

Rigidità nominali e reali: una misurazione micro

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1- Stime per l'Italia di IWFP

- Il significato delle rigidità nominali e reali: vincoli alla riduzione dei salari nominali (e connesso ruolo di lubrificante dell'inflazione) e vincoli istituzionali e contrattuali da rispettare a prescindere dalla situazione di mercato (minimi salariali e/o real wage resistance).
- Difficoltà logiche e di identificazione: rigidità versus addensamenti naturali nella distribuzione (norme come vincoli versus norme come meccanismi di coordinamento); rigidità (nominali) versus menu costs.

- Le misure macro tradizionali: velocità di reazione all'inflazione e rispondenza alla disoccupazione.
- L'IWFP (International Wage Flexibility Project): misure micro sulla base di una metodologia comune applicata alla distribuzione dei wage changes; analisi sensitività rispetto a metodologia e natura dei dati; metanalisi e link tra misure di rigidità e caratteristiche istituzionali.
- Il caso italiano nell'IWFP: combinazione di rigidità reali e nominali; mutamenti istituzionali (rimozione scala mobile) che possono approssimare un “esperimento naturale”.

2- Il sistema italiano di contrattazione ed i dati adoperati

- Predominant role of minima dictated by industry based national contracts: in level terms they account between 70-80% of total wages (10-15% added up by firm level collective agreements and 10-15% by individual bargaining and firm's wage policy).
- Multiannual rounds (every 2 years since 1993, every 3-4 years before) with pre-determined wage rises over the whole period (but mostly concentrated just after the contractual round)
- Indexation to prices until 1991 (with a coverage rate wrt inflation declining with actual wage and, on average, around 60% in the late '80s).
- Room for flexibility: attribution of "job-category" within contract (but no downward changes are possible); top-up components

I dati

- Daily Earnings (yearly earnings/days of work) from social security files in the private non farm sector.
- Peculiar measurement error:
Overtime (and to some extent temporary layoff time) impact upon actual earnings
Irregular components of earnings
- Cleaning of the data:
Job stayers only (later on comparison with job movers for whom nominal/real rigidities should matter less)
- Top/bottom cleansing

Issues of interest/critical aspects

- The role of indexation mechanism: the change since 1992 may provide for a “natural experiment”
- The role of minima contracted for vis-a-vis the real rigidity
- The possibility of comparing job stayers and job movers
- How to identify wage minima and minima changes?
- How to deal with a business cycle driven “measurement error”?

3- Descriptive evidence

- Identification of wage cuts/freezes and rises. Wage rises distinguished among 9 classes: below/equal/above inflation; below/equal/above modal change (in absolute amount within each industry/category cell), the modal change being representative of the rise dictated by the national contract (and indexation clauses).

- Results:

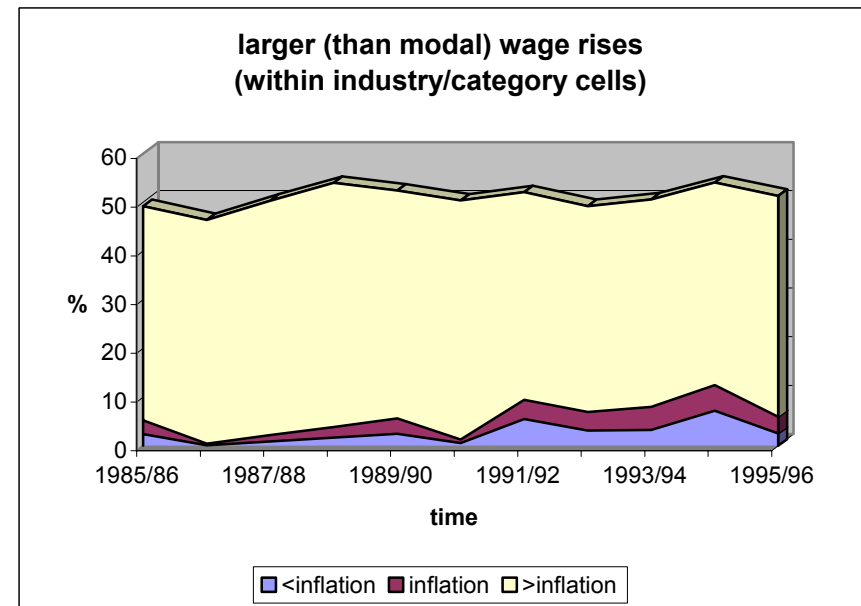
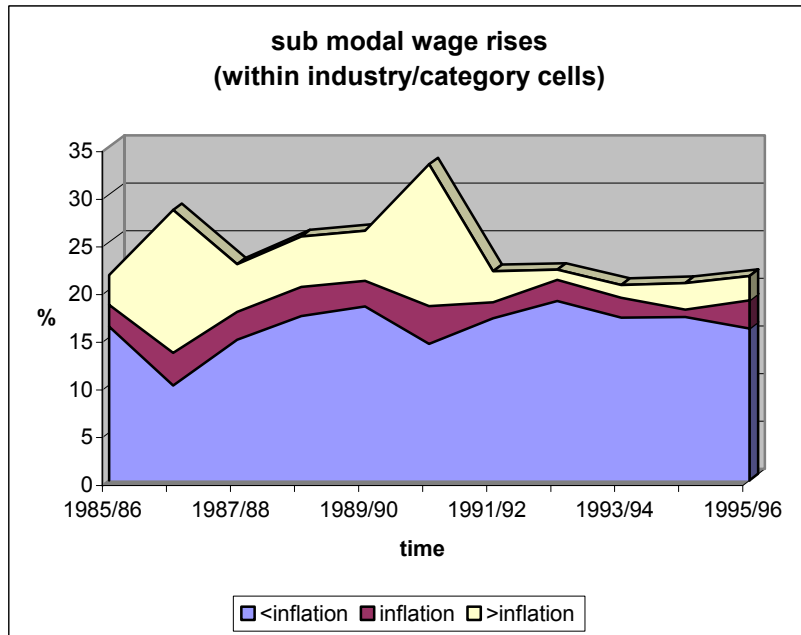
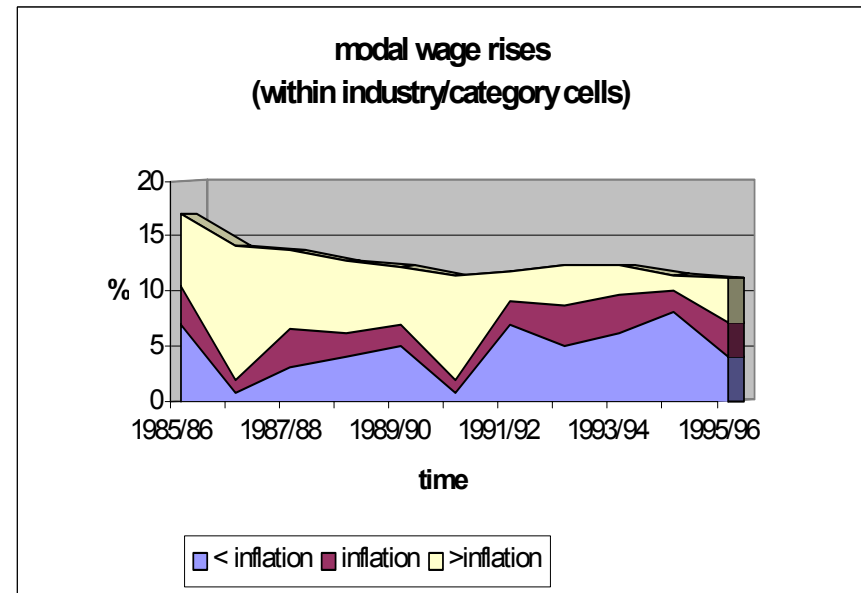
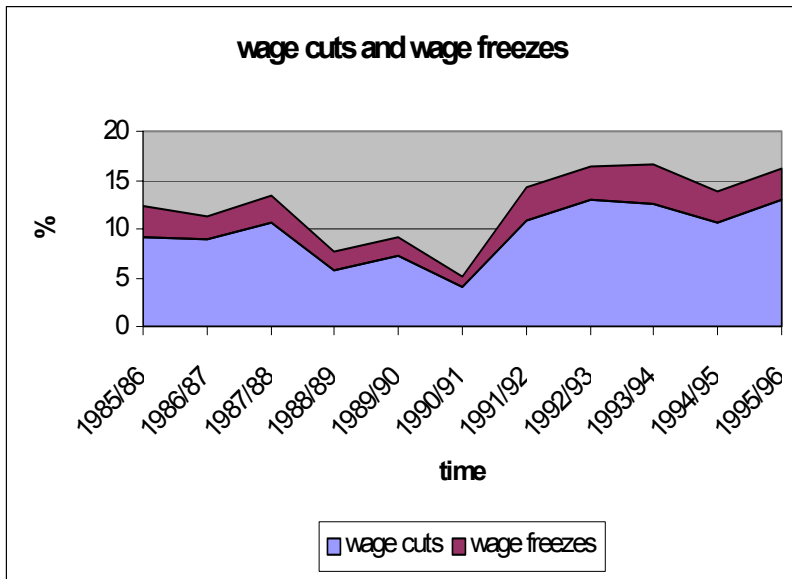
Wage cuts around 10%-Wage freezes around 3%

Below modal changes around 20%/Modal changes around 15%/ above modal around 50%

Over time: more wage cuts and more above modal wage rises

- Interpretation:

Decreasing relevance of national contracts (and floor/ceiling effects relating to them)



4- Prime stime

Modelling strategy:

comparison of the distribution of observed wage changes to a distribution of notional wage changes, allowing for measurement error and aiming at identifying the impact of a real rigidity threshold and of the nominal threshold (the no change outcome).

Benchmark estimates: a model with no use of external information, i.e. with ML estimates directly identifying the real rigidity threshold and the notional wage changes distribution, besides computing the measurement error and the impact of the thresholds upon the actual wage changes distribution.

The general statistical model and the ML estimates:

In every period each observation can fall into one of three groups:

- (i) those wages which cannot be increased less than a “real rigidity threshold”,
- (ii) those nominal wages which cannot be decreased, and
- (iii) those wage changes which will be set to the notional wage change no matter what it is.

Each person’s propensity to be in each of the three groups is a random variable

The **notional wage change**: $d_i^n = a_0 + X_i' a + e_{1i}$ $\text{var}(e_{1i}) = \sigma_e$

Real rigidity threshold: $r_i = c_0 + e_{2i}$, $\text{var}(e_{2i}) = \sigma_r$

NB: in the benchmark case a_0 and c_0 are yearly constant estimated by the ML routine, while in the alternative case use is made of external information: a macroeconomic wage rule is used for the former, the modal wage changes proxying national contracts (differentiating the threshold across observations according to industry and category) are used for the latter.

Correspondingly the **Actual wage change**:
$$d_i^a = \begin{cases} r_i & \text{if } y_{ri} > y_{ni} \text{ and } y_{ui}, \text{ and } d_i^n \leq r_i \\ 0 & \text{if } y_{ni} > y_{ri} \text{ and } y_{ui}, \text{ and } d_i^n \leq 0 \\ d_i^n & \text{otherwise} \end{cases}$$

As the propensity to **measurement error** in period t and t+1:

$$\begin{aligned} y_{0i} &= g_0 + e_{5i}, \\ y_{1i} &= g_1 + e_{6i}, \end{aligned} \quad \text{var}(e_{5i}) = \text{var}(e_{6i}) = 1$$

The **observed nominal wage change** is:

$$d_i = \begin{cases} d_i^a & \text{if } y_{0i} \text{ and } y_{1i} < 0 \\ d_i^a + e_{7i} + e_{8i} + X_i (h_0 + h_1) & \text{if } y_{0i} \text{ and } y_{1i} \geq 0 \\ d_i^a + e_{8i} + X_i h_1 & \text{otherwise} \end{cases}$$

The estimates lead to identification (for each year) of:

- propensity to measurement error and its variance;**
- propensity to be affected by real threshold and % of observation actually affected by it; % wage sweeps caused by this**
- propensity to be affected by nominal threshold and % of observation actually affected by it; % wage sweeps caused by this**

ML benchmark estimates

Anno	No. of observations	Mean observed	Sigma observed	Mean notional	Mean real threshold	Sigma real threshold	% exactly measured	Sigma meas. error	Propensity real rigidity	% obs affected by real threshold	% wage sweeps attributed to the real threshold	Propensity nominal rigidity	% obs affected by nominal threshold	% wage sweeps attributed to the nominal threshold
85/86	35650	.070	.073	0.034	0.055	0.026	0.958	0.283	0.640	0.370	0.032	0.108	0.039	0.003
86/87	44403	.086	.091	0.045	0.070	0.030	0.975	0.321	0.660	0.384	0.040	0.071	0.025	0.002
87/88	44167	.069	.070	0.034	0.055	0.026	0.966	0.277	0.600	0.347	0.031	0.086	0.031	0.002
88/89	43057	.098	.093	0.047	0.063	0.063	0.977	0.480	0.735	0.406	0.041	0.065	0.022	0.002
89/90	400066	.084	.091	0.054	0.059	0.028	0.976	0.552	0.679	0.353	0.030	0.070	0.021	0.001
90/91	39610	.103	.109	0.046	0.083	0.044	0.985	0.514	0.838	0.514	0.060	0.036	0.013	0.001
91/92	43229	.062	.067	0.046	0.037	0.020	0.956	0.249	0.496	0.225	0.014	0.127	0.035	0.002
92/93	42951	.046	.051	0.024	0.039	0.020	0.960	0.253	0.502	0.290	0.020	0.106	0.040	0.002
93/94	47737	.045	.046	0.029	0.031	0.015	0.949	0.222	0.480	0.243	0.014	0.140	0.047	0.002
94/95	46497	.059	.061	0.042	0.032	0.016	0.961	0.241	0.512	0.232	0.014	0.122	0.037	0.002
95/96	44351	.048	.046	0.031	0.035	0.018	0.958	0.238	0.435	0.225	0.014	0.113	0.373	0.002

Alternative estimates: ML estimates using external info about the real rigidity threshold and the notional wage.

Real rigidity threshold identified using the modal wage change by industry/category. We still allow for some variability of the threshold (may be this tends to enlarge too much in some years the area covered by the real threshold [eg. 1986/87])

Notional wage change: some variability according to age and age squared (as in the benchmark estimates) plus a wage rule given by: inflation+ long run productivity $-.06 * \log(\text{unempl}/\text{NAIRU})$ where .06 is four times the unemployment coefficient in a std Phillips curve for Italy [Bank of Italy econometric model] and the NAIRU has been put at 8.5% (four times as the notional change should be net of the effects of the real rigidity).

ML estimates with external info

Anno	No. of observations	Mean observed	Sigma observed	Mean notional	Mean real threshold	Sigma real threshold	% exactly measured	Sigma meas. error	Propensity real rigidity	% obs affected by real threshold	% wage sweeps attributed to the real threshold	Propensity nominal rigidity	% obs affected by nominal threshold	% wage sweeps attributed to the nominal threshold
85/86	35650	.070	.073	.053	.060	.021	.930	.229	.497	.264	.017	.186	.043	.002
86/87	44403	.086	.091	.043	.090	.046	.820	.157	.824	.603	.048	.176	.028	.001
87/88	44167	.069	.070	.041	.063	.025	.940	.237	.547	.324	.027	.107	.034	.002
88/89	43057	.098	.093	.056	.078	.031	.960	.417	.659	.383	.036	.087	.025	.001
89/90	400066	.084	.091	.074	.074	.022	.960	.483	.459	.229	.017	.125	.023	.001
90/91	39610	.103	.109	.085	.105	.029	.960	.357	.505	.295	.024	.120	.016	.001
91/92	43229	.062	.067	.052	.051	.019	.947	.223	.427	.208	.013	.156	.035	.001
92/93	42951	.046	.051	.040	.044	.014	.939	.215	.332	.174	.009	.155	.041	.002
93/94	47737	.045	.046	.024	.038	.019	.949	.222	.505	.291	.019	.137	.051	.002
94/95	46497	.059	.061	.042	.047	.021	.946	.212	.529	.274	.019	.133	.037	.002
95/96	44351	.048	.046	.018	.042	.023	.966	.255	.553	.340	.027	.093	.039	.002

5- Summing up (e futuri passi)

In media le rigidità reali sembrano prevalere (nel caso italiano) su quelle nominali

Nel tempo, anche in relazione con l'abolizione della scala mobile, queste crescono di importanza e le prime si riducono.

La plausibilità di queste indicazioni è di conforto alla metodologia adoperata. Rimangono però dei dubbi:

stime di benchmark o uso di info esterna?

l'info esterna sul real threshold dovrebbe essere più “esterna”: uso ccnl (da meglio identificare) e minore variabilità arbitraria (che effettivamente cambia nel tempo in maniera incontrollata).

Il notional dovrebbe essere “meno” arbitrario e più differenziato tra osservazioni (uso unemp regionale?)

Risultati poco soddisfacenti sul measurement error: troppo poco on average, troppo variabile (e senza collegamenti con i fattori ciclici e contrattuali plausibilmente sottostanti lo stesso) nel tempo