The Macroeconomic Implications of Internal Promotions

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Introduction

- Standard theories in macro-labor economics link wages to workers' productivity (effort) and outside options. But wages often deviate from this prediction.

- Internal labor markets: firms offer many types of jobs, organized in hierarchical structures (job ladders). Workers can climb to higher-paying positions through internal promotions.

- Job ladders within firms imply that wages are tied to job levels $\rightarrow$ break the link between wages and labor supply – implications for the labor wedge.

  Workers at lower-level jobs may be willing to exert high effort, without an immediate pay reward, to increase their chances of promotion, and will gain a wage increase only upon promotion.

Evidence on internal labor markets/job ladders

Earlier evidence:

- Baker et al. (1993, 1994a,b) – based on case studies of individual firms
- McCue (1996) show that a significant fraction of wage growth occurs through internal promotions.

Recent evidence:

- Huitfeldt et al. (2023) using detailed employer-employee data on a large number of private-sector firms in Norway.

  "In contrast to a spot market where workers are paid their marginal productivity, workers have careers within firms and receive wages attached to the job characteristics and are not subject to influence from the outside market."

Evidence on job ladders - cont.

Huitfeldt et al. (2023)

- The are on average 4.4 internal labor markets (ILM) per firm.
- Most firms have one large ILM and several smaller ones.
- 70% of worker-year observations are employed in the largest ILM.
- The large ILM has around 5 hierarchy levels on average.
- ILMs have a pyramid shape: the number of workers is decreasing in the hierarchy level.
- External hires decline with the hierarchy level.
- Wages increase with the hierarchy level: the average wage in the top hierarchy level is about 20% higher than the wage at entry level.

Micro Literature

Micro literature on promotion tournaments and incentive-based wage schemes

Lazear Rosen (1981), Green Stokey (1983), Nalebuff Stiglitz (1983), Carmichael (1983), Malcomson (1984), Mookherjee (1984), Rosen (1986), Baker et al. (1988), McLaughlin (1991), Prendergast (1993), Gibbons Waldman (1999), Zabojnik Bernhardt (2001) and Gibbons Waldman (2006), Zabojnik (2012), DeVaro Waldman (2012), Moallemi et al. (2017), Ekinci et al. (2018), DeVaro et al. (2019) and Gurtler & Gurtler (2019).

- firms can strategically use wage spreads across job levels and promotion tournaments to elicit more effort from their employees.
- focus on the implications for individual firms in isolation from the rest of the labor market

Our contribution

Our paper analyzes the implications of such practices on aggregate labor market outcomes.

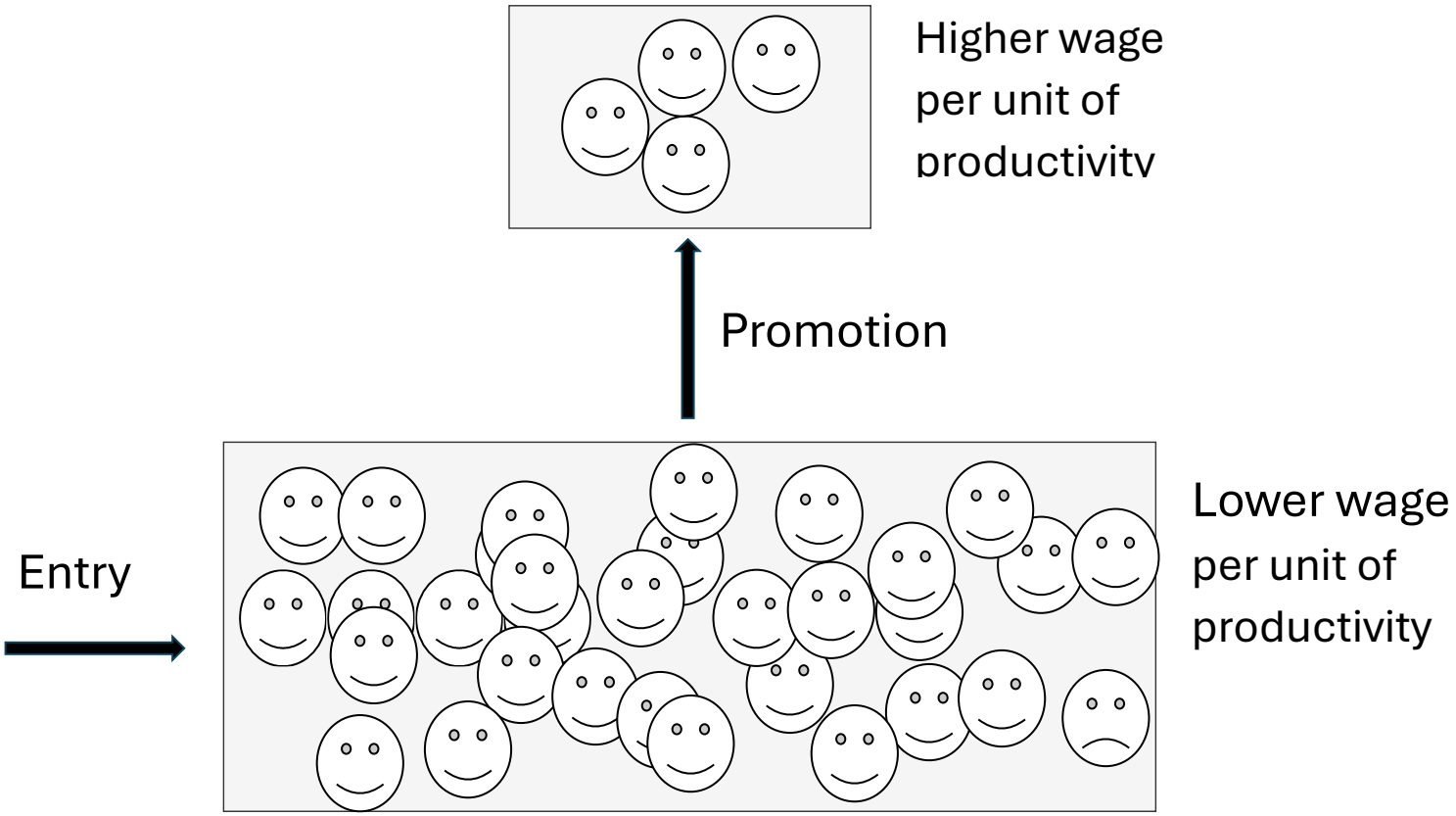
We develop a model of the labor market with "career" and "non-career" firms.

Non-career firms:

- have the typical one-type job structure and pay workers according to their marginal product.

Career firms:

- all workers start at the low rank, but have the possibility of getting promoted to a higher rank as a reward to a relatively high effort.
- optimal payment structure is to compensate workers' effort disproportionally:


Higher wage per unit of productivity
Promotion
Entry
Lower wage per unit of productivity

Our contribution - Cont.

We show how our model can explain a macroeconomic puzzle: the existence and cylicality of the labor wedge.

The labor wedge

$$\log\left(\frac{MPL_t}{MRS_t}\right) = \underbrace{[\log(MPL_t) - \log(w_t)]}_{\text{“price markup”}} + \underbrace{[\log(w_t) - \log(MRS_t)]}_{\text{“wage markup”}}$$

- Evidence: there is a labor wedge and it is countercyclical. (Chari et al. (2007), Shimer (2009)).
- Gali et al. (2007), Karabarbounis (2014) show that countercyclical movements in the wage markup explain most of the cyclical variation in the labor wedge.

The model

Households - Labor supply

- A continuum of utility maximizing households, with a unit measure of members.
- Supply labor, consume the final good, hold bonds, own the firms.
- The unemployed search for jobs in either career or non-career firms.
- Workers maximize their value in each job type by choosing the amount of labor effort (labor supply)

Firms - Labor demand

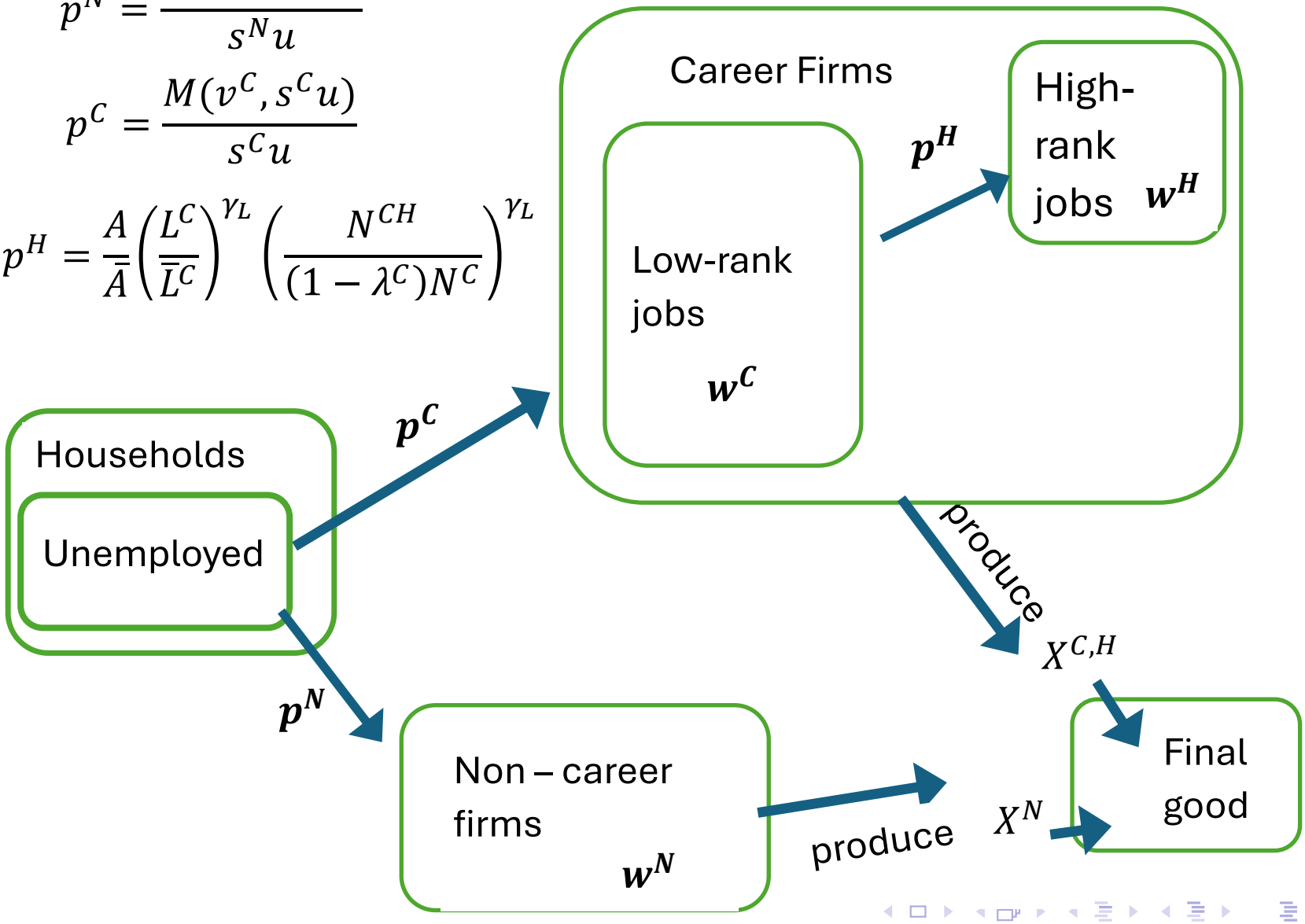
- Hire workers to produce a labor input which they then sell to the final good sector to produce the final good.
- They max profits by choosing how many vacancies to open and the wage per unit of effort.
- Career firms choose also the wages at the top positions and also the number of top positions – opportunities for promotion

The labor market structure

$$p^N = \frac{M(v^N, s^N u)}{s^N u}$$

$$p^C = \frac{M(v^C, s^C u)}{s^C u}$$

$$p^H = \frac{A}{\bar{A}}\left(\frac{L^C}{\bar{L}^C}\right)^{\gamma_L}\left(\frac{N^{CH}}{(1-\lambda^C)N^C}\right)^{\gamma_L}$$



1 Wage markup

In low-rank career jobs:

$$w^C < MRS^C$$

$$MRS^C - w^C = \frac{\partial \rho^H}{\partial L^C}\left(W^H - W^C\right) = \gamma_L \frac{\rho^H}{L^C}\left(W^H - W^C\right) > 0$$

The gap increases as:
$\rightarrow$ the value of a promotion increases ($\uparrow W^H - W^C$)
$\rightarrow$ the (perceived) probability of a promotion increases ($\uparrow \rho^H$)

In high-rank- and non-career jobs:

$$\begin{aligned} MRS^H &= w^H \\ MRS^N &= w^N \end{aligned}$$

Main model mechanisms- cont.

1. Price markup

In low-rank career jobs:

$$MPL^C > w^C$$

In high-rank career jobs:

$$MPL^H < w^H$$

In non-career jobs:

$$MPL^N = w^N$$

price markups in low and top positions have opposite signs, suggesting a relatively small average price markup

Main model mechanisms -cont.

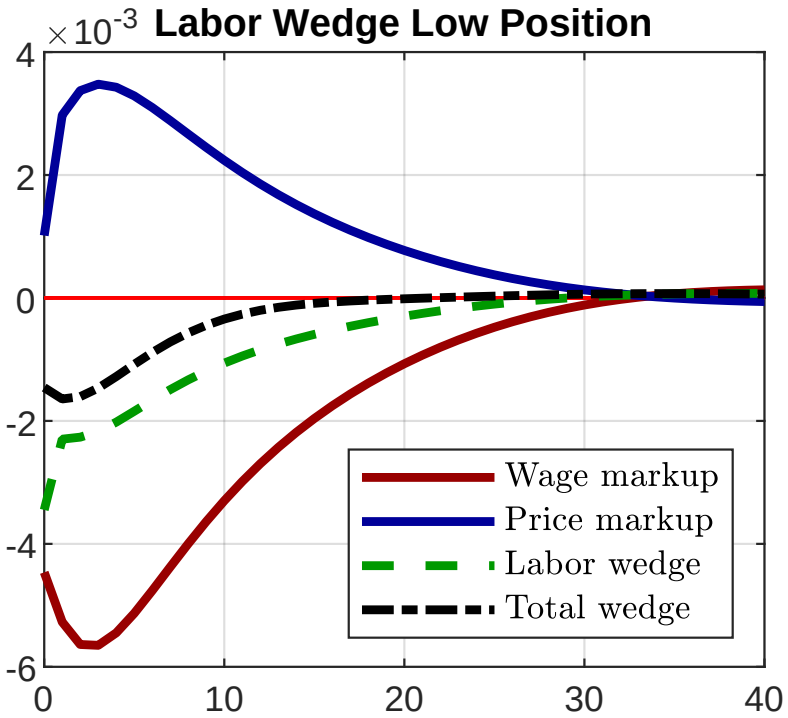
2. **The cyclical response of career firms:**

Career firms react to an increase in aggregate productivity by

- increasing compensation at the top (w^H) and the number of top positions (promotions, N^{CH})
- posting fewer vacancies (v^c) and lowering wages at the bottom (w^c)
- thereby increasing the probability and option value of a promotion.
  - $\uparrow p^H$ (fewer workers in low-rank jobs and more high-rank positions)
  - $\uparrow w^H - w^C \Rightarrow \uparrow W^H - W^C$

Implications for the labor wedge

- $\downarrow (w^C - MRS^C)$ – countercyclical wage markup
- $\uparrow (MPL^C - w^C)$ and $\downarrow (MPL^H - w^H)$
  price markups move in opposite directions


×10-3
Labor Wedge Low Position
4
2
0
-2
-4
-6
0
10
20
30
40
Wage markup
Price markup
Labor wedge
Total wedge


×10-3
Labor Wedge Top Position
1
0.5
0
-0.5
-1
-1.5
-2
0
10
20
30
40
Wage markup
Price markup
Labor wedge
Total Wedge

Conclusion

- Macro models of the labor market overlook internal labor markets and job ladders/hierarchies within firms.
- There is evidence that wages are tied to job levels/ranks and of career paths within firms.
- We show that allowing for a hierarchical wage structure and internal promotions into a macroeconomic model of the labor marker can help explain the existence and cyclicality of the labor wedge.

Work in progress:

- Carefully calibrate and validate our model.
- Central model prediction: career firms adjust entry-level hires and opportunities for internal promotions differently over the business cycle. If we can identify these in the data we could test the model.