Bargained wages, wage drift and the design of the wage setting system

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Motivation

- *European* bargaining systems have a *bad reputation*: rigidities lead to unemployment
- Result may change, depending on degree of coordination/centralization in the bargaining process. Ex: Nickell (1997), Calmfors and Driffill (1988), Teulings and Hartog (1998)
- Portugal: one of the OECD economies with highest wage flexibility and lowest unemployment rate
- Despite its *European* institutional framework:
  - collective bargaining sets wages for unionized as well as non-unionized workers
  - extension mechanisms are widespread
  - national minimum wage is enforced
- Unique data set with information on worker, firm and collective bargaining contract

Questions

- What's the degree of freedom that employers have when manipulating wages in a regulated institutional framework?
- How can a typically *European* bargaining system co-exist with high wage flexibility and low unemployment rate?
- What's the impact of collective bargaining on the wage distribution?

Data

- Matched employer-employee data set
- Each year:
  - 2,500,000 workers
  - 200,000 firms
  - 500 collective bargaining contracts
  - 30,000 worker categories
- Worker data:
  gender, age, skill, occupation, schooling, date admission into firm, monthly earnings, duration of work, date latest promoted, mechanism of collective bargaining and category in collective bargaining
- Employer data:
  location, industry, employment, sales, ownership, legal setting

Concepts

- Contractual wage: $wbarg$
- Actual monthly wage:
  $wactual = wbase + wtenure + regular\_subsid$
- Wage drift:
  $wdrift_{it} = log(\frac{wactual_{it}}{wbarg_{it}})$

Computation of the contractual wages

- Problem to overcome
- Idea for solution
- Checks & results

$\Downarrow$

Analyze job categories with at least 50 workers and agreements with at least 1000 workers

- Textiles —cotton and knitted fabrics:
  low-wage manufacturing;
- Electric and electronic goods industry:
  high-wage manufacturing;
- Banking:
  high-wage services.

	Full-time wage-earners			
	total		selected sample	
Industry	1998	1999	1998	1999
Banking	60,922	63,599	53,291	54,502
Electric and electronic equipment	38,832	42,870	23,951	29,717
Textiles: cotton and knitted fabrics	72,518	72,407	52,849	53,240

Sample sizes when checking the procedure to compute the contractual wage.

Note: The sample selected covers full-time wage-earners in professional categories with at least 50 workers, with category and contractual wage unambiguously defined. Source: Computations based on Portugal, MTSS (1998-1999).

Industry	1998	1999
Banking	0.992	0.994
Electric and electronic equipment	0.885	0.949
Textiles: cotton and knitted fabrics	0.834	0.768

Correlation between contractual wage and the mode of the base-wage for the worker professional category.

Note: Weight equal to size of professional category. Source: Computations based on Portugal, MTSS (1998-1999) and *Boletim do Trabalho e Emprego* (several numbers).

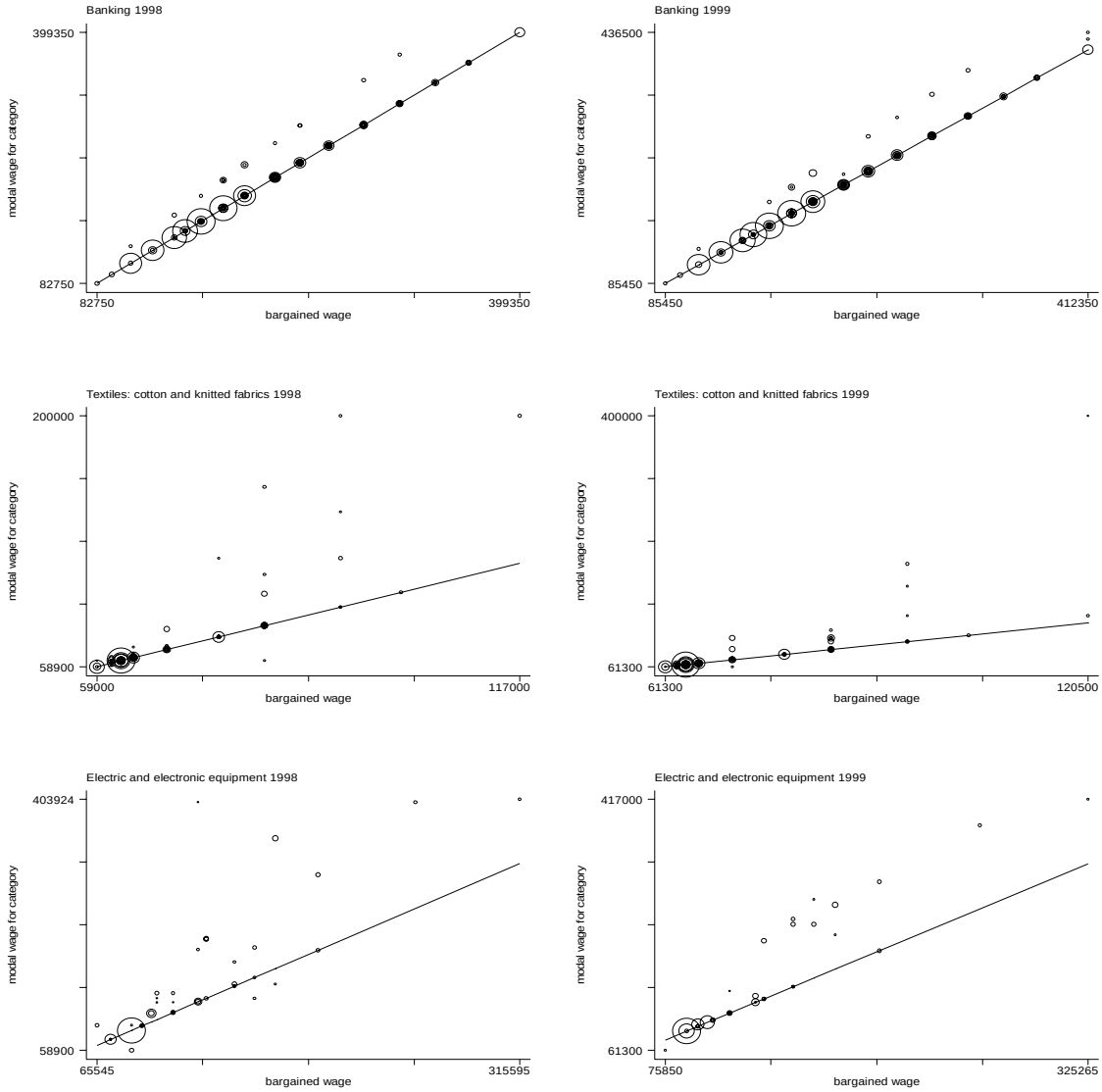

Figure 1: CONTRACTUAL WAGE VERSUS MODE OF THE BASE-WAGE BY WORKER PROFESSIONAL CATEGORY.

Note: Each circle represents one worker professional category and its area is proportional to the number of workers covered. Source: Computations based on Portugal, MTSS (1998-1999) and *Boletim do Trabalho e Emprego* (several numbers).

Sample size	workers	firms	agreements	categories
Total employer-employee data set	2,568,456	242,026	531	30,659
Ftimers, 16-65 yrs, manuf & serv., w>=min	1,644,550	172,372	385	24,114
Col. barg. worker categories>=50 workers	1,462,932	165,795	232	3,871
Col. barg. agreements>=1000 workers	1,438,699	162,604	133	3,662

Sample sizes in analysis of wage bargained and wage drift, 1999.

Source: Computations based on Portugal, MTSS (1999).

Wage drift: overview impact on the wage distribution

- Drift by broad industrial sector
- Wage dispersion:
  drift has de-equalizing impact on the distribution
  it is specially heterogeneous at the top

Industry	Av. wage drift
food, bev,tobacco	.300
textiles, wearing app, leather	.233
wood	.265
pulp, paper, printing	.465
petroleum prod, chemicals, rubber, plastic	.435
other non-metallic mineral prod	.327
basic metals, fabricated metal products	.326
machinery, equipment	.338
other manufacturing	.241
electricity, gas, water supply	.362
construction	.298
trade	.383
hotels, restaurants	.199
transportation, storage, communication	.352
financial intermediation	.456
real estate, business activities	.402

Average wage drift by industry, 1999.

Source: Computations based on Portugal, MTSS (1999).

	Gini	$Q90/Q10$	$Q50/Q10$	$Q90/Q50$
Bargained wage	0.228	2.46	1.25	1.96
Wage drift	0.199	2.06	1.27	1.62
Actual wage	0.319	3.64	1.47	2.48

Dispersion of bargained wages, wage drift and actual wages, 1999.

Source: Computations based on Portugal, MTSS (1999).

Determinants of the bargained wage and of the wage drift

- *Worker attributes*:
  gender
  schooling
  age and age squared
  tenure and tenure less than 1 year;

- *Firm attributes*:
  size
  age
  average labor productivity
  gross job flow;

- *Collective bargaining system*:
  degree of coordination among employers
  union bargaining power.

- Controls for industry and region.

Major results

- Wage drift reinforces the impact of worker and firm attributes on wages: it "stretches" the distribution of the returns to worker and firm attributes

- On the contrary, wage drift dilutes the impact of collective agreement attributes: it "shrinks" the returns to union bargaining power

- Therefore, wage drift as a mechanism allowing firms to overcome, to some extent, the constraints imposed by collective bargaining

- Higher coordination among employers seems to restrain wage growth

- Fragmentation of bargaining (within occupation or firm) reduces union capacity to extract rents, leading to lower bargained wages

- Agreements covering wider geographical areas set lower wages, possibly because unions are unable to fully exploit local labor market conditions

	wage bargained		wage drift		wage actual	
	(coef.)	(marg.)	(coef.)	(marg.)	(coef.)	(marg.)
gender	-.109	-.062	-.128	-.079	-.204	-.177
	(.0007)		(.0007)		(.0007)	
schooling	.027	.016	.030	.019	.053	.047
	(.0001)		(.0001)		(.0001)	
age	.034	.020	.018	.011	.038	.034
	(.0002)		(.0002)		(.0002)	
age squared	-.0003	-.0002	-.0002	-.0001	-.0004	-.0003
	(2.41e-06)		(2.34e-06)		(2.43e-06)	
tenure	.007	.004	.002	.001	.007	.006
	(.00005)		(.00005)		(.00005)	
tenure less than 1 year	-.033	-.019	-.038	-.024	-.058	-.051
	(.0009)		(.0009)		(.0009)	
firm size (log)	.048	.028	.012	.008	.041	.036
	(.0002)		(.0002)		(.0002)	
firm age	-.0004	-.0003	-.0002	-.0001	-.0005	-.0005
	(1.00e-05)		(1.00e-05)		(.00002)	
firm av. labor productivity (log)	.044	.026	.033	.021	.064	.057
	(.0003)		(.0003)		(.0003)	
firm gross job flow rate	.002	.001	.012	.007	.016	.014
	(.0006)		(.0006)		(.0007)	
ag. multi-firm	.093	.058	-.025	-.016	-.017	-.015
	(.004)		(.004)		(.004)	
ag. sectoral	-.036	-.022	-.024	-.016	-.145	-.132
	(.003)		(.003)		(.003)	
ag. mandatory regime	-.150	-.078	.179	.127	-.023	-.020
	(.004)		(.004)		(.004)	
conc. ag. within occup. (Herfind.)	.112	.065	-.092	-.058	-.025	-.022
	(.001)		(.001)		(.001)	
conc. ag. within firm (Herfind.)	.263	.153	-.214	-.135	-.013	-.011
	(.003)		(.003)		(.003)	
conc. ag. within region (Herfind.)	-.032	-.019	-.063	-.040	-.183	-.161
	(.011)		(.011)		(.011)	
geog. scope agr. (number regions)	-.005	-.003	.010	.006	.002	.002
	(.0001)		(.0001)		(.0001)	
size col. agreement (log)	-.035	-.021	.008	.005	-.008	-.007
	(.0004)		(.0004)		(.0005)	
Obs.	1134427		1134427		1134427	
Log likelihood	-403240.9		-362584.8		-372350.1	
R2	0.54		0.30		0.59	
$\hat{\sigma}$	.301		.312		.327	

Table 1: Tobit models: bargained wage and wage drift, 1999.
Source: Computations based on Portugal, MTSS (1999). Note: Three regional dummy variables and 15 industry dummy variables have been included in each regression. Standard-errors in parenthesis.