

Economics Working Paper 83

**The Wage Setting Process in Spain. Is it
Really only about Wages?***

Sergi Jiménez-Martin
Universitat Pompeu Fabra

May 1994[†]

Keywords: Wages, Employment, Pay Structure, Collective Bargaining.

Journal of Economic Literature classification: J41, J33, J23, C23, C33.

* I would like to thank Javier Andrés, Jaume García, José María Labeaga and Josep Lluís Raymond for their comments and suggestions. I am also grateful to Josep Manel Comajuncosa and Angel López. The data is provided by the Spanish' Ministerio de Economía y Hacienda. Financial support from the Generalitat de Catalunya (CIRIT EE-92/1-164) for a stay in Carnegie Mellon's GSIA is acknowledged.

[†] First version: April 1993.

Abstract

A Insider–Outsider Right to Manage wage and employment model is estimated for the manufacturing and services sectors using Spanish firm level data in the 1985–1990 period. We set insider power in wage setting in a range from 0.12 to 0.16 for the manufacturing sector and 0.01 to 0.02 for the services. Using the employment equations, we reject the null that bargaining is only about wage, for the manufacturing and we do not reject it for the services. We also worried about the relevance of pay structure (base, tenure and productivity payments) in wage and employment determination. We reject the neutrality of pay structure in both sectors. For services we have found that tenure payments reduce the base wage and also the wage bill.

I. Introduction.

Wage determination and employment determination have been often analyzed in recent years. The availability of microdata and better data management capabilities have been shifting the focus from aggregate models, that is, the estimation of Phillips curve based models, towards disaggregate models, although this must not put in the shade that we are implicitly estimating Phillips curve based models¹. This is also the case for Spain. Initially the evidence about wage determination was aggregate. As an examples we could mention some recent studies by Dolado et al (1986), Andrés et al (1990) and Bentolila and Blanchard (1990). But more recently a growing set of studies, on a more disaggregate basis, have started to appear. Among those Alonso (1989) and Anchuelo (1989) are applications of the efficiency wage model using firm data from the 'Central de Balances'. Alternatively, Andrés and Garcia (1991), Bentolila and Dolado (1992) and Draper (1993) are applications of the Insider-Outsider model. The first is an application of this model to the manufacturing sector using the Industry Survey data set. The next two also are applications of the Insider-Outsider model but using firm level data from the 'Central de Balances'. The last three mentioned studies are comparable to the present study due to the partially shared framework and objectives.

This study has several objectives. On the one hand, we like to add new evidence to wage determination (in a bargaining context) in Spain using a well establish framework: the Insider-Outsider model of Lindbeck and Snower (1987), though we will follow closely Nickell and Wadhvani's (1990) modelization for the wage equation. On the other hand, we like to investigate the underlining Spanish bargaining structure itself. In particular, we are interested in responding to two questions: First; is bargaining done only over wage or is it also over employment level? and second, does it matter the form in which wages are paid?.

To answer the first question we opt for a very simple

¹ See Manning (1992) for a recent discussion of the wage equation in a macroeconomic context but using a microeconomic perspective.

alternative rather than for a full specified model which requires an extremely complete information set². We formulate the bargaining model under the null hypothesis that there is only negotiation about wages and firms set unilaterally employment levels. This is usually known as the Labour Demand Model (LDM). Notice that under the above hypothesis employment lies on the firm's demand curve. Thus, a test against this null hypothesis is an indirect test against the null that bargaining is only over wages and not over employment. The alternative hypothesis is a combined wage-employment negotiation, which might be found, for instance, in Manning (1987).

With respect to the wage equation, there are several topics that we shall emphasize. First, we shall try to estimate the employees 'insider' power, that is, their ability to capture situation rents. If this power is extremely high, i.e. close to one, productivity increases will not be translated into higher employment level but into wage increases. If the insider power is low, i.e. close to zero, industry wage differential are also close to zero, favouring dynamic industries. The existing evidence suggests a value close to zero in centralized (in a bargaining sense) countries, like Finland (0.00), Norway (0.03) and Sweden (0.04), a middle value in countries with simultaneous centralized and decentralized wage setting like Germany (0.10) and U.K. (a range of 0.08-0.18), and a higher value in countries like, US (0.30 and more recently, 0.20) and Japan (0.33), where bargaining is completely decentralized³. For Spain, previous estimations range from 0.05 to 0.10⁴, although for some industries estimates are rather higher⁵. We would like to point out that previous evidence suggests an inverse relation between centralization degree and insider power, according with the theory (see Layard et al (1991)). Hence, the higher (the lower) the centralization the lower

² For a good example of full specified model of bargaining about wage and employment see Dorion (1992).

³ See Holmud and Zetterberg (1991) for the Scandinavian countries, Germany and the first US reference; Nickell and Wadhvani (1990) for the U.K; Janet and Currie (1992) for the second US reference and finally, Brunello and Wadhvani (1990) for Japan.

⁴ Andrés and Garcia (1990) and Dolado and Bentolilla (1992) for the manufacturing sector.

⁵ For instance, in Draper (1992) insider power for the chemist industry is estimated as high as 0.390.

(the higher) the effect of specific firm factors and the higher (the lower) the effect of conditions for the whole economy on the wage levels. It has been extensively argued the best macroeconomic performance (inflation-unemployment) might be achieved in either an economy with a high level of decentralization or an economy with a very low centralization level. Otherwise, when bargaining system is mixed the performance is significantly worse. This is the Spanish case. Thus, we expect to show, corroborating the existing evidence, an insider power not very high not very low.

Apart from the above objective, shared with others empirical papers, this study will pay special attention to the consideration of a set of bargaining related variables, not available in many of the alternative data sets. Additionally, as far as bargaining structure seems rather different for the manufacturing and services sectors we opt for formulate separate wage equation for each of both. Nevertheless the focus will be centered mostly on the manufacturing sector because the sample is larger and also information about this sector is more complete.

On the other hand, we use a simple *ad hoc* approach to analyze the impact of the wage structure on base wage and employment levels for testing purposes. Our basic interest will be to confirm whether or not wage and base wage equation contain the same information. That is, it does not matter how the worker is paid, it matters how much he is paid. In other words we are interested in knowing whether wage bill equation suffices to explain the wage setting process. The procedure of analysis will follow the recent work of Wadhvani and Wall (1990).

As Layard et al. (1991), among others, pointed out, a single price, the wage, has a multiple function: *Recruit, Retain, Motivate*. Flexible wage structure may help to accomplish such functions. For instance, the base wage has the recruitment mission. The tenure payments, the retaining function. Finally either productivity related payments (more frequent in manufacturing), or sales related payments (more frequent in services), or profits related payments, the motivating one.

The profits sharing model has often been used, particularly after the initial seminal boost of Weitzman's (1984,1987) work, to test the incidence of flexible pay structures. Although the evidence suggest a positive relationship between profits sharing schemes and productivity⁶, there is not strictly an agreement about the effect of such a scheme on base wage and hence on wage bill. Further, in accord with Wadhvani and Wall (1990), there is no real evidence about the base wage marginal cost role. That is, it does not matter how the worker is paid but how much he is paid. It would seem that this must hold in an economy with perfect certainty, but as long as firm results are subject to uncertainty and capital markets are far from being perfect, the opposite might be true. That is, flexible payment structures may reduce the base wage, lowering the labor marginal cost and, hence, *ceteris paribus*, increasing employment and decreasing unemployment. Here we cannot be extremely ambitious on this issue for we only know the amount of payment related to production, sales or profits without any distinction, but we think that our simple approach will provide some indirect evidence on the effects of a flexible wage structure.

No less important than payments related to firm's performance are payments related to the tenure at workplace, which can be considered a proxy of the tenure period itself. We are not able to carry on a formal modelization including tenure. Nevertheless, under the assumption that tenure payments are proportional to the base wage we are able to illustrate the effects of the tenure payments on base wage and also on employment. It is expected that the higher the tenure payments the lower the base wage, because a representative worker is accounting for some tenure payment that will not have in any alternative job. However, the effect on payroll is unclear, like the effect on employment. We reasonably expect that the direct effect is negative but there is also a positive indirect effect through a productivity increase⁷.

Third, a simple employment equation will be specified with two

⁶See the exhaustive and recent survey of results by Weitzman and Kruege (1991).

⁷A direct productivity increase in workers with some experience and also a shift in general productivity via hierarchies.

different purposes. One, it will be used to test Weitzman's theoretical argument that employers use the base wage and not the wage bill as a relevant marginal cost of labour. And two, we are going to carry out some tests about on underlining wage setting process. It is said that bargaining is only done over wages in Spain. In fact there is little evidence in support of bargaining over the level of employment. However, as long as employment adjustment costs are very high and union bargaining power is assumed to be high, we may expect some implicit bargaining about employment specially in large firm. Thus, we are going to test the labor demand model, our null hypothesis model (which is equivalent to absence of bargaining about employment), against a more general framework, although we must point out the alternative is not well defined. It might be either some kind of negotiation about the employment level if we assume that the Insider-Outsider framework holds or the well known efficiency wages model, sometimes forgotten in previous research⁸.

The empirical application will be carried out using the Spanish 'La Negociación Colectiva en las Grandes Empresas en ...' in the 1985-1990 period. This survey is constrained to firms with at least two hundred workers, so the results should be considered with some of caution, mainly due to the more simple wage structure in small firms. It should be pointed out that there is only a previous work⁹ exploiting this special data set, and that its objective is quite different. Despite some shortcomings, this survey has many possibilities in analyzing fields other than wage determination (See the data appendix for a brief description on the data set).

The paper is organized as follows. Section II describes briefly the Spanish bargaining system and some stylized facts. Section III presents the underlying wage bargaining model and some extensions for testing purposes. The data, econometrics specification and estimation methods are briefly described in section IV. The empirical findings are discussed in Section V. Finally, in section VI we present a brief summary of findings.

⁸ See Alogoskoufis and Manning (1992) for a comment on the indefinición of the alternative.

⁹ See Alba (1989), which deals with an employment equation.

II. Bargaining stylized structure.

Bargaining about wages is strongly mixed in Spain¹⁰. There are several (not compulsory) bargaining stages. Figure 1 summarizes the most important bargaining levels and options. The top level implies an agreement between union representatives, the firm's association and (possibly) the government. The bottom level implies an agreement between a group of workers (or a plant) and a firm. At any stage [from bottom to top] we could characterize three basic options: To follow an aggregate agreement, to follow an aggregate agreement with a particular improvement and bargaining alone. Notice that the second option, to follow an aggregate agreement with a particular improvement is an important source of wage pressure, as far as improvement implies a bargaining process itself and normally means an increase in wages. In fact, particularly at firm level, the three possibilities pointed above collapse into only two: Following an aggregate agreement or Bargaining. We expect insider power to be higher in firms that negotiate than in firms which follow any aggregate agreement.

Although there are many registered unions, workers representativeness is concentrated in a very few unions -two unions, CCOO and UGT, have about 7/10 of workers representatives in negotiating committees-. Moreover, the larger (or more aggregate) is the negotiation unit the more concentrated are the representatives in this two unions. This fact seems to be an attempt to simplify and also to favor coordination during negotiations, but it could also increase union power. It is useful to point out that union power cannot be measured as in other countries (i.e. USA). The most important difference is that any agreement has efficacy over all the bargaining units under it (For instance, an industry agreement has efficacy over all the firms in this industry, a firm agreement has efficacy over all the workers in the firm, ...). So we cannot distinguish between unionized and non-unionized sectors (i.e. we can't identify an union mark-up). In fact, we are only able to

¹⁰For a complete picture of Spanish bargaining system and related facts see Jiménez (1992).

discriminate differences between different unions.

Bargaining could cover almost everything (working conditions, social advantages, etc, ..). In any case the most frequent topics are wages (increases), annual hours and a cost of living allowance clause to prevent unexpected inflation. There is no evidence of negotiation about the level of employment, but there are some agreements that include some clauses concerning the employment level¹¹. Probably, a reasonable assumption is that the larger the firm the higher the probability that negotiations cover bargaining about the level of employment, though our guess would be that the above pattern arises more often in bad firms than in good ones (i.e. union are strongly concerned about employment levels when the probability that expected employment will be lower than past employment is high).

* *Some facts.*

In the second half of the 70's the macroeconomic scenario was in a very bad shape for Spain. Inflation was on double figures (mean 1975-79:18.4%) and BP deficit was on red. As the government policy prioritised inflation curbing (with a very restrictive monetary police) and a deep industrial rationalization, the labor market suffered strongly. From 1975 to 1984 employment decreased by 15 per cent¹² and unemployment rose by four times (from 3.6% in 1975 to 20.6% in 1984).

In the first half of the 80's, although inflation (mean 1980-84:11.5%) was steadily decreasing, the performance was not as good as police makers were expecting *a priori*, strongly worried in those years, before the Spanish' integration in the EEC, about the inflation differential with European economies. Although performance was better in the second half (mean 1985-1989: 6.9), the inflation differential was, more or less, the same than in previous years. What could be the main cause of the failure in the fight against inflation?. Undoubtedly, an important factor is the strong wage

¹¹See "La Negociación Colectiva en 1990", Comisión consultiva Nacional de Convenios Colectivos, MINISTERIO DE TRABAJO Y S.S. 1991.

¹²Is the worse figure in western Europe. For instance, one of the worse cases, U.K., only suffered a 5 per cent cut in workforce in 1975-83. On the other hand, workforce in the states rose by 17.9 per cent, 9.7 per cent in Japan, 14.5 in Canada and 10.4 in Italy.

pressure coming from collective agreements.

Each year from 1978 to 1986 (except 1984) there was a National agreement (between government, main unions and firm representatives) to drive the collective bargaining following a prefixed inflation target, but the real inflation (higher than the prefixed target all the years) cuts were always modest. Why?. I think this was basically a question of a wrong design of the collective bargaining system (even if we consider the first years as a learning time). There are some basic failures: The wrong design of aggregate agreements that practically never included an increase gap to facilitate small firms adjustment. The nefast design of cost of living allowance clauses in many cases (we highlight, as an example, the AES-like clause, which in many cases implies additional inflation pressure¹³); and, also the spread of the negotiation period.

13 The AES cola clause, used frequently since 1985, implies that the proportion between ex-post and ex-ante wage increase is equal to the ratio between observed inflation and inflation target. It is easy to show that if the ex-ante wage is higher than the inflation target the wage-price elasticity is higher than one. Hence an unexpected price increase might induce additional inflation (see Jiménez (1993))

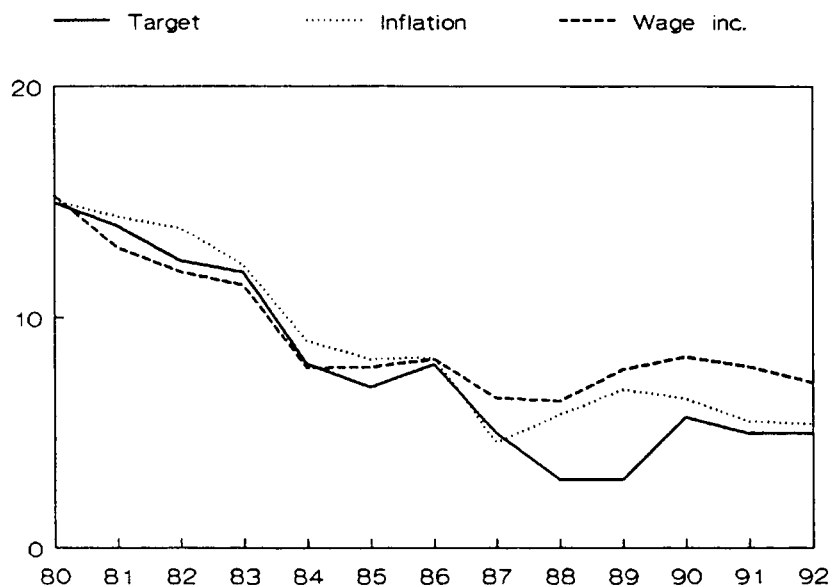
Figure 2
Basic figures about Bargaining in Spain during the 80's.

AGGREGATE BARGAINING		WAGE		INFLATION		DIF W-I		% GROWTH GNP	% UNEMP
NAT. AGRE.	WAGE ¹ GAP	[A] $\Delta\omega$ *	[B] $\Delta\omega$ **	[C] TARGET	REAL	A-C	B-C		
80	YES	13.0-16.0	15.26	-	15.0	15.3	-0.04	-	11.2
81	YES	11.0-15.0	13.06	20.3	14.0	14.4	-1.34	5.9	14.4
82	YES	9.0-11.0	12.02	14.5	12.5	13.9	-1.88	0.6	16.3
83	YES	9.5-12.5	11.44	13.5	12.0	12.3	-0.86	1.2	17.8
84	NO	-	7.81	9.3	8.0	9.0	-1.19	0.3	20.6
85	YES	5.5- 7.5	7.90	9.6	7.0	8.2	-0.30	1.4	21.9
86	YES	5.4- 6.4	8.26	11.4	8.0	8.3	-0.04	3.1	21.5
87	NO	5.0- 8.0	6.51	7.1	5.0	4.6	1.91	2.5	20.6
88	NO	3.0- 6.0	6.38	6.0	3.0	5.8	0.58	0.2	19.5
89	NO	4.0- 8.0	7.70	5.7	3.0	6.9	0.80	-1.2	17.3
90	NO	6.0- 9.0	8.32	8.5	5.7	6.5	1.82	2.0	16.3

1. from 1986, initial position of unions and firm representatives.

* Collective agreements mean increase ** Wage survey

Figure 31. Wage inc., target and Inflation Spain, 1980-1991.



III. The framework.

As we have pointed in the first section, it is far of the scope of this paper to develop a combined wage-employment negotiation framework. Instead of it, we will formalize a model under the null hypothesis there is only negotiation over wages¹⁴ and the firm sets unilaterally the employment level, which is usually know as the Right to Manage model (RTM). Later, we shall consider, under the above null model, the wage structure and a simple employment equation for testing purposes.

Consider a firm producing an output, Y , with a Cobb-Douglas technology:

$$[1] \quad Y = AN^\alpha \qquad 0 < \alpha < 1$$

being A the technical progress coefficient, N the employment, and α , the scale parameter. The firm maximizes the expected profits Π

$$[2] \quad \Pi(w, \Theta) = \Theta \cdot Y - w_B \cdot N$$

where Θ , the demand that the firm faces, is defined as $\Theta = \epsilon P^e$; where ϵ is a unit mean random shock and P^e is the expected price and w_B is the wage bill per worker. The firm bargains with a workers council that is concerned about the expected wage of a representative worker and employment. Assume that the workers' council has a utility function of the form:

$$[3] \quad U(w_B, N_o) = (1 - L(N_o)) w_B + L \cdot W_a$$

where L is the probability that employment will be lower than a predetermined employment objective (N_o) and W_a is the earnings expected to be available to the laid-off workers. More precisely, and following closely Nickell and Wadhvani (N&W, 1990),

$$[4.a] \quad L = \text{prob}(N < N_o) [1 - E(N : N < N_o) / N_o]$$

$$[4.b] \quad W_a = \bar{W} [1 - p(u)(1 - b)]$$

¹⁴In the case that they are following an aggregate agreement (i.e. a sector agreement) we can think bargaining is an adjustment of that aggregate agreement to specific firm conditions.

being \bar{W} the mean aggregate wage, u is the mean aggregate employment and b is the benefit replacement ratio. Assuming that the solution to the negotiation problem between the workers council and the firm could be represented by a Nash model like:

$$[5] \text{Max}_{WB} [(1-L(N_0))(WB-W_a)]^\beta [\Pi(WB, \Theta)]^{(1-\beta)}$$

where β is the workers' council bargaining power in wage setting. If the union only cares about the payroll of a representative worker, the maximization variable is the wage bill per head (WB). Following N&W, and omitting the technical details, given [5], the wage may be written as a function of the following form:

$$[6] WB = F (AP^e/N_0^{1-\alpha}, \bar{W}, u, b, \beta) \quad F_1, F_2, F_4, F_5 > 0 \text{ and } F_3 < 0$$

It is easy to show that F is homogeneous of degree one in the first two arguments; so, in the absence of uncertainty, we can write [5] as (all the variables in logs):

$$[7] WB = \mu_0 + \lambda I^e + (1-\lambda) O^e$$

hence the observed wage is a combination of the (expected) inside firm conditions (I^e), and the (expected) outside firm conditions (O^e). Using [1], the production function, to eliminate the unknown technical progress factor, we are able to write I^e as¹⁵,

$$[7.a] I^e = a + p^e - (1-\alpha)n_0 + \alpha_1\beta = (p+y-n)^e + \alpha_1\beta + (1-\alpha^*)(n^e - n_0)$$

¹⁵Notice that setting the employment objective (membership) to past employment, n_{-1} [7.a] is equal to Nickell and Wadhvani's (1990) specification. Hence, insider hysteresis might be written as $(1-\alpha)\Delta n^e$.

But in the case that the relevant membership is not past employment, the specification pointed above might not be adequate. Think for instance in a model with two kinds of labor, permanent and temporary, with quite different cost of adjustment (low firing cost for temporary and high firing cost for permanent workers, as high as 40 days per year of tenure) where only permanent are insiders (see Dolado and Bentolila (1992) for a complete picture). Under this set of circumstances, the insider term might be written as,

$$I = (p+y-n)^e + \alpha_1\beta + \phi^e + (1-(\alpha_p + \alpha_T))\Delta n_p$$

where ϕ^e is the proportion of temporary workers in firm employment, n_p is the number of permanent employees, and α_p and α_T are the production function coefficients ($\alpha_p + \alpha_T < 1$) for permanent and temporary employment, respectively.

and from [4.b] we obtain,

$$[7.b] O^e = \bar{W} - \gamma_1 u + \gamma_2 b$$

The first component (I^e), may be seen as the wage level that will sustain the existing level of employment (Wadhvani and Wall (1990)) if the expectation on θ remains unchanged and, the second (O^e) may be viewed as the set of factors which influences the firm's ability to pay. So our proposal for the wage equation may be written as,

$$[8] wB = \mu_0 + \lambda[(p+y-n)^e + \alpha_1 \beta] + (1-\lambda)[\bar{W} - \gamma_1 u + \gamma_2 b] + (1-\alpha)(n^e - n_0)$$

* *A simple employment equation.*

Through [4] to [8] we assume that the firm and the workers' council only bargain about the wage but it is possible that they bargain also about employment in a combined wage-employment framework (see Manning (1987) for a complete description of such a framework). To keep the spirit of our wage equation intact we formulate an ad hoc employment equation. That is (following Manning (1987) and Alogoskoufis and Manning (1991)), if employment bargaining power is zero or bargaining cares only about wage, employment lies on the labor demand curve (the commonly called Right to Manage model). So, from [1] and [2] it is easy to reach the following specification,

$$[9] n = \mu_n + [\log(P^e) + \log(Y) - \log(wB)] + Z_1' \mu_1$$

where Z_1 includes all the employment push factors. As, $\log P^e$ is not observable we make use of the revenue function to substitute $\log P^e + \log Y$ by using the observed log of sales, s . So the final specification is,

$$[10] n = \mu_n + [s - wb] + Z_1' \mu_1$$

As it is shown in Alogoskoufis and Manning (1991) equation [10] is adequate if employment lies on the labor demand curve given the

production function. If not, we will expect that the variables affecting the utility function (basically outside wage and unemployment in our specification) and the variables affecting the union bargaining power will affect employment directly (there is also an indirect effect through wages).

$$[11] n = \mu_n + [s - wb] + Z_1' \mu_1 + Z_2' \mu_2$$

A test against $\mu_2=0$ is equivalent to a test against the labor demand model¹⁶. Unfortunately, the alternative is not well defined; that is, rejecting $\mu_2=0$ does not imply necessarily that an efficient bargaining framework (i.e., combined bargaining about wages and employment) holds¹⁷. For instance, in an efficiency wage model, the production function includes the relative wage so we expect that outside wages enter the labor demand curve with a sign opposite to that of firm's wage. Note that this fact is the only approximate evidence we have to discriminate among those two different models.

* *Ad hoc wage structure considerations: Testing for nominal neutrality.*

Following, Layard et al (1991), the wage is a single price for three different functions: *Recruit, Retain, Motivate*. Therefore, flexible payroll structures might be considered an attempt to solve this apparent conflict. Simplifying a more complex wage structure, they consist in a base wage (recruit wage); some fix payment (retain wage), usually related to specific employee characteristics such as tenure payments; and some variable payments (motivate wage), that is, output related payments, being the most popular one the profits share, though we are not able to discriminate into variable payments this last form of payment. Without loss of generality, we can consider that the wage structure is the following.

16 Assuming union employment bargaining power is zero, the labor demand model is called either Right to Manage model if union wage bargaining power is lower than one or Monopoly union model if union wage negotiation power is just one.

17 Most of the previous relevant literature; see, for instance, MacCurdy and Pencavel (1986) and Brown and Ashenfelter (1986) among other, tested only the labor demand model against the efficient bargain model. No other possible alternatives were specified.

$$[12] \quad \text{WB} = \text{BASE} + \text{TEN} + \text{PROD} + \text{TAX}$$

where BASE is the base wage, TEN is the tenure related payment and PROD is the output or sales related payment and finally TAX is firms labor tax. Using ω for BASE, we rewrite WB in term of the base wage and the tax rate (ν) as a proportion of employees payroll (WB-TAX)

$$[13] \quad \text{WB} = \left\{ \omega \cdot \left(1 + \frac{\text{TEN}}{\omega} + \frac{\text{PROD}}{\omega} \right) \right\} \cdot (1 + \nu)$$

As we pointed out above, we are interested in testing several theoretical hypothesis. First it has been argued that a flexible payroll structure, specially when it takes the profit sharing form, may lower the base wage. Our aim is to test the same implication but using an alternative form of flexibility. An easy way to test this implication is to look at [8] but substituting the wage by using [13]:

$$[14] \quad \ln \omega \approx \mu_0 - \tau_1 \frac{\text{TEN}}{\omega} - \tau_2 \frac{\text{PROD}}{\omega} - \tau_3 \ln(1 + \nu) + [\lambda I^e + (1 - \lambda) O^e] + (1 - \alpha^0) \Delta n^0$$

Following closely Wadhvani and Wall (1990) (although their comments are closely related to profit sharing schemes), if $\tau_1 > 1$ then the related pay reduces the total wage bill, leading to a reduction in the wage pressure. If $\tau_1 = 1$, a flexible payment structure has no incidence at all. $\tau_1 < 1$ leads to an increase in the wage bill. And finally, in the extreme case where $\tau_1 = 0$, the related pay is an additional payment. Notice that in this last case the wage bill model and the base wage model are the same. Note that if the model is correctly specified, the labor tax ν in [14] is expected to have a zero coefficient, that is, employer labor tax is viewed as an additional payment (cost in that case). Clearly, the first is the more interesting case because it is implicitly implying tenure or productivity are important bargaining factors that must be taken into account.

On the other hand, the consequences of introducing a flexible payroll structure when looking to the employment equation?. Before answering the question let's reformulate [11] (using the same procedure as above) allowing for a flexible wage structure,

$$[15] \quad n \approx \alpha^* + \delta s - \gamma \ln \omega - \gamma_1 \frac{\text{TEN}}{\omega} - \gamma_2 \frac{\text{PROD}}{\omega} - \gamma_3 \ln(1+\nu) + Z_1' \mu_1 + Z_2' \mu_2$$

If the wage structure does not matter, that is, if only the total amount paid matters, we shall observe $\gamma_1 = \gamma$. It is important to note the case where $\gamma_1 = 0$, when only the base wage matters for employment determination. In such circumstance, Weitzman's argument should be considered valid. Hence, the base wage should be considered the marginal price of labor.

IV. Econometric specification and methods.

* *The data.*

The data set used in the estimation is an unbalanced panel of 375 manufacturing firms (with a total of 1192 observations) and 172 services (512 observations) firms for more than 3 years (up to 7 years) in the 1984-90 period. We shall note that we rejected the null hypothesis that the model is the same for both sector consider. The manufacturing sample is small but it seems large enough to estimate the model with confidence. However, the services sample is rather small, so we must be cautious when considering any result about services. A detailed description of the variables and source might be found in Appendix A, which describes briefly the basic characteristics of the dataset and also includes some useful statistics.

* *The econometric specification*

The starting points are our basic wage equation [8] and our basic employment equation [11]. Note, that all the other specifications may be viewed as a linear transformation of the two pointed above, therefore their econometric specifications are straightforward and we shall not write them explicitly.

Only minor changes are needed to get an empirical specification for the wage equation. The specification is almost identical for both sectors. We shall describe the manufacturing specification with services differences in brackets. First, we allow firm specific effects and time specific factors. Second, we include some push factors. As inside factors we use lagged profits $(B/N)_{-1}$, extensively¹⁸ used as a proxy for firm profitability and union power; a proxy of firm's market power, mp , defined as the ratio between added value less labor cost over added value; the (log) effective hours (regular hours in services) , eh , as an hours correction

¹⁸Among the closest to ours, we point out the recent works of Barghava and Jenkinson (1992) and Currie and McConnell (1992).

factor; we introduce also a proxy for differences in union power: the proportion of union representatives that belong to the UGT union¹⁹. Finally we consider two variables representing strike activity during bargaining. First, a dummy taking one if there was a strike during negotiations, S_i ; and second, the observed length of the strike, dur_S_i . According to Card (1990), the strike duration should have a negative coefficient.

Instead of current unemployment rate we consider past unemployment rate for manufacturing. As outside push factors we use the proportion of long unemployment (more than two years, LTU), the industry unemployment (not considered in services), u_j , and finally, the lagged (twice) inflation difference, Δ^2P_{-1} , to account for uncompensated past inflation²⁰. And third, some inertia is likely to be present in wage determination because of nominal rigidity or long term contracts, therefore we introduce the lagged wage (in fact we allow for dynamics in most of the inside variables). Consequently our specification for the manufacturing wage equation is as follows,

$$\begin{aligned}
 [16] \quad wb_{it} = & \mu_t + \pi wb_{it-1} + (1-\pi) [\lambda \{ (p+y-n)_{it} + \varphi_2 (B/N)_{it-1} \\
 & + \varphi_3 eh_{it} + \varphi_4 UGT_{it} + \varphi_5 mp_{it} + \varphi_6 S_i + \varphi_7 Dur_S_i \} \\
 & + (1-\lambda) \{ \bar{w}_t + \psi_1 u_{t-1} + \psi_2 LTU_t + \psi_3 u_{jt} + \psi_4 \Delta^2 P_{t-1} + \psi_5 afr_j \} \\
 & + (1-\alpha^*) \Delta n_t^e + f_i^w + u_{it}^w
 \end{aligned}$$

$$i=1, \dots, N$$

$$t_1 = t_{10}, \dots, T_1$$

where u_{it}^w is a serially uncorrelated error term. We shall come back to it later. Note that [16] has been written under the assumption of neutrality in nominal variables, extensively used in previous research²¹. Finally, we do not need to make any special assumption about the firm-wage specific effect, f_i^w , apart from stationary. Note the fact that a nominal variables neutrality restriction, $\pi + (1-$

¹⁹ We have information about seven union groups but in fact only two can be considered, in general, important.

²⁰ See Andrés and García (1991) for a detailed explanation of that variable.

²¹ For instance, in Andrés and García (1991) and Dolado and Bentolila (1992).

$\pi[\lambda+(1-\lambda)]=1$, has been imposed in both sectors (though it will be tested) to concentrate the work in the nominal variables equation.

The same changes are needed in the employment equation, although the most important reason to allow for dynamics is, in this case, the existence of employment adjustment costs²². The vector of employment push factors, Z_1 , includes lagged profits per employee, the market power proxy defined above, overtime hours in previous year per worker as a proportion of the regular annual working hours, xh , the industry output (in log) index (1972=100), o_j (only for the manufacturing sector), and some bargaining clauses, like the cost of living allowance clause, COLA, and a general productivity clause, PRODC. We expect a negative value for the cost of living allowance clause because it is in fact an implicit (deferred) wage increase²³ and because it increases the payroll uncertainty²⁴. The effect of a productivity clause has not any prioristic restriction on its sign, but in any case we expect that productivity increases (if any) will be partially translated into payments and partially translated into employment. The Z_2 vector should not have any significant effect on employment if it lies on the labor demand curve. It includes the mean wage, \bar{w} ; the industry level of unemployment, u_j and as well the proportion of representatives that belong to the UGT union. Nevertheless, we must be extremely cautious when considering unemployment, specially in services, because this variable might be proxying the industry demand level. Noting that all the nominal variables are corrected by using an specific industry price level, p_j , the employment equation can be summarized as,

²² Notice that employment adjustment cost are closely related to tenure adjustment cost. Employment adjustment cost are extremely high in Spain with a maximum of 40 days of wage for each year of experience, the higher figure in Western Europe.

²³ Notice that COLA clause is in fact an implicit contract with an implicit cost for workers in term of wage increase. Previous estimates are, for instance, a cost-range between 0% and 2% in the US (Hendricks and Khan (1985)) and around 1.5% in Spain (Jiménez (1992)). Our model is not really adequate to evidence the effect of cost of living allowance clause in wage level because payroll costly includes COLA compensations (if any).

²⁴ So the effect of this variables into employment might be think as a test of the effect of uncertainty on employment.

$$\begin{aligned}
[17] \quad n = & \alpha_t + \rho n_{1t-1} + \delta(s_{1t} - p_{jt}) - \delta_1 m p_1 - \gamma_0(wb_{1t} - p_{jt}) - \gamma_1(wb_{1t-1} - p_{jt-1}) \\
& + \mu_{11}(B_{1t-1}/(N_{1t-1} * P_{jt-1})) + \mu_{12} XH_{1t-1} + \mu_{13} CLA_{1t} + \mu_{14} PROD_{1t} \\
& + \mu_{15} O_{j-1} + \mu_{21}(\bar{w}_t - p_t) + \mu_{22} UGT_{1t} + \mu_{23} u_{jt} + f_1^n + u_{1t}^n \\
& i=1, \dots, N \qquad t_1 = t_{10}, \dots, T_1
\end{aligned}$$

where u_{1t}^n is a serially uncorrelated error term and f_1^n , the firm employment specific effect, is assumed to be stationary.

* *Econometric methods and testing.*

Least squares on any of both equations will result in inconsistent estimates since there are, in every equation, variables potentially correlated either with the error term or the firm specific effect²⁵. Also, the error terms in [16] and [17] are potentially cross correlated since both might be the outcome of a joint maximization process (when a wage-employment efficiency bargaining framework holds) or, alternatively, both may be related by a common unexpected firm specific demand shock (ζ_{1t}) or by the same misspecification problem. The problem of correlation of some variables with the firm specific effects can be easily solved by differentiating the system. However, this induces serial correlation in the first differenced system, which invalidates variables dated $t-1$ as an instruments. In general, the first differences error terms will have the following structure:

$$[18] \quad \begin{cases} v_{1t}^w = \epsilon_{1t}^w - \epsilon_{1t-1}^w = u_{1t}^w - u_{1t-1}^w + \zeta_{1t} - \zeta_{1t-1} \\ v_{1t}^n = \epsilon_{1t}^n - \epsilon_{1t-1}^n = u_{1t}^n - u_{1t-1}^n + \zeta_{1t} - \zeta_{1t-1} \end{cases}$$

Under the assumption that ζ_{1t} , u_{1t}^w , u_{1t}^n are independent and serially uncorrelated error terms with finite variance, σ_ζ^2 , $\sigma_{u^w}^2$, $\sigma_{u^n}^2$, respectively, it is easy to show that,

²⁵In fact, almost all firm specific variables are treated as potentially endogenous.

$$[19] \text{cov}(v_{1t}^w, v_{1t}^n) = 2\text{cov}(u_{1t}^w, u_{1t}^n) = 2 \cdot \sigma_\zeta^2$$

$$\text{and hence } \text{corr}(v_{1t}^w, v_{1t}^n) = \text{corr}(u_{1t}^w, u_{1t}^n) = \rho_{wm}$$

Consequently all the variables dated $t-2$ and earlier are valid instruments for the first differenced equation. Consistent but not efficient estimates for each equation considered may be obtained by using the Arellano and Bond (A&B,1991) GMM-IV estimator based on the potential use of all the available orthogonality conditions. However, if there is any cross correlation between errors in the wage and employment equations as we can reasonably expect, efficient estimates may be obtained by means of a simultaneous equations GMM-IV method for panel data. Our approach, an extension of the A&B method for a single equation to a system of equation is close to the Holtz-Eakin, Newey and Rosen (1988) GLS-IV proposal.

We shall note that, since we are using an unbalanced panel of observations, these estimators imply a variable number of instruments for each cross-section because the available orthogonality conditions are increasing in time. The validity of such estimators rely strongly on the assumption that the error in levels is serially uncorrelated. Hence a test of such a hypothesis will be crucial. Under the null of no serial correlation in the error in levels, we expect to show first order serial correlation on the first difference errors but not any second order serial correlation. A simple test²⁶ of this assumption will always be provided. We shall also provide a Sargan test for overidentifying restrictions, which under the null hypothesis of all the instruments being valid is distributed as χ_m^2 , where m is the number of overidentifying restrictions as well as a test for the correlation of the error in levels in both equation, which under the null of absence of cross-correlation between the wage and the employment equation is distributed as an standard normal.

²⁶ See Arellano and Bond (1991) for a detailed description of the test.

IV. Empirical Results.

a. The common wage equation.

The common specifications for the manufacturing sector and the services are reported in Table I.a and II, respectively. The basic specification for both sectors is set in column (1). Column (2) and (3) show a specification similar to (1). Column (4), in both tables, contains a base wage specification. Finally, some extensions of the wage equation for the manufacturing sector can be found in Table I.b. The nominal variables neutrality restriction, $\pi+(1-\pi)[\lambda+(1-\lambda)]=1$ is well supported in the manufacturing equation¹. For the services, evidence is unclear, though it is not rejected².

The insider power³ is estimated to be higher in the manufacturing sector (all the estimates lying between 0.13 and 0.17) than in the services sector for which is set rather close to zero (around 0.01 in all the cases). This difference may be explained by the different value of knowledge in manufacturing and services. Employees in the services sector might not be able to capture productivity increases, at least as much as manufacturing employees do. Both findings are robust to the substitution of the set of aggregate variables by time dummies, and to the consideration of wage structure variables. Notice that our estimated range for manufacturing is over the upper bound for a previously estimated range from Spanish data, using industry level data, centered around 0.09 (Andrés and Garcia (1991)). It is slightly higher than a recent estimation (Dolado and Bentolila (1992), 0.10) using firm level data, and lower than the mean (0.184) of a set of industry estimations by Draper (1993). Thus, evidence about the insider power in the Spanish manufacturing sector implicitly suggests a negative aggregation bias when estimating it, because, on the one hand, the estimates using sector data are lower than when using firm data and, on the other

¹ The statistic is 0.21 with is distributed as a F(1,1156).

² The statistic in this case is F=0.18 which is distributed as a F(1,500).

³ The estimate for the insider power, $\hat{\lambda}$, is computed as follows:

$$\hat{\lambda} = \text{coef}((p+y-n)_1)/(1-\text{coef}(w_{1-1}))$$

hand, the estimates when looking to the whole manufacturing sector are lower than the mean of estimates for some manufacturing industries.

Wage dynamics are similar when considering the wage bill than when considering base wages (Table I.a.(4), 0.07) in the manufacturing sector. In both cases, the estimates are much lower than the recent estimate by Dolado and Bentolila (1992) which is set around 0.25. Our guess is that our coefficient for wage dynamics is underestimated due to a lack of valid instruments for the wage⁴. Both wage structure variables, the tenure-based one, (TEN/ ω), and the productivity-based one, PROD/ ω are significantly different from 0 (we reject the null hypothesis that both are additional payments) and -1 (we reject the null that the related payment has no incidence at all), being our estimates -0.15 (non-significant) and -0.47 (highly significant) in Table I.a(4), respectively. Consequently, we might conclude that, for the manufacturing sector, a flexible wage structure lowers base wage but increasing the total payroll. Patterns in the services sector are sensibly different. First, though wage dynamics is similar when considering the wage bill (Table II(1), 0.075), the pattern is quite different when considering base wage (Table II(4), 0.207). Second, we also reject the extreme hypothesis that coefficients are 0 for both variables, productivity payments and tenure payments, but while the productivity related payment has a coefficient between 0 and -1 (Table II(4), -0.27) and therefore it is increasing the total payroll; the coefficient of the tenure-related payments is significantly lower than minus one (Table II (4), -1.73). Consequently, tenure payments lower the base and the total payroll in services.

There are two sources of hysteresis in our specification; an insider one, Δn , and an outsider one, the proportion of long term (more than two years) unemployment over total unemployment, LTU. Both are expected to have a positive effect on wages, so both might be viewed as wage pressure variables. This is true for LTU in both

⁴For the subset of observations with T=3 we can only use a lag (T-2) of wage for instrumenting the wage variables in the differenced model.

manufacturing and services (around 0.15 and 0.10 respectively), but it is not true for the employment hysteresis, found negative in both cases (-0.042 -Table I.a(1)- and -0.077 -Table I.a(4)) in manufacturing and in the services sector (-0.12 -Table II(1)- and -0.034 -Table II(4)), although the estimated coefficient is not relevant for services. The result for manufacturing is consistent with those obtained by Andrés and García (1990) (there is no previous evidence for services) but not with the recent work by Dolado and Bentolilla (1992) where membership is not set to lagged employment but to lagged fixed-term employment, under the implicit assumption that only permanent employees are insiders. These last authors obtained a highly significant positive insider hysteresis effect, that is, a result in accord with theory. If only permanent employees should be considered insiders, the specification in column (1) should be considered inadequate. An immediate implication of such an inadequacy (if the assumption that only permanent employment is relevant holds) is that the coefficients of expected and past employment (membership) coefficients are, in general, different. The results of such a model are reported in column (3) of Table I.a and II, whose statistics are better than those in column (1). The past employment coefficient is estimated to be positive and significant in both manufacturing and services, 0.069 (Table I.a(3)) and 0.10 (Table II(3)), respectively, a fact that confronts theoretical predictions. Consequently, there is some evidence for supporting the rejection of past employment as a targeted employment level.

Real past profits per employee $((B/N)_{t-1})$ has been found, as expected, having a positive but small effect on wage levels for both sectors. However, the implicit elasticity is rather small, not higher than one per cent in neither case. The market power proxy (only for manufacturing) is found having a significantly negative effect over wage bill but positive on base wage. Likewise the case of profits, the implicit elasticity is rather small (less than a half per cent in all the cases). Evidence about the effect of effective annual working hours (regular hours less lost hours by conflict, absentism, etc...) is different for each of both sectors. Our finding for manufacturing is implying a wage premium of about a half for each additional

effective hour of work, as we could reasonably expect *a priori*. Alternatively, the effect for services is negligible through columns (1) to (3) and negative in column (4).

The unemployment variables used in the manufacturing wage specification, lagged unemployment rate and current industry unemployment rate (although this last variable may be proxying the specific industry demand) have been found significant and both have the expected negative coefficient. Thus unemployment seems to be a relevant factor in wage determination. Our finding (a range between -0.21 and -0.33) is closer to Andrés and García (1991) finding about unemployment effect on wages for the 1980-1986 period and lower than Dolado and Bentolila's (1992) finding for the 1985-1988 period, although in this last case the specification was rather different. For services, we use only current unemployment. The estimated coefficient may be set around -0.70, though in the base wage equation the estimate is sensibly lower (Table II(4) -0.20). Finally unexpected past inflation has been found, as expected, to have a positive effect on wage. This result is clear for manufacturing (around 0.025 in Table I.a) but not for services for which it is not found significantly different from zero.

Finally we'll comment the effect on wages of a set of variables directly related to the implicit bargaining process like the proportion of workers representatives that belongs to the UGT union, which is found to affect the wage negatively in both manufacturing and services (except for services in Table II(4) in which is found positive). That suggests that CCOO, the other main union, specially powerful in large firms, is putting more wage pressure than UGT on firm level negotiations. The ratio of the number of industry agreements over firm level agreements is a measure of concentration in bargaining. Although it is never found highly significant, it has been found consistently negative in both sectors. Thus it is implicitly implying a lower wage in sectors in which bargaining is mostly driven at industry level.

Several interesting conclusions may be deduced from strike variables (incidence and duration). On the one hand, for the manufacturing sector, the occurrence of an strike implies,

unconditionally, a small cut in gross wages (four per thousand) and a small increase in base wage⁵ (less than one per thousand). The conditional (to the occurrence of a strike) effects are of the same sign but larger in size (a cut of 2 per cent in gross wages and an increase of 1 per cent in base wage). On the other hand, for the services, work stoppages imply an small increase in both, gross and base wage. Being, naturally, the unconditional effect much more small in size (between one and two per thousand) than the conditional one (between three and one and a half per cent. Combining both pieces of evidence, it can be assessed that strike effect on wages it is, unconditionally, not very important in wage determination in Spain⁶, though, given the simplicity of the approach, assertions must be taken with extreme caution.

b. Extension for the manufacturing sector's wage equation: Insider effect by level of bargaining and System estimates.

As we have pointed out in section II in our sample firms negotiate either at firm level (about 80 percent in sample) or at industry-wide level (20 per cent). So, according with the centralization theory⁷, it is expected that the relevant insider parameters, λ (the nominal productivity coefficient) and α^* (the insider hysteresis coefficient) will be different for both kinds of bargaining. We expect insider power to be lower for firms that negotiate at industry level.

Table I.b. provides the basic set of results about differences in insider power by bargaining level. We report the same basic specification for all the sample (columns (1) a joint wage-employment estimation results); for all the sample but interacting the insider variables with a dummy which takes the value of 1 if the bargaining unit negotiates at industry level and 0 if the bargaining unit negotiates at firm level (column (2)); and finally, using the sample

⁵ Both have been computed in sample means.

⁶ Our result is similar to previous findings for the US and Canada, see Card (1990) for a review.

⁷ Which might be found in Layard et al (1991) and recently, in Jimeno (1992).

of firms which negotiates at firm level for the whole period (columns (5) and (6)). Note that we are excluding from this sample firms that changes, at least once, its bargaining level. Consequently, findings on this restricted subsample must be taken with a lot of caution due to the possibility of some kind of sample selection bias⁸.

Overall, we must point out the similarity between the results of estimation using all the sample (column (1) in Table I.a or I.b) and the results using the restricted subsample of firms that negotiate at firm level (column (3) or (4) of Table I.b), specially with respect to insider power estimation (in fact is estimated higher using all the sample, see Table V for a summary of findings). Notice the fact that the estimated correlation between the wage and employment equations is positive (as expected if both result from a joint maximization process) and also the fact that it is found higher when looking at the restricted sample estimates (0.18 compared with 0.10 in the whole manufacturing sample). There seems to be no significant difference between the effect of strike incidence (around 0.01 in all the cases) and strike duration (negative and significant in all the cases except in column (5) in which is found non relevant) on wages by bargaining level.

On the other hand, the results of interacting a bargaining level dummy with all the insider variables are quite different. Insider power is found to be lower (column (2)) in firms that negotiate at industry level (0.05) than in firms bargaining at firm level (a range of 0.15-0.19), as we a priori could expect. Note also the difference in the size of the insider hysteresis coefficient (considerably higher in absolute value for firms that negotiate at industry level). This might be explained by a different employment objective for firm and industry bargaining levels.

Figure V. A summary of insider's power.

⁸ Some exploratory results do not confirm such a possibility, though we must point out the difficulty of modeling bargaining level decision.

Sector	TABLE	GROUP OF FIRMS	(1)	(2)	(3)	(4)
Manufacturing	I.a.	ALL	0.13	--	0.16	0.12
	I.b.	ALL	0.13	--	--	--
		BARGAINERS FOLLOWERS	--	0.13	0.13	0.14
			--	0.05	--	--
Services	II	ALL	0.01	--	0.01	0.00

c. The Employment Equation.

The basic manufacturing and services employment equations are reported in Table III.a and Table IV, respectively. As we did for the wage equation, some extensions for the manufacturing sector are reported in Table III.b. In the common tables, there are two basic specifications, column (1) where we only consider the wage bill as a wage variable, and column (3) and (4) where the base wage is considered. The sample we use is exactly the same as that for the wage equation we described above. The basic set of instruments is the same for all the columns of both tables. However, columns (3) and (4) include more instruments than column (1), due to the consideration of wage's structure variables. Notice that all the equations reported in both tables pass the m_2 specification test, under the null that there is no second order serial correlation on the estimated first differences residuals.

Despite the simplicity of our employment equation specification, which does not include capital nor financial variables, the findings about employment dynamics are satisfactory, for they reflect the existence of strong employment adjustment costs. For the manufacturing sector we estimate a significant coefficient of 0.46 in our basic model. For services our basic estimate is 0.667. However, employment dynamics are estimated to be lower than alternative estimates in the manufacturing sector in the 1984-1988 period⁹.

⁹ For instance, in the recent work of Arrazola (1992) in a model with capital and financial factors it is reported a coefficient of 0.66 for manufacturing firms in good financial condition and 0.32 for firms in bad financial condition.

The wage variable has the expected negative coefficient in both cases, when using the wage bill (wb) and when using the base wage (w), the estimated coefficient being quite similar in both variables for manufacturing (-0.271 in (1) and -0.319 in (3), respectively), but not in services (-0.339 in (1) and -0.137 in (3)). Likewise, lagged wage is found negligible in manufacturing and positive in services. Firm variables have been found significant in manufacturing but not in services (except past overtime hours that have a significant positive effect on employment).

The effect of a cost of living allowance clause has been found negative for both manufacturing (-0.014 in (1)) and services (-0.008 also in (1)). This estimate corroborates our initial guess about the COLA clause's effect on employment. This estimate suggest that a COLA clause, that can be considered a deferred wage increase (although subject to a degree of uncertainty), lowers employment around one percent. Hence, in the Spanish case, where COLA clauses are signed very often in large firm agreements (mean 1985-90: 52%) and industry-wide agreements (mean 1985-90: 44%), we might conclude that revision clauses depress employment, though we should be cautious about the consistency of such a result¹⁰. On the other hand, the productivity clause (which normally targets an increase in productivity) has a different effect on manufacturing (negative) than in services (positive, although in some columns of Table IV is not significant).

Evidence about wage structure variables is ambiguous in both manufacturing and services. In manufacturing, we might reject the hypothesis that only the base wage is relevant in employment determination (Table III.a, column (3), Wald-test(df): 18.9(2)) but we should reject also the alternative that the base wage coefficient (-0.319) is equal to the tenure payments (0.01 , Table III.a(3)) and the productivity (-0.138 , Table III.a(3)) coefficients. In column (4), for both Tables, we report the best alternative specification considering a lag of tenure and productivity payments and the tax

¹⁰ There are several forms of COLA clause. Since we have no information about the COLA provisions, we opted for considering a dummy taking one if the clause is present, zero otherwise. Consequently, we should not generalize the estimated coefficient.

wedge, (current and lagged). The findings are basically the same¹¹. Notice that, for the manufacturing sector, we cannot reject that the tenure coefficient is zero. Hence, there is some evidence in favor of Weitzman's argument with respect to tenure payments, though we might be cautious not to use this result to do inference about the effect of tenure itself on employment.

In services, the null hypothesis that only base wage matters is not rejected (Table IV, column (3), Wald-test(df): 4.81(2)). In any case, we shall note that the observed pattern is opposite to the manufacturing pattern. On the one hand, the productivity payments coefficient is close to zero¹². On the other hand, the tenure payments coefficient has a strong negative coefficient in column (3), though there is no clear long run effect, as we can see when looking the results in column (4) which includes the lagged tenure payments. Therefore, our guess is that tenure matters more in the services sector than in the manufacturing sector and that productivity incentives are more important for manufacturing than for the services sector.

For the manufacturing sector, the consideration of the subsample of firms which negotiate at firm level (columns (3) and (4), for system estimates, in Table III.b) do not change abruptly the relevant findings in the employment equation. In any case, we mention that employment dynamics (0.396 in (3) and 0.336 in (4)) are lower than when estimating using all the available sample (0.439 in (1) and 0.426 in (2) of the same Table) and the current wage coefficient is higher in magnitude (-0.415 in (3) compared with -0.301 in (1), though long run effect is much more similar (-0.33 in (3) and -0.30 in (1)). Combining both pieces of evidence, it seems that employment is slightly more flexible in the sample of firms negotiating at firm

¹¹ We also tried using a more general definition of flexible wage structure. We used fix payments instead of tenure payments and variable payments instead of productivity payments. For the manufacturing sector, the results were similar in variable payments (around -0.20) and different in fix payments, which we found significantly negative (-0.04) with respect to those in Table III(3). For services we obtained close results in both fix payments (-0.177) and variable payments (-0.029) with respect to those for tenure and productivity in Table IV(3).

¹² This hypothesis might be not rejected in Table IV, column (3).

level than in the whole manufacturing sample, though there is little evidence to support it.

Apart of this, in this Table we have introduced a couple of additional variables. On the one hand, a dummy taking one if there was a work stoppage during negotiations ($Strike_i$). For that variable evidence is ambiguous. Whilst equation estimates are negligible (columns (1) and (3)), system estimates are significantly negative (columns (3) and (4)). However, the implicit elasticity is not very important (less than two per thousand unconditionally and six per thousand conditional to the occurrence of a strike). On the other hand, we also consider a variable which represents the degree of centralization of bargaining in the industry (afr_j). Whilst its effect is not significantly different from zero in the subsample of firms negotiating at firm level, is found negative in the whole sample (specially in column (2)). The findings suggest that firm's employment is less flexible when negotiating at industry level.

Our final comment concerns the bargaining structure test (See Table VI). It is not rejected for services and rejected for manufacturing. Hence, we do not reject the labour demand model (only bargaining over payroll) for the services and we reject it for the manufacturing sector. As a matter of fact, evidence for this last sector might be interpreted in favor of either a combined wage-employment bargaining or an efficiency wage model. The wage-employment framework, which is a reasonable bargaining assumption in large firms, is poorly determined. The reason is that we are using very few variables that should enter the wage equation and should not enter the employment equation if bargaining is only over wages (in fact in the common specification -Tables III.a and IV- we are only considering three variables: the aggregate wage, the industry unemployment level and the proportion of workers representatives that belongs to the UGT union). On the other hand, we have the efficiency wages model, which implies that the coefficient of the mean aggregate wage (in fact should be the alternative wage: $W_a = \bar{W}\{(1-u)+uB\}$) is equal (but opposite in sign) to the wage coefficient. This model is not rejected in our manufacturing employment equation. Note that this result suggests the insider-Outsider model is not an adequate

representation of the wage setting process in Spain. Therefore, there is an incentive to improve our specification, using more union objective function variables to discriminate between this two alternatives.

Figure VI. A summary of the Z_2' test (Tables III and IV).

Null: Labor demand Model.

Sector	REF.TABLE	Dist	(1)	(2)	(3)	(4)
Manufacturing	T.III.a	χ_3^2	18.00	--	20.86	12.66
	T.III.b [†]	χ_4^2	18.24	19.8	33.50	343.6
Services	T.IV	χ_3^2	11.29	--	7.63	3.29

[†] The variable afr_j is also considered in Z_2'

V. Summary of findings.

In this work we have analyzed wage setting and employment. We have formalized the wage-setting process using the Nickell and Wadhvani (1990) influential Insider-Outsider model and we also have assumed a simple labor-demand employment equation for testing purposes. Therefore, our initial assumption was that The Right to Manage model constitutes an adequate bargaining assumption for the Spanish case. Then, we have formulated some *ad hoc* extensions of this basic model. More in detail, we have formulated a base wage equation to show the effect of some special kind of payments, like tenure payment and productivity payments, on the base wage. We also have tested, using the employment equation, the validity of the Right to Manage assumption, although we must point out that the rejection of such a model should not be generalized to all the firms. Our guess is that such a result is only valid in a large firm context. We used an unbalanced panel of large firms in the 1984-1990 period (although only the 1986-1990 period had been used in estimation) to test such a extensions.

We have found an insider power range of 0.12 to 0.16, slightly higher than previous estimates for the whole manufacturing sector. Likewise, we have found a lower range from 0.01 to 0.02 for the services. Both results are consistent with the alternative base wage equation specification. Aggregate variables like unemployment rate and long unemployment proportion have been found relevant factors of the wage-setting process. Particularly important is the evidence about outsider hysteresis, which might be interpreted as an additional wage pressure determinant. Hence, any policy intended to reduce the long term unemployment proportion might be interpreted as a policy against wage pressure. We also confirm, at least partially, our initial guess that insider power is different between units that bargain at firm level and units that follow an industry-wide agreement. There is evidence to support the idea of different employment objectives in those two bargaining levels. There is also evidence supporting the idea of lower employment flexibility in firms bargaining at industry-level. Our suggestion for further research is

to discriminate the model for those two bargaining. The possibility of sample selection bias must be taken into account, though this requires to analyze in deep the determinants of the bargaining level decision, which it was out of the scope of our analysis.

The results about wage structure (tenure and productivity payments) variables suggest that those variables are relevant in the wage-setting process, that is, the gross wage does not suffice to explain wage determination. For the manufacturing sector we have found that tenure and productivity payments lower the base but increase the total payroll. Services are similar with respect to productivity payments but different with respect to tenure payments. We have found that this kind of payments lower the base wage and also the payroll. This finding suggests a higher value of tenure in services than in manufacturing, and more important, it also suggests that the group of employees that have long tenure periods in firms have higher bargaining power and, consequently, they might fix better pay conditions.

Flexible pay structures have, recently, captured the interest of policy makers, because it has been argued (Weitzman (1984, 1987) and Jackman (1988)) that the introduction of flexible a flexible pay structure may reduce unemployment. If that is the case, the government has a clear incentive to motivate, through tax incentives, the generalization of bonuses and other flexible pay schemes. The assertion relies crucially in the fact that employers look only at the base wage in setting employment, making the trade-off between employment and wages more favourable to the first. In our case, the crucial question (only the base wage is relevant in employment determination) has no clear answer, although our guess is that base wage is not the relevant marginal price of labour. For the manufacturing sector we have found that the productivity payment, our measure of flexible payment, is a relevant employment determinant. Consequently, the base wage should not be consider the relevant marginal price of labour for that sector. For the services we have found, in the basic equation, a positive answer to the above question, although the results must be taken with a lot of caution because the sample is, in this case, rather small. In any case, it

has been found that the base wage is more important for employment determination in services than in manufacturing. Undoubtedly there is a lot of room for improvement on this subject but we shall note that the results are better than we expected a priori.

The result about the COLA clause's effect on employment might be interpreted as a warning about the incidence of this clause in the wage-setting process, although the evidence about this might be taken with a lot of caution¹³. Our final point is about the bargaining framework test. We reject the alternative model, either a combined wage-employment framework or an efficiency wage model, for services and we do not reject it for manufacturing. In fact, there is some evidence in favor of both alternative models. We do not reject the alternative efficiency wage model, though the power of the test is very low, because we used very few time series observations (no more than five in estimation). An avenue to improvement would be to use more information to discriminate the alternative options. Our guess is that there is some implicit employment bargaining in manufacturing (notice that the correlation between the wage equation and the employment equation is sensibly higher in the subsample of firms that bargain at firm level), but any properly test on this negotiation framework requires more sophisticated specification.

¹³ If the firm is risk neutral the cola clause has, *ceteris paribus*, no incidence on employment. Alternatively, if the firms is risk averse and the union enforces a cola clause, it may have a negative effect on employment.

References.

Alba, A. (1989), "El comportamiento de los Salarios y el Empleo en la Negociación Colectiva en las Grandes Empresas en el periodo 1985-1987. Una Aproximación Cuantitativa" en *La Negociación Colectiva en las Grandes Empresas en 1988. Principales Características Económicas*. Ministerio de Economía y Hacienda, Madrid, chapter XIV, p. 185-207.

Alogoskoufis, G. and Manning, A. (1991), "Test of Alternative Wage Employment Bargaining Models with an Application to the U.K. aggregate Labor Market", *European Economic Review*, 35, 1991, pp.23-37.

Alonso, C. (1989), "Salarios de Eficiencia y Mercado de Trabajo: Analisis para el Caso Español con Datos de Panel", mimeo.

Anchuelo, A. (1989), "A Direct Test of the Efficiency Wage Hypothesis: The Spanish Case", mimeo.

Andrés, J., Dolado, J.J., Molinas, C. and Zabalza, A. (1990), "The Influence of Demand and Capital Constrains on Spanish Unemployment" in Dreze and Bean ed, *Europe Unemployment Problem*, MIT Press, London.

Andrés, J. and Garcia, J. (1991), "Wage Determination in the Spanish Industry", *Economic W.P. 4*, Universitat Pompeu Fabra.

Arellano, M. and Bond, S. (1991), "Some Test of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations", *Review of Economic Studies*, 58, pp.277-297.

_____ (1988), "Dynamic Panel Data Estimation using DPD - A Guide for Users", *Institut for Fiscal Studies, WP: 88/15*, London.

Arrazola, M. (1992), " Efectos de los Factores Financieros en el Empleo usando Datos de Empresas", DT 92-03, FEDEA, Madrid.

Barghava, S. and Jenkinson, T. (1992), "Explicit vs Implicit Profit Sharing and the Determination of Wages: Microeconomic Evidence from the U.K.", mimeo.

Bentolila, S. and Blanchard, O. (1990), "Spanish Unemployment", *Economic Policy*, 9, p.

Brown, J.N. and Ashenfelter, O. (1986), "Testing the Efficiency

of Employment Contracts" *Journal of Political Economy*, 94, May supp., s41-87.

Brunello, G and Wadhvani, S. (1989), "The determinants of wage flexibility in Japan: Some Lessons from a Comparison with the UK using Micro-data", *CLE*, WP 1116, LSE, London.

Card, D. (1990), "Strikes and Bargaining: A Survey of the Recent Empirical Literature", *AEA papers and proceedings, American Economic Review*, 80(2), May, p. 410-415.

Currie, J. and MacConell, S. (1992) " Firm Specific Determinants of the Real Wage", *Review of Economic Studies*, 59, pp.297-304.

Doiron, D. (1992), "Bargaining Power and Wage-Employment contracts in a unionized Industry", *International Economic Review*, 33, 3, pp 583-606.

Dolado, J.J., Malo de Molina, J. and Zabalza, A. (1986), "Spanish Industrial Unemployment: Some Explanatory Factors.", in C. Bean, R. Layard and S. Nickell, eds, *The Rise in Unemployment*, Basil Blackwell, London.

Dolado, J.J. and Bentolila, S. (1992) "Who are the Insiders?. Wage setting in Spanish Manufacturing firms", Banco de España, Servicio de Estudios, D.T. No 9229.

Draper, M. (1993) "Indiciación Salarial y Empleo: Un Análisis desagregado para el Caso Español", CEMFI, D.T. No 9305.

Hendricks, W. and Kahn, L. (1985) "Wage Indexation and Compensating Wage Differentials", *Review of Economics and Statistics*, 68, August, p.484-492.

Holmund, B. and Zetterberg, J. (1991), "Insider Effects in Wage Determination: Evidence from Five Countries", *European Economic Review*, 35, p. 1009-1034.

Holtz-Eakin, D. , Newey, W. and Rosen, H. (1988), "Estimating Vector Autoregressions with Panel Data", *Econometrica*, 56, p. 1371-1395.

Jackman, R. (1988), "Profit-Sharing in a Unionised Economy with Imperfect Competition", *International Journal of Industrial Organization*, (Special Issue), 6, p. 47-57.

Jiménez, S. (1992), "A Picture of Conflicting Activity in Spain in the 80's", Universitat Pompeu Fabra, mimeo.

_____ (1993), "The wage effect of an indexation clause: Evidence from Spanish Manufacturing firms" Universitat Pompeu Fabra, mimeo.

Jimeno, J.F. (1992), "Las implicaciones Económicas de la Negociación Colectiva: El Caso Español", Fundación de Estudios de Economía Aplicada, D.T. 92-08.

Layard, R. Nickell, S. and Jackman, R. (1991), *Unemployment: Macroeconomic Performance and the Labor Market*, Oxford University Press.

Lindbeck, A. and Snower, D.J. (1988), *The Insider-Outsider Theory of Employment and Unemployment*. MIT press. Cambridge (MA).

MacCurdy, T. and Pencavel, J. (1986), "Testing Between Competing Models of Wage and Employment Determination in Unionized Markets, *Journal of Political Economy*, 94, May supp, s3-40.

Manning, A. (1992), "Wage Bargaining and the Phillips Curve: The Identification and Specification of Aggregate Wage Equations". D.P. 62, Centre for Economic Performance, LSE, London.

Manning, A. (1987), " An integration of Trade Unions Model in a Sequential Bargaining Framework", *Economic Journal*, 97, pp.121-139.

Nickell, S. and Wadhvani, S. (1990), "Insider Forces and Wage determination", *The Economic Journal*, 100, p. 496-509.

Wadhvani, S. and Wall, M. (1990), "The effects of Profits Sharing on Employment, Wages, Stock Returns and Productivity: Evidence from micro-Data", *Economic Journal*, 100, p. 1-17.

Weitzman, M. (1984), *The Share Economy*. Harvard University Press. Cambridge. Ma.

_____ (1987), " Steady State Unemployment under Profits Sharing" *Economic Journal*, 97, pp.86-105.

_____, and Krueger, D. (1990), "Profits Sharing and Productivity" in Alan Blinder (ed.), *Paying for Productivity. A Look of the Evidence*. The Brookings Institutions, W.D.C.

Appendix. The Data Set.

The data used in this study comes from "La Negociación Colectiva en las Grandes Empresas" (NCGE), an annual survey about bargaining in Spanish large firms (more than 200 employees). Each survey provides information about the firms main results (sales, profits), employment structure and negotiation by bargaining unit so we have to take into account that a single firm may have several bargaining units. Unfortunately there are some problems that prevent us against using the bargaining unit information. First, much of the information is provided at firm level. Secondly, the number of bargaining units inside a firm often changes from year to year. And Thirdly, for avoiding the potential cross-correlation between bargaining units inside a given firm.

Despite the survey runs since 1978 we only have information for the period 1985-1990. Although it is not a typical panel data, we use some code information to extract an unbalanced panel of bargaining units. From the original sample, we have excluded firms which did not report information about some key variables such as wages, sales or employment. We restricted the analysis to those firms which were observed at least for three consecutive years, minimum required to study dynamics in panel data.

The industry data has been taken from several data sources. In what it follows, there is a brief description of the set of available data in each one of the two informational levels considered firm and industry.

▣Variables. Definition and main source.

-Firm variables. [Source:NCGE]

p+y: Gross sales.

WB: Gross wage bill.

n: Employment.

B: Gross profit.

mp: A proxy of the market power of the firm. (Added Value-Labor Cost)/Added Value.

eh: effective annual working hours (regular hours minus lost hours by conflict, absentism, etc...)
rh: annual regular hours agreement.
tax: firm's labor tax.
xh: extra hours as a ratio of gross hours (i.e. $e \cdot rh$)
 ω : Base wage.
PROD: Productivity payments.
TEN: Tenure Payments.
COLA: cost of living allowance clause (1 agreed; 0 otherwise).
PROC: Productivity Clause (1 agreed; 0 otherwise).
UGT: % workers council representatives that belongs to the UGT union.
BL: Bargaining Level Dummy. (1 if bargaining takes place at aggregate level -without any explicit improvement-, 0 otherwise).
PWW: Per cent of of firm's white collar workers.
 S_1 : 1 if there was a strike in negotiation, 0 otherwise.
dur_ S_1 : Length of S_1

-Other variables.

u: National unemployment ratio. Source: (EPA).
LTU: National long unemployment ratio (more than two years).
Source:EPA.
 u_j : Industry unemployment ratio (44 industries). Source:EPA.
 O_j : Industry output (100=1972). Source: BE.
 P_j : Industry price Index (100=1976).Source:BE.
W: National wage level.Source: ES.
 W_j : Industry wage level (1 digit level). Source: ES.
 S_j : Working days lost per man at the industry j.(Source: BEL).
 E_j : Employment in the j industry (44 industries). Source:EPA.
P: Inflation index (1983=100). Source:BE.
 afr_j : # agreements at industry level by # agreements at firm level

Data sources:

-Banco de España. Boletín de Estadística (BE).
-Ministerio de Economía y Hacienda. La Negociación colectiva en las grandes empresas en... (NCGE). 1985 to 1990.
-Ministerio de Trabajo:
Boletín de Estadísticas Laborales (BEL).
Estadística de Convenios Colectivos (ECC). Recording Tape. 1981-1990.
Estadística de Huelgas (EH). Recording Tape. 1986-1990.
-Instituto Nacional de Estadística.
Encuesta de Población Activa (EPA).
Encuesta de Salarios (ES).

Some descriptive statistics.

a. Employment wages and sales by year and broad industry.

a1. Manufacturing.

	N	EMP.	BASE ¹² WAGE	WAGE ¹²	SALES ²
1985	190	1438	1.21	2.14	25812,2
1986	276	1459	1.31	2.33	22009,9
1987	339	1308	1.43	2.51	21198,0
1988	375	1245	1.52	2.67	22375,2
1989	375	1243	1.68	2.93	25526,8
1990	273	1367	1.87	3.24	32234,1

a2. Services.

	N	EMP.	BASE ¹² WAGE	WAGE ¹²	SALES ²
1985	62	2636	1.60	2.58	46283,2
1986	133	2408	1.72	2.81	28467,8
1987	154	2210	1.81	2.97	41702,3
1988	171	2275	1.91	3.14	50949,1
1989	171	2357	2.06	3.44	57745,1
1990	127	2906	2.20	3.68	64979,9

1. Wage bill per employee.

2. 10⁶ pesetas.

b. Other useful statistics.

b.1. Manufacturing. 1985..1990.

WAGE BY BARGAINING LEVEL	#	emp	wage	%prod	%ten	%tax	%cla	%proc
Follow a sector agreement	424	533	2.09	9.80	3.72	30.8	41.1	21.2
Bargaining at firm level	1518	1693	2.79	8.41	4.34	29.2	54.0	25.8
All	1942	1440	2.64	8.71	4.20	29.5	51.2	24.8

b.2. Services. 1985..1990.

WAGE BY BARGAINING LEVEL	#	emp	wage	%PROD	%ten	%tax	%cla	%proc
Follow a sector agreement	286	1677	3.11	4.12	5.71	25.2	41.4	27.3
Bargaining at firm level	574	2963	3.16	5.06	6.13	25.6	59.4	28.2
All	860	2535	3.15	4.75	6.00	25.4	53.4	27.9

Table I.a. Manufacturing wage equations.

Dependent Variable	WB (1) coef. (t-stat)	WB (2) coef. (t-stat)	WB (3) coef. (t-stat)	ω (4) coef. (t-stat)
Constant	-0.017 (2.24)	-0.012 (1.19)	-0.009 (0.99)	-0.014 (1.27)
wb_{1-1}	0.074 (3.20)	0.071 (3.09)	0.082 (3.57)	-----
ω_{-1}	-----	-----	-----	0.07 (6.34)
$(p+y-n)_1$	0.137 (6.09)	0.138 (5.83)	0.163 (5.93)	0.125 (5.43)
$(B/N)_{1-1}$	0.024 (0.53)	0.032 (0.70)	0.138 (1.85)	0.083 (1.27)
mp_1	-0.002 (2.48)	-0.0018 (2.17)	-0.002 (2.31)	0.005 (3.85)
Δn_1	-0.042 (2.71)	-0.043 (2.81)	-----	-0.077 (4.15)
n_1	-----	-----	0.015 (0.50)	-----
n_{1-1}	-----	-----	0.069 (2.55)	-----
Strike ₁	-0.042 (2.71)	-0.021 (1.80)	-0.024 (1.84)	-0.006 (0.55)
S_dur ₁	0.009 (3.41)	0.008 (3.22)	0.013 (4.75)	0.007 (4.01)
eh ₁	0.506 (9.67)	0.489 (9.39)	0.509 (8.33)	0.662 (12.7)
$(TEN/\omega)_1$	-----	-----	-----	-0.151 (1.51)
$(PROD/\omega)_1$	-----	-----	-----	-0.475 (13.6)
UGT ₁	-0.114 (4.56)	-0.115 (4.58)	-0.157 (4.48)	-0.134 (5.03)
W_m	0.852 ^c	-----	0.823 ^c	0.867 ^c
u_{-1}	-0.212 (3.00)	-----	-0.233 (2.99)	-0.333 (5.65)
LTU	0.14 (3.90)	-----	0.164 (4.18)	0.196 (5.77)
u_j	-0.083 (2.60)	-0.091 (2.45)	-0.065 (1.82)	-0.136 (4.53)
$\Delta^2 P_{-1}$	0.024 (3.96)	-----	0.029 (4.20)	0.031 (5.50)
afr _j	-0.231 (2.00)	-0.212 (1.85)	-0.059 (0.43)	-0.118 (0.96)
Wald Test	321.3	271.0	336.2	926.6
Sargan (DF)	80.0 (84)	79.4 (84)	67.8 (83)	90.2 (100)
m_1	-3.49	-3.46	-4.09	-1.43
m_2	1.45	1.44	1.42	0.32
ρ_{v_H, v_e}	--	--	--	--
time dum.	No	Yes	No	No
Ind. dum.	Yes	Yes	Yes	Yes

c: constrained.

INSTRUMENTS SET: $wb_{1t-2}, \dots, wb_{10t-2}, n_{1t-2}, \dots, n_{10t-2}, (p+y-n)_{1t-2}, \dots, (p+y-n)_{t-4}$
 $(B/N)_{1t-2}, \dots, (B/N)_{t-4}, S_{1t-2}, S_{1t-3}, pm_{1-2}, pm_{1-3}, eh_{1t-2}, \dots, eh_{t-4}, UGT_{1t-2},$
 $PWH_{1t-2}, H_{jt-2}, S_{jt-2}$ and all the exogenous variables.

Table I.b. Further manufacturing wage equations.

SAMPLE	ALL		firms bargaining at firm level(249)	
	FIML-IV (1) coef. (t-stat)	LIML-IV (2) coef. (t-stat)	LIML-IV (3) coef. (t-stat)	FIML-IV (4) coef. (t-stat)
Constant	-0.015 (2.51)	-0.006 (0.94)	0.0079 (1.79)	0.0129 (5.36)
wb_{1-1}	0.070 (4.27)	0.086 (3.43)	0.108 (5.01)	0.078 (8.27)
$(p+y-n)_1$	0.160 (11.72)	0.122 (4.93)	0.120 (6.07)	0.134 (17.4)
$(B/N)_{1-1}$	0.024 (2.45)	-0.0006 (0.013)	0.052 (1.63)	0.092 (6.39)
mp_1	-0.002 (4.02)	-0.001 (1.06)	-0.001 (1.43)	-0.002 (8.93)
Δn_1	-0.062 (6.67)	-0.019 (1.43)	-0.055 (5.89)	-0.068 (17.9)
$BL*w_{-1}$	----	-0.093 (2.35)	----	----
$BL*(p+y-n)_1$	----	-0.069 (1.34)	----	----
$BL*mp_1$	----	-0.007 (1.73)	----	----
$BL*\Delta n_1$	----	-0.140 (2.09)	----	----
Strike ₁	-0.022 (1.91)	-0.036 (4.11)	0.001 (0.12)	-0.024 (6.14)
Strike_dur ₁	0.011 (7.37)	0.013 (6.21)	0.010 (5.42)	0.011 (12.9)
eh ₁	0.478 (13.4)	0.312 (5.73)	0.504 (16.6)	0.536 (50.2)
UGT ₁	-0.132 (7.45)	-0.050 (2.44)	-0.086 (4.41)	-0.110 (16.5)
W_m	0.827 ^c	0.866 ^c	0.866 ^c	0.855 ^c
$BL*W_m$	----	0.946 ^c	----	----
u_{-1}	-0.237 (4.73)	-0.141 (2.21)	-0.221 (3.30)	-0.215 (9.05)
LTU	0.153 (5.70)	0.128 (3.73)	0.142 (4.30)	0.144 (12.1)
u_j	-0.068 (2.91)	-0.086 (3.04)	-0.038 (2.23)	-0.033 (3.26)
$\Delta^2 P_{-1}$	0.027 (5.85)	0.018 (3.39)	0.031 (5.33)	0.034 (13.0)
afr_j	-0.085 (0.97)	-0.137 (1.73)	0.182 (2.20)	0.200 (4.98)
Wald Test	1057.6	269.6	1219.9	11802.1
Sargan(DF)	144.9(162)	93(105)	85.1(84)	161.2(162)
m_1	-3.07	-3.25	-2.02	-2.55
m_2	1.32	1.72	1.04	0.85
ρ_{v_w, v_e}	0.109 [†]	----	----	0.183 [‡]
Test BL*I (df)	----	16.6(4)	----	----

Instrument set: same as Table I.a. All the columns consider time dummies.

c:constrained. †:Jointly estimated with Table III.b(2).

‡:Jointly estimated with Table III.b(2).

Table II. Services wage equations. 172 firms.

Dependent variable	WB (1) coef. (t-stat)	WB (2) coef. (t-stat)	WB (3) coef. (t-stat)	ω (4) coef. (t-stat)
Constant	-0.04 (4.39)	-0.020 (1.73)	-0.035 (3.70)	-0.013 (1.37)
wb_{1-1}	0.075 (1.80)	0.080 (1.93)	0.078 (1.84)	-----
ω_{1-1}	-----	-----	-----	0.207 (6.68)
$(p+y-n)_1$	0.008 (2.08)	0.011 (2.83)	0.009 (2.50)	0.002 (0.95)
$(B/N)_{1-1}$	0.001 (2.49)	0.001 (2.83)	0.001 (2.46)	-0.0001 (0.58)
Δn_1	-0.12 (1.83)	-0.087 (1.26)	-----	-0.034 (0.56)
n_1	-----	-----	-0.176 (3.47)	-----
n_{1-1}	-----	-----	0.010 (1.49)	-----
eh_1	0.17 (1.20)	0.05 (0.32)	0.18 (1.22)	-0.35 (2.24)
$(TEN/\omega)_1$	-----	-----	-----	-1.73 (8.30)
$(PROD/\omega)_1$	-----	-----	-----	-0.27 (4.32)
Strike ₁	0.028 (2.14)	0.033 (2.90)	0.028 (2.15)	0.029 (2.60)
dur_S ₁	-0.001 (0.20)	-0.008 (1.18)	-0.001 (0.20)	-0.01 (1.81)
UGT ₁	-0.017 (0.54)	-0.034 (1.16)	-0.028 (0.90)	0.061 (2.84)
W_{\square}	0.99 ^c	-----	0.99 ^c	1.00 ^c
u	-0.735 (5.78)	-----	-0.72 (5.60)	-0.20 (1.56)
LTU	0.113 (4.67)	-----	0.098 (3.83)	0.047 (1.72)
$\Delta^2 P_{-1}$	-0.01 (1.27)	-----	-0.01 (0.95)	0.003 (0.45)
afr _j	-0.074 (1.12)	-0.030 (0.51)	-0.090 (1.36)	-0.133 (1.87)
Joint Sign.	130.2	22.02	142.7	363.2
Sargan(df)	45.2(66)	58.5(66)	48.7(65)	65.5(81)
m_1	-2.11	-2.34	-2.16	-2.86
m_2	1.05	1.04	1.09	-1.29
time dum.	No	Yes	No	No
Ind. dum.	Yes	Yes	Yes	Yes

INSTRUMENTS SET: Same as Table I but using rh instead of eh.

Table III.a. Manufacturing employment equations.

variable	(1) coef. (t-stat)	(2) coef. (t-stat)	(3) coef. (t-stat)	(4) coef. (t-stat)
Constant	-0.030 (2.88)	0.005 (0.51)	-0.023 (2.39)	-0.015 (1.72)
e_{-1}	0.460 (17.5)	0.484 (21.0)	0.409 (17.7)	0.423 (19.2)
$(p+y)_{i-p_j}$	0.070 (1.97)	0.110 (3.40)	0.082 (2.34)	0.057 (1.73)
$(B/NP_j)_{i-1}$	0.619 (9.14)	0.208 (11.7)	0.570 (8.72)	0.591 (9.53)
wb_{i-p_j}	-0.271 (2.64)	-0.147 (3.10)	-----	-----
$wb_{i-1-p_{j-1}}$	0.027 (1.03)	0.033 (1.76)	-----	-----
ω_{i-p_j}	-----	-----	-0.319 (4.59)	-0.272 (4.28)
$\omega_{i-1-p_{j-1}}$	-----	-----	0.006 (0.40)	0.004 (0.27)
$(TEN/\omega)_i$	-----	-----	0.013 (1.23)	-----
$(TEN/\omega)_{i-1}$	-----	-----	-----	0.015 (1.36)
$(PROD/\omega)_i$	-----	-----	-0.138 (3.41)	-0.086 (2.15)
tax_i	-----	-----	-----	0.145 (1.69)
xh_{i-1}	-0.16 (0.63)	-0.210 (1.00)	-0.218 (0.91)	-0.205 (0.97)
$COLA_i$	-0.014 (2.74)	-0.015 (3.11)	-0.015 (3.11)	-0.014 (2.94)
$prodc_i$	-0.020 (3.70)	-0.020 (3.70)	-0.019 (4.00)	-0.021 (4.33)
UGT_i	0.110 (2.91)	0.076 (2.22)	0.098 (2.67)	0.091 (2.56)
O_j	0.048 (1.06)	0.100 (1.00)	0.056 (1.37)	0.024 (0.61)
w_m	0.241 (3.13)	-----	0.387 (3.61)	0.205 (3.57)
u_j	-0.026 (1.07)	-0.037 (1.08)	-0.024 (0.93)	-0.021 (0.86)
Wald test	673.3	932.6	738.1	806.9
Time dum.	No	Yes	No	No
Ind. dum.	Yes	Yes	Yes	Yes
Sargan(df)	54.2(65)	49.8(65)	67.2(81)	82.0(89)
m_1	-2.835	-2.781	-2.944	-2.869
m_2	0.085	0.054	-0.108	-0.072
Test $Z_2'(df)$	18.00(3)	-----	20.86(3)	12.66(3)

INSTRUMENTS SET: (1) to (2): $wb_{it-2}, \dots, wb_{i0}; n_{it-2}, \dots, n_{i0}; (p+yn)_{it-2}, \dots, (p+y-n)_{t-4}, (B/N)_{it-2}, \dots, (B/N)_{t-4}, xh_{it-2}, \dots, xh_{t-4}, UGT_{it-2}, PW_{it-2}, w_{jt-2}, S_{jt-2}$ and all the exogenous variables. (4): Same set as above but using ω instead of wb ; add $(TEN/\omega)_{it-2}, (TEN/\omega)_{it-3}, (PROD/\omega)_{it-2}, (PROD/\omega)_{it-3}$.

Table III.b. Further Manufacturing employment equations.

SAMPLE	all the sample 375 firms		firms bargaining at firm level(272)	
	LIML-IV (1) coef. (t-stat)	FIML-IV (2) coef. (t-stat)	LIML-IV (3) coef. (t-stat)	FIML-IV (4) coef. (t-stat)
Constant	-0.026 (2.07)	-0.003 (0.36)	-0.006 (0.73)	0.017 (4.84)
e_{i-1}	0.439 (21.7)	0.426 (32.6)	0.396 (15.2)	0.338 (32.1)
$(p+y)_{i-p_j}$	0.038 (0.95)	-0.068 (2.47)	-0.047 (1.10)	-0.179 (8.00)
$(B/NP_j)_{i-1}$	0.577 (7.48)	0.712 (15.6)	0.489 (6.27)	0.559 (17.9)
mp_i	0.0009 (1.31)	-0.0001 (0.27)	0.0001 (0.04)	0.0022 (4.80)
wb_{i-p_j}	-0.301 (4.11)	-0.288 (6.99)	-0.415 (4.74)	-0.446 (17.7)
wb_{i-1-p_j}	0.013 (0.48)	-0.01 (0.42)	0.083 (2.27)	0.114 (6.51)
xh_{i-1}	-0.035 (0.11)	-0.632 (3.28)	-0.400 (1.03)	-1.446 (15.1)
$COLA_i$	-0.010 (1.75)	-0.012 (2.97)	-0.016 (2.03)	-0.037 (11.0)
$prodc_i$	-0.022 (4.31)	-0.03 (7.88)	-0.040 (4.87)	-0.056 (12.4)
UGT_i	0.060 (1.65)	0.061 (2.38)	0.281 (5.06)	0.404 (7.71)
$Strike_i$	-0.004 (0.12)	-0.007 (3.96)	-0.0002 (0.07)	-0.006 (4.72)
W_m	0.420 (3.51)	0.229 (2.93)	0.488 (3.56)	0.452 (7.71)
u_j	-0.056 (1.94)	-0.026 (1.28)	-0.023 (0.76)	-0.012 (1.04)
afr_j	-0.082 (1.46)	-0.111 (2.50)	-0.049 (0.61)	-0.038 (1.01)
O_j	-0.082 (1.46)	0.035 (1.01)	-0.001 (0.02)	0.046 (2.06)
Wald Test	959.7	2715.8	1488.3	9789.9
Sargan(DF)	57.0(78)	144.9(162)	57.4(78)	161.2(162)
m_1	-2.88	-2.69	-2.46	-2.52
m_2	0.07	0.08	0.03	0.13
ρ_{v_u, v_e}	----	0.11 [†]	----	0.183 [‡]
Test $\mu_2^2=0(df)$	18.24(4)	19.8(4)	33.5(4)	343.6(4)
time dum.	No	No	No	No
Ind. dum.	Yes	Yes	Yes	Yes

†: Estimated jointly with Table I.b (1).

‡: Estimated jointly with Table I.c (4).

Table IV. Services employment equations.

variable	(1) coef. (t-stat)	(2) coef. (t-stat)	(3) coef. (t-stat)	(4) coef. (t-stat)
Constant	0.009 (1.99)	0.019 (3.18)	0.019 (4.79)	0.001 (2.65)
e_{-1}	0.697 (17.4)	0.731 (17.5)	0.668 (20.7)	0.694 (24.8)
$(p+y)_{1-p_j}$	-0.010 (1.15)	-0.010 (0.97)	-0.001 (0.14)	0.0001 (0.02)
$(B/NP_j)_{1-1}$	-0.027 (1.70)	-0.036 (2.04)	-0.035 (3.01)	-0.027 (2.42)
wb_{1-p_j}	-0.339 (7.02)	-0.290 (5.16)	-----	-----
$wb_{1-1-p_{j-1}}$	0.111 (2.72)	0.118 (2.51)	-----	-----
ω_{1-p_j}	-----	-----	-0.137 (4.14)	-0.139 (6.23)
$\omega_{1-1-p_{j-1}}$	-----	-----	0.156 (8.33)	0.169 (10.6)
$(TEN/\omega)_1$	-----	-----	-0.263 (1.61)	-----
$\Delta(TEN/\omega)_1$	-----	-----	-----	-0.586 (7.37)
$(PROD/\omega)_1$	-----	-----	-0.029 (1.70)	-0.026 (1.57)
Δtax_1	-----	-----	-----	-0.126 (6.74)
xh_{1-1}	0.102 (2.47)	0.122 (2.89)	0.087 (3.26)	0.060 (2.04)
$COLA_1$	-0.008 (1.87)	-0.009 (1.88)	-0.008 (2.54)	-0.009 (3.44)
$prodc_1$	0.002 (0.63)	0.002 (0.51)	0.005 (1.88)	-0.0002 (0.72)
UGT_1	-0.02 (1.26)	-0.01 (1.00)	-0.01 (0.86)	-0.007 (0.50)
w_m	-0.054 (0.48)	-----	0.093 (1.27)	0.010 (0.14)
u_j	-0.047 (2.07)	-0.031 (1.18)	-0.037 (2.34)	-0.074 (4.97)
Wald test	603.9	476.0	1234.6	1996.1
Time dum.	No	No	No	No
Ind. dum.	Yes	Yes	Yes	Yes
Sargan(df)	50.6(65)	52.0(63)	77.6(81)	79.9(89)
m_1	-2.848	-3.106	-2.684	-3.054
m_2	0.441	0.152	0.113	0.777
Test Z_2^1 (df)	11.29(3)	3.61(3)	7.63(3)	3.29(3)

INSTRUMENTS SET: See Table III.a.

RECENT WORKING PAPERS

1. Albert Marcet and Ramon Marimon
Communication, Commitment and Growth. (June 1991)
[Published in *Journal of Economic Theory* Vol. 58, no. 2, (December 1992)]
2. Antoni Bosch
Economies of Scale, Location, Age and Sex Discrimination in Household Demand. (June 1991)
[Published in *European Economic Review* 35, (1991) 1589-1595]
3. Albert Satorra
Asymptotic Robust Inferences in the Analysis of Mean and Covariance Structures. (June 1991)
[Published in *Sociological Methodology* (1992), pp. 249-278, P.V. Marsden Edt. Basil Blackwell: Oxford & Cambridge, MA]
4. Javier Andrés and Jaume Garcia
Wage Determination in the Spanish Industry. (June 1991)
[Published as "Factores determinantes de los salarios: evidencia para la industria española" in J.J. Dolado et al. (eds.) *La industria y el comportamiento de las empresas españolas (Ensayos en homenaje a Gonzalo Mato)*, Chapter 6, pp. 171-196, Alianza Economía]
5. Albert Marcet
Solving Non-Linear Stochastic Models by Parameterizing Expectations: An Application to Asset Pricing with Production. (July 1991)
6. Albert Marcet
Simulation Analysis of Dynamic Stochastic Models: Applications to Theory and Estimation. (November 1991), 2d. version (March 1993)
[Forthcoming in *Advances in Econometrics* invited symposia of the Sixth World Congress of the Econometric Society (Eds. JJ. Laffont i C.A. Sims). Cambridge University Press]
7. Xavier Calsamiglia and Alan Kirman
A Unique Informationally Efficient and Decentralized Mechanism with Fair Outcomes. (November 1991)
[Forthcoming in *Econometrica*]
8. Albert Satorra
The Variance Matrix of Sample Second-order Moments in Multivariate Linear Relations. (January 1992)
[Published in *Statistics & Probability Letters* Vol. 15, no. 1, (1992), pp. 63-69]
9. Teresa Garcia-Milà and Therese J. McGuire
Industrial Mix as a Factor in the Growth and Variability of States' Economies. (January 1992)
[Forthcoming in *Regional Science and Urban Economics*]
10. Walter Garcia-Fontes and Hugo Hopenhayn
Entry Restrictions and the Determination of Quality. (February 1992)

11. Guillem López and Adam Robert Wagstaff
Indicadores de Eficiencia en el Sector Hospitalario. (March 1992)
[Published in *Moneda y Crédito* Vol. 196]

12. Daniel Serra and Charles ReVelle
The PQ-Median Problem: Location and Districting of Hierarchical Facilities. Part I (April 1992)
[Published in *Location Science*, Vol. 1, no. 1 (1993)]

13. Daniel Serra and Charles ReVelle
The PQ-Median Problem: Location and Districting of Hierarchical Facilities. Part II: Heuristic Solution Methods. (April 1992)
[Forthcoming in *Location Science*]

14. Juan Pablo Nicolini
Ruling out Speculative Hyperinflations: a Game Theoretic Approach. (April 1992)

15. Albert Marcet and Thomas J. Sargent
Speed of Convergence of Recursive Least Squares Learning with ARMA Perceptions. (May 1992)
[Forthcoming in *Learning and Rationality in Economics*]

16. Albert Satorra
Multi-Sample Analysis of Moment-Structures: Asymptotic Validity of Inferences Based on Second-Order Moments. (June 1992)
[Forthcoming in *Statistical Modelling and Latent Variables* Elsevier, North Holland. K.Haagen, D.J.Bartholomew and M. Deistler (eds.)]

- Special issue Vernon L. Smith
Experimental Methods in Economics. (June 1992)

17. Albert Marcet and David A. Marshall
Convergence of Approximate Model Solutions to Rational Expectation Equilibria Using the Method of Parameterized Expectations.

18. M. Antònia Monés, Rafael Salas and Eva Ventura
Consumption, Real after Tax Interest Rates and Income Innovations. A Panel Data Analysis. (December 1992)

19. Hugo A. Hopenhayn and Ingrid M. Werner
Information, Liquidity and Asset Trading in a Random Matching Game. (February 1993)

20. Daniel Serra
The Coherent Covering Location Problem. (February 1993)

21. Ramon Marimon, Stephen E. Spear and Shyam Sunder
Expectationally-driven Market Volatility: An Experimental Study. (March 1993)
[Forthcoming in *Journal of Economic Theory*]

22. Giorgia Giovannetti, Albert Marcet and Ramon Marimon
Growth, Capital Flows and Enforcement Constraints: The Case of Africa.
(March 1993)
[Published in *European Economic Review* 37, pp. 418-425 (1993)]
23. Ramon Marimon
Adaptive Learning, Evolutionary Dynamics and Equilibrium Selection in
Games. (March 1993)
[Published in *European Economic Review* 37 (1993)]
24. Ramon Marimon and Ellen McGrattan
On Adaptive Learning in Strategic Games. (March 1993)
[Forthcoming in A. Kirman and M. Salmon eds. "Learning and Rationality in
Economics" Basil Blackwell]
25. Ramon Marimon and Shyam Sunder
Indeterminacy of Equilibria in a Hyperinflationary World: Experimental
Evidence. (March 1993)
[Forthcoming in *Econometrica*]
26. Jaume Garcia and José M. Labeaga
A Cross-Section Model with Zeros: an Application to the Demand for
Tobacco. (March 1993)
27. Xavier Freixas
Short Term Credit Versus Account Receivable Financing. (March 1993)
28. Massimo Motta and George Norman
Does Economic Integration cause Foreign Direct Investment?
(March 1993)
[Published in *Working Paper University of Edinburgh* 1993:1]
29. Jeffrey Prisbrey
An Experimental Analysis of Two-Person Reciprocity Games.
(February 1993)
[Published in *Social Science Working Paper* 787 (November 1992)]
30. Hugo A. Hopenhayn and Maria E. Muniagurria
Policy Variability and Economic Growth. (February 1993)
31. Eva Ventura Colera
A Note on Measurement Error and Euler Equations: an Alternative to
Log-Linear Approximations. (March 1993)
32. Rafael Crespi i Cladera
Protecciones Anti-Opa y Concentración de la Propiedad: el Poder de Voto.
(March 1993)
33. Hugo A. Hopenhayn
The Shakeout. (April 1993)

34. Walter Garcia-Fontes
Price Competition in Segmented Industries. (April 1993)
35. Albert Satorra i Brucart
On the Asymptotic Optimality of Alternative Minimum-Distance Estimators in Linear Latent-Variable Models. (February 1993)
36. Teresa Garcia-Milà, Therese J. McGuire and Robert H. Porter
The Effect of Public Capital in State-Level Production Functions Reconsidered. (February 1993)
37. Ramon Marimon and Shyam Sunder
Expectations and Learning Under Alternative Monetary Regimes: an Experimental Approach. (May 1993)
38. José M. Labeaga and Angel López
Tax Simulations for Spain with a Flexible Demand System. (May 1993)
39. Daniel Serra and Charles ReVelle
Market Capture by Two Competitors: The Pre-Emptive Location Problem. (May 1993)
[Forthcoming in *Journal of Regional Science*]
40. Xavier Cuadras-Morató
Commodity Money in the Presence of Goods of Heterogenous Quality. (July 1993)
[Published in *Economic Theory* 4 (1994)]
41. M. Antònia Monés and Eva Ventura
Saving Decisions and Fiscal Incentives: A Spanish Panel Based Analysis. (July 1993)
42. Wouter J. den Haan and Albert Marcet
Accuracy in Simulations. (September 1993)
[Forthcoming in *Review of Economic Studies*]
43. Jordi Galí
Local Externalities, Convex Adjustment Costs and Sunspot Equilibria. (September 1993)
[Forthcoming in *Journal of Economic Theory*]
44. Jordi Galí
Monopolistic Competition, Endogenous Markups, and Growth. (September 1993)
[Forthcoming in *European Economic Review*]
45. Jordi Galí
Monopolistic Competition, Business Cycles, and the Composition of Aggregate Demand. (October 1993)
[Forthcoming in *Journal of Economic Theory*]

46. Oriol Amat
The Relationship between Tax Regulations and Financial Accounting: a Comparison of Germany, Spain and the United Kingdom. (November 1993)
[Forthcoming in *European Management Journal*]
47. Diego Rodríguez and Dimitri Vayanos
Decentralization and the Management of Competition. (November 1993)
48. Diego Rodríguez and Thomas M. Stoker
A Regression Test of Semiparametric Index Model Specification. (November 1993)
49. Oriol Amat and John Blake
Control of the Costs of Quality Management: a Review of Current Practice in Spain. (November 1993)
50. Jeffrey E. Prisbrey
A Bounded Rationality, Evolutionary Model for Behavior in Two Person Reciprocity Games. (November 1993)
51. Lisa Beth Tilis
Economic Applications of Genetic Algorithms as a Markov Process. (November 1993)
52. Ángel López
The Command for Private Transport in Spain: A Microeconomic Approach. (December 1993)
53. Ángel López
An Assessment of the Encuesta Continua de Presupuestos Familiares (1985-89) as a Source of Information for Applied Research. (December 1993)
54. Antonio Cabrales
Stochastic Replicator Dynamics. (December 1993)
55. Antonio Cabrales and Takeo Hoshi
Heterogeneous Beliefs, Wealth Accumulation, and Asset Price Dynamics. (February 1993, Revised: June 1993)
56. Juan Pablo Nicolini
More on the Time Inconsistency of Optimal Monetary Policy. (November 1993)
57. Lisa B. Tilis
Income Distribution and Growth: A Re-examination. (December 1993)
58. José María Marín Viguera and Shinichi Suda
A Model of Financial Markets with Default and The Role of "Ex-ante" Redundant Assets. (January 1994)
59. Angel de la Fuente and José María Marín Viguera
Innovation, "Bank" Monitoring and Endogenous Financial Development. (January 1994)

60. Jordi Galí
Expectations-Driven Spatial Fluctuations. (January 1994)
61. Josep M. Argilés
Survey on Commercial and Economic Collaboration Between Companies in the EEC and Former Eastern Bloc Countries. (February 1994)
62. German Rojas
Optimal Taxation in a Stochastic Growth Model with Public Capital: Crowding-in Effects and Stabilization Policy. (September 1993)
63. Irasema Alonso
Patterns of Exchange, Fiat Money, and the Welfare Costs of Inflation. (September 1993)
64. Rohit Rahi
Adverse Selection and Security Design. (February 1994)
65. Jordi Galí and Fabrizio Zilibotti
Endogenous Growth and Poverty Traps in a Cournotian Model. (November 1993)
66. Jordi Galí and Richard Clarida
Sources of Real Exchange Rate Fluctuations: How Important are Nominal Shocks?. (October 1993, Revised: January 1994)
[Forthcoming in *Carnegie-Rochester Conference in Public Policy*]
67. John Ireland
A DPP Evaluation of Efficiency Gains from Channel-Manufacturer Cooperation on Case Counts. (February 1994)
68. John Ireland
How Products' Case Volumes Influence Supermarket Shelf Space Allocations and Profits. (February 1994)
69. Fabrizio Zilibotti
Foreign Investments, Enforcement Constraints and Human Capital Accumulation. (February 1994)
70. Vladimir Marianov and Daniel Serra
Probabilistic Maximal Covering Location Models for Congested Systems. (March 1994)
71. Giorgia Giovannetti.
Import Pricing, Domestic Pricing and Market Structure. (August 1993, Revised: January 1994)
72. Raffaella Giordano.
A Model of Inflation and Reputation with Wage Bargaining. (November 1992, Revised March 1994)
73. Jaume Puig i Junoy.
Aspectos Macroeconómicos del Gasto Sanitario en el Proceso de Convergencia Europea. (Enero 1994)

74. Daniel Serra, Samuel Ratick and Charles ReVelle.
The Maximum Capture Problem with Uncertainty (March 1994)
75. Oriol Amat, John Blake and Jack Dowds.
Issues in the Use of the Cash Flow Statement-Experience in some Other Countries
(March 1994)
76. Albert Marcet and David A. Marshall.
Solving Nonlinear Rational Expectations Models by Parameterized Expectations:
Convergence to Stationary Solutions (March 1994)
77. Xavier Sala-i-Martin.
Lecture Notes on Economic Growth (I): Introduction to the Literature and
Neoclassical Models (May 1994)
78. Xavier Sala-i-Martin.
Lecture Notes on Economic Growth (II): Five Prototype Models of Endogenous
Growth (May 1994)
79. Xavier Sala-i-Martin.
Cross-Sectional Regressions and the Empirics of Economic Growth (May 1994)
80. Xavier Cuadras-Morató.
Perishable Medium of Exchange (Can Ice Cream be Money?) (May 1994)
81. Esther Martínez García.
Progresividad y Gastos Fiscales en la Imposición Personal sobre la Renta (Mayo
1994)
82. Robert J. Barro, N. Gregory Mankiw and Xavier Sala-i-Martin.
Capital Mobility in Neoclassical Models of Growth (May 1994)
83. Sergi Jiménez-Martin.
The Wage Setting Process in Spain. Is it Really only about Wages? (April 1993,
Revised: May 1994)