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ABSTRACT

Inter-industry Wage Dispersion in Portugal: high but falling*

This paper examines the size of inter-industry wage dispersion in Portugal and compares with other countries. We find that the country has a high inter-industry wage inequality compared with the European standard. Nevertheless, the dispersion reduced over the 1980s and the early 1990s along a process of centralisation of the wage setting. This finding may add to the emerging notion that centralisation reduces inter-industry wage dispersion.

JEL Classification: J31

Keywords: Inter-industry wage dispersion, Portugal, centralisation

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1. Introduction

Following the seminal work of Krueger and Summers (1988), several studies have been carried out in a large number of countries and shown the existence of inter-industry wage differentials for apparently equally skilled workers. Although part of these differentials can be explained by unobserved heterogeneity, this does not explain all the variation (Krueger and Summers, 1988, Gibbons and Katz, 1992, Arai, 1994 and Gera and Grenier, 1994). These findings pose a challenge to textbook competitive models of the labour market and alternative explanations based on efficiency wage mechanisms or rent sharing have been put forward (Krueger and Summers, 1988, Thaler, 1989, and Lindbeck and Snower, 1990). Nevertheless, the existence of such differentials has not been clearly understood and remains an intricate and unresolved puzzle.

Another related and recent issue focuses on the relationship between inter-industry dispersion and the institutional wage setting. Empirical evidence has revealed that the magnitude of inter-industry dispersion is unequal across countries. Such a magnitude has been associated with the degree of corporatism or centralisation. The main conclusion from these studies is that the higher the level of corporatism or centralisation of the wage bargaining, the smaller is the size of inter-industry wage dispersion (Zanchi, 1992, Edin and Zetterberg, 1992, Zweimüller and Barth, 1994, Hartog et al., 1997, and Teulings and Hartog, 1998).

The present paper analyses empirically the size of inter-industry wage differentials in Portugal. The role of industry affiliation for wage formation has been a topic of great interest, but little is known on this for Portugal. This study aims to partially fill this gap and the goal is twofold. First, it examines the size and the evolution of inter-

industry wage dispersion in Portugal and compares with other countries. Second, the findings are related to the institutional wage setting and changes that occurred in Portugal over the 1980s. This may add to the current discussion relating inter-industry wage dispersion to the level of corporatism or centralisation.

The organisation of the paper is as follows. The next section describes the Portuguese institutional setting and changes occurred throughout the 1980s. Section 3 includes the empirical results. Finally, section 4 concludes and summarises.

2. The Institutional Setting

The Portuguese institutional wage setting has been characterised by multi-unionism and a fragmented trade union structure. The employer side is also very fragmented and the bargaining unit seems largely determined by the organisation of the employer associations. As a consequence, collective bargaining is very fragmented. However, mechanisms of social concertation did develop over the 1980s, and collective bargaining became more centralised and co-ordinated.

Several authors have developed rankings of national labour markets with respect to the degree of corporatism or centralisation (Blyth, 1979, Lehmbruch, 1984, Bruno and Sachs, 1985, Tarantelli, 1986 and Calmfors and Drifill, 1988). According to those rankings, the wage bargaining systems show substantial differences among countries. Three of these rankings are summarised in Table 1. Although differences between the rankings exist, there is also broad agreement. One extreme is represented by the U.S. and Canada with decentralised wage setting enacted at the firm level. The Nordic countries and Austria have traditionally represented the other extreme with highly

centralised bargaining structures. Other countries such as Germany, Belgium, the Netherlands, Italy and France align between those polar cases.

---------- insert Table 1 about here ----------

Portugal was not included in the corporatism/centralisation rankings referred to above but was included in OECD (1997) which ranks countries according to their levels of centralisation and co-ordination of collective bargaining. In their definition, *centralisation* describes the locus of the formal structure of wage bargaining. This acknowledges the notion of Calmfors and Driffill (1988). Three strata are distinguished for this purpose: the national or central bargaining between peak organisations, which may cover the whole economy (centralised bargaining); negotiations between trade unions and employers organisations for particular industries or occupations (intermediate bargaining); and firm level bargaining between trade unions and management (decentralised bargaining). On the other hand, *co-ordination* focuses on the degree of consensus among the collective bargaining partners. This relies on the notion of Soskice (1990). These rankings are also reported in Table 1.

Although there are exceptions, the rankings for centralisation and co-ordination agree largely with those proposed by Calmfors and Driffill (1988), Bruno and Sachs (1985), and Blyth (1979). With respect to Portugal, a remarkable change occurred. According to the index of centralisation, the country shifted from low to high centralisation over the 1980s. The shift in the co-ordination ranking is more modest: from low to middle. These changes in ranking are the result of implementation of mechanisms of social concertation during the 1980s. The establishment of a neo-corporatist setting after 1983-1984 leading to tripartite negotiations and the signature of several national agreements involving income and wage policies is the essence of the Portuguese centralisation.

3. Empirical Results

Inter-industry wage differentials in Portugal are estimated and analysed using cross-sectional human capital wage relations. The data were drawn from Quadros de Pessoal for the years of 1982, 1986 and 1992. All firms with wage earners must complete a standardised questionnaire every year and send it to the Department of Labour. The data refer to March of each year and include information on individual workers such as age, tenure with the current firm, the highest completed level of education, and gender. Information is also available on firm size, industry, region, bargaining regime, firm ownership structure, job complexity and hours worked. It also includes information on workers' monthly wages. Years of education were calculated by imputing the nominal number of completed years in order to complete the level reported in the data. Potential labour market experience was computed as age minus years of education minus six. Data on firm age were gathered from an external file used in MESS-DE (1994). Civil servants and people serving in the armed forces are not included in the data source. Each random sample contains more than fifty thousand observations of full-time, non-agricultural and non-fishermen workers between 14 and 65 years of age. Records with missing values were deleted from the original samples, as were part-timers, the self-employed, unpaid family workers and apprentices. Observations in which tenure was greater than labour market experience were also deleted. The resulting final samples include 57737 (in 1982), 57299 (in 1986) and 54307 (in 1992) observations.

The estimated wage equation is written as:

$$\ln W_i = \alpha' X_i + \beta' Z_i + \varepsilon_i \qquad i=1,...,N \qquad (1)$$

where W denotes monthly gross wages, X stands for a vector variables such as experience, experience squared, experience cubed, tenure, tenure squared, firm size, firm age, and hours worked. It also includes a set of binary variables aimed at controlling for education, gender, bargaining regime, region, firm ownership structure, and entrants (tenure <1 year). Z includes a set of dummy variables that control for

industry affiliation. The parameter vector β is the main concern of this study. The subscript i denotes the individual. Equation (1) was estimated by OLS.

In order to evaluate the importance of industry affiliation in shaping the wage structure, conventional F-tests were performed for all three years. The null hypothesis that industry wage differentials jointly equal zero (i.e. $\beta'=0$) is rejected at the 1% level of significance.

Estimated industry premiums appear in Table 1 in the appendix. These are shown in deviations from the employment weighted mean (see Krueger and Summers, 1988). The figures are easy to read: a negative (positive) sign means that the industry pays below (above) the mean.

The results indicate that Portugal follows the international patterns in terms of ranking. For instance, textiles and clothes, leather, footwear, wood and furniture, personal and domestic services and restaurants and cafés are sectors with low pay in other studies, and in other countries, and in Portugal as well. On the other hand, insurance, banking, electricity, chemical products and petroleum are examples of high paying industries in many studies, and also in Portugal.

A widely used summary statistic for the magnitude of inter-industry wage differentials, conditional on worker and other job characteristics, is the weighted and adjusted standard deviation of the industry premiums presented by Krueger and Summers (1988). The adjusted standard deviation of the wage premiums is given by:

$$ASD(\beta) = \left[var(\hat{\beta}) - \sum_{d=1}^{K} \frac{\hat{\sigma}_d^2}{K} + \sum_{d=1}^{K} \sum_{j=1}^{K} \frac{\hat{\sigma}_{dj}}{K^2} \right]^{1/2} \qquad d, j=1,...,K \qquad (2)$$

where $var(\hat{\beta})$ is the variance of the estimated industry coefficients, $\hat{\sigma}_d$ is the standard error of $\hat{\beta}_d$, $\hat{\sigma}_{dj}$ is the covariance term between $\hat{\beta}_d$ and $\hat{\beta}_j$ ($d \neq j$) and K is the number of industries. Ignoring covariance terms and weighting, the weighted and adjusted standard deviation of the inter-industry wage differentials is commonly calculated as:

$$WASD(\beta) = \left[w\, var(\hat{\beta}) - \sum_{d=1}^{K} \alpha_d \hat{\sigma}_d^{\,2} \right]^{1/2} \qquad (3)$$

where α_d is the share of workers in industry d and $w\,var(\hat{\beta})$ is the employment-weighted variance of the estimated industry differentials.

Table 2 presents the value of the employment-weighted and adjusted standard deviation of inter-industry wage differentials for Portugal and for other countries. Of course comparisons of this type must be viewed with caution. The results are not strictly comparable because of differences in the industry classification, differences in the number and nature of explanatory variables in the regression, or differences in the level of aggregation of industry variables which is reflected in the number of industry dummies. Also the data is not reported for the same years. Any interpretation must therefore be prudent, although we hope it is possible to develop an understanding of the relative position of each country, particularly of Portugal.

---------- insert Table 2 about here ----------

The values support a common claim that inter-industry wage dispersion is higher in decentralised counties (U.S. and Canada) and lower in the corporatist countries such as the Scandinavian ones. Countries normally ranked as having an intermediate level of centralisation seem to have an intermediate level of dispersion (e.g., The Netherlands and Germany). The results suggest that the Portuguese inter-industry wage dispersion is high when compared with other European countries. Indeed, it seems similar to that of countries rated as having a decentralised wage setting. It is noteworthy however that dispersion decreased from 1982 to 1992. This occurred along with a process of centralisation of the wage setting, supporting the notion that centralisation reduces inter-industry wage differentials.

3. Conclusions and Remarks

The main goal of this paper has been to report evidence on inter-industry wage dispersion in Portugal. For a clearer understanding, we chose to compare Portugal with results found for other countries.

The study shows Portugal has a high inter-industry wage inequality. The size of the inter-industry wage dispersion in Portugal seems similar to that of countries rated as having a decentralised wage setting. Nevertheless, the dispersion decreased during the 1980s. We argue that shifts towards a more centralised and co-ordinated wage setting may have played a role here.

In any case, the dispersion found in 1992 is still quite high by European standards. This can indicate that despite those institutional changes in the 1980s, the system might still be rather decentralised and uncoordinated. Indeed, Vieira (1999) argues that there is still latitude for more concerted industrial relations in Portugal.

Finally, we must say that centralisation was not the only change occurring over the 1980s and other hypotheses can also be advanced. Moreover, their role may not be dismissed without testing. For instance, the European integration and the process of deregulation of the industry that occurred in Portugal might also have compressed the industry wage structure.

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APPENDIX

Table 1 - Industry Wage Differentials (deviations from the employment-weighted mean)

	1982	1986	1992
Mining (metals)	0.0073	0.0186	0.1441
Mining (non-metal)	0.0239	0.0294	0.1814
Food	-0.0628	-0.0715	-0.0510
Beverages	0.0223	0.0301	0.0360
Tobacco	0.2389	-0.0606	0.2854
Textiles	-0.2319	-0.1424	-0.1700
Clothing	-0.2139	-0.0922	-0.1297
Leather	-0.1631	-0.0649	-0.0447
Footwear	-0.1827	-0.0790	-0.1227
Wood and cork	-0.1848	-0.1679	-0.0973
Furniture	-0.2315	-0.2433	-0.2192
Paper	0.0304	0.0796	0.0008
Printing and publishing	0.0221	0.0047	0.0852
Chemical products	0.0128	0.1660	0.2691
Other chemical products	0.1279	0.1797	0.1864
Petroleum	0.1051	0.2680	0.3465
Rubber	-0.0323	0.1130	-0.0326
Plastics	0.0028	0.1974	0.0377
Porcelain and allied products	-0.0117	0.0234	0.0843
Glass	0.0718	0.2267	0.2042
Other prod. made of non-metal minerals	-0.0009	-0.0303	0.0727
Primary metals (iron and steel)	-0.0151	-0.0467	0.0233
Other primary metals	-0.0168	0.0232	0.0008
Fabricated metals	-0.0754	-0.0715	-0.0182
Machinery	-0.0672	-0.0890	0.0107
Electronics	-0.0129	0.1333	0.0735
Transport equipment	0.0674	0.0321	0.1111
Scientific and optical instruments	-0.0931	0.0150	0.0384
Other manufacturing industries	-0.0691	-0.0683	-0.0551
Electricity and gas	0.3541	0.2710	0.1724
Construction and public works	0.0309	-0.0342	-0.0174
Wholesale trade	0.0577	0.0564	0.0882
Retail trade	-0.0366	-0.0331	-0.0138
Restaurants and cafés	-0.1197	-0.1454	-0.1663
Hotels and pensions	-0.0282	-0.0087	0.0161
Ground transport	0.0224	0.0591	0.0808
Sea transport and inland shipping	0.5089	0.7211	0.5191
Air transport	0.4499	0.5701	0.2990
Services related with transport	0.4767	0.2922	0.3790
Communications	0.1229	0.0496	-0.0785
Banking	0.2823	0.2148	0.1163
Insurance	0.6081	0.6101	0.5258
Services supplied to firms	0.1026	0.0133	0.0219
Cleaning services	-0.1472	-0.1518	-0.2119
Education	0.0583	-0.0494	-0.0272
Scientific research institutions	0.0125	0.0071	-0.0623
Social and humanitarian services	-0.1031	-0.1476	-0.1737
Employers and employees associations	0.1393	0.0736	0.1119
Cinema, theatre, radio and television	0.1363	0.0640	0.2096
Sports and recreational services	-0.0847	-0.0475	-0.0051
Repair	-0.0388	-0.1097	-0.0128
Other personal and domestic services	-0.0970	-0.0148	-0.0983

Tables to insert in the text

Table 1 - Some Rankings of Corporatism/Centralisation

Country	C&D (1988)	B&S (1985)	Blyth (1979)	OECD (1997) Centralisation in 1980	Centralisation in 1990	Co-ordination in 1980	Co-ordination in 1990
Austria	1	1	1	3	1	1	1
Norway	2	4	2	8	1	4	4
Sweden	3	5	3	1	1	4	5
Denmark	4	6	4	3	8	4	5
Finland	5	7	5	2	1	7	5
Germany	6	2	7	8	8	1	1
Netherlands	7	3	9	8	8	10	10
Belgium	8	8	8	3	1	10	10
Australia	9	13	6	3	1	7	5
France	10	11	11	8	8	13	10
U.K.	11	10	12	8	14	15	16
Italy	12	12	13	15	14	15	15
Japan	13	9	10	17	17	1	1
U.S.	14	15	15	17	17	18	17
Canada	15	14	14	17	17	18	17
Spain				3	8	10	10
Portugal				15	1	13	10

Notes:1=most corporatist/centralised. C&D=Calmfors and Driffill, B&S=Bruno and Sachs. The rankings by C&D (1988) and B&S (1985) also include Switzerland; the ranking by Blyth (1979) did not include Switzerland but included New Zealand. Because of this, the numbers in the table differ in some cases from those in the original source. The ranking is fully preserved, however. The rankings in OECD (1997) also include New Zealand and Switzerland.

Table 2 - Weighted-adjusted standard deviation of inter-industry wage differentials

Countries	WASD(β)					Year					# Industries
USA		0.132	0.108	and	0.140		1974	1979	and	1984	42
Canada		0.151					1986				47
Portugal		0.158	0.144	and	0.125		1982	1986	and	1992	52
Germany		0.065	0.092	and	0.108		1979	1984	and	1989	40
Netherlands		0.067	0.067	and	0.073		1979	1985	and	1989	42
Finland		0.084	0.075	and	0.079		1975	1980	and	1985	37
Sweden		0.071	0.043	and	0.026		1968	1974	and	1981	24
Norway		0.059					1983				24
Denmark	0.053	0.052	0.050	and	0.054	1982	1984	1986	and	1990	18
Austria		0.054					1983				21

Sources: Krueger and Summers (1988) for the USA, Gera and Grenier (1994) for Canada, Bellmann and Möller (1994), for Germany, Hartog et al. (1997) for The Netherlands, Arai (1994) for Sweden, Zweimüller and Barth (1994) for Austria and Norway, Lausten (1995) for Denmark and Vainiomäki and Laaksonen (1995) for Finland.