	14,59	15,89	1,30	62,95	58,76	-4,19
South America	76,57	83,34	6,76	13,28	10,09	-3,18	66,41	74,93	8,52
Asia	66,23	70,44	4,21	6,09	4,68	-1,41	62,20	67,14	4,95
Average	72,85	70,38	-2,47	15,08	10,60	-4,48	62,05	62,61	0,56

To summarise, both the intensity of immigration and its different composition by origin are relevant and important aspects to be taken into account in the analysis of the domestic labour market.

3.2 Immigration and its labour characteristics: a regional analysis.

Data of Table 3, ordered according to the present rate of migration, show that the rates of migration in Spanish regions vary in a range of no less than 10 percentage points from a minimum in Extremadura (1.4 6%) to a maximum in Murcia (11.5 2%)¹². On the other hand, we can observe a high concentration of immigrants in Madrid, Catalonia, the Balearics and Murcia, regions that have undergone spectacular increases in their rates of immigration. The conclusion is therefore, the existence of a regionally uneven distribution of the immigrant population resident in Spain.

¹² Regional rates figures are different from the aforementioned in the first section because the analysis is restricted here to the immigration of economic character.

Table 3. Economic immigration rates per region. Source: EPA (INE).

	RATE ECONOMIC IMMIGRATION		
	2 qtr. 2000	2 qtr. 2005	Grth.
Extremadura	0.13	1.46	1.33
Asturias	0.23	1.56	1.33
Castile & Leon	0.47	2.13	1.66
Cantabria	0.08	2.43	2.35
Galicia	0.66	2.46	1.80
The Basque Country	0.57	2.59	2.02
Andalusia	0.84	3.29	2.45
Aragon	1.30	4.04	2.74
Castile-La Mancha	0.90	4.24	3.34
Navarre	0.51	5.71	5.20
Average	1.42	5.71	4.29
Community of Valencia	1.14	7.24	6.10
Ceuta & Melilla	3.46	7.97	4.51
La Rioja	1.50	7.97	6.47
Canaries	2.61	8.18	5.57
Madrid	2.36	9.14	6.78
Catalonia	2.80	9.43	6.63
Balearics	3.07	11.49	8.42
Murcia	2.87	11.52	8.65

Furthermore, the immigrant population presents regional differences from the point of view of their professional activities. This could be due, as underlined in the previous section, to the fact that immigrants are professionally different depending on their origin, or that the different regions create distinct behaviour due to peculiarities in their respective labour markets. To answer these questions table 4 includes the activity, employment and unemployment rates of economic immigrants according to region in which they live. From this data some interesting observations can be made.

Aragon, the Balearic Islands, the Canary Islands, Castile-Leon, Madrid, Murcia, Navarre, the Basque Country and the Community of Valencia are regions where economic immigrants enjoy the most favourable rates of employment and the lowest unemployment rates.

- a) Although in terms of activity rates its results are below average, in Catalonia immigrants enjoy higher employment rates and lower unemployment rates.
- b) On the other hand, employment rates are worse in Extremadura, Galicia and Ceuta and Melilla, where they are always below average. Andalusia, Asturias, Cantabria and the Rioja also present poor employment opportunities for immigrants though not as general as those in the regions mentioned previously. They coincide with those regions that are 'badly situated' in so far as the relative characteristics of their labour markets are concerned.
- c) Only in Castile-Leon, Extremadura and Galicia has there been an above average improvement in the immigrants employment prospects in the three indicators used. However, they are regions with a comparatively low number of immigrants.

Table 4. Activity rate, unemployment and employment rates of economic immigrants according to the region in which they reside.
Source: Authors. From EPA (INE).

	Activity rate			Unemployment rate			Employment rate		
	2 qtr. 2000	2 qtr. 2005	Grth.	2 qtr. 2000	2 qtr. 2005	Grth.	2 qtr. 2000	2 qtr. 2005	Grth.
Andalusia	68.4	71.4	3.0	21.8	13.5	-8.3	53.5	61.8	8.3
Aragon	66.5	86.7	20.2	13.4	11.7	-1.7	57.6	76.5	19.0
Asturias	57.2	46.9	-10.3	-	12.9	-	57.2	40.9	-16.3
Balearics	72.9	86.0	13.2	6.5	5.9	-0.6	68.1	80.9	12.8
Canaries	66.2	79.9	13.7	15.6	13.0	-2.7	55.9	69.5	13.7
Cantabria	63.3	81.6	18.4	-	28.9	-	-	58.0	-
C-La Mancha	63.0	77.2	14.1	12.8	16.9	4.1	55.0	64.1	9.1
C-Leon	53.7	76.1	22.3	28.0	10.7	-17.2	38.7	67.9	29.2
Catalonia	74.5	74.6	0.0	14.3	12.9	-1.4	63.8	65.0	1.1
Extremadura	55.5	66.7	11.2	40.5	16.2	-24.3	33.0	55.9	22.8
Galicia	52.4	63.1	10.6	37.4	24.1	-13.2	32.9	47.9	15.0
La Rioja	74.1	78.1	4.0	20.4	22.5	2.1	59.0	60.6	1.6
Madrid	77.2	85.1	7.8	19.2	11.5	-7.7	62.4	75.3	12.9
Murcia	86.9	81.3	-5.6	7.0	11.7	4.8	80.9	71.8	-9.1
Navarre	61.4	77.4	16.0	-	1.3	-	61.4	76.4	15.0
Basque. C.	49.0	81.7	32.6	12.0	13.2	1.2	43.2	70.9	27.8
C. Valencia	71.7	81.2	9.5	29.7	12.5	-17.2	50.4	71.0	20.7
Ceuta & Melilla	47.1	43.8	-3.3	6.6	38.6	32.0	44.0	26.9	-17.1
Average	64.5	74.4	9.9	19.0	15.4	-3.4	53.9	63.4	9.8
Typical deviation	10.71	12.24	1.5	10.72	8.54	-2.2	12.61	13.75	1.1

To sum up, it can be concluded that the intense wave of immigration taking place in Spain shows notable regional differences, related as much to the territorial distribution of their residence, their country of origin, their employers and the registered growth in employment. In general, regions with better labour markets contain larger numbers of immigrants. Besides which, the immigrant population resident in these communities are also associated with better labour results. The opposite results are usually produced in regions that are in a worse situation in the national labour market.

Departing from these results, the focus of the work will be to determine the influence this behaviour has on the regional convergence of the Spanish labour market.

4. The contribution immigration makes to regional differences and convergence: the construction of virtual economies.

To determine the influence an unequal geographic distribution of immigrants has on the process of regional convergence a double level strategy will be followed. Firstly, we are going to carry out different shift-share analyses with the objective of determining which components are responsible for the evolution of the regional labour statistics we have been using (activities, occupation and unemployment). Secondly, we will build a series of 'virtual economies' (Marimon and Zilibotti, 1996 and 1998; Murillo, Nuñez and Usabiaga, 2003), enclosed to different stages of growth, depending on some of the results previously obtained by means of the shift-share analyses, and try to isolate the

effect the immigrant population has on the questions raised (regional differences and convergence)

4.1 Explanatory factors in the regional growth of the active population, employed and unemployed: a shift-share analysis.

The shift-share analysis allows us to differentiate between those factors responsible for the registered variation between determinate variables, so that the contribution to growth made by each of the variables components can be isolated. In our case, and with the aim of analysing the contribution made by the unequal regional distribution of the immigrant population, two groups have been formed, one for the growth of the total population irrespective of nationality and the other limited to the economic immigrant population.

In the first analysis carried out, the active population, employed and unemployed by regions, has been divided into three effects: the national effect, the mix or composition effect and the regional effect. According to the following equation, growth in employment can be divided in the following way (Mayor, López y Pérez, 2004):

$$E'_{ij} - E_{ij} = \Delta E_{ij} = E_{ij} r + E_{ij} (r_i - r) + E_{ij} (r_{ij} - r_i) \quad (1)$$

being,

$$r = \frac{\sum_{i=1}^s \sum_{j=1}^r (E'_{ij} - E_{ij})}{\sum_{i=1}^s \sum_{j=1}^r E_{ij}} \quad r_i = \frac{\sum_{j=1}^r (E'_{ij} - E_{ij})}{\sum_{j=1}^r E_{ij}} \quad r_{ij} = \frac{E'_{ij} - E_{ij}}{E_{ij}} \quad (2)$$

Each term of the equation indicates the following effects:

- a) **National Effect:** $NE_{ij} = E_{ij} r$, represents the change in the active population, employed and unemployed, that would have been produced in each of the regions if these had grown at a similar rate to that registered for the country as a whole.
- b) **Mix Effect:** $ME_{ij} = E_{ij} (r_i - r)$, represents the change in the active population, employed and unemployed, of the regions due to a change or modification in the structure of the nationality of the resident population. To achieve this, we have considered that the population of a region is composed of native individuals and immigrants. This term assumes that part of the changes registered in the labour variations of each region is due to the relative specialisation of one nationality or another.
- c) **Regional Effect:** $RE_{ij} = E_{ij} (r_{ij} - r_i)$, represents the change in the active population, employed and unemployed, due to the dynamism of the region itself. It obtains, in relative terms, what the region itself contributes to the variations in the populations under consideration.

Table 5. Breakdown of the percentage of growth of the active population, employed and unemployed, for all Spanish regions.

Source: Authors. From EPA (INE), 2000-2005.

	Percentage of growth of the active population			Percentage of growth of the employed population			Percentage of growth of the unemployed population		
	National Effect	Mix effect	Regional effect	National Effect	Mix effect	Regional effect	National Effect	Mix effect	Regional effect
Andalusia	123.9	-30.9	7.0	76.8	-12.3	35.5	60.9	14.2	24.9
Aragon	92.2	-4.9	12.7	119.7	-5.3	-14.4	-915.6	75.5	940.1
Asturias	298.3	-159.0	-39.2	162.6	-61.6	-1.0	65.0	25.5	9.6
Balearics	53.0	30.0	16.9	78.9	34.7	-13.6	-29.3	11.9	117.4
Canaries	85.9	23.9	-9.7	104.5	23.2	-27.7	-710.1	76.2	733.9
Cantabria	90.0	-51.7	61.7	93.6	-41.5	47.9	110.3	31.4	-41.7
C-La Mancha	80.7	-19.9	39.2	92.8	-15.6	22.8	250.0	54.2	-204.2
C-Leon	177.4	-76.4	-1.0	142.7	-46.7	4.0	69.0	16.3	14.7
Catalonia	100.3	46.5	-46.8	121.4	39.8	-61.2	302.1	-147.3	-54.8
Extremadura	413.0	-236.5	-76.5	132.9	-56.8	24.0	61.7	22.1	16.2
Galicia	277.1	-109.6	-67.5	215.3	-70.2	-45.1	108.3	13.1	-21.4
La Rioja	55.0	-0.4	45.3	70.2	-3.6	33.4	-2625.5	1094.8	1630.7
Madrid	64.2	27.6	8.2	70.3	18.6	11.1	88.1	-51.3	63.2
Murcia	70.3	48.9	-19.2	80.0	48.3	-28.2	146.9	-1.8	-45.1
Navarre	122.9	-55.8	32.9	175.2	-57.0	-18.1	-103.5	-40.6	244.1
Basque. C.	223.6	-103.9	-19.7	176.8	-60.7	-16.1	68.4	20.1	11.4
C. Valencia	73.6	-9.2	35.7	89.1	-12.6	23.5	1211.9	-228.7	-883.2
Ceuta & Melilla	4881.4	1021.8	-5803.2	377.0	121.8	-398.8	129.0	35.4	-64.4

Note: The major effects of each region have been highlighted.

Table 5 summarises the results obtained and shows the percentage due to each of the effects under consideration. From table a number of important questions are raised:

- A) First, national effect is larger in each of the labour groups considered (active, employed and unemployed). Independent of the arrival of immigrants, the main growth in the labour market is due to the general growth in the country as a whole.
- B) The contribution made by immigrants (mix effect) is not the largest in any of the regions. So although the immigrant flows are important and growing but the levels reached are not exterminating to the evolution of regional employment and unemployment.
- C) Nevertheless, the arrival of immigrants has been especially positive in the growth of the active population in Murcia, the Balearics, Madrid and the Canaries. On the other hand it can be seen that in Extremadura, Asturias and the Basque country the mix effect has been negative.
- D) The arrival of immigrants and the change they have produced in the structure of the regional population has also contributed to an increase in employment in the Balearics, Murcia, the Canaries, Catalonia and Madrid. Equally the lack of immigration to the Basque Country, Extremadura and Asturias has impeded greater growth in these regions.
- E) With respect to the unemployed population, the regions with larger mix effects (Castile-La Mancha, the Canaries and the Balearics IIs.) are those in which the arrival of immigrants has contributed more to an increase in unemployment. The positive effect here representing a negative aspect. On the other hand, C.

Valencia, Catalonia and Madrid are the regions with the highest negative mix effect and so the regions where immigrants have had a greater impact on a reduction in unemployment.

Secondly, the same analysis has been carried out, but taking into account only the growth of the economic immigrant population. In this way the mix effect comes closer to the implication that each region has got a different immigrant population structure depending on its origins which has therefore evolved differently in each region.

In this case, each of the effects of the shift-share responds to the following interpretation:

- **The national effect** represents the change to the active economic immigrant population, both employed and unemployed, of each region, if within the region they have grown at the same pace as that of the economic immigrant population at a national level.
- **The mix effect** represents the change to the active immigrant population, both employed and unemployed, in each region because said region possesses an immigrant population structure with origins that are different to those of the country as a whole. This effect reflects the importance that an unequal distribution of economic immigrants according to their origins has.
- **And the regional effect** shows the change to the active economic immigrant population, employed and unemployed, due to the fact that the total immigrant population has increased more in some regions than others.

It is important to emphasise the aim of correctly interpreting the results, which unlike the previous shift-share, where the breakdown was concerned with the activities, employment and unemployment of both the native and immigrant population of the region, this second definition of the analysis is limited to explaining the evolution of the basic labour indicators for the economic immigrant population.

In table 6 the results of the second breakdown are presented as percentage points. At a general level the new data shows that regional differences are now more marked.

Table 6. Breakdown of the percentage of active, employed and unemployed, economic immigrant population of each region.

Source: Authors. From EPA (INE), 2000-2005.

	Percentage of growth of the active population			Percentage of growth of the employed population			Percentage of growth of the unemployed population		
	National Effect	Mix effect	Regional effect	National Effect	Mix effect	Regional effect	National Effect	Mix effect	Regional effect
Andalusia	114.7	18.3	-33.1	110.5	18.1	-28.6	132.0	22.7	-54.8
Aragon	90.9	5.9	3.2	97.9	12.6	-10.4	56.9	-29.2	72.3
Asturias	53.5	12.7	33.8	71.5	14.0	14.5			
Balearics	100.2	-8.4	8.3	110.4	-11.0	0.6	45.2	-0.8	55.6
Canaries	131.1	6.2	-37.3	136.0	1.8	-37.8	104.4	26.5	-30.9
Cantabria	10.5	10.4	79.1	4.3	9.1	86.6	25.0	162	58.8
C-La Mancha	63.5	-10.4	46.9	69.9	-8.6	38.8	34.2	-17.5	83.4
C-Leon	65.4	23.3	11.3	59.2	25.0	15.8	121.3	28.7	-50.0
Catalonia	160.0	-28.4	-31.6	167.7	-25.8	-42.0	120.8	-44.7	23.8
Extremadura	30.4	-7.2	76.8	25.5	-8.5	83.0	37.3	0.4	62.3
Galicia	125.6	50.6	-76.2	108.7	47.4	-561	146.5	63.2	-109.7
La Rioja	61.4	-25.5	64.1	62.4	-23.8	61.4	50.7	-26.0	75.3
Madrid	94.8	7.1	-1.9	87.5	5.3	7.2	162.5	23.8	-86.3
Murcia	131.4	-10.8	-20.7	150.2	-13.2	-37.0	46.1	-9.2	63.1
Navarre	26.9	0.1	72.9	29.3	-0.6	71.3			
Basque. C.	57.6	-2.7	45.0	62.7	-1.4	38.7	34.5	-11.0	76.5
C. Valencia	48.6	9.5	41.9	46.4	10.2	43.3	71.4	8.9	19.7
Ceuta & Melilla	289.0	-163.2	-25.8	579.6	-325.3	-154.3	24.5	-12.6	88.1

Note: The major effects of each region have been highlighted.

Nevertheless, in our opinion the most relevant results are the following:

- For the active population, the national effect remains predominant, though the exceptions are high. Mix effect show that the change to the immigrant structure according to their origin is not a determinant factor. The regional effect is only in the majority in Cantabria, Extremadura, La Rioja and Navarre.
- The results for the employed population are identical: The national effect predominates except in the regions mentioned previously. The only exception being La Rioja.
- We found the greatest differences amongst the unemployed. The growth in unemployed immigrants is, in the cases of Aragon, the Balearics, Cantabria, Extremadura, La Rioja, Murcia and Basque Country due mainly to regional issues. In the other Spanish regions unemployment amongst the immigrant population can be explained by the growth of immigrant unemployment nationally or as a combination of all the issues.

To sum up, the mix effect does not appear to be excessively relevant in explaining the growth of the main labour variables considered. The national behaviour is predominantly responsible for the growth of the active and employed sections of the population. The regional effect is important in a notable number of regions, but only to explain the growth of the unemployed population.

The main effects of immigration on regional labour markets are due to the number of immigrants and their unequal distribution rather than the origin of the immigrants

within each region. The unequal distribution of the immigrants depending on their origin is responsible for certain regional differences but is not a fundamental reason for differences in regional labour markets.

4.2 Virtual settings: Immigration and regional convergence.

From the previous results we have constructed a series of virtual settings to intention of check the effect the immigrant population has on the labour parameters within the Spanish regions. Given previous calculations in which we have registered the growth of the active, employed and unemployed populations according to a series of effects, we can estimate the virtual growth of said populations without taking into account any of these effects. In our case, we are interested in eliminating the contribution made by the mix effect, which reflects the contribution made by the arrival of economic immigrants to the growth of the different working populations under consideration, just as the regional differences that exist as far as their composition is concerned. As a consequence we calculate a scenario for the growth of the active, employed and unemployed populations based only on the national and regional effect without taking into account the mix effect.

Given that we have defined two shift-share analyses, one for the economic immigrant population and the other for population as a whole, we can estimate two alternative scenarios. In the first, we assume that the number of natives and economic immigrants within the populations is the same for all regions. (The mix effect is zero in the first shift-share analysis). In this way we can see what the labour results would be if the immigrants were distributed equally amongst all the Spanish regions. In the second scenario, using the data from the shift-share analysis carried out for the immigrant population alone, we consider a scenario in which the economic immigrants of different origins are distributed equally amongst the Spanish regions. Once again, we consider that the growth of the active, employed and unemployed, immigrant population is based on the national and regional effect and that the mix effect is zero.

a) Virtual activity, unemployment and employment, growth rates of the regions for the population as a whole.

Using the previous scenarios, we have obtained virtual active, employed and unemployed populations and with them we have calculated the main labour rates, which we have also called virtual rates. Table 7 shows the virtual activity, employment and unemployment rates for the Spanish regions and the differences between them and the real rates; that is to say, those that would exist if the population of native and economic immigrants were of equal volume.

Table 7. Virtual activity, employment and unemployment rates with a zero mix effect. The population as a whole.

Source: Authors. From EPA (INE).

	Virtual Rates			Differences (Virtual-Real)		
	Rate of activity	Rate de unemployment	Rate of employment	Rate of activity	Rate de unemployment	Rate of employment
Andalusia	55.57	14.49	47.50	0.87	0.60	0.39
Aragon	57.15	5.98	53.70	0.16	-0.15	0.20
Asturias	50.25	11.40	44.49	1.98	0.50	1.48
Balearics	64.18	6.20	59.90	-1.70	0.15	-1.99
Canaries	58.68	12.37	51.38	-1.00	0.19	-1.04
Cantabria	56.53	9.13	51.43	1.91	-0.01	1.80
C-La Mancha	55.17	9.51	49.89	0.82	0.18	0.61
C-Leon	53.92	8.64	49.30	1.55	0.10	1.39
Catalonia	61.07	6.70	56.91	-1.60	-0.38	-1.33
Extremadura	53.83	15.62	45.40	2.14	0.48	1.53
Galicia	54.76	10.76	48.96	1.43	-0.29	1.53
La Rioja	60.90	5.66	57.54	0.04	-0.57	0.47
Madrid	62.24	6.12	58.54	-1.33	-0.85	-0.60
Murcia	57.19	8.80	51.82	-2.26	0.81	-2.88
Navarre	60.89	4.85	57.94	1.52	0.03	1.42
Basque. C.	58.65	7.77	54.11	1.64	0.18	1.42
C. Valencia	58.38	8.67	53.41	-0.10	-0.57	0.33
Ceuta & Melilla	54.79	20.80	43.24	0.04	0.96	-0.65

Note: The positive differences have been highlighted.

According to the data obtained, if the populations had been of the same composition; that is to say, if the arrival of the economic immigrants had been homogenous, the activity and employment rates would have been larger and the unemployment rates would have been more similar in most of the Spanish regions. Furthermore, the regions with lower immigration rates would have reached higher rates of activity and employment and lower rates of unemployment.

Regarding the activity rate, the regions of Extremadura, Asturias and the Basque Country stand out as regions that could have obtained much higher activity rates had they received more immigrants. On the other hand, Murcia, the Balearics, Madrid and Catalonia present negative differences. So their activity rates would have been much lower had it not been for the in-flow of immigrants to these regions.

Regarding the unemployment rate, Murcia and Andalusia are the regions that present the greatest differences. Had they received the same number of immigrants as the other regions, their unemployment rates would have been lower.

Lastly, it must be emphasized that, Galicia, the Basque Country and Cantabria would have obtained higher employment rates if the economic immigrants in their population structure had carried more weight.

To sum up, looking at the results, we come to the conclusion that if the regions with more/less immigration had the same rates of immigration as those registered nationally, they would see their activity and employment rates rise/fall accordingly as would their unemployment rates. Therefore, immigration could compensate for regional differences,

but only if it is distributed homogenously amongst the regions. As this is not happening at the moment, it can be concluded that the unequal distribution of immigrants is, if not increasing inequality amongst the different regions, at least not helping to reduce it.

b) Virtual activity, employment and unemployment growth rates of the regions for the economic immigrant population.

In this section we repeat the previous scenario so as to take into account the results from the second shift-share analysis. In this way, we limit the analysis to the regional growth of the economic immigrant population. Therefore, we analyse the principal labour rates for the economic immigrant population within each Spanish region.

As in the previous case, we have constructed virtually what the labour rates would be if the population structure of the economic immigrants residing within each region were not differentiated by origin. That is to say, assuming that the mix effect is zero, we force the economic immigrants to distribute homogenously throughout the Spanish regions according to their origin. The difference between the real rates and the virtual ones demonstrate the fact that the regions present greater or lesser immigrant populations with higher or lower activity, employment and unemployment growth rates. This highlights the importance of the differences in the composition of the immigrant populations in the Spanish regions. Table 8 contains these calculations.

Table 8. Virtual activity, employment and unemployment rate with a zero mix effect. Economic immigrant population.

Source: Authors, from EPA data (INE), 2nd. quarter 2005.

	Virtual rates			Difference (Virtual-Real)		
	Activity rate	Unemployment rate	Employment rate	Activity rate	Unemployment rate	Employment rate
Andalusia	67.28	20.47	53.51	-5.33	7.22	-9.48
Aragon	64.36	11.43	57.00	-18.06	-0.23	-15.80
Asturias	57.21	-	57.22	6.82	-	15.66
Balearics	74.88	5.87	70.49	-10.50	-2.01	-8.17
Canaries	65.84	15.10	55.89	-14.37	2.28	-14.03
Cantabria	71.45	68.75	22.35	-12.64	49.05	-45.18
C-La Mancha	66.10	11.22	58.69	-14.52	-1.87	-11.38
C-Leon	58.93	22.14	45.88	-19.58	12.65	-25.17
Catalonia	74.45	13.89	64.11	-0.55	1.55	-1.64
Extremadura	57.70	37.04	36.34	-11.82	16.55	-18.94
Galicia	51.03	34.80	33.27	-11.53	12.24	-15.18
La Rioja	74.12	20.41	59.00	-7.78	4.01	-9.47
Madrid	77.81	20.74	61.67	-7.17	10.72	-14.79
Murcia	85.03	6.85	79.21	4.10	-4.36	7.35
Navarre	61.45	-	61.46	-15.13	-	-14.27
Basque. C.	49.91	14.95	42.45	-32.67	-0.95	-27.00
C. Valencia	73.15	26.32	53.90	-9.23	13.38	-17.83
Ceuta & Melilla	47.14	6.62	44.02	-0.64	-26.35	12.00

Firstly, in relation to the activity rate, it can be seen that if the regions did not differentiate their immigrant population by origin the majority of them would notice a reduction in the value of their participation in the labour force. This is true for all the regions except Asturias and Murcia where the activity rates would increase. Furthermore the unequal national mix of the immigrants has had important consequences on the growth of unemployment rates amongst the immigrant population in the majority of the Spanish regions. The immigrant unemployment rates would be higher in those regions with very few immigrants, compensating in this way for the regional differences.

Results for the employment rates are similar to those obtained for the activity rates, though with a higher degree of heterogeneity. In the majority of regions the results obtained show that if the immigrants were distributed more homogeneously according to origin, there would be a greater similarity in the different regional employment rates for this section of the population, thus reducing the regional differences amongst immigrants. Therefore the unequal distribution of immigrants according to origin affects the labour results they obtain. However, as was demonstrated earlier, the most relevant factor in explaining the regional differences in the labour market is the unequal global distribution of the economic immigrants.

c) Convergence equations and the speed of approach derived from the virtual settings.

Finally, to determine the importance of the the arrival of immigrants and their unequal geographic distribution on the convergence of the regional labour markets, we have re-estimated the convergence equations using the virtual data obtained in the first shift-share analysis. Given that the analyses carried out previously have shown us that the effect of immigration on the regional labour markets is based principally on its unequal concentration rather than on its unequal distribution according to origin.

We have calculated the beta-convergence between the 2000 and 2005, taken for the last year those activity, employment and unemployment rates that would be obtained for the population as a whole if the mix effect were null; that is to say, if the immigrant population had grown at the same rate in each and every Spanish region. The results obtained show us whether the unequal arrival of immigrants has benefited the convergence of the Spanish regions in labour terms, or not. Table 9 shows the results obtained.

Table 9. Convergence regressions taking into account the virtual labour rates, assuming that the mix effect is zero.¹³. 2000-2005.

	Activity rate	Unemployment rate	Employment rate
Initial level	-1.199 (-6.580)**	-1.573 (-7.195)**	-1.408 (-6.462)**
Constant	4.843 (6.692)**	3.423 (7.206)**	5.526 (6.565)**
R squared	0.73	0.87	0.72
Speed of convergence	0.038	0.045	0.042
Time needed to reduce the difference by half	18.5 (quarters) 5 (years)	15.4 (quarters) 4 (years)	16.6 (quarters) 4 (years)

Number of observations: 17.

The values of the t-Student are in brackets.

** Significant under a probability of 95 %.

Results show that convergence (or the approach between the principal labour rates - activity, employment and unemployment-) of the Spanish regions would have been much higher if the arrival and distribution of the immigrants had been more homogenous. Removing the mix effect, the speed of convergence increases considerably and the time needed to reduce by half the present regional differential is estimated to be around 4 or 5 years depending on the rate under consideration; much lower than previous figures, 22 years for the employment rate and 11 years for the unemployment rate.

Besides this, convergence in terms of unemployment rates would be very high. Given the extensive regional inequalities that exist in Spain regarding the distribution of unemployment, this result is extremely important.

These results are in agreement with the data observed previously. The arrival of immigrants is greater in those regions with more favourable or dynamic labour markets; areas with greater employment opportunities, for example the regions of Madrid and Catalonia, which present elevated immigration rates and where the possibilities of getting employment are easiest. Given that the immigrants are at the same time a more active labour group (they usually present activity and employment rates higher than nationals¹⁴), their arrival contributes towards making the regional labour market they enter more dynamic. Therefore, due as much to the concentration of the immigrants in those regions with a more dynamic labour market, as to the existence of a higher level of labour activity among the immigrants, it leads us to conclude that the arrival of immigrants contributes to an increase in the labour differences that exist between the Spanish regions, and helps to explain the limited labour convergence processes between the regions.

5. Conclusions.

The purpose of this paper was to ascertain whether the migratory flows to Spain and their uneven geographical distribution have had effects on the regional labour markets

¹³ Although methodological changes of the EPA affect the temporal series of the activity, employment and unemployment rates, estimation of these regressions has been done maintaining the earlier assumptions in so far as said methodological changes affect all the regions in the same way and so should not be relevant in the analysis of the regional distribution or of the regional convergence.

¹⁴ In this respect see Iglesias, C. y Llorente, R (2006).

by reducing or increasing the differences among them. Although a slight process of convergence starting from the years 2000 and 2001 was observed, the existence of high heterogeneity among the regional labour markets was disclosed, especially sharp in the case of unemployment.

The shift-share analyses showed that the arrival of immigrants has had important consequences in the evolution of the main labour rates, contributing to the increase in the activity and employment rates and to the reduction of the unemployment rate. The shift-share analysis of the immigrant population of an economic nature showed that its uneven geographical distribution by origin did not have important labour results, except in the case of unemployment. The regional differences between the unemployment rates of immigrants would be smaller if they were more uniformly distributed with respect to their geographical origin.

The construction of virtual scenarios disclosed the great importance of immigrants in the present rates of activity, employment and unemployment. Regions with lower rates of immigration would get better labour results if they received the same migratory flows as all the other regions. Therefore, immigration could offset regional differences if their patterns of territorial location were different.

A fundamental conclusion is that immigrants tend to concentrate in the regions with better labour conditions, and there are fewer of them in the regions with worse placed job markets in the context of the country as a whole. Moreover, although in aggregate terms the immigrants increase the activity and employment rates and reduce the unemployment rate, these results are intensified in the regions with the best job markets and moderated in the worse placed regions.

Thus, the present geographical distribution of immigration and its differing labour performance have ultimately contributed to increasing the regional differences. The Spanish regions with highest immigration rates are those that have the most dynamic job markets, and since the arrival of immigrants adds dynamism to the market which they enter, the overall effect has been to increase the regional labour differences. The opposite pattern can be seen for the less favoured regions.

The foregoing observations were confirmed by the convergence analysis performed using the virtual rates. The approximation of Spanish regions in labour terms would have been much greater had the immigrant presence in the population structure in each region been similar. Therefore, the convergence achieved in recent years among Spanish regions was not driven by the arrival of immigrants. Hence, in order to establish what the determining factors of convergence would be, it would be necessary to analyse another series of issues such as the evolution of labour productivity, the evolution of wage differences or the inter-regional mobility of workers.

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