Regional Unemployment in Spain: Disparities, Business Cycle and Wage Setting[∇]

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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 changes in the regional wage setting mechanism, and how this relationship has influenced the aggregate Spanish labour market performance in the recent past. The empirical finding of an important regional imitation effect in wage bargainings may explain both the persistence of disparities and the positive relationship between regional unemployment dispersion and the business cycle. This result has a direct implication on employment policies, which must take into account the regional dimension of the unemployment problem.

Key words: regional unemployment, disparities, business cycle, wage setting

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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 (EU) countries. In addition to the persistence of high aggregate unemployment rates during the last 20 years, the spatial distribution of unemployment 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. 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), requiring thus a higher unemployment rate to keep inflation unchanged. On the other hand, and as is well known, the aggregate unemployment level has different repercussions on social welfare depending on its regional distribution, i.e., the same aggregate unemployment rate is compatible with very different regional distributions. Additionally, the existence of regional differences 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 regional unemployment 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 concerned 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, in labour and firm mobility, in housing supply, in family or social ties, in the regional amenities, etc. Lastly, a higher unemployment rate in a particular region could be explained by institutional factors, such as unemployment benefits schemes, the degree of wage bargain centralisation and coordination, 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 roughly constant. 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 characteristics 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...). Alternatively, capital would not move because high unemployment regions are generally geographically isolated and often show a low endowment of infrastructures.[1] Finally, it must be clarified that this concept of equilibrium is distinct from the "pure" competitive equilibrium, under which all of the regions tend towards the same unemployment rate.

A second approach to explain 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 "pure" competitive equilibrium outcome, but the adjustment mechanisms in the regional labour markets are so slow or weak, such that adverse shocks are not fully absorbed. This would imply that regional unemployment rates are permanently away from their equilibrium position. Specifically, 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

[1] 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.

adjustment and introduces new differences. This mechanism generates an increasing dispersion, characterised by diverging regional unemployment rates, a kind of polarisation effect (Overman and Puga, 2002). Obviously, these two explanations, far from exclusive, are frequently complementary. Moreover, a great number of intermediate set-ups between those mentioned can be actually observed, depending on the evolution followed by each particular region (for a more detailed analysis on this possibility, 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 notably different to Europe. Regional differences between states are present, but do not persist. In fact, it is observed that regions which in a particular period show a greater than the average unemployment rate, in a few years show a lower rate than the average. 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 workforce.[2]

The existing evidence for the Spanish economy during the last 20 years seems to fit well the European version. Thus, external migration (and from the country side to the city) during the 50s and 60s was reduced during the 70s and 80s, and has even reverted its sign during the last decade. Since then, net interregional migration flows have been reduced, while intrarregional flows have increased slightly.[3] The current situation in Spain is characterised by low internal migration rates and persistent differences

[2] 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 is 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). For a discussion of the European case, see Decresin and Fatás (1995).

[3] 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).

between the regional unemployment rates.[4] Concerning firms' localisation, they have tended to locate in the development poles (Madrid, Ebro Axis and the Mediterranean Coast), i.e., in the lowest unemployment regions. This empirical fact rejects the hypothesis of firms moving from one region to another in order to benefit from a cheaper workforce. Rather, the predictions of the New Economic Geography on positive externalities of agglomeration (Krugman, 1998) seem to better suit the current description. Finally, wage flexibility has been found to be low, as in other EU countries. Specifically, the elasticity of wages to changes in the regional unemployment rate is low, around –0.1, indicating that high unemployment rates are followed by weak reductions in wages, as Jimeno and Bentolila (1998) and García and Montuenga (2003) have shown.

In this paper we focus on this last kind of explanations by linking the lack of wage flexibility with the performance of labour market institutions in Spain. During the last years, the literature has related the differences in the national unemployment across countries to differences between their corresponding labour market institutions. However, this sort of arguments have not been used to explain unemployment rate differences at the regional level. The reason seems to be clear; the main features of the labour market institutions (minimum wages, dismissal costs, unemployment benefits, legally worked hours and wage bargaining) are common to all of the regions within a country, as it happens in Spain.[5] This fact, hence, limits its potential explanatory power for the problem of regional disparities in the unemployment rate.

However, some of the labour market institutions may have important effects at the regional level. Specifically, regional disparities in unemployment may be sustained provided that the wage bargaining system prevalent in the economy avoids that wages act as an adjusting mechanism, given that bargained wages show low response to changes in the regional, local or firm conditions. In particular, if labour productivity is different across regions and the wage bargain is centralised, those areas in which productivity is low will not be able to create additional employment because unit labour costs may be too high as a result of the wages agreed at the national level. A similar situation can be reached, even when wage bargaining is geographically decentralised, (as in Spain), if relative payment criteria or wage imitation effects are explicitly

[4] A similar situation is found in Italy by Faini et al., (1997) and Brunello et al., (2001).
[5] The Spanish legal system establishes a general principle of equal treatment to workers, independently of their regional localisation.

introduced into the wage setting mechanism (see Saint Paul, 1997, Brunello *et al.*, 2001, Bande *et al.,* 2001).

The aim of this paper is to provide an explanation for the existence and the persistence of 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 an important wage imitation effect in the wage bargaining, specially in those less dynamic sectors of the less productive regions, may explain both the persistence of the regional disparities in unemployment and its positive relationship with the business cycle. This result has an immediate implication for policy. Governmental 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 confirms the strong relationship between the regional unemployment dispersion and the business cycle. Section 3 shows a single model to present the empirical specification, while Section 4 offers an estimation of the Spanish wage setting mechanism and interprets the empirical findings. Finally, section 5 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 1980s. First, we develop a comparative static analysis, consisting in examining the distribution of regional unemployment at different moments of time. Even though all of the dynamic aspects of the evolution followed by each region are omitted, the comparison over time 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 behaviour in response to changes in the business cycle.

2.1. Existence and persistence of regional disparities in unemployment

In Table 1 we show the ranking of regional unemployment rates in different moments of time since 1981 until 2001.[6] During the last 20 years, Andalusia and Extremadura have been located at the bottom of the regional distribution, with unemployment rates much greater than the average. Until the mid 1990s, the Canary Islands and the Basque Country followed them closely, but more recently they have improved their relative position, being replaced by Galicia and Asturias, which have exhibited a negative evolution of their macroeconomic aggregates.[7] In the other extreme of the distribution, the Balearic Islands, La Rioja, Aragón and Navarre 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 trend, moving from a relative position below (above) the average to another above (below) the average- a relative degree of mobility can be observed.

On the other hand, the differences between the extremes of the distribution have not been reduced during our analysis period. Thus, in 1981 the difference between 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 (La Rioja) had been slightly reduced to 16.1 points. In 1996 the difference rose again up to 20.9 points. Finally in 2001, 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

[6] All the information used here come from the Spanish Labour Force Survey (EPA), elaborated by the Spanish National Statistics Institute, according to the European standard issued by Eurostat. The deep reform of the EPA undertook 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.

[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 the 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%, it has moved to a 7.84%, a reduction of more than 45%. The shattering path followed by Galicia has been deeply analysed in Bande and Fernandez (1999, 2003) and in Fernández and Polo (2002).

Navarre, with a rate of 6.2%, which implies a difference of 15.6 points. Similarly, the increasing trend in regional unemployment dispersion, measured through the standard deviation, seems to be stabilised only during the last years. In summary, we find the presence of high regional unemployment rates in Spain, and a marked persistence of the regional differences through time..

Table 1
Regional Unemployment Ranking

	1981	1986	1991	1996	2001
Navarre	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
Standard Deviation	0.034	0.046	0.051	0.054	0.052
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, measured at year 2001.

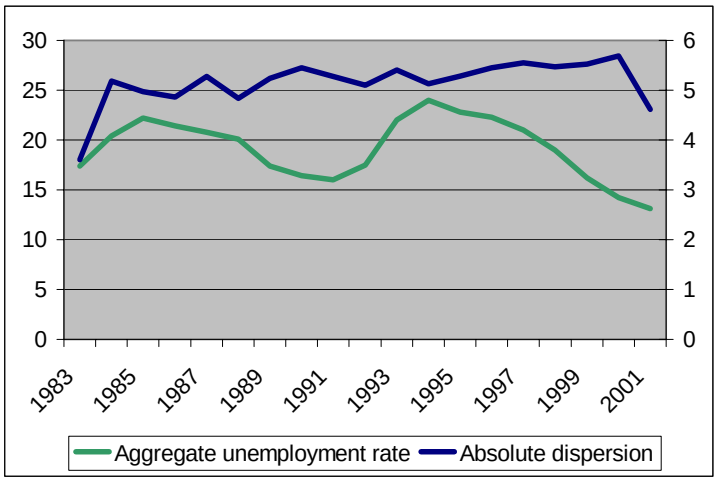
2.2. Regional disparities and the business cycle

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. Some empirical studies (see among others 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 increased 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 show a greater share of GDP produced by the less dynamic industries, and hence they are probably more affected (and for a longer period of time) by aggregate shocks. Moreover, the ability of adjustment in the less developed regions is lower, because those firms with a more adapted technology to absorb 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, 1990), and this will reduce its ability to even regional labour markets.

Being such result common to many European countries, we may ask if this is true also for Spain. Villaverde and Maza (2002), with a dataset from FUNCAS,[8] 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 1990s. Graph 1, with data coming from the Labour Force Survey, reveals that, in Spain, the standard deviation has exhibited a slightly upward sloping trend during the last 20 years, indicating no relationship with the business cycle (a similar result is found by Alonso and Izquierdo, 1999).



Graph 1.Aggregate Unemployment rate and absolute dispersion (standard deviation)

[8] *Fundación de las Cajas de Ahorros* (Saving Banks Foundation)

This behaviour has a distinguishing feature in Spain. Table 2 shows the correlation coefficient between the standard deviation of the regional unemployment rates and the aggregate unemployment rate for the sample period analysed. It can be observed that, while in most European countries theres exists a clear positive correlation between absolute regional disparities and the aggregate unemployment rate, -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.[9]

Table 2
Correlation coefficient between aggregate unemployment rate and the standard deviation of the regional unemployment rates. 1986-2001.

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 higher or lower degree of convergence during the period of analysis. The relative dispersion coefficient (RDC hereafter) is given by

$$RDC_t = \left[\sum \left(\frac{L_{jt}}{L_{Nt}} \right) \left| U_{jt} - U_{Nt} \right| \right] \left[\frac{1}{U_{Nt}} \right] \qquad (1)$$

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 this measure 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

[9] Note that a negative relationship between the dispersion measure and the aggregate unemployment rate is a sign of a positive relationship between the evolution of regional disparities and the business cycle.

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 as in Table 2, the relative dispersion coefficient in 1986 and 2001 including, additionally, 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 bewteen RDC and the aggregate unemployment rate. 1986 and 2001

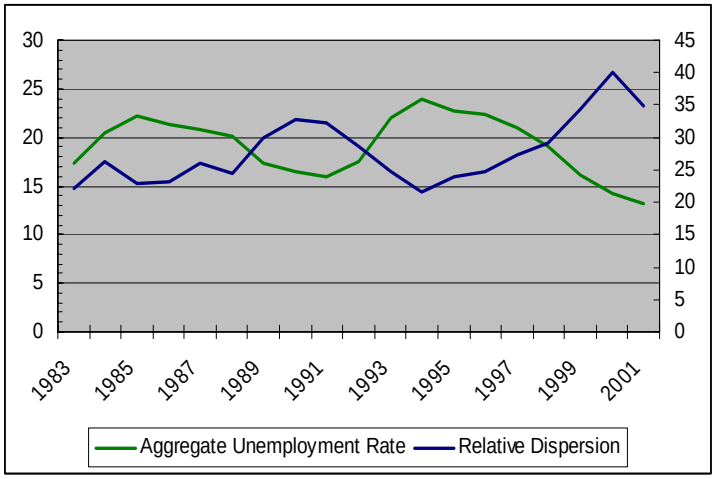
		1986		2001		
Country	Number of regions	Unemp. Rate	RDC	Unemp. Rate	RDC	Corr[c].
Belgium	11	11.2	0.26	6.6	0.54	-0.638
Germany	41	6.6	0.33	7.8	0.52	0.239
Greece[a]	13	7.7[a]	0.24[a]	10.2	0.28	-0.268
Spain	17	21.4	0.22	13.1	0.35	-0.948
France	22	10	0.16	8.5	0.29	-0.289
Italy	20	10.5	0.46	9.5	0.77	-0.146
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.

The results obtained allow us to conclude that the regional problem is greater nowadays than it was in the 1980s, 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 noticeably 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). By contrast, in other countries, as Italy, Portugal, the 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 2 shows this evolution for the period 1983-2001, which includes different periods in the Spanish business cycle.

When we consider this relative dispersion measure, the negative relationship with the national unemployment rate is quite remarkable.



Graph 2. Aggregate unemployment rate and relative dispersion (RDC)

Focusing our attention in the years after 1986, when Spain joined the European Community (EC), we first observe that there was a strong economic upturn, with a solid 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 percentage points, but also into an important increase in the regional disparities. From 1991 to 1994, the Spanish economy suffered from one of the most important recessions in the last decades (the GDP showed a negative growth rate of 1.3% in 1993). At the same time, employment reduced in almost 900,000 jobs during this period. This led unemployment rate to rise 8 percentage points, reaching its historical ceiling in the first quarter of 1994, with a value of 24.1%. At the same time, regional disparities fell sharply. Since then, the new upturn in economic activity has been followed by increases in regional differences. The dispersion coefficient has experienced a sustained increase during this last period. This process has coincided with a divergence process in the regional unemployment rates, in which simultaneous processes of strong employment creation and reduction of the aggregate unemployment rate have been observed, being the latter much stronger than in the 1986-1991 period.

Given all of these findings we may provide three conclusions. First, during the last years, Spain has not experienced a convergence in the regional unemployment rates. This implies that nowadays, regional dispersion is greater than it was when Spain joined the EC. 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. Although other countries exhibit similar characteristics concerning the relationship between regional disparities and business cycle, the intensity of such relationship is much stronger in Spain. This fact requires a differential explanation. Finally, these results suggest that the magnitude of the regional dimension of the Spanish unemployment problem is mainly determined by the evolution of 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 they 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, any of them is always partial because it does not allow to interpret the relationship between the regional unemployment rates dispersion and the business cycle. Thus, in this section we will explore an alternative argument, probably complementary to those previously proposed, that tries to address such peculiar relationship. This will be based on the role of the wage setting mechanism and its influence on regional unemployment rates.

Our hypothesis is the following: when the sectoral level dominates wage bargaining, and this bargaining is neither fully centralised nor coordinated at the regional level, then there is scope for an important wage imitation effect in the wage-setting process within sectors in different regions,which can have relevant effects on aggregate and regional unemployment rates. This seems to be the case of Spain (see Table 4 below), especially after 1986, when the national social agreements, designed to fight against inflation, by the settlement of fixed narrow bandwidths for wage growth, disappeared. Since that year, wage setting moved to an increasingly decentralised framework, which was stimulated by the subsequent reforms of the labour markets (see Jimeno and Bentolila, 2005).

Furthermore, since real wages in Spain show downward rigidity but are upward flexible, the imitation process affects regional unemployment disparities through the business cycle, given that during an upturn the imitation effect can induce a higher gap between wage and productivity growth than during downturns, which in turn implies different evolutions in real unit labour costs.On its part, the imitation effect is not only

found between sectors within a region, but when the geographical dimension is considered (regional and provincial wage bargaining) the imitation is possible between sectors in different regions aswell. So, during economic upturns, the most dynamic industries/regions will exhibit wage increases that would be imitated by the less dynamic industries/regions. 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 due to different behaviour of real unit labour costs.

This explanation 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 explicitly assumed that wages in one region may be determined by wages bargained in other regions (see Saint Paul, 1997). A similar argument has been used by Brunello *et al.,* (2001) to explain how, in Italy, the wage level set in the Northern regions is used as a reference to establish the wage level in the Southern regions, such that, the unemployment rates in the latter do not exert any influence on aggregate wages. This fact gives rise to the existence and persistence of strong regional disparities in the unemployment rates.

Since our argument relies on the wage bargaining structure, before developing our empirical work to test this hypothesis, we summarise briefly the main characteristics of the wage bargaining model in Spain (for more details see, for example, Jimeno and Bentolila, 2005). In Table 4, with data published by the Ministry of Labour (*Ministerio de Trabajo y Asuntos Sociales)*, it is observed that, as regards the number of workers covered, sectoral agreements are the norm in Spain. Within this kind of agreements, the province territorial level is the most relevant, followed by the national level. Altogether they represent around the 80% of the total number of covered workers. On the contrary, the firm-level agreements are less important (the proportion of workers covered by this type of agreements is below 15%) and has been reduced during the last decade. Simultaneously, the sectoral-regional agreements have experienced an increase to about the 9% in 2002. With respect to the agreed wage increases (see Appendix B), the official statistics show that these are lower at the firm-level than at the upper level agreements. Also, we find that within the sectoral agreements, the highest wage increases are found in the province and region levels, while the wage increase at the

national level (with the exception of 1999 and 2000) are lower, but higher than the firm-level ones. This fact is an evidence that, often, sectoral or national agreements set wage growths that are greater than those that the specific conditions of a particular firm may afford, especially in the less productive regions.

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

Spain. 1982-2002

	Firm-level	Sectoral 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 test our hypothesis, and 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 features that will allow us to test 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 (see Nickell and Kong, 1992 and Graafland and Lever, 1996), for the period 1980-1995. With the aim of

maintaining a simple structure, and as has been suggested in other empirical works[10] (Andrés and García, 1991, Fernández and Montuenga, 2001, Bande *et al.*, 2001) we assume that the observed real wage in a certain sector is a linear function of sectoral productivity and the alternative wage to this sector. This relationship is of the form:

$$w_{ijt} = \alpha_{ij0} + \beta_1 \Pi_{ijt} + \beta_2 w^a_{ijt} + \varepsilon_{ijt} \quad (2)$$

where α_{ijo} 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, reflecting the internal conditions of the sector, w^a_{ijt} is the alternative wage of sector i in region j (to be defined below), reflecting the outside opportunities of workers, and ε_{ijt} is a random error term. All the variables are expressed in logs. This equation is estimated for the Spanish regions in next section.

4. Data description and empirical results

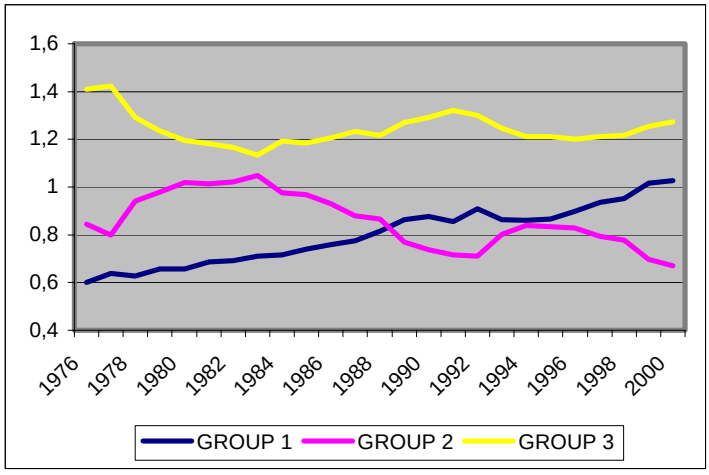
In order to estimate equation (2) we use data from the BD-MORES database, published by the *D.G. de Análisis y Programación Presupuestaria* and the University of Valencia for the period 1980-1995. Specifically, the variables used in our empirical work are the following. The sectoral wage has been proxied by the ratio of labour income to the number of wage-earners. Labour productivity has been proxied by the ratio of Gross Value Added (GVA) at factors cost to 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 A for description of the dataset)[11] and 17 regions. We finally pooled the sectors according to the regional relative unemployment rates. Thus, we constructed three groups of regions, each with 15 sectors and a variable number of regions. In Group 1 we include those regions where the unemployment rates have behaved worse than the national unemployment rate (that is to say, those regions that departed from lower rates than the national unemployment rate and have ended up with rates higher than the average). These regions are Asturias, Cantabria, Castilla-León, Castilla-La

[10] Fernández *et al.* (2000) 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 estimation. This allows us to be confident about our theoretical framework.

[11] Agriculture is excluded given the reduced number of wage earners with respect to the total number of workers. Energy is excluded because of the extremely high market value of labour productivity.

Mancha and Galicia. Group 2 is composed by those regions where unemployment rates have behaved better than the national unemployment rate throughout the sample. These regions are Aragón, Balearic Islands, Catalonia, Madrid, Navarre and La Rioja. Finally, in Group 3 we include those regions whose unemployment rate have persistently been larger than the national average: Andalusia, Canary Islands, Extremadura, Murcia, Valencia and the Basque Country. Graph 3 shows the relative unemployment rate of each group, measured as the ratio of total unemployed to total labour force in each group divided by the aggregate unemployment rate, and clearly shows the different evolution that these three geographical areas have exhibited with respect to the national rate.



Graph 3. Relative regional unemployment rates. 1976-2001

Initial estimates of equation (2) showed signs of misspecification, especially concerning serial correlation. We estimated different versions of this equation, including several with the regional and/or the national unemployment rates as external variables. These two variables nevertheless never became significant (as in Brunello *et al.,* 2001 for Italy or Jimeno and Bentolila, 1998 for Spain), and thus are not included in our empirical work. Given these misspecification results, and that both labour productivity and the alternative wage are likely to be endogenous in this context, we estimated 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, the national aggregate wage is 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 does not show substantial differences concerning the relationship between the real wage and both labour productivity and the alternative wage in the different groups of regions. Thus, we observe that the short-run elasticity of the real wage with respect to productivity is similar for the three groups (between 0.31 and 0.47) while the alternative wage shows a slightly higher elasticity in Groups 2 and 3. These results suggest that elements related to the alternative income 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 supported we should expect that the alternative wage 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 affecting wage setting have taken place, such that the estimated coefficient for the whole period represents an average for two different periods of time.

In fact, there has been a fundamental change in wage setting in the Spanish labour market. Since 1977 until 1986 the Spanish wage bargaining was highly centralised and coordinated, especially in what centralisation is concerned. This was due to the existence of extensive social agreements, binding at the national level and with inter-sectoral scope. These agreements established, for the whole economy, maximum ceilings in the wage growth with a narrow bandwidth, as a way to fight against inflation.[12] The final agreed wage growth was later determined at the sectoral or firm-level agreements.[13] This model was abandoned in 1986, when the last social national agreement was signed. Distrust among unions, firms and government, joined with a favourable upturn in the business cycle lead to a breakdown of the agreements, and the wage bargaining mechanism began a decentralisation process, in the sense that the fixed bandwidths were eliminated. This fact gave rise to the apparition of a higher dispersion in wage growth across sectors and regions, even within the same wage bargaining structure.

[12] The inflation rate measured by the consumer price index reduced from 26.4% in 1977 to 8.3% in 1986. This reduction in inflation was accompanied by a marked reduction in the purchasing power of workers.
[13] OECD (1997) shows that Spain was among the group of countries with the highest levels of wage bargaining centralisation in 1980. However, in 1994 it moved to an intermediate centralisation level.

Thus, in order to take into account the possible break in the wage-setting mechanism, we split the sample into two subsamples. The first goes from 1980 to 1988[14], and the second one from 1989 to 1995. Columns 2 and 3 in Table 5 summarise the results of the estimation of the wage regressions for the different groups of regions. We clearly see that our main hypothesis gains support. First, focusing on Group 1, note that before 1988 the alternative wage was not significant, being wages mainly determined by productivity. In Group 2 the alternative wage was significant, with its value being lower than the one found for the whole period. Additionally, productivity did not play any role in wage setting during this first sub-period. Finally in Group 3, the relevance of the alternative wage was clearly higher than in Group 1. After the decentralisation process of the wage bargaining, the situation changed dramatically. Thus, in Group 1 the elasticity with respect to the alternative wage increased up to 0.85, being highly significant. Additionally, the elasticity of real wages to productivity reduced in this group, from 0.53 to 0.26. In the second group of regions, a completely different behaviour is found. Note that even though the coefficient on the alternative wage was slightly smaller than in the first sub-period, the productivity coefficient rose up to 0.48. Finally, in Group 3 (those regions that have been in the same relative bad position through time) the coefficients on the alternative wage and productivity are approximately similar during the two subsamples.

Table 5. GMM estimation. Regional alternative wage

	Group 1			**Group 2**			**Group 3**		
	80-95	**80-88**	**89-95**	**80-95**	**80-88**	**89-95**	**80-95**	**80-88**	**89-95**
Productivity	0,473*	0,531*	0,257*	0,308*	0,123	0,484*	0,440*	0,436*	0,542*
	(4,13)	(6,06)	(2,07)	(2,52)	(0,93)	(3,97)	(4,21)	(2,59)	(2,23)
Alt. Wage	0,549*	0,187	0,846*	0,708*	0,683*	0,647*	0,710*	0,537*	0,668*
	(4,83)	(0,89)	(6,69)	(5,51)	(3,06)	(5,36)	(6,47)	(2,07)	(5,65)
M1	-2,27	-2,06	-0,46	-1,89	-2,19	1,99	-2,7	-2,45	-0,25
M2	-1,07	-1,3	-0,11	-1,25	-1,46	0,45	-1,73	-2,16	-0,45
Obs	1125	600	450	1320	704	528	1335	712	534

Notes: Differenced GMM estimation robust to heterokedasticity. Instruments are lags of the endogenous and exogenous variables. t-statistics in parenthesis. The alternative wage is the going wage outside the sector within the region. M1 and M2 are the first and second order autocorrelation Arellano and Bond tests. Obs. is the number of observations in each regression. * stands for those significant coefficients.

[14] 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 increase of decentralisation is present in the bargaining.

Thus, we find evidence in favour of our hypothesis. The decentralisation process implied that, in a number of regions, wages in a particular sector were linked to external conditions within the region. However, this cannot be considered as a "pure" wage imitation effect at the regional dimension in this context, since regional wages depend only on own regional variables. In order to come by more robust conclusions, we must estimate a different model, considering as the alternative wage the national average wage. The results of such estimation are shown in Table 6.

Table 6. GMM Estimation. National alternative wage

	Group 1			**Group 2**			**Group 3**		
	80-95	**80-88**	**89-95**	**80-95**	**80-88**	**89-95**	**80-95**	**80-88**	**89-95**
Productivity	0,435*	0,517*	0,325*	0,149	-0,009	0,499*	0,377*	0,435*	0,561*
	(3,77)	(5,23)	(2,93)	(1,1)	(-0,06)	(4,46)	(3,28)	(2,11)	(2,57)
Nat. Alt. Wage	0,990*	0,348	1,300*	1,040*	0,965*	0,976*	1,040*	0,597	1,099*
	(5,4)	(0,79)	(7,87)	(5,97)	(2,17)	(6,32)	(7,1)	(1,61)	(6,36)
M1	-2,36	-2,07	-0,53	-1,76	-2,06	1,32	-2,75	-2,41	-0,58
M2	-0,83	-1,22	-0,2	-1,08	-1,39	0,69	-1,28	-2,02	0,19
Obs	1125	600	450	1320	704	528	1335	712	534

Notes: Difference GMM estimation robust to heterokedasticity. Instruments are lags of the endogenous and exogenous variables. t-statistics in parenthesis. The alternative wage is the national average wage. M1 and M2 are the first and second order autocorrelation Arellano and Bond tests. Obs. is the number of observations in each regression. * stands for those significant coefficients.

The results in this table confirm the change in the wage setting mechanism between the two subperiods, reflected by the different estimated coefficients for productivity and the national alternative wage in the three groups of regions. A common finding for the three groups, for the whole period analysed, is that the estimated coefficient for the national alternative wage is close to the unity, and even greater during the second period in groups 1 and 3. This result can be interpreted as indication of the existence of an important relative payment effect. The end of the social agreements stimulated the influence of the alternative wage in bargaining through two channels. First, all workers were willing to imitate the wage fixed by the sectors in the most dynamic regions, departing from their specific sectorial conditions; second, workers in the dynamic sectors were willing to obtain a relative payment because, given the economic upturn, they were trying to obtain a higher share of the rents within the sector. This second channel is reinforced by the behaviour of firms, which are ready to pay a higher wage to maintain the most productive workers (efficiency wages hypothesis).

Focusing now on the differences across groups, for the whole period estimates in Table 6 show that the productivity coefficient is similar in Groups 1 and 3, but non-significant in Group 2. However these estimated coefficients hide big differences between subperiods: Group 1 decreases its linkage to productivity; groups 3 increases this linkage but with a significant coefficient for both periods; it is in Group 2 where the most important changes are found, since it increases the elasticity of wages to productivity from a non-significant coefficient up to 0.5, being highly significant. Besides, during the 1980-88 period, the alternative wage had reduced influence in determining the sectoral wage rise in Groups 1 and 3, whereas in the period 1989-95, the coefficient was clearly above unity which implies that real wages grew over productivity (unit labour costs increased during this period, see Graph 4). By contrast, the coefficient of the alternative wage was basically the same throughout the whole period in Group 2.

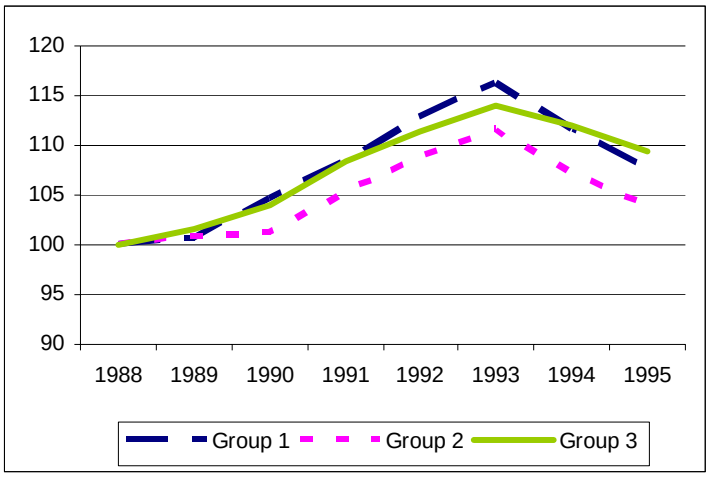
Considering all together, it can be conjectured that in the regions of Group 1 employment did not raise as much as it could during the expansive period, because of the great change in the relative influence of productivity and the alternative wage in the wage setting: productivity played a less important role since 1988, whereas the alternative wage, by contrast, was much more relevant during this period than in preceeding one. In regions of Group 2, the change in the wage setting mechanism went into a different direction: there was a significant increase in the productivity coefficient with practically the same alternative wage coefficient. On consequence, the wage-setting behaviour of these two group of regions explains why relative unemployment rose in the first group and fell in the second. However, it cannot explain the general increase in regional disparities observed since 1988. It is the behaviour of group 3 the true responsible for this evidence (see again Graph 3). For this latter group, there were no big changes in the wage setting behaviour when we consider as the alternative wage the going wage in the region outside the sector. But when we consider really the “true” imitation effect (table 6) we observe a radical change. During the first period the alternative wage did not affect wage growth, while during the second period the alternative wage had a sizeable effect (coefficient greater than 1). In other words, these regions were linking their wage growth to what was happening in the whole economy. This fact was coincident with a strong economic upturn (1986-1991), in which aggregate unemployment fell by 500,000 workers. However, Group 3 increased its

share in total unemployment during this period.[15] Why do we observe this change in the behaviour of regions in Group 3? We hypothesise that the change in the degree of centralisation and coordination in wage setting allowed for a stronger wage imitation effect, which is reflected in our estimation. In fact, we find an increase in the imitation effect for every group. This imitation effect had stronger repercussion during the upturn, given that the differentials in productivity across sectors and regions were greater. This explains why regional unemployment dispersion is strongly positively related with the business cycle.

The imitation effect may be a reflection of the insider power in a decentralised wage bargaining context. Until 1986, wage bargaining was highly centralised, and insiders were concerned on the general conditions of the labour market (unemployment and wage growth). After 1986, with the decentralised model, insider´s concern moved to relative payment effects. This means that their objective was to maximize wage growth, and not to reduce unemployment. This interpretation is in line with that presented in Flanagan (1999), who argues that insider power is directly related to the wage bargaining structure.

In order to reinforce our hypothesis, and to link our empirical results with the stylized facts described in Section 2, we consider a final argument. If our hypothesis were correct, we should expect that real unit labour costs in the different group of regions evolved differently, given the differences found in their wage setting mechanism, as already noted in the preceding paragraphs. Graph 4 shows the real unit labour costs for the three groups since 1988. In this Graph we have normalised the starting value to 100. It can be observed that unit labour costs rose more in Group 1 and Group 3, while remained at lower levels in Group 2. This evidence is consistent with our estimates, and reflects that the change in the degree of centralisation and coordination of the wage setting mechanism has affected the regional distribution of unemployment. Those regions where the relationship between bargained wages and the alternative wage rose most after 1988 are precisely those areas where unit labour costs increased also the most (Groups 1 and 3).

[15] Since 1986 until 1991 this share increased by 7 points, representing in the latter 54% of total unemployment.



Graph 4. Real unit labour costs. 1988-1995

4.- Conclusions

The existence and persistence of strong disparities in the Spanish regional unemployment rates has been the topic of this paper. We have focused on the role that labour market institutions, namely the wage setting mechanism and its degree of centralisation and coordination, may have played in the explanation of such situation. After a summary of the absolute and relative measures of regional dispersion on the unemployment rate over the period 1980-1995 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 accompanied by reductions in the disparities.

The main contribution of this paper is to provide an explanation to this empirical fact, which is at odds with the theoretical arguments which often propose a negative relationship between disparities and business cycle. The estimation of a sectoral wage equation for different groups of regions (clustered according to the evolution of their relative unemployment rates) let us show the existence of significant differences concerning wage setting and the relative weight given to the internal and external variables. We may summarise our conclusions as follows.

When the whole sample period is considered, we find a clear bias towards the relative payment criteria (alternative wage), especially when we use the national measure for this variable. However, we do not trust on this specification, due to fundamental changes in the wage setting process (change in the degree of centralisation and coordination) 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 in Jimeno and Bentolila (1998) or in Bande *et. al.*, (2001). In order to identify the influence that the change in the degree of centralisation and coordination may have played in the regional wage setting, we have split our sample into two subperiods (1980-1988 and 1989-1995). The results show that the estimated coefficients for productivity and the alternative wage for the three groups of regions have changed through the two subperiods. Is the change similar for each group? What are the consequences of these changes? Considering the alternative wage as measured by the national average wage, there has been a striking increase in the linkage between wage growth and the alternative income in Groups 1 and 3. These regions are those that perform worse in terms of unemployment. On the other hand, Group 2, despite of a great linkage of wages to alternative income, it also increased markedly the linkage to productivity, allowing thus for a smaller increase in unit labour costs. The final repercussion in these regions is a better performance of unemployment.

How do these changes affect regional unemployment dispersion? Recall that dispersion rose dramatically after 1986. Focusing only in the observed changes in groups 1 and 2, these would allow to explain why relative unemployment increased in the first group and fell in the second since that year. But this is just a change in the distribution of regional unemployment, not a change in its dispersion. In order to explain the increase in disparities we must look at group 3 (which has shown a negative relative evolution of unemployment, which speeded up after 1986). We argue that this negative behaviour is directly related to the change in the wage setting mechanism. During the first period the alternative wage did not affect wage growth while, during the second, the alternative wage had a large effect (coefficient greater than 1). In other words, these regions are linking their wage growth to what is happening in the rest of the economy. The change in the degree of centralisation and coordination in wage setting allows for an stronger wage imitation effect which has stronger repercussion during upturns, given that the differentials in productivity across sectors and regions are greater. This explains why regional unemployment dispersion is strongly positively related with the business cycle.

When wage bargaining is sectoral and decentralised (as in Spain since 1986), insiders only take into account wage growth, and not unemployment. The observed change in the relative weight given to both internal and external variables, however, is not related to changes in the insider power, but to changes in the degree of centralisation and coordination of wage setting, as alreday noted by Flanagan (1999). Thus, the imitation

effect may be a reflection of the insider power in a more decentralised wage bargaining context.

These results are similar to those found in Brunello *et al.* (2001) in Italy or by Bande *et al.,* (2001) for Spain, but in our paper we relate this imitation effect to the business cycle and the repercussion in relative unemployment. Furthermore, the paper has important policy implications. The fact that unemployment disparities increase when the aggregate unemployment rate decreases and *vice versa* is very negative, and brings into light the fact that when aggregate unemployment is falling, it does not decrease in those regions where unemployment is a serious problem. In fact, nowadays, we may define the Spanish unemployment problem a regional problem (i.e. a problem of certain regions), and thus cannot be observed as a national problem. After this result we must warn the policy maker: a deep reform of the wage bargaining system (as proposed by Bentolila and Jimeno, 2002, or Segura, 2001) or a strong increase in productivity in the less productive regions until they reach levels similar to the average are needed if the national unemployment problem is to be reduced. In other case, regional disparities will keep on increasing during upturns and decreasing during downturns, with a clear set of losers: the less productive regions.

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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 et al., (2002).

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 not considered 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

Appendix 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