BARGAINING ABOUT WAGES:
EVIDENCE FROM SPAIN

DEPARTAMENT D'ECONOMIA
FACULTAT DE CIÈNCIES ECONÒMIQUES I EMPRESARIALS
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Table 2.3. Workers Representation.

* The electoral system distinguish between firms with:

-less than 50 workers. They choose **Employees Representatives.**
-more than 50 workers. They choose **Workers Council.**

Also in firms above 50 workers it is possible to elect:

- White Collar Workers representatives.
- Blue Collar Workers representatives.

* The number of representatives is as in the following table:

Number of workers	Representatives	Name
1-5	None	
6-10	1 optional	EMPLOYEES
11-30	1	REPRESENTATIVES
31-49	3	
50-100	5	
101-250	9	WORKERS
251-500	13	COUNCIL
501-750	17	
751-1000	21	
+each 1000	2 more (max 75)	

* Other characteristics:

- Multi-plant council (only for collective bargaining):
  Max. 13 representatives.
- Temporal employees representation: Proportional to contract spells.
- Unions delegates (Only in firm above 250 workers):
  They can take part in Collective Bargaining.
  They can negociate directly with the firm in the case their union has the majority at the workers council.

Table 2.4. Spanish Bargaining framework. Possible stages.

WHOLE ECONOMY

Stage.1: GOVERNMENT
signal: Expected inflation at the end of the year: π^e
Announcement: Fiscal and Monetary Policy of the year.
strategy: public employees wages increase.

Stage.2: REPRESENTATIVES UNIONS-FIRMS REP. (poss. GOVERMENT)
signal: Reference Agreement.
wages gap. ω_{max} and ω_{min}
threat: General Strike (non-usual)

INDUSTRY LEVEL

Stage.3: UNIONS-FIRMS IN AN INDUSTRY
signal: Industry agreement.
Wages (can be a gap) for the industry. ω_i
threat: Industry Strike.

REGION (OR PROVINCE) BY INDUSTRY LEVEL

Stage.4: UNIONS-FIRMS OF ANY INDUSTRY IN A PROVINCE.
signal: Provincial industry agreement.
Wages increases. ω_{ij}
threat: Provincial (or Region) industry strike.

FIRM LEVEL

Stage.5: WORKERS COUNCIL-FIRM
option a: To apply an aggregate agreement (if any)
a1. With an improvement on wage increase. ω_{ijk}
a2. Without an improvement on wage increase. ω_{ij}
option b: Bargain over wages (ω_{ijk}) and other issues.
threat: Firm level strike.

Table 2.5. Bargaining choices and stages.

GROUP OF SKILLED WORKERS ⇒ 01 BARGAINING

WITH IMPROVEMENT 03 ← FOLLOW → 02 WITHOUT IMPROVEMENT

PLANT LEVEL ⇒ 01 BARGAINING

WITH IMPROVEMENT 03 ← FOLLOW → 02 WITHOUT IMPROVEMENT

FIRM LEVEL ⇒ 01 BARGAINING

WITH IMPROVEMENT 03 ← FOLLOW → 02 WITHOUT IMPROVEMENT

AN INDUSTRY AT PROVINCE LEVEL ⇒ 01 BARGAINING

WITH IMPROVEMENT 03 ← FOLLOW → 02 WITHOUT IMPROVEMENT

AN INDUSTRY AT REGIONAL LEVEL ⇒ 01 BARGAINING

WITH IMPROVEMENT 03 ← FOLLOW → 02 WITHOUT IMPROVEMENT

INDUSTRY AT NATIONAL LEVEL ⇒ 01 BARGAINING

WITH IMPROVEMENT 03 ← FOLLOW → 02 WITHOUT IMPROVEMENT

ALL THE INDUSTRIES AT NATIONAL LEVEL ⇒ 01 NATIONAL AGREEMENT

Table 2.6. Per cent of workers representatives gained in election by the two major unions. By bargaining level. 1978-1990.

	NATIONAL / INDUSTRY		REGION / INDUSTRY		FIRM LEVEL		COUNCIL ELECTIONS	
year	CCOO	UGT	CCOO	UGT	CCOO	UGT	CCOO	UGT
1978(1)	--	--	--	--	--	--	34	22
1980(1)	--	--	--	--	--	--	31	29
1981	--	--	36	37	--	--	--	--
1982(1)	37	39	35	40	--		33	37
1983	37	41	35	41	--		--	--
1984	36	41	36	43	28	26	--	--
1985	33	43	35	43	28	27	--	--
1986(2)	36	40	35	43	28	28	34	40
1987	37	42	37	43	30	31	--	--
1988	40	46	37	45	31	31	--	--
1989	38	46	39	44	32	31	--	--
1990(2)	35	45	39	44	32	32	(3)	(3)

1. Two years elections.
2. Four years elections.
3. UGT has won.

SOURCE: Fina and Hawkesworth (1984).
Own calculations using the ECC recording tape.

Table 2.7.a. Coverage of Collective agreements. 1983..1990

i) Aggregate figures.

	#	covered	employees	coverage	Δ ω
1983	3655	6226.3	7635.0	81.54	11.44
1984	3796	6181.9	7309.9	84.64	7.81
1985	3834	6131.1	7309.2	83.88	7.90
1986	3790	6275.1	7653.9	82.00	8.23
1987	4112	6867.7	7973.0	86.10	6.51
1988	4096	6864.7	8351.5	82.20	6.38
1989	4267	6993.8	8879.5	78.76	7.77
1990	4434	7426.5	9273.4	80.08	8.11

ii) Coverage by bargaining level.

	National/Industry		Region/Industry		Firm/level	
	#	covered	#	covered	#	covered
1983	69	1673.7	1173	3460.0	2376	1074.6
1984	66	1694.5	1156	3402.5	2539	1060.5
1985	64	1666.0	1157	3391.0	2590	1062.5
1986	69	1753.1	1109	3417.2	2588	1092.8
1987	67	1880.4	1197	3841.8	2817	1106.5
1988	68	1894.2	1181	3879.8	2826	1070.4
1989	70	1908.5	1180	3803.6	3016	1061.9
1990	66	1636.0	1070	3910.4	3137	1084.5

Table 2.7.b. Delay (weighted) in Bargaining. In months

	LEVEL			LEVEL	
	FIRM	INDUSTRY		FIRM	INDUSTRY
1981	5.3	4.6	1986	5.4	3.8
1982	4.0	4.0	1987	5.4	4.8
1983	4.5	4.6	1988	4.9	4.8
1984	4.6	4.6	1989	5.2	4.7
1985	4.4	3.8			

SOURCE: Own calculations using the ECC recording tape. 1981-1991.

Table 2.8. Some characteristics of the bargaining in Spain. 1980-1990.

aggregate negotiation				wage increase		inflation		dif. Δw-I	
Year	N.A.	COR	gap Δw	[A] Δw†	[B] Δw‡	Target	[C] real	A-C	B-C
1980	Yes	?	13-16	15.3	--	15.0	15.3	0.0	--
1981	Yes	?	11-15	13.1	20.3	14.0	14.4	-1.3	5.9
1982	Yes	?	9-11	12.0	14.5	12.5	13.9	-1.9	0.6
1983	Yes	?	9.5-12.5	11.4	13.5	12.0	12.3	-0.9	1.2
1984	No	?	-	7.8	9.3	8.0	9.0	-1.2	0.3
1985	Yes	No	5.5-7.5	7.9	9.6	7.0	8.2	-0.3	1.4
1986	Yes	No	5.2-8.6	8.3	11.4	8.0	8.3	0.0	3.1
1987	No	No	5.0-6.4	6.5	7.1	5.0	5.2	1.3	1.9
1988	No	No	3.0-6.0	6.4	6.0	3.0	4.9	1.5	1.1
1989	No	Yes	4.0-8.0	7.7	7.7	3.0	6.7	1.0	-1.0
1990	No	Yes	6.0-9.0	8.1	8.5	5.7	6.8	1.3	1.7

Notes and keys:

†: ECC wage increases.

‡: ES wage increases.

N.A.: Whether or not there is a Nationwide agreement in the year amongst workers' representatives and the employers association.

COR: Whether or not main unions (CCOO and UGT) coordinate during aggregate bargaining.

GAP ΔW: low: Aggregate union initial bargaining position.
high: Aggregate employees association bargaining position.

SOURCE: As Table 2.2.
Circular para la Negociación Colectiva, CEOE, Madrid, 1993.

Table 2.9. Regular hours and wage increases by collective bargaining level. 1981-1990.

a. Hours

year	NATIONAL INDUSTRY	REGION INDUSTRY	FIRM LEVEL
1981	1916.5	1934.9	1899.1
1982	1872.9	1905.9	1871.0
1983	1848.1	1877.9	1843.4
1984	1797.8	1819.7	1804.2
1985	1796.5	1817.3	1792.6
1986	1785.9	1817.9	1792.6
1987	1769.5	1815.7	1783.6
1988	1754.2	1813.6	1777.3
1989	1743.1	1810.6	1771.1
1990	1739.4	1808.2	1768.9

b. Wage increases.

	NAT. INDUSTRY		REG. INDUSTRY		FIRM LEVEL		WAGE SURVEY	
year	Δw	ΔHw	Δw	ΔHw	Δw	ΔHw	Δw	ΔHw
1981	14.23	--	13.32	--	13.50	--	20.3	22.6
1982	12.15	14.46	11.87	13.83	11.44	13.12	14.5	15.8
1983	11.59	13.07	11.43	13.24	11.73	13.38	13.5	15.1
1984	7.78	10.46	7.77	10.82	7.80	9.88	9.3	11.7
1985	7.57	7.73	7.44	7.52	7.52	7.83	9.6	10.0
1986	8.04	8.22	8.11	8.17	8.24	8.50	11.4	11.0
1987	6.81	7.06	6.94	7.06	7.02	7.36	7.1	7.5
1988	5.67	5.91	5.76	5.88	5.77	6.17	6.0	6.5
1989	6.95	7.28	7.04	7.24	6.90	7.32	5.7	7.3
1990	7.94	8.14	8.31	8.55	8.22	8.60	8.5	8.8

KEYWORDS:

Δw: mean wage increase.

ΔHw: mean wage increase corrected by hours change.

SOURCE: See Table 2.7.

Encuesta de Salarios. Instituto Nacional de Estadística.

Table 2.10. Coordination in wage increase setting among bargaining levels during the eighties.

a. Considering 44 industries.

year	coordination in Δw	coordination in weighted Δw
1981	1.41	1.19
1982	1.14	0.79
1983	0.65	0.79
1984	0.94	0.94
1985	0.63	0.85
1986	0.87	0.92
1987	1.01	0.94
1988	0.80	0.89
1989	0.69	0.46
1990	0.67	0.97

b. Considering 17 regions.

year	coordination in Δw	coordination in weighted Δw
1981	0.98	0.69
1982	1.77	1.27
1983	1.12	1.01
1984	0.70	0.76
1985	0.27	0.70
1986	0.47	0.96
1987	0.72	0.93
1988	0.77	0.86
1989	0.63	0.86
1990	0.53	0.32

Measurement of coodination: Each year we have information of the wage increase mean of each bargaining level, industry (Δw_j^I) and firm level (Δw_j^F), for 44 industries (or 17 regions).

$$\text{Coordination} = \frac{\text{var(difference)}}{\text{var(firm level)} + \text{var(industry level)}} = \frac{\text{var}(\Delta w_j^I - \Delta w_j^F)}{\text{var}(\Delta w_j^F) + \text{var}(\Delta w_j^I)}$$

for j= 44 industries or 17 regions.
Maximum coordination ⇒ Coordination is zero.
No-coordination ⇒ Coordination is one.
Full negative coordination ⇒ Coordination is two.

SOURCE: See Table 2.7.

Table 2.11.a. Manufacturing industry level agreements. 1984-1991.

year	COLA clause present	#	% COLA	% ex ante wage	% ex post wage	% trig gered COLA	mean hold -out	mean emp	mean reg. hours
1984	No COLA	325	--	7.9	--	--	0.93	2458	1822
	COLA	136	29.5	7.5	7.8	0.34	0.98	9377	1824
1985	No COLA	220	--	7.7	--	--	0.88	1931	1819
	COLA	223	50.3	7.2	8.2	0.86	0.91	6981	1821
1986	No COLA	229	--	8.1	--	--	0.79	2494	1821
	COLA	189	45.2	8.1	8.4	0.74	0.75	6931	1821
1987	No COLA	295	--	6.9	--	--	0.91	2858	1819
	COLA	169	36.4	6.7	6.7	0.01	0.95	8194	1816
1988	No COLA	252	--	5.9	--	--	0.85	1378	1818
	COLA	197	43.9	5.2	6.9	0.90	0.67	9485	1815
1989	No COLA	188	--	7.1	--	--	0.78	1981	1814
	COLA	254	57.5	6.8	8.3	0.86	0.91	7271	1811
1990	No COLA	190	--	8.4	--	--	0.86	2240	1808
	COLA	270	58.7	8.0	8.3	0.25	0.81	6881	1808
1991	No COLA	195	--	8.5	--	--	0.79	2359	1807
	COLA	264	57.5	8.0	8.1	0.07	0.86	7006	1804

SOURCE: see below Table 2.7.

Table 2.11.b. Manufacturing firm level agreements. 1984-1991.

year	COLA clause present	#	% COLA	% ex ante wage	% ex post wage	% efec ttive COLA	mean hold -out	mean emp	mean regul. hours
1984	No COLA	1023	--	7.8	--	--	0.91	354	1811
	COLA	372	26.7	7.8	7.9	0.18	0.94	654	1813
1985	No COLA	805	--	7.5	--	--	0.87	335	1805
	COLA	598	42.6	7.3	8.1	0.74	0.94	549	1801
1986	No COLA	708	--	8.2	--	--	0.74	374	1797
	COLA	625	46.7	8.1	8.4	0.62	0.72	495	1803
1987	No COLA	861	--	7.0	--	--	0.89	255	1794
	COLA	574	40.0	6.4	6.4	0.01	0.87	613	1792
1988	No COLA	893	--	5.7	--	--	0.77	298	1785
	COLA	501	35.9	5.2	6.6	0.78	0.63	554	1786
1989	No COLA	765	--	7.0	--	--	0.78	246	1780
	COLA	704	47.9	6.4	8.0	0.84	0.80	486	1781
1990	No COLA	733	--	8.5	--	--	0.78	187	1780
	COLA	838	53.3	7.6	8.2	0.48	0.64	507	1775
1991	No COLA	799	--	8.0	--	--	0.77	186	1780
	COLA	828	50.9	7.4	7.6	0.26	0.74	505	1768

SOURCE: see below Table 2.7.

Table 2.12. Target, Inflation and its deviation from the target.

	Target	Inflation Expected (in may)	Observed (dec/dec)	Deviation from target
1981	14.0	13.9	14.5	0.5
1982	12.5	13.0	14.0	1.5
1983	12.0	11.9	12.2	0.2
1984	8.0	10.5	9.0	1.0
1985	7.0	10.3	8.1	1.1
1986	8.0	7.9	8.3	0.3
1987	5.0	5.1	4.6	-0.4
1988	3.0	3.4	5.8	2.8
1989	3.0	4.6	6.9	3.9
1990	5.7	5.3	6.5	0.8
1991	5.0	5.7	5.5	0.5
1992	5.0	---	5.4	0.4

SOURCE: Circular para la Negociación Colectiva. CEOE, Madrid, 1993.
Own calculations for the expected inflation in May.

Table 2.13. Working days (10^3) lost by work stoppages. 1980/1991.

Year	Spain	UK	Germany	France	Italy	Greece	US	Japan
1975	310	265	3	229	1970	--	408	220
1980	780	520	6	96	1119	--	230	25
1981	662	195	3	85	716	--	187	14
1982	360	248	1	133	1262	830	100	14
1983†	580	178	2	84	982	320	192	12
1984†	870	278	262	80	611	320	93	8
1985†	440	299	2	50	269	620	82	6
1986‡	320	90	--	60	390	710	120	10
1987‡	640	164	--	50	320	9940	40	10
1988‡	1394	167	--	70	230	3550	40	--
1989‡	415	181	--	50	300	4950	150	--
1990‡	263	--	10	40	340	12310	50	--
1991	470	30	10	40	--	--	40	--
mean 82/91	580	270	30	60	520	3710	90	10

Notes: †: No data from Catalonia (Spain).
‡: No data from The Basque Country (Spain).

SOURCE: U.K.: Metcalf and Milner (1991).
Spain: Estadística de Huelgas. MTSS, 1990.
Others:
La Negociación Colectiva en las Grandes Empresas en 1987, MEH.
Circular para la Negociación Colectiva. CEOE, Madrid, 1993.

Table 2.14. Spanish strike statistics.

Source: Estadísticas de Huelgas.
in Boletin de Estadísticas Laborales
Ministerio de Trabajo y Seguridad Social. Monthly.

-Measurament unit:

SPAIN: strike/province/month/call
OIT suggestion: strike/call

-Recording:

All kind of strikes, but excluding:
*Work to rule and Go Slow.
*Less than an hour.
*Non-Market sector strikes.
*Workers without striking rights (as army).
*Public employees.

-Measurement of the number of workers involved:

*Firm Level: Number of wage earners.
*Industry level: All the workers.

Consequently the incidence of strikes in both bargaining levels are not strictly comparable.

Table 2.15. Contract strikes: Incidence and Duration. 1985-1990.

	ALL THE CONTRACTS			FIRM BARGAINING			NCGE SAMPLE		
		STRIKE			STRIKE			STRIKE	
YEAR	Δw %	INC %	DUR d	Δw %	INC %	DUR d	Δw %	INC %	DUR d
1985	7.9	n.d.	-	7.4	n.d.	-	7.3	12.2	9.6
1986	8.3	8.1	4.8	8.1	9.4	5.4	8.1	8.6	4.5
1987	6.5	15.2	5.6	6.9	15.8	5.9	6.6	16.4	7.3
1988	6.4	11.2	5.1	5.8	11.7	5.4	5.5	13.3	3.7
1989	7.7	10.6	4.9	7.0	11.2	5.1	6.4	16.6	4.5
1990	8.3	8.9	5.6	8.3	10.5	6.2	7.8	10.1	3.1

d: days.

SOURCE: Own calculations using the NCGE.

Table 2.16. Large firms survey. Main features. 1981/1990.

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Sample size	241	262	351	416	423	676	721	699	610	489
Emp (10^5)	7.3	7.3	8.4	8.5	8.4	9.8	10.2	9.8	9.4	8.6
Wage bill (10^3 pta)										
nominal	1431	1645	1884	2094	2293	2445	2701	2896	3342	3639
real†	2225	2235	2282	2279	2293	2247	2356	2412	2607	2660
Negotiation										
Claim(%)	21.0	13.0	15.0	10.0	9.3	10.2	8.7	7.8	8.8	10.1
Offer(%)	9.0	9.0	9.0	5.0	5.9	6.8	4.9	4.2	4.2	5.3
Agreement(%)	13.9	12.8	12.8	7.9	8.3	8.7	7.0	5.7	6.2	7.5
Annual Hours	1888	1856	1829	1802	1797	1785	1775	1759	1753	1745
Length of neg.	69	73	65	87	75	117	96	150	157	131
Lost hours‡	10.8	4.6	4.2	10.2	3.0	2.0	6.0	2.0	4.7	2.7
Clauses (%)										
COLA	nd	nd	nd	nd	49.8	82.4	89.3	85.6	86.8	91.6
Productivity	nd	nd	36.0	43.0	33.0	23.0	41.6	31.8	35.8	27.6
Workers Council (%)										
CCOO	32.0	35.0	31.9	29.0	34.9	32.8	35.6	36.2	37.9	36.8
UGT	27.9	28.1	33.7	34.0	30.9	39.3	31.3	29.9	32.0	31.4
REGIONAL	4.7	5.3	4.4	3.7	4.8	5.2	6.2	6.9	5.0	5.7

†: Deflacted with the CPI (1985 mean=1.00).
‡: Lost hours by work stoppages per employee.
SOURCES: See below Table 2.15.
"La Negociación Colectiva en las Grandes Empresas en..",
Ministerio de Economía y Hacienda, Madrid, Various Issues.

Table 2.17. Threats Incidence and Duration by year.

Sampling condition: CLAIM,OFFER,AGREEMENT, NEGOTIATION LENGTH>0

	incid ence				Length of negotiations				
	uncondit ional				cond. to Hold.			cond to strike	
year	#	Holdout %	Strike %	Length neg.	Strike Inc.%	Length neg.	Length Holdout	Length neg.	Length strike
1985	308	89.0	14.0	67.6	13.8	66.2	93.0	86.3	85.1
1986	391	78.0	10.2	74.4	12.4	74.0	102.4	104.6	38.9
1987	466	98.1	19.1	78.9	19.3	79.0	125.4	110.8	42.3
1988	409	78.5	14.4	104.2	16.8	101.5	111.9	99.5	33.8
1989	552	75.5	17.7	109.5	21.8	94.6	117.8	130.5	39.6
1990	460	81.1	11.3	101.7	12.6	97.2	131.7	148.9	23.8
TOT.	2586	83.0	14.7	91.5	16.5	86.2	115.6	111.7	33.0

Table 2.18. Strike Incidence by calendar month.

Sampling condition: NEGOTIATION LENGTH>0

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Set	Oct	Nov	Dec
Unconditional obs.	174	307	443	419	492	385	171	29	56	37	20	56
Strike incidence %	5.7	6.8	12	15	16	20	28	21	18	27	10	3.5
Cond. to delay obs	159	277	406	362	407	308	129	25	39	24	5	8
Strike incidence %	5.0	7.2	13	16	18	25	34	24	23	37	20	--

Table 2.19. Sampling strike conditional Probabilities. 1984-1990.

Year ⇒		84	85	86	87	88	89	90
Unconditional prob. ⇒		16.0	13.4	8.7	18.7	14.2	16.9	11.0
Strike in..	No strike							
T-1	--	--	35.0	34.3	36.6	24.2	43.6	20.7
T-2;T-1	--	--	--	35.0	33.0	42.0	40.0	35.0
T-3 OR T-2 OR T-1	--	--	--	--	32.7	30.0	34.0	16.3
T-1	T-2	--	--	43.8	42.8	19.2	46.9	8.20
T-2	T-1	--	--	27.8	31.4	30.8	19.7	14.9
--	T-1	--	9.8	6.3	16.6	10.7	13.4	9.1
--	T-2;T-1	--	--	2.9	16.3	8.2	11.6	9.0
--	T-3;T-2;T-1	--	--	--	20.9	9.0	11.6	4.9

SOURCE: See Table 2.15.

Table 2.20. Threats Incidence and Duration by Groups of industries. 1985-1990.

Sampling condition: CLAIM,OFFER,AGREEMENT, NEGOTIATION LENGTH>0

	unconditional				conditional to a strike		Sampling: past year ratios			Sector ratios	
Sector	#	Delay %	Strike %	Duration neg.	Duration neg.	Strike dur. (hour)	Past wage mpta	Ben p/emp mpta	Δ Sales p/emp	SSA	U %
01-09	15	100.0	--	33.3	-	-	1.08	0.27	7.6	0.08	6.15
10-19	160	76.2	15.6	99.2	121.3	34.8	1.93	1.09	7.2	1.59	5.53
20-29	432	80.0	13.2	82.0	106.4	41.8	1.52	0.79	8.2	0.25	11.8
30-39	583	82.5	22.6	86.6	109.7	31.1	1.36	0.27	9.6	0.55	15.8
40-49	615	87.8	13.0	77.9	115.1	35.4	1.29	0.53	8.5	0.26	22.0
Manuf.	1790	83.2	16.4	83.6	111.5	34.7	1.43	0.56	8.7	0.42	18.0
Build.	53	86.8	24.5	94.3	121.9	23.4	1.26	0.43	6.6	0.37	26.3
60-69	146	83.6	7.5	78.9	101.3	49.9	1.28	0.46	8.5	0.03	14.3
70-79	165	80.0	22.4	105.5	130.7	27.8	1.67	-0.15	7.1	0.42	7.6
80-89	347	80.7	6.1	133.7	158.8	12.3	1.79	1.18	9.3	0.11	13.1
90-99	70	90.0	7.1	86.1	102.8	43.9	1.32	0.19	7.2	0.32	11.5
Serv.	728	82.0	10.0	111.7	132.4	27.7	1.62	0.64	8.4	0.19	12.3

SSA: Strike's lost days per employee in a given industry.

Table 2.21. Strike's Incidence and Duration by Sector and Year.

	SAMPLE STRIKE		Sample: past year ratios			SECTOR RATIOS	
	INC. %	DUR (hours)	Past wage	Ben p/emp	Δ sales p/emp	SSA	U
MANUFACTURING							
1985	14.1	87.4	1.42	0.27	8.8	0.29	0.192
1986	9.8	33.8	1.39	0.31	11.8	0.29	0.193
1987	18.2	65.8	1.39	0.45	5.6	0.49	0.188
1988	16.1	28.1	1.39	0.56	7.1	0.36	0.184
1989	19.5	39.7	1.43	0.66	8.9	0.75	0.167
1990	9.2	28.5	1.46	0.71	7.8	0.32	0.155
SERVICES							
1985	6.1	23.5	1.70	0.42	6.1	0.05	0.120
1986	6.4	31.2	1.55	0.51	6.6	0.11	0.124
1987	11.6	36.4	1.58	0.48	7.5	0.29	0.131
1988	6.5	28.9	1.60	0.64	10.4	0.42	0.131
1989	9.6	30.4	1.66	0.67	9.4	0.14	0.120
1990	11.5	21.7	1.68	0.96	9.1	0.15	0.117

S.S.A: See below Table 2.20.

SOURCE: See below Table 2.15.

Table 2.22. Four ways for reaching agreement. 1985-1990.

Sampling condition: NEGOTIATION LENGTH>0

	first union claim accepted	first union claim accepted after a counteoffer	first firms' offer accepted	regular outcome claim > agree > offer
claim	7.21	7.45	9.33	10.1
agreement	7.21	7.45	6.54	7.01
offer	--	5.87	6.54	5.22
strike inc	4.2	13.7	7.0	16.0
length of neg.	51.8	95.0	68.6	96.0
observations	118	51	217	2268

Table 2.23. Claim and offer distribution and aggregate initials.

Sampling condition: CLAIM,OFFER,AGREE, NEGOTIATION LENGTH>0

		OFFER				CLAIM			
year	#	all the firms aggreg. initial	greater than firm aggregate initial	modal value	freq. of the modal value	major unions agreg. initial	greater than union aggregate initial	modal value	freq. of the modal value
1985	321	5.5	84.4	6.0	17.4	7.5	61.7	7.5	21.1
1986	412	5.2	89.3	8.0	14.6	8.5	35.0	8.5	12.9
1987	517	5.0	81.2	5.0	48.5	6.4	77.6	8.0	26.1
1988	430	3.0	98.8	3.0	17.7	6.0	77.4	7.0	17.2
1989	558	4.0	83.0	4.0	21.7	8.0	42.1	8.0	18.4
1990	438	6.0	70.1	6.0	28.5	9.0	26.2	9.0	29.7

SOURCE: See Table 2.15.

Table 2.24. Claim, offer and agreement by year and threat.
Sampling condition: CLAIM,OFFER,AGREEMENT, NEGOTIATION LENGTH>0

	UNCONDITIONAL			COND. TO DELAY			COND. TO STRIKE		
year	claim	offer	agree	claim	offer	agree	claim	offer	agree
1985 mean	9.91	6.24	7.32	9.76	6.21	7.29	10.47	5.70	7.21
(median)	9	6.5	7.3	9.0	6.3	7.3	9.0	5.5	7.0
1986 mean	11.37	6.92	8.13	11.50	7.15	8.28	12.46	6.61	8.10
(median)	10	7	8	10	7.2	8.3	11	6	8
1987 mean	9.75	5.32	6.67	9.76	5.32	6.67	11.66	5.03	6.76
(median)	8.5	5	6.5	8.5	5	6.5	9	5	6.7
1988 mean	9.15	4.41	5.82	8.85	4.34	5.77	10.52	4.23	5.93
(median)	7.7	4	5.75	7.5	4	5.6	8	4	5.9
1989 mean	9.16	4.84	6.51	9.49	4.90	6.64	9.89	4.64	6.73
(median)	8	5	6.5	8	5	6.6	8	5	6.6
1990 mean	10.40	6.10	7.80	10.25	6.37	8.03	10.97	6.12	8.07
(median)	9	6	9	9	6	8	10	6	8
emp<=1000	9.82	5.60	7.03	9.89	5.67	7.11	11.05	5.32	7.16
emp>1000	10.03	5.45	6.89	9.99	5.54	6.95	10.54	5.04	6.74
tot. mean	9.92	5.76	7.00	9.91	5.64	7.07	10.90	5.19	6.99

SOURCE: See Table 2.15.

Table 2.25. Evidence about the wage increases mean by quartiles of the length of the threats.

		Q1	Q2	Q3	Q4
Strike(hours)		0-8h	8h-16h	16h-40h	+40h
1985		7.02	7.51	6.82	7.24
1986		7.99	7.33	8.00	8.32
1987		6.61	6.64	6.62	6.65
1988		5.69	6.28	5.54	5.89
1989		6.44	6.68	6.72	7.03
1990		7.65	7.60	8.30	8.70
Spell of neg. (days)		-37d	37-70d	70-120d	+120
1985		7.36	7.26	7.26	7.26
1986		8.13	8.00	8.28	8.09
1987		6.76	6.63	6.66	6.35
1988		5.69	5.82	5.65	5.42
1989		6.47	6.63	6.57	6.23
1990		7.98	7.80	7.79	7.69
delay (days)	No.del	0-68	68-112	112-153	+153
1985	7.68	7.32	7.27	7.24	7.14
1986	7.70	8.31	8.18	8.26	8.27
1987	6.52	6.91	6.70	6.71	6.32
1988	5.53	5.81	5.79	5.67	5.39
1989	6.07	6.31	6.87	6.67	6.43
1990	6.95	8.04	7.91	8.15	7.97

SOURCE: See below Table 2.15.

Table 2.26. Sampling distribution by strike and profits/losts.

	STRIKE		NO STRIKE	
	PROFITS AT YEAR T	NO PROFIT AT YEAR T	PROFITS AT YEAR T	NO PROFIT AT YEAR T
Wages:				
CLAIM (med.)	10.00(9)	9.95(9)	8.29(9)	8.38(9)
OFFER (med.)	4.83(5)	4.28(5)	5.02(5.5)	4.65(5)
AGREEMENT (med.)	7.07(7)	6.68(6.75)	7.05(7)	6.91(7)
AGREEMENT (d)	0.31	-0.22	0.14	-0.16
Conflicting:				
LENGTH OF NEG	122.7	104.1	82.1	79.8
STRIKE -hours- (med.)	40.1(16.9)	48.1(16.8)	--	--
STRIKE (H) (d)	-2.6	0.6	--	--
Others:				
COLA clause (%)	77.0	70.3	74.9	70.0
$wage_{-1}$	1.38	1.36	1.51	1.42
$\Delta\log(\text{sales per emp})_{-1}$	0.15	0.04	0.09	0.07
employment mean	2070	5129	1097	1052
(median)	516	1092	460	378

(d): detrended of year and industry effects.

SOURCE: See below Table 2.15.

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CHAPTER 3

THE WAGE SETTING PROCESS IN SPAIN. IS IT REALLY ONLY ABOUT WAGES?

I. Introduction.

Wage determination and employment determination have been much 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 the fact that we are implicitly estimating Phillips curve based models[42].

This is also the case for Spain. Initially the evidence about wage determination was aggregate. As 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, has started to appear. Among these Alonso (1989) and Anchuelo (1989) are applications of the efficiency wage model using firm data from the "Central de Balances" of the Bank of Spain. Alternatively, Andrés and García (1991), Dolado and Bentolila (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.

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

The next two also are applications of the Insider-Outsider model but using firm level data also from the "Central de Balances". These studies are comparable to the present research due to the partially shared framework and objectives.

This study has several objectives. On the one hand, we would like to add new evidence to wage determination (in a bargaining context) in Spain using a well established framework: the Insider-Outsider model of Lindbeck and Snower (1988), though we will follow closely Nickell and Wadhwani's (1990) modelization for the wage equation. On the other hand, we would like to investigate the underlining Spanish bargaining structure itself. In particular, we are interested in answering two questions: Firstly, is bargaining carried out only over wages or is it also over employment level?, and secondly, does it matter the form in which wages are paid?.

To answer the first question we opt for a very simple alternative rather than for a full specified model which requires an extremely complete information set[43]. We formulate the bargaining model under the null hypothesis that there is only negotiation about wages and firms set employment levels unilaterally. 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) or, as suggested by Layard et al. (1991, ch. 2) a combined wage-layoffs negotiation

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

process if the currently employed workers only concern about layoffs.

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 differentials 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, the US (0.30 and more recently, 0.20) and Japan (0.33), where bargaining is completely decentralized[44]. For Spain, previous estimations range from 0.05 to 0.10[45], although for some industries estimates are rather higher[46]. We would like to point out that previous evidence suggests an inverse relation between centralization degree and insider power, according to the theory (see Layard et al (1991)). Hence, the higher (the lower) the centralization the lower (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

[44]See Holmund and Zetterberg (1991) for the Scandinavian countries, Germany and the first US reference; Nickell and Wadhwani (1990) for the U.K; Currie and McConnell (1992) for the second US reference and, finally, Brunello and Wadhwani (1989) for Japan.

[45]Andrés and García (1991) and Dolado and Bentolila (1992) for the manufacturing sector.

[46]For instance, in Draper (1993) insider power for the chemist industry is estimated as high as 0.39.

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 the 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 between 0.10 and 0.20.

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. On the other hand, as far as bargaining structure seems rather different for the manufacturing and services sectors we opt for formulating separate wage equations for each of them. Nevertheless, the focus will be centred mostly on the manufacturing sector because the sample is larger and also the 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 equations 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 a wage bill equation suffices to explain the wage setting process. The procedure of analysis will follow the recent work of Wadhwani 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.

There is no strict agreement about the incidence of flexible wage structures (as the one pointed above) on the base wage, sometimes called the marginal wage. The profit-sharing model has often been used, particularly after the initial seminal boost of Weitzman's (1984, 1987) work. Although the evidence suggests a positive relationship between profits sharing schemes and productivity[47], there is not strictly an agreement about the effect on base wage and hence on wage bill. Further, in accordance with Wadhwani 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 marginal cost of labour and, hence, *ceteris paribus*, increasing employment and decreasing unemployment. Here we cannot be extremely ambitious on this issue because 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

[47] See the exhaustive and recent survey of results by Weitzman and Kruge (1990).

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 the direct effect to be negative but there is also a positive indirect effect through a productivity increase[48].

Third, a simple employment equation will be specified with two different purposes. One, it will be used to test some assumptions about wage structure effects on base wage. And two, we are going to carry out some tests about on the underlining wage setting process. It is said that bargaining is only carried out 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 especially in large firms. Thus we are going to test the labour 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 that 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,

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

sometimes forgotten in previous research[49].

The empirical application will be carried out using the Spanish "La Negociación Colectiva en las Grandes Empresas en ..." (NGCE) for the 1985-1990 period. This survey is constrained to firms with at least two hundred workers, so the results should be considered with some caution, mainly due to the more simple wage structure in small firms. It should be pointed out that there is only one previous work[50] exploiting this special data set, and that its objective is quite different. Despite some shortcomings, this survey has many possibilities of analyzing fields other than wage determination (see the appendix for a brief description on the data set).

The rest of the chapter is organized as follows. Section II presents the underlying wage bargaining model and some extensions for testing purposes. The data, econometric specification and estimation methods are briefly described in section III. The empirical findings are discussed in section IV. Finally, in section V we present a brief summary of findings. The tables, an appendix describing the data and variables and the references end the chapter.

[49]See Alogoskoufis and Manning (1991) for a comment on the indefinition of the alternative.

[50]See Alba (1989), which deals with an employment equation.

II. Economic model.

As we have pointed out in the first section, it is far beyond the scope of this chapter to develop a combined wage-employment negotiation framework. Instead of this, we will formalize a model under the null hypothesis that there is only negotiation over wages[51] and that the firm sets its employment level unilaterally, which is usually known as the Right to Manage model (RTM). Later, we shall consider, as extensions of the above model, the wage structure and a simple employment equation for testing purposes.

Consider a firm producing an output (Y) using a single factor (N) with a Cobb-Douglas technology:

$$[3.1] \qquad Y = AN^{\alpha} \qquad\qquad 0 < \alpha < 1$$

where A the technical progress coefficient and α the scale parameter. The firm maximizes the expected profits, Π:

$$[3.2] \qquad \Pi(w,\Theta) = \Theta.Y - w_B.N$$

where Θ, the demand that the firm faces, is defined as $\Theta = \varepsilon P^e$; 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:

[51] In the case that the negotiation unit is following an aggregate agreement (i.e. a sector agreement) we can think of bargaining as an adjustment of the aggregate agreement to the specific conditions of the firm.

[3.3] $U(\text{WB},N_o) = (1-L(N_o))\ \text{WB} + L.W_a$

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 Wadhwani (1990),

[3.4.a] $L(N_o) = \text{prob}(N<N_o).\left\{1-\frac{E(N\ /\ N<N_o)}{N_o}\right\}$

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

$\bar{W}$ being the mean aggregate wage, u is the mean aggregate unemployment rate and b is the benefit replacement ratio.

Assume that the solution to the negotiation problem between the workers' council and the firm could be represented by a Nash bargaining model like:

[3.5] $Max_{\text{WB}}\ [(1-L(N_o))(\text{WB}-W_a)]^{\beta}.[\Pi(\text{WB},\Theta)]^{(1-\beta)}$

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 the reasoning by Nickell and Wadhwani (1990), and omitting the technical details, given [3.5], the wage may be written as a function of the following form:

[3.6] $\text{WB} = F(AP^e/N_o^{1-\alpha},\bar{W},u,b,\beta)$ $F_1,F_2,F_4,F_5 > 0$ 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 write [3.5] as (all the variables in logs):

$$[3.7] \qquad wb = \mu_o + \lambda\, I^e + (1-\lambda)\, O^e$$

Hence, the observed wage is a combination of the (expected) inside firm conditions (I^e), and the (expected) outside firm conditions (O^e). Using [3.1], the production function, to eliminate the unknown technical progress factor, we rewrite I^e as[52],

$$[3.7.a] \qquad I^e = a + p^e - (1-\alpha)n_o + \alpha_1\beta = (p+y-n)^e + \alpha_1\beta + (1-\alpha^*)(n^e-n_o)$$

note the later equality is obtaining after replacing the log of the technical progress by means of the production function. Additionally, from [3.4.b] we obtain,

$$[3.7.b] \qquad O^e = \bar{w} - \gamma_1 u + \gamma_2 b$$

The first component (I^e), may be seen as the wage level that will sustain the existing level of employment (Wadhwani and Wall (1990)) if the

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[52]Notice that setting the employment objective (membership) to past employment, n_{-1} [7.a] is equal to Nickell and Wadhwani'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 the past level of employment, the specification pointed above might not be adequate. Think for instance in a model with two kinds of labour, 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.

expectation on Θ remains unchanged and, the second (O^e) may be viewed as the set of factors which influence the firm's ability to pay. So, our proposal for the wage equation may be written as,

$$[3.8] \qquad wb = \mu_0 + \lambda[(p+y-n)^e + \alpha_1\beta] + (1-\lambda)[\bar{W} - \gamma_1 u + \gamma_2 b] + (1-\alpha)(n^e - n_o)$$

a. A simple employment equation.

Through [3.4] to [3.8] we have assumed that the firm and the workers' council only bargain about the wage. However, it is possible that they bargain also about employment in a combined wage-employment framework[53]. Alternatively, Layard et al. (1991, ch. 2) pointed that they could be worried not about the employment level but the layoffs[54]. Here, we will opt for considering the model under the former assumption, though we must point that we will not be able to distinguish which case, if any, is binding (bargaining over the employment level or over layoffs).

To keep the spirit of our wage equation intact we formulate an *ad hoc* employment equation. Under the maintained assumption bargaining only cares about wages (or in a combined wage-employment bargaining framework the union's employment bargaining power is extremely close to zero), employment lies on the labour demand curve (the commonly called Right to Manage model[55]). So, from [3.1] and [3.2] it is easy to derive the following

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[53] See Manning (1987) for a complete description of such a framework which is called "efficient bargaining" solution.

[54] Gottfries (1992) formulated a model in which the key employment concern is the variation of hiring instead of layoffs. Such a possibility will not be considered here.

[55] We follow the reasoning in Manning (1987) and Alogoskoufis and Manning (1991)).

specification,

$$[3.9] \qquad n = \mu_n + [\ \ln P^e + \ln Y - \ln w_B\ ] + Z_1'\mu_1$$

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 (in logs),

$$[3.10] \qquad n = \mu_n + [\ s - wb] + Z_1'\mu_1$$

As it is shown in Alogoskoufis and Manning (1991), equation [3.10] is adequate if employment lies on the labour demand curve given the production function. If not, we will expect the variables affecting the utility function (basically outside wage and unemployment rate in our specification) and the variables affecting the union bargaining power, both grouped in a vector that which be called Z_2 to affect employment directly (there is also an indirect effect through wages).

$$[3.11] \qquad n = \mu_n + [s - wb] + Z_1'\mu_1 + Z_2'\mu_2$$

A test against $\mu_2=0$ is equivalent to a test against the labour demand model[56]. 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) holds[57]. For

[56]Assuming union employment bargaining power is zero, the labour 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.

[57]Most of the previous relevant literature (see, for instance, MaCurdy and Pencavel (1986) and Brown and Ashenfelter (1986) among others) tested only the labour demand model against the efficient bargain model. No other possible alternatives were specified.

instance, in an efficiency wage model, the production function includes the relative wage so we expect that the outside wage enters the labour 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.

b. Ad hoc wage structure considerations.

As we mentioned in section I, the wage is a single price for three different functions: *Recruit, Retain, Motivate.* Therefore, a flexible payroll structure might be considered an attempt to solve this apparent conflict. In what follows, it will be assumed that the relevant parts of the wage bill are the base wage (recruit wage); some fix payment (retain wage), usually related to specific employee characteristics such as tenure payments; some variable payments (motivate wage), that is, output related payments[58]; and the labour tax. Formally,

$$[3.12] \qquad \mathrm{WB} = \mathrm{BASE} + \mathrm{TEN} + \mathrm{PROD} + \mathrm{TAX}$$

where BASE is the base wage, TEN is the tenure related payment, PROD is the output or sales related payment and finally TAX is the firm's labour 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):

$$[3.13] \qquad \mathrm{WB} = \{\omega.(1 + \frac{\mathrm{TEN}}{\omega} + \frac{\mathrm{PROD}}{\omega})\}.(1+\nu)$$

[58]The profits-sharing is the most popular for of variable payments. Unfortunately we will not be able to identify the amount of variable payments related to profits.

As we pointed out above, we are interested in testing several theoretical hypothesis. First, it has been argued that a flexible payroll structure, especially when it takes the profit-sharing form, may lower the base wage. Our aim is to test the same implication but using an alternative definition of flexible payroll. An easy way to test this implication is to look at [3.8] but substituting the wage by using [3.13]:

$$[3.14] \qquad \ln\omega \approx \mu_o - \tau_1\frac{\mathrm{TEN}}{\omega} - \tau_2\frac{\mathrm{PROD}}{\omega} - \tau_3\ln(1+\nu) + [\lambda I^e + (1-\lambda)O^e] + (1-\alpha^*)\Delta n^e$$

As it can be found in Wadhwani and Wall (1990) (although their comments are closely related to profit sharing schemes), if $\tau_i > 1$ then the related payment reduces the total wage bill, leading to a reduction in the wage pressure. If $\tau_i = 1$, a flexible payment structure has no incidence at all. $\tau_i < 1$ leads to an increase in the wage bill. And finally, in the extreme case where $\tau_i = 0$, the related pay is an additional payment. Note that in the last case ($\tau_i = 0$; for all i), the wage bill model and the base wage model are the same. Note that if the model is correctly specified, the labour tax ν in [3.14] is expected to have a zero coefficient, that is, employer labour tax is viewed as an additional payment. Clearly, the first is the more interesting case because it is implicitly implying that tenure or productivity are important bargaining factors that must be taken into account.

On the other hand, a flexible payroll structure has also consequences in the employment equation. let us first rewrite [3.11] allowing for a flexible wage structure,

$$[3.15] \qquad n \approx \alpha^* + \delta s - \gamma\ln\omega - \gamma_1\frac{\mathrm{TEN}}{\omega} - \gamma_2\frac{\mathrm{PROD}}{\omega} - \gamma_3\ln(1+\nu) + Z_1'\mu_1 + Z_2'\mu_2$$

If the wage structure variables do not matter, that is, if only the total amount paid matters, we shall observe $\gamma_i = \gamma$. It is important to note the case where $\gamma_i = 0$, when only the base wage matters for employment determination. In such circumstance, the base wage should be considered the relevant marginal price of labour and which implies that a diversified payment structure (that is considering bonuses, tenure payment and other benefits) may produce positive benefits on the level of employment.

III. Econometric specification.

The starting points are our basic wage equation [3.8] and our basic employment equation [3.11]. Note that all the other specifications may be viewed as a linear transformations 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 (f_i^w) and time specific factors (d_t). Second, we include some push factors. As inside factors we use lagged real profits $(B/NP_j)_{-1}$, extensively[59] 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 labour cost over added value; the (log) effective hours (regular hours in services), eh, as an hours correction factor. We also introduce a proxy for differences in union power: the proportion of union representatives that belong to the UGT union[60]. Finally, we consider two variables representing strike activity during bargaining. First, a dummy taking the value 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.

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

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

As outside push factors we consider the mean wage ($\bar{w}$), the past unemployment rate (u_{-1}), the proportion of long term unemployment (more than two years, LTU), the industry unemployment rate (u_j, not considered in services) and, the lagged (twice) inflation difference, $\Delta^2 P_{-1}$, to account for uncompensated past inflation[61] and the ratio of the number of industry level agreements over the number of firm level agreements in a given industry (afr_j).

Finally, some inertia is likely to be present in wage determination because of nominal rigidity of 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,

$$
\begin{aligned}
[3.16] \qquad wb_{it} = {} & \mu_t + \pi wb_{it-1} + (1-\pi)[\ \lambda\{(p+y-n)_{it} + \varphi_2(B/NP_j)_{it-1} \\
& + \varphi_3 eh_{it} + \varphi_4 UGT_{it} + \varphi_5 mp_{it} + \varphi_6 S_i + \varphi_7 Dur\_S_i\} \\
& + (1-\lambda)\{\bar{w}_t + \psi_1 u_{t-1} + \psi_2 LTU_t + \psi_3 u_{jt} + \psi_4 \Delta^2 P_{t-1} + \psi_5 afr_j\}] \\
& + (1-\alpha^*)\Delta n_t^e + f_i^w + d_t^w + e_{it}^w \\
& i=1,\ldots\ldots, N \qquad t_i = t_{io},\ldots.., T_i
\end{aligned}
$$

where e_{it}^w is a serially uncorrelated error term.

Note that [3.16] has been written under the assumption of neutrality in nominal variables, extensively used in previous research[62]. Finally, we do not need to make any special assumption about the firm-wage specific effect, part from being stationary. Note the fact that a nominal variables neutrality restriction, $\pi+(1-\pi)[\lambda+(1-\lambda)]=1$, has been imposed in both sectors

[61] See Andrés and García (1991) for a detailed explanation of that variable.

[62] For instance, in Andrés and García (1991) and Dolado and Bentolila (1992).

(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 costs[63]. The vector of employment push factors, Z_1, includes lagged real 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 effect for the cost of living allowance clause because it is, in fact, an implicit (deferred) wage increase[64] and because it increases the payroll uncertainty[65]. The effect of a productivity clause has no 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 labour demand curve. It includes the mean wage, $\bar{w}$; the industry level of unemployment, u_j, and as well the proportion of

[63]Notice that employment adjustment costs are closely related to tenure adjustment costs. They are extremely important in Spain (a maximum of 40 days of wage for each year of experience, the higher figure in Western Europe).

[64]Notice that COLA clause is in fact an implicit contract with an implicit cost for workers in terms of wage increase. Previous estimates are, for instance, a cost-range between 0% and 2% in the US (Hendricks and Kahn (1985)) and around 1.5% in Spain (see chapter 4). Our model is not really adequate to evidence the effect of cost of living allowance clause in wage level because payroll mostly includes COLA compensations (if any).

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

representatives that belong to the UGT union. Nevertheless, we must be extremely cautious when considering unemployment, especially 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,

$$[3.17] \quad \begin{aligned} n_{it} = {} & \alpha_t + \rho n_{it-1} + \delta(s_{it}-p_{jt}) - \delta_1 mp_i - \gamma_o(wb_{it}-p_{jt}) \\ & - \gamma_1(wb_{it-1}-p_{jt-1}) + \mu_{11}(B_i/(N_i{*}P_j))_{t-1} + \mu_{12}XH_{it-1} \\ & + \mu_{13}COLA_{it} + \mu_{14}PRODC_{it} + \mu_{15}\, O_{j-1} + \mu_{21}(\bar{w}_t-p_t) \\ & + \mu_{22}UGT_{it} + \mu_{23}u_{jt} + f_i^n + d_t^n + e_{it}^n \\ & i=1,......, N \qquad t_i= t_{io},....., T_i \end{aligned}$$

where e_{it}^n is a serially uncorrelated error term, f_i^e, the firm employment specific effect, assumed to be stationary, and d_t^n a time effect.

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 effect[66]. Also, the error terms in [3.16] and [3.17] 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_{it}) 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

[66]In fact, almost all firm specific variables are treated as potentially endogenous.

instruments. In general, the first differences error terms will have the following structure:

$$[3.18]\qquad \begin{cases} v^{w}_{it} = \varepsilon^{w}_{it} - \varepsilon^{w}_{it-1} = e^{w}_{it} - e^{w}_{it-1} + \zeta_{it} - \zeta_{it-1} \\ v^{n}_{it} = \varepsilon^{n}_{it} - \varepsilon^{n}_{it-1} = e^{n}_{it} - e^{n}_{it-1} + \zeta_{it} - \zeta_{it-1} \end{cases}$$

Under the assumption that ζ_{it}, e^{w}_{it}, e^{n}_{it} are independent and serially uncorrelated error terms with finite variance (σ^2_{ζ}, $\sigma^2_{e^w}$, $\sigma^2_{e^n}$, respectively) it is plain to show that,

$$[3.19]\qquad \mathrm{cov}(v^{w}_{it}, v^{n}_{it}) = 2\mathrm{cov}(e^{w}_{it}, e^{n}_{it}) = 2.\sigma^2_{\zeta}$$

and, hence,

$$\mathrm{corr}(v^{w}_{it}, v^{n}_{it}) = \mathrm{corr}(e^{w}_{it}, e^{n}_{it}) = \rho_{wn}$$

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 (1991) GMM-IV estimator based on the potential use of all the available orthogonality conditions. In the case there is any cross correlation between errors in the wage and employment equations as we can reasonably expect, more efficient estimates may be obtained by means of a simultaneous equations GMM-IV method for panel data. Our approach, an extension of the Arellano and Bond method for a single equation to a system of equation is close to the Holtz-Eakin et al. (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 relies 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 no second order serial correlation. A simple test[67] 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^2_m, 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.

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 have rejected the null hypothesis that the model is the same for both sectors considered. 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 the data appendix, which describes briefly the basic characteristics of the dataset and also includes some useful statistics.

[67] See Arellano and Bond (1991) for a detailed description of the test.

IV. Empirical results.

a. The common wage equation results.

The common specifications for the manufacturing sector and the services are reported in Table 3.1.a and 3.2, respectively. The basic specification for both sectors is set in column (1). Column (2) and (3) show a specification similar to (1) and both are devoted to specification exercices. 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 3.1.b. The nominal variables neutrality restriction, $\pi+(1-\pi)[\lambda+(1-\lambda)]=1$ is well supported in the manufacturing equation[68]. For the services, evidence is unclear, though it is not rejected[69].

The insider power[70] 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 (among other reasons) 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 the wage base and other payments instead of the wage bill. Notice that

[68]The statistic is 0.21 with is distributed as a χ^2_1.
[69]The statistic is 0.18 which is distributed as a χ^2_1.
[70]The estimate for the insider power, $\hat{\lambda}$, is computed as follows:

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

our estimated range for manufacturing is over the upper bound for a previously estimated range from Spanish data, using industry level data, centred around 0.09 (Andrés and García (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 hand, the estimates when looking at the whole manufacturing sector are lower than the mean of the estimates for some manufacturing industries.

Wage dynamics is similar when considering either the wage bill or base wages (Table 3.1.a.(4), 0.07) in the manufacturing sector. In both cases, the estimates are much lower than that in Dolado and Bentolila (1992), which is set at around 0.25. Our guess is that our coefficient for wage dynamics is underestimated due to a lack of valid instruments for the wage[71]. The coefficients of both wage structure variables, the tenure variable (TEN/ω) and the productivity variable (PROD/ω), are significantly different from 0 (the null hypothesis that both are additional payments is rejected) and -1 (the null that the related payment has no incidence at all is also rejected), being our estimates -0.15 (non-significant) and -0.47 (highly significant), respectively. Consequently, we might conclude that, for the manufacturing sector, a flexible wage structure lowers the base wage but increases the total payroll.

[71]For 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.

Patterns in the services sector are sensibly different. First, though wage dynamics is similar when considering the wage bill (Table 3.2(1), 0.075), the pattern is quite different when considering base wage (Table 3.2(4), 0.244). 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 3.2(4), -0.20) and, therefore, it is increasing the total payroll; the coefficient of the tenure-related payments is significantly lower than minus one (Table 3.2(4), -1.84). Consequently, tenure payments lower the base wage 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 manufacturing and services (around 0.15 and 0.10 respectively), but it is not true for the employment hysteresis, found negative for both the manufacturing (-0.042 -Table 3.1.a(1)- and -0.077 -Table 3.1.a(4)) and the services sector (-0.12 -Table 3.2(1)- and -0.034 -Table 3.2(4)), although the estimated coefficient is not relevant for services. The result for manufacturing is consistent with those obtained by Andrés and García (1991) but not with those in Dolado and Bentolila (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 accordance with the theory. If only permanent employees should be considered insiders, the specification in column (1) should be considered inadequate. An immediate implication of such a inadequacy (if the assumption that only permanent employment is relevant holds) is that the coefficients of expected and past employment (membership) coefficients must be, as a rule, different. The results of such a model are reported in column (3) of Table 3.1.a and Table 3.2, 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 3.1.a(3)) and 0.10 (Table 3.2(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 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 0.01 in either case. The market power proxy is found to have a significantly negative effect on wage bill but positive on base wage for the manufacturing sector[72]. 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, absenteeism, 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).

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[72]For services, it was found irrelevant and it was not considered in our final specification.

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 3.2(4) -0.20). Finally, unexpected past inflation has been found, as expected, to have a positive effect on wages. This result is clear for manufacturing (around 0.025 in Table 3.1.a) but not for services for which it is not found significantly different from zero.

Finally, we will discuss 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 3.2(4) in which is found positive). That suggest 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