Collective Bargaining and Employment Growth in Italy

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VisitINPS Seminar, Rome
June 6th, 2018
Introduction

- This project aims at studying the employment effects of collective bargaining among private-sector dependent workers.

- Collective bargaining, by imposing statutory pay scales, produces downward wage rigidity. This institution can be considered similar to an occupation- and sector-specific minimum wage, but there is an important specificity:
  - Increments in pay scales have to be added to the base wage for all workers, unless specific agreements between employers and employees paid above the minimum state otherwise.

- Standard economic theory predicts that there could be disemployment effects associated to minimum wages, but the empirical evidence on this prediction is mixed.
Downward Wage Rigidity in Italy

Italian wages are considered to be **rigid**, as they are linked to statutory collective bargaining pay scales that are **uniform at the national sector-wide level**:

- *Boeri, Ichino, Moretti and Posch (2018)* show that wages are not linked to regional differences in productivity and price levels
- *Belloc, Naticchioni and Vittori (2018)* show that the urban wage premium is substantially lower among workers covered by collective bargaining
- *Devicienti, Fanfani and Maida (2018)* show that the growth of wage inequality in Italy is only episodic in nature and it is closely linked to greater differences between collective bargaining pay scales

This paper provides a **direct estimate of employment effects related to wage rigidity**.
Unemployment and Wages

Unemployment Rate by LLM (2006)

Mean Log Daily Wage by LLM (2006)
Unemployment Growth in Recent Years

Unemployment Rate by LLM (2006)

- 12.2 - 22.6
- 10.4 - 12.2
- 8.2 - 10.4
- 5.9 - 8.2
- 4.6 - 5.9
- 3.8 - 4.6
- 3.1 - 3.8
- 1.5 - 3.1

Unemployment Rate by LLM (2016)

- 21.3 - 39.1
- 18.1 - 21.3
- 14.6 - 18.1
- 10.6 - 14.6
- 9.0 - 10.6
- 7.6 - 9.0
- 6.6 - 7.6
- 2.4 - 6.6
Nominal Wage Growth in Recent Years (CPI coeff≈15%)
Sources of Information

- I evaluate the influence of collective bargaining on employment using information on **statutory pay scales applied by each contract for each month between January 2006 and December 2016**.

- I analyse **159 contracts out of the around 284 contracts** reported in INPS data (INPS aggregates smallest/newest contracts in residual contract groups).

- I study the employment effects of collective bargaining using the **population of private sector employees** (UNIEMENS) available from VisitINPS data, since pay scales apply to this category of workers.

- The matched sample **covers 77% of person-month observations** available in INPS data between Jan. 2006 and Dec. 2016 (1.246 Billions out of 1.616 Billions)
Every contract defines an **arbitrary number of pay scales** (usually between 5 and 10)

To make the data more comparable across time, I exclude contracts where the total number of pay scales is different than that observed at the next renewal.
I consider the **effective** pay scale in each month.

Pay scales are negotiated typically every **two years**, but dates of renewals can vary widely for each contract.

Usually there are automatic adjustments if a contract is not renewed after the limit.
Matching Within Contracts Pay Scales to Workers

- Each worker is subject to a specific pay scale within a contract, but only contracts can be matched to workers deterministically.

- I consider the evolution of mean and median pay scales within contracts as quasi-natural shocks affecting wages.

  - By the law, pay scales increases are added to the wage even for workers above the minimum.
    → Virtually all workers in a wage level are bitten by a growth in their pay scale.

  - Pay scale increments within contracts are highly correlated.
    → Average and median pay scales of the contract can be considered as valid proxies for actual pay scales.
Empirical Model Specification

I construct a monthly panel of Local Labour Market (LLM)/2-Digit Sectors/Collective Contracts cells.

Adopting a classical model derived from the minimum wage literature (e.g. Neumark et al., ILRR, 2014; Dube et al., RESTAT, 2010) I estimate the following equation

\[ Y_{Lscm} = \beta PS_{ctm} + \gamma X_{Lctm} + \epsilon_{Lscm} \]

Where:
- \(L = \text{LLM}, \quad s = 2\text{-digits sector}, \quad c = \text{contract}, \quad t = \text{year}, \quad m = \text{month}\)

\(Y = \begin{cases} 
\text{Mean wage in the cell} \\
\text{Full-time equivalent workers in the cell} \\
\text{LLM workforce}
\end{cases} \)

\(PS = \begin{cases} 
\text{Average pay scale within the contract} \\
\text{Median pay scale within the contract}
\end{cases} \)

Depending on the model, controls included in \(X\) are LLM unemployment and activity rates, year*(20) sector groups, month*sector, LLM, contract and contract*LLM fixed effects.
I adopt a log-log specification of the models, so that the coefficients of interest are interpreted as

\[ Y = E \langle \ln(\text{wage}) \rangle \rightarrow \beta = \text{elasticity of average wages to the relevant contract pay scales} \]

\[ Y = \ln(\text{Empl. rate}) \rightarrow \beta = \% \text{ change in the proportion of the LLM workforce that is employed in the cell for a 1\% change in the contract pay scales} \]

Notice that

- A change of the proportion of employees in a given contract, sector and LLM is not a change in employment. **Firms could react** by hiring more workers under **different contracts**, relying on **self-employed**, or they could resort to the **informal labour market**.

- **Changes in contract pay scales** can be endogenous. It is highly likely that they **tend to be pro-cyclical**, so that the bias on \( \beta \) would be toward the positive sign.
## Estimation Sample

### Weighted Summary Statistics

<table>
<thead>
<tr>
<th></th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Employment Rate of the Cell</td>
<td>-2.134</td>
<td>1.713</td>
</tr>
<tr>
<td>Mean Log Wage in the Cell</td>
<td>4.192</td>
<td>0.542</td>
</tr>
<tr>
<td>Contract’s Real <strong>Median</strong> Pay Scale</td>
<td>4.093</td>
<td>0.131</td>
</tr>
<tr>
<td>Contract’s Real <strong>Mean</strong> Pay Scale</td>
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<td>0.131</td>
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<td>Contract’s Real <strong>Growth in Mean</strong> PS</td>
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<td>0.008</td>
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<tr>
<td>Contract’s Real <strong>Highest</strong> Pay Scale</td>
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<tr>
<td>LLM Activity Rate</td>
<td>50.734</td>
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<tr>
<td>LLM Unemployment</td>
<td>8.462</td>
<td>4.825</td>
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<tr>
<td>Mean Number of Workers in the Cell</td>
<td>5,692</td>
<td>14,666</td>
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<tr>
<td>FTE Workers in Cell/LLM Workforce</td>
<td>0.332</td>
<td>0.570</td>
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<td><strong>Number of Cells</strong></td>
<td>17,302,281</td>
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<td><strong>Weighted Observations</strong></td>
<td>1.245 Bill.</td>
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## Effect of Pay Scales on Average Wages

<table>
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<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
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<td>Mean CCNL PS</td>
<td>1.238**</td>
<td>0.439**</td>
<td>0.434**</td>
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<td>0.397**</td>
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<tr>
<td>Median CCNL PS</td>
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<td>1.214**</td>
<td>0.397**</td>
<td>0.400**</td>
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<td>[0.0194]</td>
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<td>LLM Activity r.</td>
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<td>Sector*month</td>
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<td>0.388</td>
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Number of Observations: 17302281
Cluster-robust standard errors in parentheses (* p<0.01, ** p<0.001)
Effect of Pay Scales on Employment Rates

<table>
<thead>
<tr>
<th></th>
<th>(1) log Empl.</th>
<th>(2) log Empl.</th>
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<th>(4) log Empl.</th>
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<th>(6) log Empl.</th>
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<tr>
<td>Mean CCNL PS</td>
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<td>-0.514**</td>
<td>-0.414**</td>
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<td>[0.136]</td>
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<td>Median CCNL PS</td>
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<td>-0.582*</td>
<td>-0.619**</td>
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<td>LLM Activity r.</td>
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<td>-0.016**</td>
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<td>LLM Unempl.</td>
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<td>-0.0053*</td>
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</tbody>
</table>

Sector*year: YES, Sector*month: YES, LLM: YES, Contract: YES, Contr*LLM: YES

Adjusted R-s: 0.282, 0.476, 0.649, 0.283, 0.476, 0.649
RMSE: 1.452, 1.240, 1.015, 1.451, 1.240, 1.015

Weighted Number of Observations: 1244919718; Number of Cells: 17302281
Cluster-robust standard errors in parentheses (* p<0.01, ** p<0.001)
Further Robustness Tests

- Average and median pay levels are significant predictors of the 90th and 10th wage percentiles within cells, with elasticities in the range of 0.3 and 0.5

- The elasticity of employment to pay scales is negative and significant also when **LLM-specific year effects** are included to address the concerns of Dube et al. (RESTAT, 2010) (similar point estimates and very marginal growth in the fit of the model)

- The model provides similar results when pay scales are measured in nominal levels and CPI is included as a separate regressor (the coefficient on CPI is not statistically different from zero)

- The lowest pay scale within contracts affects employment only if it is instrumented by other pay scales (measurement error or irrelevance?)
Summary of the Results

- The elasticity of employment to pay scales is **stronger** than that documented by the most recent minimum wage literature on the US
  - For example, using a comparable estimation strategy, Meer *et al.*, JHR 2015 show an elasticity of employment to the MW of around -0.17 (it is -0.5 in our estimates)
  - This evidence suggests that, for what concerns employment outcomes, **minimum wages are a more efficient policy** than collectively bargained pay scales
- The **elasticity of labour demand** implied by our estimates is in the range of -1 (model with mean pay scales) and -1.4 (model with median pay scales)
  - This suggests that **total labour income would grow** after a (moderate) reduction in pay scales
Further Discussion and Research Plans

► When heterogeneity in employment levels across contracts is not accounted for, employment to pay scales elasticities are **positively biased**
  ► This issue could be further tackled adopting an **instrument** for changes in pay scale levels.

► Our evidence shows a strong **contemporaneous** negative relationship between pay scales and employment, but **employment effects could take time to show up**
  ► Longer-term effects of pay scales should be further explored through a **long-difference model specification**

► **Firm-level outcomes** in terms of productivity, profitability and adjustment on other margins (e.g. changes in contracts, reliance on self-employed, etc.) should be further explored
Thank you!
Correlation of Pay Scales’ Growth Within Contracts

Correlation of Nominal Pay Level Growth Within Contracts
Contracts where at least one pay level is changed wrt the previous month
Overall corr. coeff. = 0.74

Correlation of Real Pay Level Growth Within Contracts
Contracts where at least one nominal pay level is changed wrt the previous month - Overall corr. coeff. = 0.8

Corr. Coefficient

Year

Contracts where at least one pay level is changed wrt the previous month
Overall corr. coeff. = 0.74

Correlation of Nominal Pay Level Growth Within Contracts

Correlation of Real Pay Level Growth Within Contracts

Corr. Coefficient

Year

Contracts where at least one nominal pay level is changed wrt the previous month - Overall corr. coeff. = 0.8