

**REGIONAL WAGE
FLEXIBILITY IN SPAIN, 1989-1992***

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ABSTRACT

In this paper we provide a first analysis on the role of wage flexibility at a regional level for the Spanish case. To this end, we compute regional inequality indices for industry wages and productivity, which is complemented with an econometric estimation of an equation for regional and industry wages. Our results point to a high degree of rigidity of regional wages, which show a considerably lower variability than productivity levels, so that the process of wage setting would have been driven mainly by between-industries and across-regions homogeneity considerations in union behaviour.

1. INTRODUCTION

Unemployment figures and its persistence are undoubtedly the main economic problem in Europe. This is indeed particularly true in Spain, recording the highest unemployment rate in the European Union (EU), now at about 20 per cent of the labour force.

This fact, together with the prospects about a monetary union across the EU for the next years, has motivated a renewed interest on the regional dimension of the labour market. So, on the one hand, the available evidence points to the predominant role of asymmetric shocks in Europe as opposed to the US [see, e. g., the paper by Bayoumi and Eichengreen (1993), and the subsequent research surveyed in Bajo and Vegara (1997)]. On the other hand, the limited labour mobility across Europe as compared again to the US, makes difficult the applicability of the well known Mundell's (1961) requirement stated in his pioneering paper within the optimum currency areas literature. So, wage flexibility at a regional level becomes a key parameter which would make easier the adjustment faced to the occurrence of asymmetric shocks across the regions of Europe, in the framework of a monetary union.

The evidence concerning wage flexibility in Spain has not traditionally explored its regional dimension. For instance, Andrés and García (1993) find a prominent role from relative wages in the manufacturing sector with respect to other industries in the process of wage setting, together with a low influence from other factors such as productivity or unemployment. These results point to a low degree of wage dispersion not favouring in principle labour mobility, which is confirmed by the available empirical evidence on migration [see, e. g., Bentolila and Dolado (1991)].

The first step to incorporate the regional dimension within the process of wage setting for the Spanish case has been made by Jimeno and Bentolila (1995), who use data for 17 industries and 17 Spanish regions covering the years 1980 through 1988, taken from the Regional Accounts of the National Institute of Statistics. These authors study regional wage determination in the context of a discussion of regional unemployment persistence, starting from a theoretical model based on Blanchard and Katz (1992). They find that the most important determinant of regional wages are nationwide industry wages, followed by other industries' wages, whereas the effect from unemployment rates (both nationwide and regional) is much weaker.

The present paper makes part of a wider research project, and tries to provide some additional empirical evidence on the degree of real wage flexibility, at the regional level for the Spanish case. To this end, we will make use of an alternative and improved data set elaborated within the Institute for Fiscal Studies (Instituto de Estudios Fiscales, various years), built from the tax declarations of Spanish firms (so that it would provide an almost exhaustive coverage), for the period 1989-1992.

The paper is organized as follows. In Section 2 we compute regional inequality indices for industry wages and productivity, which will allow us to draw some preliminary conclusions about the degree of wage flexibility with respect to productivity levels. In Section 3 we estimate an equation for regional and industry wages using panel data for the period 1989-1992, so that we could discriminate among the different sources of real wage variability. The main conclusions are presented in Section 4.

2. REGIONAL WAGE FLEXIBILITY IN SPAIN: A DESCRIPTIVE ANALYSIS

In this section we perform a descriptive analysis of the sensitivity of wages to productivity, by computing inequality indices for wages and productivities. We make use of regional industry wages and productivity data for the years 1989 through 1992. In particular, we compute regional and overall between-groups (between-industries) wage inequality indices, $I^B(W)$, and compare them with the analogous productivity inequality indices, $I^B(PR)$.

The regions included in the analysis are the Spanish "Comunidades Autónomas" (autonomous communities) under a common fiscal regime, i. e., Andalucía, Aragón, Asturias, Baleares, Cantabria, Castilla-La Mancha, Castilla-León, Cataluña, Extremadura, Galicia, Madrid, Murcia, La Rioja, and the Comunidad Valenciana. However, data from the País Vasco, Navarra, and Canarias are not available in our data set.

Regarding the sectoral disaggregation, we have used the fourteen sectors appearing in our data source: Agriculture and Fishing; Energy; Industry; Construction; Trade and Reparatons; Hostelling and Catering; Transports and Communications; Financial Services and Insurance; Services to the Firms; Real Estate Services (Investment and Promotion); Real Estate Renting; Education, Health, and Other Personal Services; Other Services provided by Non-profit Institutions; and Other Activities.

We have used as proxies for productivity and wages the variables sales per employee, and the annual average wage, both by sector and region. Three alternative indices are computed to allow for three different inequality aversion parameters, corresponding to the Gini coefficient, $I_G^B(\bullet)$, as well as the Theil 1, $I_{T(c=1)}^B(\bullet)$ and Atkinson 1, $I_{T(a=1)}^B(\bullet)$ inequality indices [see Atkinson (1970) or Cowell (1977) for a definition of these indices]. The results are shown in Tables 1 to 8, and are very similar for the three indices considered.

Notice that the three indices point at a same picture regarding inequality, both among wages and productivities, and for the whole period (see Tables 1 to 8). The most remarkable feature of our results is the great difference between the indices computed on wages and those computed on productivity: inequality among sectoral productivities seems to be much higher than that existing among sectoral wages, across the four-year period used in the analysis.

Making use of the Yitzhaki (1987) and Yitzhaki and Slemrod (1991) result, implicit non-parametric elasticity estimators between both variables, W and PR , can be obtained by dividing the Gini coefficient $I_G^B(W)$, by the corresponding concentration ratio $I_G^B(PR,W)$:

$$\hat{\epsilon}_{W,PR} \approx \frac{I_G^B(W)}{I_G^B(PR,W)} \quad (1)$$

The results for regional and overall elasticities are shown in Table 9 for our four-year period. They confirm the low wage elasticity with respect to the existing high productivity variability, which points to a high degree of wage rigidity, as well as to the existence of external wage-homogeneizing factors.

3. REGIONAL WAGE FLEXIBILITY IN SPAIN: AN ECONOMETRIC ANALYSIS

We will provide in this section some econometric evidence on regional wage flexibility in Spain. To this end, we will present estimates of a wage equation along the lines of Layard, Nickell and Jackman (1991), such as:

$$w_{ijt} = a_0 + a_1 pr_{ijt} + a_2 w_t - a_3 u_{it} - a_4 u_t \quad (2)$$

This equation can be derived from a model of wage bargaining between unions and employers as in, e. g., Abraham (1996). According to (2), the real wage in region i and industry j (w_{ij}) would be the result of union behaviour, depending positively on the level of labour productivity for that region and industry in real terms (pr_{ij}), and on the average national real wage (w); and negatively on the regional unemployment rate (u_i) and the national unemployment rate (u).

As in the previous section, the data on wages and productivities have been taken from Las empresas españolas en las fuentes tributarias [The Spanish firms according to the tax sources], published by the Institute for Fiscal Studies and built from the tax declarations of Spanish firms. We have also made use of data on (regional and national) consumption price indices to deflate nominal wages and productivities, as well as on (regional and national) unemployment rates, which have been taken from the publications of the Ministry of Economy and Finance (in particular, regional prices and unemployment rates from the Boletín de Coyuntura Regional of the Dirección General de Planificación, and their corresponding national values from the Síntesis de Indicadores Económicos of the Dirección General de Previsión y Coyuntura). As before, our data set includes 14 industries (covering agriculture, energy, industry, construction, and services activities) and 14 Spanish regions ("Comunidades Autónomas"), for the years 1989 through 1992, which gives a total of 784 observations.

The results from the estimation of several specifications of the model given by equation (2) are presented in Table 10. All the equations include a constant as well as industry- and region-specific dummies (not shown), and the method of estimation is ordinary least squares using White's correction for heteroscedasticity. All the variables are transformed in logs, so the estimated coefficients are elasticities.

As can be seen in Table 10, when equation (2) is estimated (which is shown in column (1) of the table), we obtain estimated elasticities of 0.07 for productivity and 1.06 (not significantly different from one) for national wages. On the contrary, the coefficients for both regional and national unemployment, even though of a negative sign, are not significantly different from zero. The results do not change when the national unemployment rate is dropped from the equation (as in column (2) of the table). In this way, according to these results, regional and industry wage setting would be driven mainly by an attempt of homogenize them with respect to average national wages (with an estimated elasticity of one), with a weak influence from productivity levels, and a non significant effect from both regional and national unemployment rates¹.

¹ It should be recalled that, even though a relatively homogeneous wage across the country might be the result of a high labour mobility, this is not the case in Spain in last years, since migrations have substantially decreased since the early seventies [see, e. g., Raymond and García (1996)].

In order to discriminate if these attempts of homogenizing wage rates with respect to national averages are mainly across regions or between industries, we follow Jimeno and Bentolila (1995) so that equation (2) is modified to:

$$w_{ijt} = a_0 + a_1 pr_{ijt} + a_2 w_{i(-j)t} + a_3 w_{j(-i)t} - a_4 u_{it} - a_5 u_t \quad (3)$$

where $w_{i(-j)}$ and $w_{j(-i)}$ denote the real wage in region i excluding industry j , and the real wage in industry j excluding region i , respectively. In this way, significant coefficients for $w_{i(-j)}$ or $w_{j(-i)}$ would mean that the wage negotiation process tries to homogenize wages between industries for a given region or across regions for a given industry, respectively.

Estimates of equation (3) appear in columns (3) and (4) of Table 10 (including and excluding, as before, the national unemployment rate). The results show a positive coefficient for both real wages in the rest of the industries of the region and industry real wages in the rest of the country, which is significant only for the former, so that the role of wage equalization between industries for a given region would prevail. However, when we drop this variable in the estimated equations (as in columns (5) and (6) of Table 10), the coefficient for the latter effect turns to be significant, suggesting also a role for wage equalization across regions for a given industry, even though of a lower size.

4. CONCLUDING REMARKS

In this paper we have analysed the role of wage rigidity at a regional level in the working of the Spanish labour market. To this end, in a first step we computed regional inequality indices for industry wages and productivity, which is complemented with an econometric estimation of an equation for regional and industry wages. Our results point to a high degree of rigidity of regional wages, which show a considerably lower variability than productivity levels, so that the process of wage setting would have been driven mainly by between-industries and across-regions homogeneity considerations in union behaviour.

More specifically, our main results can be summarized as follows:

- a) Regional and industry wages are closely associated with average national wages, being the estimated elasticity not significantly different from one.
- b) The effect of labour productivity on regional wages is positive and significant, but small in quantitative terms.
- c) Regional and industry wages do not show a significant response to both regional and national unemployment rates, which reveals a high degree of wage rigidity.
- d) When disentangling the effect of average national wages, we find a positive influence on regional and industry wages from both industry wages in the rest of the country, and, more importantly, from the other industries' wages in every region.

In other words, the picture that emerge is that of a labour market characterized by a high degree of wage rigidity, with wages showing a low responsiveness to labour market conditions, and with unions trying to reduce wage dispersion both between industries and across regions.

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TABLES

TABLE 1: INEQUALITY OF INTER-INDUSTRY WAGES, 1989

	GINI	THEIL	ATKINSON
ANDALUCIA	0,14663	0.051061	0.047099
ARAGON	0.16131	0.046775	0.047861
ASTURIAS	0.23728	0.093334	0.090109
BALEARES	0.17443	0.065837	0.054292
CANTABRIA	0.26964	0.142000	0.119830
CASTILLA-LA MANCHA	0.11219	0.035856	0.029247
CASTILLA-LEON	0.19685	0.065606	0.062273
CATALUÑA	0.14407	0.043812	0.043167
EXTREMADURA	0.19181	0.078208	0.068397
GALICIA	0.16539	0.060947	0.051301
MADRID	0.16215	0.048592	0.049530
MURCIA	0.13238	0.037901	0.033654
RIOJA	0.09501	0.021524	0.021052
VALENCIA	0.14434	0.043509	0.038867
TOTAL	0.14238	0.032782	0.033626

TABLE 2: INEQUALITY OF INTER-INDUSTRY PRODUCTIVITIES, 1989

	GINI	THEIL	ATKINSON
ANDALUCIA	0.42918	0.31254	0.32885
ARAGON	0.33476	0.21269	0.30693
ASTURIAS	0.37443	0.24630	0.30199
BALEARES	0.33736	0.20816	0.18290
CANTABRIA	0.41162	0.28881	0.31053
CASTILLA-LA MANCHA	0.39978	0.29258	0.33392
CASTILLA-LEON	0.37095	0.25924	0.35244
CATALUÑA	0.34345	0.20585	0.24444
EXTREMADURA	0.51040	0.45854	0.48908
GALICIA	0.29509	0.15590	0.19567
MADRID	0.40271	0.31664	0.30135
MURCIA	0.26053	0.12532	0.16800
RIOJA	0.33474	0.27757	0.22979
VALENCIA	0.27038	0.13464	0.16885
TOTAL	0.34637	0.20587	0.25872

TABLE 3: INEQUALITY OF INTER-INDUSTRY WAGES, 1990

	GINI	THEIL	ATKINSON
ANDALUCIA	0.16951	0.056172	0.054930
ARAGON	0.17251	0.055877	0.053025
ASTURIAS	0.23264	0.087546	0.086360
BALEARES	0.20062	0.078214	0.065478
CANTABRIA	0.27257	0.142090	0.121280
CASTILLA-LA MANCHA	0.18210	0.055453	0.053210
CASTILLA-LEON	0.12447	0.042047	0.034724
CATALUÑA	0.14204	0.041765	0.041910
EXTREMADURA	0.19240	0.086438	0.073013
GALICIA	0.16123	0.061259	0.050371
MADRID	0.16938	0.051050	0.050737
MURCIA	0.13632	0.040091	0.036412
RIOJA	0.10489	0.026920	0.026668
VALENCIA	0.14401	0.044389	0.039175
TOTAL	0.13231	0.028752	0.029542

TABLE 4: INEQUALITY OF INTER-INDUSTRY PRODUCTIVITIES, 1990

	GINI	THEIL	ATKINSON
ANDALUCIA	0.37674	0.24319	0.27473
ARAGON	0.33445	0.21516	0.31447
ASTURIAS	0.32200	0.17952	0.22518
BALEARES	0.33535	0.18759	0.18485
CANTABRIA	0.44739	0.35298	0.34480
CASTILLA-LA MANCHA	0.37269	0.26237	0.35868
CASTILLA-LEON	0.36193	0.24609	0.27343
CATALUÑA	0.33443	0.19485	0.22701
EXTREMADURA	0.46702	0.38473	0.43490
GALICIA	0.29554	0.15428	0.19768
MADRID	0.39268	0.27201	0.29531
MURCIA	0.26059	0.12538	0.16854
RIOJA	0.33372	0.27261	0.22578
VALENCIA	0.26186	0.12799	0.17818
TOTAL	0.33169	0.18858	0.23104

TABLE 5: INEQUALITY OF INTER-INDUSTRY WAGES, 1991

	GINI	THEIL	ATKINSON
ANDALUCIA	0.12662	0.041234	0.035874
ARAGON	0.17464	0.056031	0.054650
ASTURIAS	0.22852	0.085527	0.084243
BALEARES	0.16924	0.061237	0.050961
CANTABRIA	0.28004	0.151560	0.128390
CASTILLA-LA MANCHA	0.14625	0.051034	0.042539
CASTILLA-LEON	0.19198	0.061454	0.059594
CATALUÑA	0.14039	0.038095	0.038017
EXTREMADURA	0.17355	0.068738	0.057984
GALICIA	0.15420	0.053718	0.045567
MADRID	0.19252	0.059689	0.059221
MURCIA	0.12896	0.034792	0.031722
RIOJA	0.08997	0.022755	0.024187
VALENCIA	0.14308	0.040587	0.036520
TOTAL	0.14493	0.033882	0.034556

TABLE 6: INEQUALITY OF INTER-INDUSTRY PRODUCTIVITIES, 1991

	GINI	THEIL	ATKINSON
ANDALUCIA	0.37819	0.24270	0.28952
ARAGON	0.29693	0.17290	0.27104
ASTURIAS	0.30998	0.16013	0.18152
BALEARES	0.34662	0.20905	0.24888
CANTABRIA	0.46470	0.38687	0.38699
CASTILLA-LA MANCHA	0.39804	0.29528	0.22500
CASTILLA-LEON	0.40705	0.30854	0.46599
CATALUÑA	0.33915	0.20325	0.24316
EXTREMADURA	0.49846	0.44586	0.25598
GALICIA	0.32927	0.18640	0.22695
MADRID	0.31960	0.20623	0.30193
MURCIA	0.23700	0.11817	0.17594
RIOJA	0.27981	0.14370	0.15174
VALENCIA	0.24705	0.12596	0.20007
TOTAL	0.31209	0.17900	0.27027

TABLE 7: INEQUALITY OF INTER-INDUSTRY WAGES, 1992

	GINI	THEIL	ATKINSON
ANDALUCIA	0.13232	0.04266	0.03820
ARAGON	0.16740	0.04972	0.05067
ASTURIAS	0.20634	0.06965	0.07132
BALEARES	0.17302	0.06490	0.05321
CANTABRIA	0.28677	0.15827	0.13327
CASTILLA-LA MANCHA	0.14473	0.05238	0.04237
CASTILLA-LEON	0.18765	0.06057	0.05710
CATALUÑA	0.14176	0.03378	0.03701
EXTREMADURA	0.18060	0.06724	0.05969
GALICIA	0.15227	0.05232	0.04455
MADRID	0.23278	0.15435	0.10225
MURCIA	0.14538	0.04052	0.03763
RIOJA	0.08527	0.01998	0.02137
VALENCIA	0.18162	0.06075	0.05430
TOTAL	0.17298	0.04961	0.04846

TABLE 8: INEQUALITY OF INTER-INDUSTRY PRODUCTIVITIES, 1992

	GINI	THEIL	ATKINSON
ANDALUCIA	0.38795	0.25487	0.30450
ARAGON	0.30870	0.18371	0.28151
ASTURIAS	0.31703	0.16850	0.19708
BALEARES	0.34942	0.22034	0.25498
CANTABRIA	0.47011	0.39862	0.37374
CASTILLA-LA MANCHA	0.38984	0.27764	0.37565
CASTILLA-LEON	0.37456	0.25701	0.33076
CATALUÑA	0.33350	0.19714	0.24042
EXTREMADURA	0.51040	0.46722	0.25406
GALICIA	0.33781	0.19452	0.23408
MADRID	0.35252	0.23569	0.31299
MURCIA	0.25207	0.13324	0.19520
RIOJA	0.26787	0.13319	0.14500
VALENCIA	0.27014	0.14613	0.18776
TOTAL	0.31726	0.18285	0.25552

TABLE 9: ESTIMATED ELASTICITIES FROM TABLES 1 TO 8

	1989	1990	1991	1992
ANDALUCIA	0.34165	0.44994	0.33480	0.34107
ARAGON	0.48187	0.51580	0.58815	0.54227
ASTURIAS	0.63371	0.72249	0.73720	0.65085
BALEARES	0.51704	0.59824	0.48826	0.49516
CANTABRIA	0.65507	0.60924	0.60262	0.61001
CAST-MAN.	0.28063	0.48861	0.36742	0.37125
CAST-LEON	0.53066	0.34390	0.38957	0.50099
CATALUÑA	0.41948	0.42472	0.41321	0.42507
EXTREM.	0.37580	0.41198	0.34817	0.35384
GALICIA	0.56047	0.54554	0.46831	0.45076
MADRID	0.40265	0.43134	0.60238	0.66033
MURCIA	0.50812	0.52312	0.54413	0.57674
RIOJA	0.28383	0.31430	0.32155	0.31832
VALENCIA	0.53384	0.54995	0.57915	0.67232

TABLE 10: REGIONAL WAGE FLEXIBILITY IN SPAIN, 1989-1992

(Dependent variable: w_{ij})

	(1)	(2)	(3)	(4)	(5)	(6)
pr_{ij}	0.07* (3.56)	0.07* (3.54)	0.07* (3.79)	0.07* (3.79)	0.07* (3.72)	0.07* (3.74)
w	1.06* (7.49)	1.05* (7.50)	-	-	-	-
$w_{i(j)}$	-	-	0.42* (2.68)	0.43* (2.77)	-	-
$w_{j(i)}$	-	-	0.15 (1.22)	0.15 (1.21)	0.26* (2.60)	0.26* (2.58)
u_i	-0.03 (-0.24)	-0.09 (-0.96)	-0.04 (-0.29)	-0.02 (-0.16)	-0.03 (-0.24)	0.06 (0.65)
u	-0.14 (-0.61)	-	0.06 (0.26)	-	0.22 (0.94)	-
σ	0.22	0.22	0.23	0.23	0.23	0.23
R^2	0.81	0.81	0.80	0.80	0.80	0.80
SSR	37.30	37.32	38.90	38.90	39.45	39.49
F	106.9	110.7	98.06	101.5	99.70	103.1

Notes:

- (i) t-ratios in parentheses
- (ii) * denotes significance at the 1% level