

Regional Unemployment in Spain: Disparities, Business Cycle and Wage Setting^Ñ

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Abstract

The existence and persistence of regional disparities is a common problem of many European economies. However, in Spain this fact exhibits a characteristic feature: a strong positive relationship with the business cycle. The analysis in this paper investigates the relationship between this distinguishing feature of the Spanish economy with the wage bargain system, and how changes in this system may have influenced the aggregate Spanish labour market performance in the recent past. The empirical findings of an important imitation effect in wage bargains may explain both the persistence of disparities and their positive relationship with the cycle. This result has a direct implication to employment policies, which must take into account the regional dimension of the unemployment problem.

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1.- Introduction

Despite the strong employment growth in Spain during the last years, the Spanish aggregate unemployment rate is still one of the highest among the European Union countries. In addition to the persistence of high aggregate unemployment rates during the last 20 years, the spatial distribution of employment has shown important and persistent regional disparities. These disparities are common to many European countries (European Commission, 2000, Baddeley *et al.*, 1998, and Giannetti, 2002). However, they show in Spain a distinguishing feature within the EU: a strong positive relationship with the business cycle.

The existence of regional disparities in the unemployment rate is a relevant economic problem, given its relationship with the aggregate unemployment rate and its implication for social welfare. Thus, in the absence of labour mobility, the persistence of important differences in regional unemployment rates may have a direct impact on the Non-Accelerating Inflation Rate of Unemployment (NAIRU), given that high unemployment rates in poor regions do not exert a downward pressure on wage demands of the low unemployment regions (Layard *et al.*, 1991, chap. 6). On the other hand, and as is well known, the same aggregate unemployment level has different repercussions on social welfare depending on its distribution. Additionally, its own existence confirms the dismal behaviour of the labour market, and serves as a justification for public intervention, with the aim of reducing the problem in high unemployment regions, and thus, in the whole country. From another point of view, the high unemployment regional differentials may be a sign that an important share of the production in high unemployment regions is established on the fringes of legal markets.

According to Marston (1985) there are two possible interpretations for the existence of regional disparities in the unemployment rate. The first one is related to an equilibrium mechanism, while the second is related to a disequilibrium context. According to the first view, each region tends to its own equilibrium unemployment rate, which is determined by the influence of three elements. First, some regions may have a greater than the national average unemployment rate due to the existence of demand-side determinants, as the sectoral composition of the regional production (the predominance of traditional industries and technologies), an insufficient demand for the regional products, etc. Second, a higher unemployment rate in some regions may be explained by supply-side factors, as differences in the qualification of the workforce,

labour and firm mobility, housing supply, family or social ties, the regional amenities, etc. Lastly, a higher unemployment rate in a particular region could be explained by institutional factors, as unemployment benefits schemes, the degree of wage bargain centralisation, legislation on minimum wages, union power, etc. Given that all of these sources of regional disparities in the unemployment rates vary slowly through time, the disparities themselves would tend to remain constant through time. This is the reason why they are considered as an equilibrium phenomena (see Adams, 1985, Topel, 1986). In other words, regional disparities reflect, in the short run, the effect of aggregate shocks that, due to the particular industrial composition of each region, may have different effects. In the long run, disparities are the result of the lack of labour and firm mobility. Workers would not move from high unemployment regions to low unemployment regions due to scant wage differentials given a centralised wage bargain system, or because labour is not sensitive to these differentials (cultural or language problems, real state prices...) On the other hand, capital does not move because high unemployment regions are generally geographically isolated and use to have a low endowment of infrastructures². Before concluding with this interpretation of the existence of regional disparities in the unemployment rates we must clarify that this concept of equilibrium is far from the “pure” competitive equilibrium, under which all of the regions tend towards the same unemployment rate.

A second approach to justify the existence of regional disparities in the unemployment rates is based on the idea of a disequilibrium phenomenon. According to this view, all of the regions would tend to a competitive equilibrium outcome, but the adjustment mechanisms in the regional labour markets are slow or weak, such that adverse shocks have persistent effects. This would imply that regional unemployment rates are permanently away from their equilibrium position. In other words, departing from an initial equilibrium, a shock generates regional differences in the unemployment rates. After this shock, these regional unemployment rates tend slowly to their equilibrium value, but the adjustment is so slow that before reaching back their initial position they are hit by a new shock that avoids total adjustment and introduces new differences. This mechanism generates an increasing dispersion, characterised by

² This argument justifies that around 35% of the EU budget is focused on the reduction of economic disparities among European regions, through strong investments in infrastructures and skill programs. Nevertheless, except in Ireland, the existence of these funds seems that only have served to reduce the incentives to migrate from the high unemployment regions.

diverging regional unemployment rates, a kind of polarisation effect (Overman and Puga, 2002).

Obviously, these two explanations, far from exclusive, are complementary. Moreover, we may find a great number of intermediate set-ups between those mentioned, given the evolution followed by each particular region (for a more detailed analysis see Baddeley et al., 1998).

The comparison of the evolution of the regional disparities in the unemployment rates between Europe and the US allows a further step in the explanation of the existence and persistence of such disparities in Europe. The US, as in many other aspects of the labour market, is completely different to Europe. Regional differences between states are present, but do not persist. In fact, it is observed that regions that in a particular period show a greater than the average unemployment rate, in a few years show a lower than the average rate. This would reflect a disequilibrium framework with fast adjustment towards the competitive equilibrium (see Devens, 1988, Blanchard and Katz, 1992 and Bertola and Ichino, 1996). For many authors the difference between Europe and the US lies in the lack of both migration and wage flexibility in the European Union, such that the US labour market is closer to a competitive model. This implies that the existence of regional disparities in the unemployment rates may be more easily absorbed in the US than in Europe since, first, workers may move from high unemployment regions to low unemployment regions; second, these workers may accept reductions in their wages to promote employment growth; and third firms can promote capital movements, in order to get gains from cheaper workforce³.

The existing evidence for the Spanish economy during the last 20 years seems to fit well the European version. Thus, external migration (or from the country side to the city) during the 50s and 60s was reduced during the 70s and 80s, and has even inverted its sign during the last decade. Since then, net interregional migration flows have been reduced, while intrarregional flows have increased slightly⁴. The current situation in Spain is characterised by low internal migration rates and persistent differences between the regional unemployment rates⁵. Concerning firm localisation, they have

³ Blanchard and Katz (1992) argue that internal migrations are the main source of regional unemployment rate convergence within the US. Moreover, many studies point to the higher wage flexibility in the US as a re-equilibrating mechanism in the labour market, even though this explanation is rejected by authors as Freeman (1995) or Baddeley et al. (2000).

⁴ For a detailed analysis of migratory movements in Spain see Ródenas (1994), Bentolila (1997, 2001), Antolín and Bover (1997), Bóver and Velilla (1999) and de la Fuente (1999).

⁵ A similar situation is found in Italy by Faini et al., (1997) and Brunello et al. (2001).

tended to locate in the development poles (Madrid, Ebro Axis and the Mediterranean Coast), i.e., in the lowest unemployment regions. This denies the possibility of firms moving in order to benefit from cheaper labour force. Rather, the predictions of the New Economic Geography (Krugman, 1998) seem to better suit the current description. Finally, wage flexibility has been found to be low, as in other EU countries. In other words, the response of wages to changes in the regional unemployment rate is low, such that high unemployment rates are not followed by reductions in wages, as Jimeno and Bentolila (1998) and Montuenga et al. (2003) show.

In this paper we focus on this last kind of explanations, linking the lack of wage flexibility with labour market institutions. During the last years the literature has related the national unemployment problem to the labour market institutions within countries. However, the use of these kind of arguments to explain regional differences has not been followed. As it is obvious, the main characteristics of the labour market institutions (minimum wages, dismissal costs, unemployment benefits, legally worked hours and wage bargain) are common to all of the regions within a country, and this fact limits its potential explanatory power of the regional disparities problem. However, some of these institutions may have important effects at the regional level. In particular, focusing on the influence of the wage bargain process, regional unemployment differences may be sustained because the wage bargain system fails, due to a lack of response of wages to changes in the regional, local or firm conditions. If labour productivity is different across regions, low productivity regions will not create additional employment because labour costs may be too high for the minimum wages fixed at the national level. Even when wage bargain is geographically decentralised (as in Spain) we could reach the same situation if relative payment criteria or wage leadership effects are introduced into the wage bargains (see Saint Paul, 1997, Brunello *et al.*, 2001).

The aim of this paper is to provide an explanation to the existence and the persistence of the regional disparities in the unemployment rate, departing from the analysis of the wage setting mechanism prevailing in Spain. This analysis may allow us to bring into light another differential fact of the Spanish labour market: the strong relationship between regional disparities and the business cycle. Even though this relationship is common to many EU countries, in Spain it reaches an intensity far above the average, and may be one of the elements that has influenced negatively the aggregate result of the Spanish labour market. The empirical finding of a important wage imitation effect

in the wage bargains, specially in those less dynamic sectors of the less productive regions, may explain both the persistence and the relationship of the disparities with the business cycle. This result has an immediate implication for policy. Policies aiming at reducing unemployment should focus on the regional dimension of the problem, and would require a substantial reform of the Spanish wage bargain system, allowing for a greater decentralisation (Segura, 2001 and Bentolila and Jimeno, 2002).

The paper is organised as follows. Section 2 describes, for the Spanish economy, the existence and persistence of regional disparities in the unemployment rate. This analysis will confirm its strong relationship with the business cycle. Section 3 offers an estimation of the Spanish wage setting mechanism and interprets the empirical findings. Finally, section 4 concludes.

2.- The Facts: existence and persistence of regional disparities in the unemployment rate and its relationship with the business cycle

The aim of this section is to analyse the regional behaviour of Spanish unemployment since the eighties. First, we develop a comparative static analysis, consisting in examining the distribution of regional unemployment in different moments of time. Even though all of the dynamic aspects of the evolution followed by each region are omitted, the comparison will provide an intuitive picture of the existence and persistence of regional disparities in the unemployment rate. Second, we consider the issue of potential different regional behaviours in response to changes in the business cycle.

2.1. Existence and persistence of regional disparities in unemployment

In Table 1 we show the regional ranking of unemployment rates in different moments of time since 1981 until 2001⁶. During the last 20 years Andalusia and Extremadura have been located at the bottom of the regional distribution concerning labour market behaviour, with unemployment rates much greater than the average. Until the mid nineties, Canary Islands and the Basque Country followed them closely, but more recently they have improved their relative position, being replaced by Galicia and

⁶ The deep reform of the Labour Force Survey (EPA) done in 2002, consisting in the change of the elevation factors and in the adaptation of the definition of unemployed to the one proposed by Eurostat, implies a clear break in the sample. The lack of homogenous data forces us to stop our analysis in this year. However, given the new definition, the situation described along the following paragraphs has not changed much since 2002.

Asturias⁷, which have exhibited a negative evolution of their macroeconomic aggregates. In the other extreme of the distribution, the Balearic Islands, La Rioja, Aragón and Navarra have always stood into the group of regions with lower unemployment rates. Despite the evident persistence of the disparities that can be observed in Table 1 -only 4 out of 17 Spanish regions have exhibited a change in their tendency, moving from a relative position below (above) the average to another above (below) the average- a relative degree of mobility can be observed.

Table 1					
Regional Unemployment Ranking					
	1981	1986	1991	1996	2001
Navarra	9	8	4	1	1
Balearic Islands	3	2	3	2	2
La Rioja	2	4	1	3	3
Aragón	7	5	2	4	4
Catalonia	13	13	6	6	5
Madrid	12	10	5	9	6
Basque Country	14	14	14	10	7
Valencia	10	11	11	12	8
Castilla-León	5	7	9	8	9
Castilla-La Mancha	11	3	8	7	10
Murcia	8	12	13	14	11
Canary Islands	15	15	16	13	12
Cantabria	4	6	12	15	13
Asturias	6	9	10	11	14
Galicia	1	1	7	5	15
Extremadura	16	16	15	16	16
Andalusia	17	17	17	17	17
Aggregate Unemployment Rate	14,3	20,9	16,3	22,2	12,9
Difference between extrema	13,6	16,6	16,1	20,9	15,6

Source: EPA and own elaboration. Regions are ordered according to their unemployment rate, from lower to higher rates.

On the other hand, the differences between the extrema of the distribution have not been reduced during our analysis period. Thus, in 1981 the difference between

⁷ The situation of Asturias is peculiar. With the new definition provided by the Labour Force Survey, Asturias would be included into the group of regions with lowest unemployment rates. This result would be explained by both the new definition of unemployed (the discouraged worker effect among the unemployed workers may be higher in regions facing strong industrial restructuring, as Asturias) and by the correction of the elevation factors (Asturias loses population and has not received relevant incoming migration). Thus, from an unemployment rate of 14.44% we move to a 7.84%, a reduction of more than 45%. The case of Galicia has been analysed by Bande and Fernandez (1999, 2004) and by Fernández and Polo (2002).

Andalusia (the region with the highest unemployment rate) and Galicia (the region with the lowest rate) was of 13.6 points. In 1986, the difference between both regions (both were in the same position of the scale) had increased slightly up to 16.6 points. In 1991 Andalusia was still the region with the highest unemployment rate, and the difference with respect to the region with lowest unemployment rate (it was La Rioja) had been reduced to 16.1 points. In 1996 the difference rises up to 20.9 points. Finally in 2000, the first place in the ranking was still occupied by Andalusia, with an unemployment rate of 21.8%, while the region with the lowest unemployment rate was Navarra, with a rate of 6.2%, which implies a difference of 15.6 points. In summary, we find the presence of high regional unemployment rates in Spain, and a marked persistence through time. This shows that regional differences do not seem to have been reduced, at least between the opposite values.

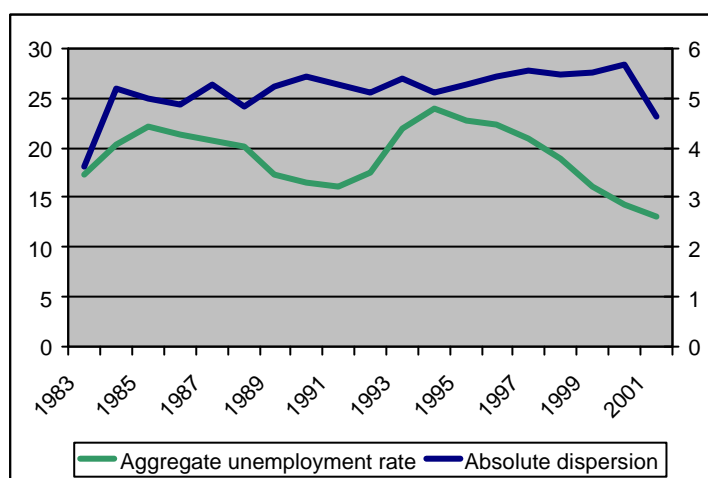
2.2. Regional disparities and business cycle

The analysis of the evolution in the long run of the regional unemployment rates has been a recurrent topic in the spatial economics literature (Evans and McCormick, 1994, Martin, 1997, Taylor and Bradley, 1997, and for Spain, Villaverde and Maza, 2002, López-Bazo *et al.*, 2002, Aláez *et al.*, 2003). However the analysis of the relationship between these unemployment rates and the aggregate economic fluctuations has not been as much analysed, probably because aggregate shocks affect differently the different regions, given that their productive structures are different. Many empirical studies (Fisher and Nijkamp, 1987; Dunford and Perron, 1994; Mackay, 1994; Hess and Shin, 1997) point to the existence of a tendency for regional disparities (measured through absolute dispersion figures, as the standard deviation) to be reduced during the expansive parts of the business cycle, and to be rised during economic downturns. More recently, Martin (1999), Pekhonen and Tervo (1998) and Baddeley *et al.* (1998), among other authors, offer similar results for different European countries, even though they do not consider the Spanish case.

The arguments for this general results are varied. First, poor regions will show a greater share of GDP produced by the less dynamic industries, and hence they will be more affected (and for a longer period of time) by aggregate shocks. Moreover, the ability of adjustment in the less developed regions will be lower, because those firms with a more adapted technology to demand shocks would have been located in the developed regions, to benefit from localisation and agglomeration externalities (Puga, 2002). Lastly, during economic downturns, migration can be less intense (Pissarides

and McMaster, 1984, Dewhurst, 1988), and this will reduce its ability to even regional labour markets, even though this argument is less relevant in Spain.

Being this result common to many European countries, we may ask if this is true also for Spain. Villaverde and Maza (2002), with a dataset from FUNCAS⁸, show that when dispersion is measured in absolute terms, there exists a direct correlation between dispersion and the national unemployment rate, at least since the beginning of the nineties. If, instead, a relative dispersion measure is used, the correlation is the inverse. Our dataset shows that, in absolute terms, dispersion has shown a slightly rising tendency during the last 20 years. If we consider relative dispersion measures, the negative relationship with the unemployment rate is remarkable⁹ (see Graphs 1 and 2).

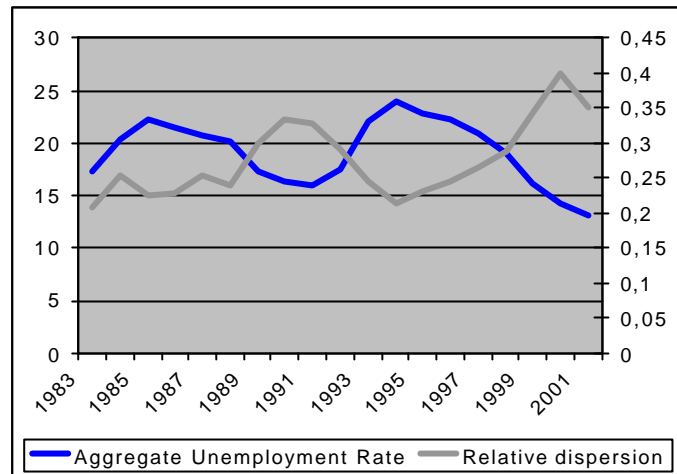


Graph 1. Aggregate Unemployment rate and absolute dispersion

This behaviour, even though is common to other European countries (see Martin, 1997, for example), has distinguishing features in Spain. Thus, a first evidence can be found in Table 2, which shows the correlation coefficient between the standard deviation of the regional unemployment rates and the aggregate unemployment rate for our sample period. We can observe that in the Spanish economy the negative relationship with the business cycle (proxied by the aggregate unemployment rate) and the regional disparities seems not to be present. While for the other European countries we find a clear tendency for regional disparities to be reduced during economic upturns, and to be raised during downturns (even though with clearly different individual behaviours; for instance, the correlation coefficient varies from 0.82 for Greece to 0.32 for Belgium), this is not true for Spain.

⁸ Fundación de las Cajas de Ahorros (Saving Banks Foundation)

⁹ Note that a negative relationship of relative dispersion with the aggregate unemployment rate is a sign of a positive relationship of disparities and the business cycle.



Graph 2. Aggregate unemployment rate and relative dispersion

Country	Number of regions	Corr. Coef.
Belgium	11	0,32
Germany	41	0,76
Greece ^a	13	0,82
Spain	17	0,03
France ^b	22	0,40
Italy	20	0,55
Netherlands ^a	12	0,71
Portugal	7	0,40
U.K.	37	0,68

Notes: Own elaboration from the Regio Database, Eurostat
a. data from 1988 to 2001
b. overseas regions not considered

A second evidence can be obtained from the use of a relative dispersion index. This measure allows to determine through an alternative way if regional unemployment rates are oriented towards a higher or lower degree of convergence through the analysis period. The relative dispersion coefficient is given by

$$RDC = \left[\sum \left(\frac{L_j}{L_N} \right) U_j - U_N \right] \left[\frac{1}{U_N} \right] \quad (1)$$

where L_j and L_N are the labour force in region j and in the aggregate economy, respectively, U_j is the unemployment rate in region j and U_N is the aggregate

unemployment rate. The lower bound of the relative dispersion coefficient is zero, which means that all of the regions have the same unemployment rate. The evolution through time of this coefficient shows directly the evolution of the degree of convergence. A big reduction in this ratio is interpreted as a clear process of convergence. On the other hand, if the coefficient rises or stabilises during a period of time, we may conclude that the regional unemployment rates are following a diverging process.

Table 3 summarises for the same group of European countries in 1986 and 2001, the relative dispersion coefficient, and additionally we include the correlation coefficient between this relative dispersion measure and the aggregate unemployment rate for the whole period.

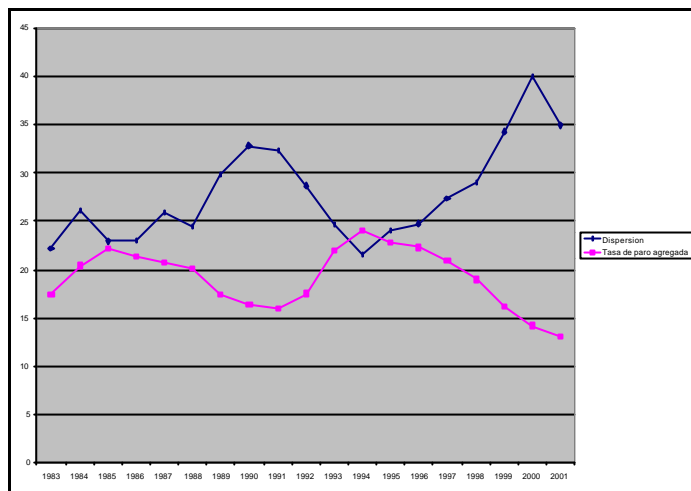
Table 3
Relative dispersion coefficient (RDC) and correlation between RDC and the aggregate unemployment rate. 1986 and 2001

Country	Number of regions	1986		2001		Corr ^c .
		Unemp. rate	RDC	Unemp. Rate	RDC	
Belgium	11	11,2	0,26	6,6	0,54	-0,638
Germany	41	6,6	0,33	7,8	0,52	0,239
Greece ^a	13	7,7 ^a	0,24 ^a	10,2	0,28	-0,268
Spain	17	21,4	0,22	13,1	0,35	-0,948
France	22	10	0,16	8,5	0,29	-0,289
Italy	20	10,5	0,46	9,5	0,77	-0,146
Netherlands ^b	12	9,2 ^a	0,19 ^a	2,3	0,37	-0,768
Portugal	7	8,6	0,45	4	0,34	-0,319
U.K.	37	17,7	0,31	7,4	0,44	-0,137

Notes: Own elaboration from Regio Database, Eurostat
a data from 1988
b Overseas regions not considered
c Correlation coefficiente between the aggregate unemployment rate and the RDC for the period 1986-2001.

Our results allow us to conclude that the regional problem is greater nowadays than it was in the eighties, because dispersion has increased (only in Portugal regional differences seem to have been reduced), in spite of the great effort developed by the European Union to fight against territorial imbalances through the structural funds. Additionally, Spain shows a completely different behaviour from the other group of countries. Even though the increase in dispersion is similar to other countries (or even lower), the response of regional differences to business cycle is very sensitive (correlation coefficient of -0.949). In other European countries, as Italy, Portugal, UK or Germany, where regional differences are also marked, such coefficient is much lower (it does not take values lower than -0.30 , and even for Germany it is positive).

Let us now focus on the evolution of the relationship between regional unemployment rates dispersion and the aggregate unemployment rate. Graph 3 (which reflects a similar information than Graph 2) shows this evolution for the period 1983-2001, which includes different parts of the Spanish business cycle.



Graph 3. RCD and Aggregate unemployment rate

Focusing our attention in the years after 1986, when Spain joined the EEC, we first observe that there is a strong economic upturn, with a strong process of employment creation (1.7 million new jobs between 1986 and 1991), which translated into a reduction of the aggregate unemployment rate of 6 points, but in an important increase in the regional disparities. From 1991 to 1994, the Spanish economy suffered from one of the most important recessions (the GDP showed a negative growth rate of 1% in 1993). At the same time, employment was reduced in almost 900.000 jobs during this period. This led the unemployment rate to rise in 8 points, reaching its historical ceiling in the first quarter of 1994, with a value of 24.1%. At the same time, regional disparities were reduced. Since then, the new upturn in economic activity has been followed by increases in the regional differences, reaching values greater than the initial ones. The dispersion coefficient has experienced a sustained increase during this subsample. This coincides with a divergence process in the regional unemployment rates, with a strong employment creation and a reduction of the aggregate unemployment rate, much stronger than the 1986-1991 reduction.

Given all of these findings we may provide three conclusions. First, during the last years, Spain has not experimented a convergence in the regional unemployment rates. This implies that nowadays, regional dispersion is greater than it was when Spain

joined the EEC. Second, the response of regional labour markets to changes in the business cycle is very heterogeneous. This is translated into a marked relationship between the business cycle and regional dispersion. Even though other countries exhibit similar characteristics concerning the relationship between regional disparities and business cycle, the intensity of such relationship is much lower. This fact requires a differential explanation. Finally, these results suggest that the intensity of the regional dimension of the unemployment problem in Spain is mainly related to the business cycle.

3.- A tentative explanation: the wage setting mechanism

In the previous section we have described the existence and persistence of regional disparities in the unemployment rate in Spain, and how these differences show a very intense relationship with the business cycle. There are many theoretical arguments that have been proposed in the literature to explain the existence of regional disparities in the unemployment rate. However, when these arguments are applied to the Spanish economy, the explanation is always partial, because they do not allow to interpret the relationship between regional unemployment rates dispersion and business cycle for the Spanish economy, which has been summarised in the previous section. Thus, in this section we will explore an alternative explanation, probably complementary to those proposed previously, to these persistent regional differences. This explanation will focus on the role of the wage setting mechanism and its influence on regional unemployment rates.

Our hypothesis is the following: If there is an important imitation effect in wage bargaining, specially in those less dynamic sectors of the less productive regions, its effects on the regional unemployment rate (and thus, on the aggregate unemployment rate) may be significant. During economic upturns, the more dynamic industries will exhibit wage increases, that would be imitated by the less dynamic industries. The same happens during economic downturns, but with an important difference: during the upturns, the differential between wage and productivity will be much greater in the less productive industries/regions than during economic downturns. If these sectors/regions keep this imitation behaviour in their wage setting, they will increase the disparities between regions, as documented for the Spanish economy.

This explanation, however, is not new. Fair wage hypothesis (Kahneman *et al.*, 1986, Akerlof and Yellen, 1990, Ball and Moffit, 2002), have served as starting points of

some models, where it is assumed explicitly that wages in one region may be determined by wages bargained in other regions (see Saint Paul, 1997). One of these models has been used by Brunello *et al.* (2001) to explain, how in Italy, the wage level fixed in the Northern regions is used as a reference to establish the wage level in the Southern regions, such that, the unemployment rates in these regions do not exert any influence in the wage setting mechanism. This fact gives rise to the existence and persistence of strong regional disparities in the unemployment rates.

Before developing our empirical work to test this hypothesis, we summarise briefly the main characteristics of the wage bargaining model in Spain. From the data published by the Ministry of Labour (*Ministerio de Trabajo y Asuntos Sociales*) we deduce that sectoral agreements are the norm in Spain. Within this kind of agreements, the province territorial level is the most relevant one (both considering the number of firms and the number of workers covered by this type of agreements). The second territorial level in importance would be the national level. On the contrary, the firm-level agreements are not important (less than 15% of agreements are signed at the firm level). Moreover, the importance of this kind of agreements has been reduced during the last decade concerning the number of workers covered. With respect to the agreed wage increase, the official statistics show that these are lower in the firm-level than in the upper level agreements (with exceptions in 1983 and 1986). Also, we find that within the sectoral agreements, the highest wage increases are found in the province and region level agreements, while the wage increase in the national level (with the exception of 1999 and 2000) are lower, but higher than the firm-level ones (see table 4 and appendix b).

Our next task is to answer to these two questions: why does this differential in the wage increases exist? What consequences has this fact on regional unemployment? Given that our data availability is reduced, at this stage of the research we have opted for a reduced form approach, through which we will estimate a wage equation with some elements, that will allow us to test our starting hypothesis: the existence of a wage imitation effect in regional wage setting.

The analysis will be done through the estimation of a wage setting equation at the sectoral level, in which we explain the observed wage as a function of internal and external variables, for the period 1980-1995. With the aim of maintaining a simple

structure, and as has been suggested in other empirical works¹⁰ (Andrés and García, 1991, Fernández and Montuenga, 1997 and 2001, Bande *et al.*, 2001) we assume that the observed real wage in a certain sector is a linear function of productivity with the sector and the alternative wage to this sector. This relationship is of the form:

$$w_{ijt} = a_{j0} + b_1 \Pi_{ijt} + b_2 w_{ijt}^a + e_{ijt} \quad (2)$$

where a_{j0} is sectoral fixed effect, w_{ijt} is real wage in sector i of region j , Π_{ijt} is labour productivity in sector i of region j , w_{ijt}^a is the alternative wage of sector i in region j (to be defined below), and e_{ijt} is a random error term. All the variables are expressed in logs.

Table 4. Workers covered by type of wage agreement. (in %).

Spain. 1982-2002

	Firm-level	Industry level		
		Province	Regional	National
1982	16	53,1	2,2	28,3
1983	17,4	53,7	4,3	24
1984	17,4	53,7	3,8	24,9
1985	17,5	53,6	3,8	24,7
1986	17,6	53	2,6	26,5
1987	16,3	54,1	2,7	26,5
1988	15,8	54,5	2	27,8
1989	15,4	54,4	2,9	27
1990	15,5	57,2	3,8	23,2
1991	14,9	56	3,9	25
1992	15,3	54,8	4,7	25,1
1993	13,9	55	9,3	21,6
1994	12,7	55,9	7,1	24
1995	13,8	55,1	2,8	28
1996	13,5	53,6	5,3	27,6
1997	12,4	51,5	5,8	30,4
1998	12,2	52	6	29,8
1999	12,4	52,2	5,5	29,8
2000	11,5	52,4	7,8	28,3
2001	10,9	54,3	9,3	24,6
2002	9,9	55,8	9,4	23,9

Source: Ministry of Labour. *Estadísticas de Convenios colectivos de trabajo*

In order to estimate equation (2) we use data from the BD-MORES database, published by the *D.G. de Análisis y Programación Presupuestaria* and the University of Valencia. Specifically, the variables used in our empirical work are following. The

¹⁰ Fernández *et al.* (2002) show that the inclusion of other relevant variables (as the degree of concentration in the markets, the union power, etc.) does not improve the quality of the estimations. This allows us to be confident about our theoretical framework.

sectoral wage has been proxied by the ratio of labour income by the number of wage-earners. Productivity has been proxied by the ratio of Gross Value Added at factors cost by the number of employed workers. Finally, the alternative wage has been calculated through two different ways. First, we calculated the average wage outside the sector within the region. A second measure of the alternative wage has been the national average wage. All of the variables have been deflated by the GVA deflator, provided by the same database. Thus we construct a panel with 15 sectors (Agriculture and Energy are excluded, see Appendix 1 for description of the dataset) and 17 regions. We finally pooled the sectors according to the regional unemployment behaviour with respect to the national unemployment rate. Thus we constructed three groups of regions, each with 15 sectors and a variable number of regions. In Group 1 we include those regions that have behaved worse than the national unemployment rate. This means those regions that departed from a lower than the national unemployment rate and have ended up with a higher than the average rate. These regions are Asturias, Cantabria, Castilla-León, Castilla-La Mancha and Galicia. Group 2 is composed by those regions that have behaved better than the average unemployment rate throughout the sample. These regions are Aragón, Balearic Islands, Catalonia, Madrid, Navarra and La Rioja. Finally, in Group 3 we include those regions that have persistently behaved worse than the national average: Andalusia, Canary Islands, Extremadura, Murcia, Valencia and the Basque Country. Our sample period goes from 1980 to 1995.

Initial estimates of equation (2) showed signs of misspecification, specially concerning serial correlation. We estimated different versions of this equation, including a version with the regional/national unemployment rate as an external variable. These two variables never became significant (as in Brunello *et al.*, 2001 for Italy or Jimeno and Bentolila, 1998 for Spain), which may interpreted as a reinforcing argument in favour of our hypothesis. Given these misspecification results we decided to estimate our model using the generalised method of moments (GMM) proposed by Arellano and Bond (1991). The equation is estimated in first differences, in order to eliminate the fixed effects. Thus if, as assumed, the random shock is white noise, the residuals of our estimated equation should show first-order correlation, but no second-order correlation. Our instruments are regional variables lagged from $t-2$ backwards. Finally, national variables are treated as strictly exogenous.

Table 5 summarises the results of our estimations. Focusing on the first columns of each panel, we observe the estimated coefficients for our entire sample period, 1980-

1995. This estimation shows substantial differences concerning the relationship between the real wage and labour productivity and the alternative wage in the different groups of regions. Thus, we observe that the elasticity of the real wage with respect to productivity and the alternative wage varies from one group to another. Group 1 and Group 3 show a balanced weight of both elements, while Group 2 exhibits a greater coefficient on the alternative wage. These results show that the alternative income elements are important in wage setting, but do not provide an explanation for the existence and persistence of regional unemployment disparities. In fact, for our argument to be reinforced we should expect that the alternative income elements should be of greater importance in Group 1, i.e., those regions that have behaved worse in terms of unemployment. One explanation for these preliminary unfavourable results is that during the sample period some important changes in the institutions around wage setting have taken place, such that the estimated coefficient for the whole period represents an average of two different periods of time. In fact, there has been a fundamental change in wage setting in the Spanish labour market. Since 1979 wage setting was centralised, due to the existence of social agreements that aimed to fight against inflation. These centralised agreements established wage floors for the whole economy. This centralisation was abandoned on 1986, when the last social agreement was signed. Distrust among unions, firms and government, joined by a favourable upturn in the business cycle lead to a breakdown of the agreements, and wage bargain began a decentralisation process. The model chosen was an intermediate one, with sectoral agreements that could be modified later at the firm level. This type of bargaining introduced a new element in the negotiations: the alternative income effect, which was not present before. Thus, although the agreements could be modified later at the firm-level bargain, currently less than 15% of agreements are bargained at this level. This allows the wage setting in a certain sector to depend on its own conditions (productivity) but also on external conditions (the wages paid elsewhere) that were absent in the centralised model.

Thus, in order to test this hypothesis, we split the sample into two subsamples. The first goes from 1980 to 1988¹¹, and the second one from 1989 to 1995. Columns 2 and 3 of the three panels in table (6) summarise the results of the estimation of our wage equation for the different groups of regions. We clearly see that our hypothesis gains

¹¹ Jimeno (1992) finds that the average duration of a wage agreement is around one year and a half. Thus 1988 should be the first year where the lack of centralisation is present in the bargainings.

sustain. First, focusing on Group 1, note that before 1988 the alternative wage is not significant, being wages mainly determined by productivity. In Group 2 the alternative wage is significant, but its value is lower than the one found for the whole period. Finally in Group 3 the relevance of the alternative wage is also higher than in Group 1. After the decentralisation of the wage bargain things change dramatically. In Group 1 the elasticity with respect to the alternative wage increases up to 0.841, being highly significant. Note that in the other Groups, even though the coefficient on the alternative wage increases, the rise is not as big as in the case of Group 1. Finally, note that in Group 3 (those regions that have been in the same low relative position through time) the coefficients on the alternative wage and productivity are barely the same.

Thus, we find evidence in favour of our hypothesis. The decentralisation process implied that in a number of regions wages were linked to external conditions, through the wage imitation effect. It is where this imitation effect is bigger (Group 1) where the worse outcome in terms of regional unemployment is found. The fact that the change in the centralisation takes place during an upturn reinforces our argument. Regions in Group 1 are characterised by a high share of GDP produced by the less productive sectors. The breakdown in the social agreements introduces the alternative wage in the bargainings. But this was more relevant in these regions due to the favourable economic conditions¹². Thus, these sectors/regions experienced an increase in their real labour costs, which obviously slowed down the employment creation process. In other words, in these regions employment did not raise as much as it could. In terms of unemployment, this means that unemployment did not fall as much as it could. In those regions where the imitation effect was less relevant (Group 2) unemployment fell more. In terms of regional disparities, this change in the centralisation of the wage bargain in a moment of favourable economic conditions has implied an increase in regional disparities. Thus, regional dispersion has a strong positive relationship with the business cycle. Note that those regions where the change in the centralisation did not implied a relevant increase in the importance of the relative payment factors (Group 3) are those regions that have not improved/worsened their relative position in the dispersion. Those regions less affected by the alternative income effect are those regions that are better off in terms of unemployment.

¹² If it were a downturn these sectors could not afford to link their wage to the alternative income.

Finally, note that if we use other definitions for the alternative wage we find similar results. When the average national wage is used as a proxy of the alternative income, the estimated coefficients are greater than those found before. However, the results are the same: it is in Group 1 where the change in the elasticity of the wage with respect to the alternative income rises more after the institutional change. Thus, our hypothesis of an important imitation effect to explain the increase and persistence of regional disparities is confirmed by our empirical results.

Table 5 . GMM estimation. 1980-1995

	<i>GROUP 1</i>			<i>GROUP 2</i>			<i>GROUP 3</i>		
	80-95	80-88	89-95	80-95	80-88	89-95	80-95	80-88	89-95
DW(-1)	0,549	0,425	-0,07	0,368	0,005	0,03	0,428	0,109	0,253
	(-8,94)	(6,41)	(-0,75)	(3,18)	(0,03)	(0,38)	(6,03)	(1,44)	(2,92)
DWA	0,243	0,079	0,841	0,47	0,391	0,638	0,397	0,418	0,453
	(-4,81)	(0,6)	(6,46)	(3,86)	(1,9)	(5,45)	(4,31)	(1,59)	(5,8)
DPROD	0,273	0,323	0,38	0,162	0,166	0,39	0,334	0,302	0,361
	(-3,85)	(4,33)	(5,19)	(2,5)	(1,88)	(6,22)	(4,77)	(4,39)	(3,8)
M1	-4,58	-2,79	0,33	-4,47	-1,63	0,25	-4,2	-3,49	-1,71
M2	0,53	0,17	-1,12	-0,79	-1,41	-0,9	0,05	-1,63	0,88
	80-95	80-88	89-95	80-95	80-88	89-95	80-95	80-88	89-95
DW(-1)	0,515	0,417	-0,05	0,271	-0,03	0	0,394	0,078	0,155
	(8,39)	(6,26)	(-0,56)	(2,37)	(-0,29)	-	(5,77)	(1,08)	(1,42)
DWAG	0,482	0,35	1,34	0,764	0,853	1,05	0,616	0,722	1,01
	(5,37)	(1,14)	(7,67)	(4,14)	(1,85)	(6,42)	(4,75)	(1,79)	(6,62)
DPROD	0,266	0,305	0,391	0,128	0,116	0,391	0,316	0,273	0,353
	(3,87)	(4,02)	(5,33)	(1,96)	(1,36)	(6,38)	(4,7)	(4,28)	(4,2)
M1	-4,53	-2,82	-0,06	-3,93	-1,3	0,17	-4,14	-3,41	-1,18
M2	0,55	0,24	-1,11	-0,73	-1,34	-0,42	0,02	-1,58	0,87

Notes: Dependent variable is W, the real wage. t-statistics in parentheses. Estimation in differences. M1 and M2 are the tests for first order and second-order correlation respectively. WA is the alternative wage, PROD is labour productivity and WAG is the aggregate wage, as defined in the text.

4.- Conclusions

The existence and persistence of strong regional disparities in the Spanish regional unemployment rates has been the topic of this paper. We focus on the role that labour market institutions, namely the wage setting mechanism and its degree of centralisation may have played in the explanation of such problem. After a summary of the absolute and relative measures of regional dispersion on the unemployment rate we concluded that these disparities were important in Spain and that they were strongly related to the business cycle. Economic upturns were positively correlated with increases in the dispersion, while recessions were followed by reductions in the disparities. This

empirical observation is not at odds with the theoretical arguments, that have proposed a negative relationship, i.e., that dispersion should increase during downturns. This fact led us to search for alternative explanations. The estimation of a sectoral wage setting equation for different groups of regions (according to their unemployment rate evolution) has shown significant differences concerning wage setting, and the relative weight given to the internal and external variables. We may summarise our conclusions through the following points:

- When the whole sample period is considered, we find differences between the three groups of regions, but these differences are not so marked. Those regions that have evolved worse than the national unemployment rate (group 1) and those that have maintained a stable relative behaviour (group 3) relate their wage equally to the alternative wage and to productivity. On the contrary, those regions where unemployment has behaved better show a greater relationship with respect to the alternative wage than to productivity. However, we do not trust on this specification, due to fundamental changes in the wage setting process (change in the degree of centralisation) during our sample period. In any case, the finding of the great importance of the alternative wage is in line with other empirical works for the Spanish economy, as Jimeno and Bentolila (1998) or Bande *et. al.*, (2001).

- We split our sample in two subperiods in order to identify the influence that the change in the degree of centralisation may have played in the regional wage setting. We find that before 1988 (the first round of bargains in the decentralised model), productivity was the only relevant variable for regions in group 1, while the alternative wage did not matter at all. In the rest of regions both elements were present. However with the institutional change we find a different wage setting scenario. Regions in group 3 (those regions where relative unemployment has not changed) keep on relating their wages to both kind of variables, with a similar weight. Regions in group 2 (those regions with an improvement in their relative unemployment rates through the period), despite that they increase the elasticity with respect to the alternative wage, they also increase their relationship to productivity. In any case, the rise in the importance of the alternative wage is not very important. It is on group 1 where we find big differences. This group of regions are those that have behaved worse in terms of unemployment (their relative unemployment rate increase

during the period of analysis). This group of regions experiment the biggest increase in the alternative wage coefficient, specially when we consider different measures for the alternative wage, as the aggregate wage.

We interpret these results as an empirical support for our starting hypothesis. The change in the centralisation of the wage bargain (that in any case, did not implied a completely decentralised model) introduced in the wage bargains a new element that was not present before: the alternative wage. This led to a kind of wage imitation effect, as has been found for Spain by Bande *et al.*, (2001), or by Brunello *et al.*, (2001) for Italy. The argument is that when the change in the decentralisation coincides with an economic upturn, all of the sectors in all of the regions experiment an increase in their relative demand, such that they expand employment. However, not all of the sectors are in the same economic conditions. Due to technological or demand-driven reasons, some sectors in some regions (precisely those in group 1) are less productive than the average (the so-called lagging sectors by Fernández and Montuenga, 1997, 2001). These sectors observe that their labour costs are raising: their wages are not fixed according to their productivity but taking into account the external conditions of the sector, specially those at the aggregate level. Thus, their ability to create employment is limited by both their lagging behaviour and the increase in the labour costs. If a region has an important share of GDP produced by these lagging sectors, we should observe that unemployment has not fallen as much as it could during this upturn. Of course an opposite behaviour is expected in those regions where the share of the GDP produced by lagging sectors is small (group2). Hence, we find an explanation for both the existence of the disparities and for the strong relationship with the business cycle.

Our results confirm the relevance of the wage setting mechanism in the explanation of the recent evolution of the labour market in Spain. We can conclude that, nowadays in Spain, unemployment is a regional problem, and it is mainly due to the fact that the wage bargaining mechanism has a relevant influence. These results have an important implication for policy making. Those policies aiming at reducing the aggregate unemployment rate should focus on the regional dimension of the problem. Our results show that if unemployment is to be reduced, substantial reforms in the wage bargaining are needed, allowing for a greater decentralisation. The intermediate model followed after 1986 has brought into light a new problem,

namely the persistence of the regional disparities and their strong relationship with the business cycle.

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Appendix

a.) Description of the dataset:

Our dataset comes from the BD-MORES database, published by the *Dirección General de Análisis y Dirección Presupuestaria* and the University of Valencia. A detailed description of this database can be found in Dabán, T., Díaz, A., Escribá, F.J. and Murgui, M.J. (2002):"La base de datos BD.MORES" *Revista de Economía Aplicada, Vol. X, 30*.

The database consists of information of 17 sectors, clasified by the NACE-CLIO classification (see table A1). We include the 17 Spanish regions. Finally, we exclude from the sample the Agriculture and Energy sectors. The first one is done because the number of wage earners is very reduced. The second one is excluded due to the high value of its GVA with respect to its employment, which overestimates the productivity.

Table A1.
Sectoral Classification

NACE CLIO R-17 Code	Description of the sector
1	Agriculture
2	Energy
3	Metalic Minerals and Metallurgy
4	Minerals and non Metallic products
5	Chemistry
6	Non metallic products
7	Transport Materials
8	Food, Brevery and Tobacco
9	Textile, Clothing and Footwear
10	Paper and byproducts
11	Other Industrial Products
12	Construction
13	Tradable goods
14	Transport
15	Credit and Insurance
16	Other tradable services
17	Non tradable services

b) Bargained wage increase by type of bargaining level (in %)

	Firm	Group Firm	Local Regional	Sectoral Province-level	Sectoral Regional	Sectoral National	Total
1992	7	6,6	7,2	7,5	7,4	7	7,3
1993	4,7	3,6	5,1	5,8	5,2	5,2	5,5
1994	3,2	1,8	3,8	3,8	4,9	3,1	3,6
1995	3,7	3,8	4	4	3,9	3,9	3,9
1996	3,5	3,2	3,9	3,9	4,7	3,6	3,8
1997	2,3	2,1	3,2	3	3,6	2,8	2,9
1998	2,2	2,2	2,5	2,7	2,9	2,5	2,6
1999	2,5	2,5	2,9	2,7	3,1	2,9	2,7
2000	3,5	3,5	3,7	3,8	3,2	3,8	3,7
2001	3,1	3,2	3,2	3,9	3,7	3,4	3,7
2002	2,6	2,4	2,8	3,2	2,9	3,1	3,1