The Effect of Non-Wage Competition on Corporate Profits

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Motivation: Corporations report that competition for talent using workplace amenities is critical for profitability

- Data extracted from S&P 500 firms' 10-K filings show that about 50% of them state that competition for employee talent through workplace amenities, such as **work-life balance**, is a critical component of their profitability
- **Question**: What is the effect of this on **corporate profits**?
    1. The extent of workers' non-pecuniary preferences: the literature on compensating differentials shows that much of the variation in wages reflects workplace amenities [e.g., see the literature review by Lavetti (2023, *JEP*)]
    2. The firm's comparative advantage in supplying amenities that workers demand: firms with such an advantage should perform better than in a world where workers only care about wages

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Our Paper

1. Document the importance of firms' *competition for talent* through non-pecuniary (in particular *work-life balance*) amenities using a contextual analysis of their SEC filings
2. Draw employee survey data from Glassdoor to provide reduced-form evidence on the relationship between wages, workers' ratings of workplace amenities, and the book asset size of publicly traded firms
3. Present a tractable assignment model [i.e., an extension of Tervio (2008, *AER*) and Gabaix and Landier (2008, *QJE*)] of a two-sided labor market where workers have non-pecuniary preferences, in order to explain the stylized facts
4. Calibrate the model and then do the counterfactual to answer the aforementioned question

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Main Takeaways

- Larger or more productive firms are associated with higher wages & greater worker satisfaction with workplace amenities
- The overall workplace rating of a firm rises with assets more quickly than its wages, consistent with *Positive Assortative Matching*, and with large firms having a comparative advantage in supplying non-pecuniary amenities
- The counterfactual implied by our model suggests that a 1% increase in workers' preferences for non-pecuniary amenities yields a 0.6% decrease in firms' expenditures
- Also: by comparing the variation in firms' *return on assets* with the variation in their *wage-to-assets ratio*, we estimate workers' preference weight on wages to be around 80%, and so their non-pecuniary amenities' preference weight is about 20%

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Related Literature

- Edmans (2011, *JFE*): a positive relationship between employee satisfaction at a firm and its long-term stock market performance (based on the list of *Fortune*'s "100 Best Companies to Work For in America")
- Fauver et al. (2018, *JFC*): an international dataset to estimate a positive effect of a firm's employee-friendly culture on its Tobin's Q, ROA, and ROE
- Edmans et al. (2024, *MS*): the positive relationship between a firm's employee satisfaction and its stock market returns is stronger in countries with greater labor market flexibility
- Chen et al. (2024, *EFM*): more family-friendly firms with smaller differences in work-life balance ratings across genders (on Glassdoor) are associated with higher employee productivity, operating performance, and Tobin's Q.

Related Literature Cont'd

- Complement the literature on how to measure compensating differentials [Hwang, Mortensen, and Reed (1998, *JLE*), Hwang, Reed, and Hubbard (1992, *JPE*)]
  - Mas and Pallais (2017, *AER*): field experiment ⇒ work hour flexibility is particularly valued by call center operators
  - Sorkin (2018, *QJE*): linear programming on job separations + administrative data on job flows ⇒ compensating differentials account for a large part of variance in wage earnings
  - Maestas et al. (2023, *AER*): stated-preference experiments to evaluate non-monetary job benefits
- Colonnelli, McQuade, Ramos, Rauter, and Xiong (2024, *WP*): estimate a model using a field experiment in Brazil and find that skilled workers' value of ESG practices is equivalent to
  - 10% of their average wages
  - 60% of the value they place on work-from-home arrangements

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Detecting workplace amenities in 10-K filings

- For each historical member of the S&P 500 Index during 2016-2023, extract human capital-related text from the **General Business** and **Risk Factors** sections
- Prior to the SEC's modernization of Regulation S-K Items 101, 103, and 105 in the second half of 2020, such disclosures were relatively scarce:
  - Firms disclosed in Item 101(c) only the number of employees, occasionally breaking it down by full- versus part-time status, or by department or division.
  - Also included brief statements about the quality of employee relations, e.g., whether they were deemed satisfactory or good
- From 2020 onward, a dedicated human capital section, under the rationale that it is a material resource and a key driver of performance (and hence a valuable information for investors)

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Competition for Talent and Workplace Amenities in the 10-K Filings — The *Human Capital* Section

sec.gov/ix?doc=/Archives/edgar/data/0000050863/000005086324000010/intc-20231230.htm

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Human Capital

Our human capital strategy is grounded in our belief that our people are fundamental to our success. Delivering on our strategy and growth ambitions requires attracting, developing, and retaining top talent across the world. We are committed to creating an inclusive workplace where the world's best engineers and technologists can fulfill their dreams and create technology that improves the life of every person on the planet. We invest in our highly skilled workforce of 124,800 people (as of December 30, 2023) by creating practices, programs, and benefits that support the evolving world of work and our employees' needs. Our human capital philosophy includes three pillars we believe are needed to position our talent strategy as a competitive advantage:

- Hire and retain the best talent: We have embraced the future of work with a flexible, hybrid-first approach that differentiates Intel from competitors.
- Develop our talent to full potential: We have updated role descriptions and career pathways to better enable movement and help top talent work on the highest priorities.
- Create a winning culture: We have reignited Intel's results-driven, performance culture.

Fostering a culture of empowerment, inclusion, and accountability is also core to our strategy. We believe that an inclusive culture is important for attracting, developing, and retaining top talent, and we strive to provide a work environment where all employees from all backgrounds are valued, challenged, and rewarded. We are focused on reinvigorating our culture to strengthen our execution and accelerate our cadence of innovation. Our values—customer first, fearless innovation, results driven, one Intel, inclusion, quality, and integrity—inspire us and are key to delivering on our purpose. All employees are responsible for upholding these values, the Intel Code of Conduct, and Intel's Global Human Rights Principles, which form the foundation of our policies and practices and ethical business culture.

Talent Management

We continue to see significant competition for talent throughout the semiconductor industry. Our hiring was limited in 2023, in line with macroeconomic forecasts, financial performance, and cost-cutting measures, and we took actions to rebalance our workforce. However, the investments we are making to accelerate our process technology require continued and focused efforts to attract and retain talent—especially technical talent. Our undesired turnover rate[1] was 5.6% in both 2023 and 2022.

We invest significant resources to develop the talent needed to remain at the forefront of innovation and make Intel an employer of choice. We offer extensive training programs and provide rotational assignment opportunities and have updated our job architecture to help employees create custom learning curricula for building skills and owning their careers. To further support the growth and development of our people we continue to increase mentoring in our technical community, drive engagement through employee resource groups, and promote health and wellness resources to all our people. Through our annual employee

Competition for Talent and Workplace Amenities in the 10-K Filings — The *Risk Factors* Section

sec.gov/ix?doc=/Archives/edgar/data/0000050863/000005086324000010/intc-20231230.htm

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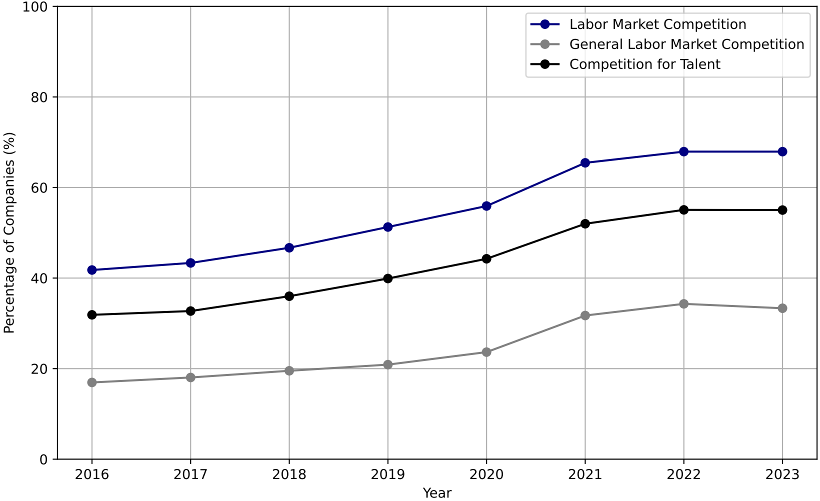
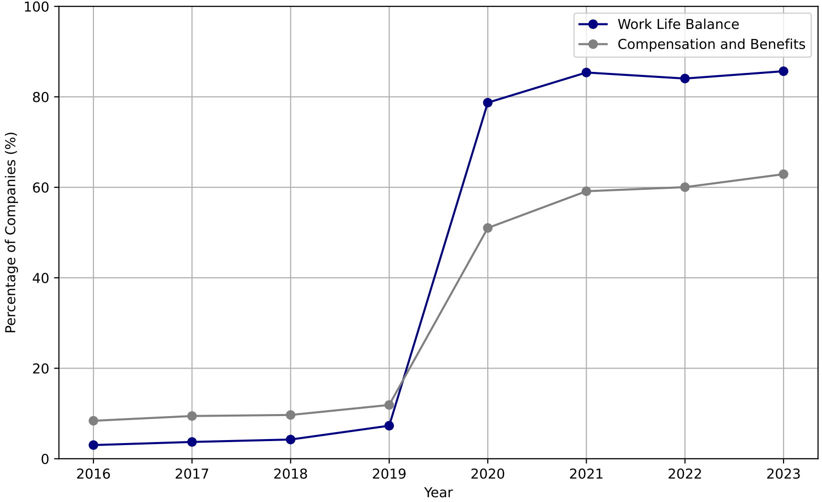
We must attract, retain, and motivate key talent.

We believe that hiring and retaining qualified executives, scientists, engineers, technical talent, sales representatives, and other professionals are critical to our business. The competition for highly skilled employees in our industry is intense, with the demand often exceeding supply. Competitors for technical talent increasingly seek to hire our employees, and the availability of flexible, hybrid, or work-from-home arrangements has both intensified and expanded competition. In addition, changes in immigration policies may further limit the pool of available talent and impair our ability to recruit and hire technical and professional talent. From time to time, we have intensified our efforts to recruit and retain talent, such as during 2021 and 1H 2022, and these efforts have increased our expenses. Further, we may not be successful in attracting, retaining, and motivating the workforce necessary to deliver on our strategy, and we have been required to curtail our planned hiring and reduce our workforce to respond to business conditions that differ from our expectations, which can be disruptive, compromise our ability to deliver on our strategy and workforce goals, and impact our ability to recruit in the future. Changes in employment-related laws applicable to our workforce practices may also result in increased expenses and less flexibility in how we meet our changing workforce needs. To help attract, retain, and motivate qualified employees, we use share-based awards, such as RSUs, and performance-based cash incentive awards. Sustained declines in our stock price or lower stock price performance relative to our competitors have been reducing the retention value of our share-based awards, which can impact the competitiveness of our compensation. Our employee hiring and retention also depend on our ability to build and maintain a diverse and inclusive workplace culture and be viewed as an employer of choice. To the extent our compensation programs and workplace culture are not viewed as competitive, or changes in our workforce and related restructuring, reduction-in-force or other initiatives are not viewed favorably, our ability to attract, retain, and motivate employees can be weakened, which could harm our results of operations. In addition, significant or prolonged turnover may negatively impact our operations and culture, as well as our ability to successfully maintain our processes and procedures, including due to the loss of historical, technical, and other expertise. Changes in our management team and any failure to successfully transition and assimilate key talent could disrupt our business and adversely affect our results of operations. To the extent we do not effectively hire, onboard, retain, and motivate key employees, our business can be harmed.

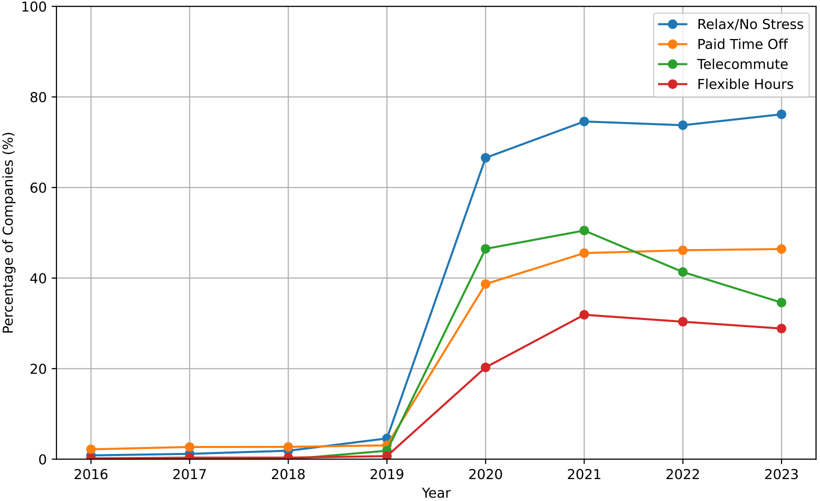
The percentage of firms referencing competition for general or talented workers by year



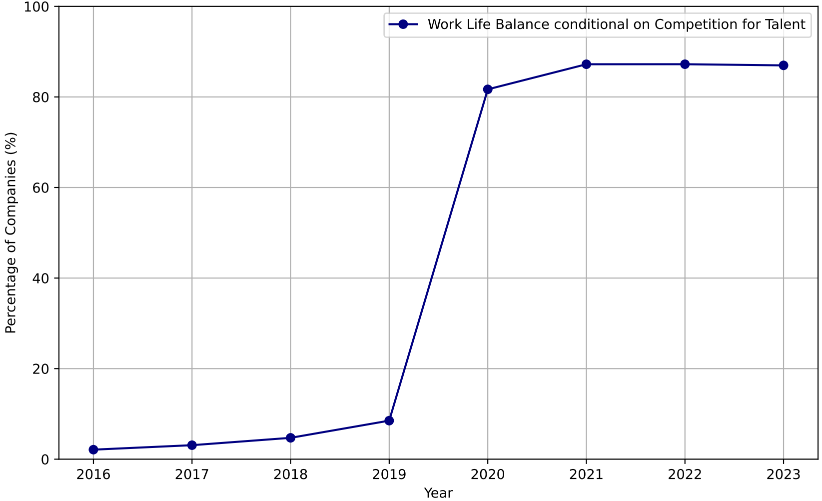
The percentage of firms referencing compensation and benefits versus work-life balance amenities over time



The percentage of firms referencing specific work-life balance amenities by year



The perc. of firms referencing work-life balance amenities, conditional on referencing competition for talented workers



Firm wages

- 2,477,126 salary reports for the period 2006-2022, extracted from Glassdoor
  - an online labor market platform where employees can anonymously write reviews about their firms and salaries
- A salary review contains information about:
  - name of the employer company
  - type of employment & job title
  - base pay & bonuses $\Rightarrow$ total pay
- Focus on jobs in members of the S&P 500 index
- Consider only full-time employees who:
  - report their job titles (1,245 occupation categories)
  - keep only reported salaries $\in$ [\$30,000, \$500,000]

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The selected top occupations in the IT industry

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rank	Title of Occupation	Number of Reviews	Relative Frequency (%)	Cumulative Relative Frequency (%)	Selected	Re-scaled Relative Frequency (%)
1	software engineer	72,385	14.5	14.5	✓	28.9
2	consultant	15,896	3.2	17.7	✓	6.4
3	engineer	14,316	2.9	20.6	✓	5.7
4	program manager	13,376	2.7	23.3	✓	5.3
5	manager	11,847	2.4	25.7	✓	4.7
6	project manager	11,123	2.2	27.9	✓	4.4
7	software developer	9,328	1.9	29.8	✓	3.7
8	product manager	8,529	1.7	31.5	✓	3.4
9	software engineer in test	7,794	1.6	33.1	✓	3.1
10	systems analyst	7,776	1.6	34.7	✓	3.1
11	systems engineer	7,564	1.5	36.2	✓	3
12	account executive	7,230	1.4	37.6	✓	2.9
13	business analyst	7,157	1.4	39	✓	2.9
14	sales representative	6,865	1.4	40.4	✓	2.7
15	design engineer	6,860	1.4	41.8	✓	2.7
16	applications engineer	6,836	1.4	43.2	✓	2.7
17	account manager	6,680	1.3	44.5	✓	2.7
18	management consultant	6,367	1.3	45.8	✓	2.5
19	analyst	5,898	1.2	47	✓	2.4
20	process engineer	5,782	1.2	48.2	✓	2.3
21	hardware engineer	5,334	1.1	49.3	✓	2.1
22	director	5,196	1	50.3	✓	2.1
23	associate	4,659	0.9	51.2		
24	financial analyst	4,482	0.9	52.1		
...	...	...	...	...		

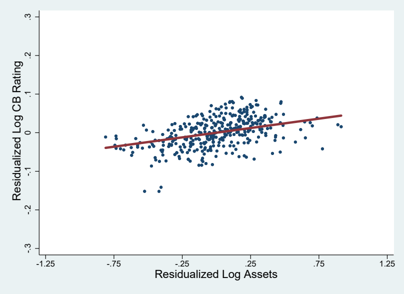
Summary statistics

	Mean	S.D.	Median	P5	P95
Panel A: Firms' salary and amenities' star ratings from Glassdoor					
Wage ($)	88,972	19,252	85,301	65,799	127,164
TotRating	3.36	0.27	3.34	2.96	3.84
CB	3.50	0.26	3.48	3.10	3.92
WL	3.18	0.31	3.18	2.72	3.72
Panel B: Firms' number of employees, assets, and profits from Compustat					
EMP	48,233	122,443	17,483	1,800	191,000
Assets (million $)	67,759	259,925	13,182	1,659	223,432
IB (million $)	1,678	5,163	603	-618	7,602
NI (million $)	1,694	5,180	611	-645	7,722
IB/EMP	63,821	442,256	33,557	-50,278	323,713
NI/EMP	66,099	449,409	34,083	-52,182	336,699

Scatterplots of firm wages and ratings against assets, after binning firm observations into 3 groups by industry-year

(a) Residualized wage against residualized assets

(b) Residualized compensation and benefits against residualized assets

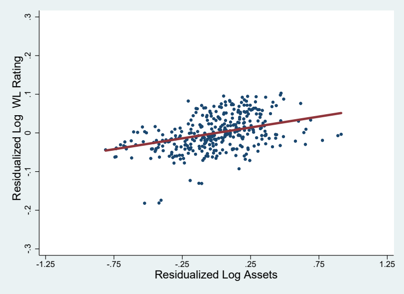


Firms are grouped into three asset bins within each two-digit GICS industry and year. Residuals are obtained by regressing the calculated log median wage, compensation and benefits rating, and asset size on industry-group fixed effects.

Scatterplots of firm wages and ratings against assets, after binning firm observations into 3 groups by industry-year

(c) Residualized overall rating against residualized assets

(d) Residualized work-life balance rating against residualzed assets



Firms are grouped into three asset bins within each two-digit GICS industry and year. Residuals are obtained by regressing the calculated log median total rating, work-life balance rating and asset size on industry-group fixed effects.

Regressions of a firm's wage and ratings on its own assets and the median firm's assets in its industry

	(1)	(2)	(3)
Panel A: Regressions of firms' wage			
ln(*Assets*)	0.014**	0.007***	0.045***
	(0.005)	(0.002)	(0.008)
ln(*IndustryMedianAssets*)	0.008	0.137***	0.100***
	(0.009)	(0.017)	(0.017)
Industry FE		✓	
Firm FE			✓
Observations	8534	8534	8534
R^2	0.016	0.235	0.332
Panel B: Regressions of firms' compensation & benefits rating			
ln(*Assets*)	0.008***	0.007***	0.048***
	(0.002)	(0.002)	(0.006)
ln(*IndustryMedianAssets*)	0.006	0.066***	0.043***
	(0.004)	(0.012)	(0.009)
Industry FE		✓	
Firm FE			✓
Observations	4,713	4,713	4,713
R^2	0.038	0.093	0.224

Two-way clustered standard errors at the firm and year level (in parenthesis). *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Regressions of a firm's wage and ratings on its own assets and the median firm's assets in its industry cont'd

	(1)	(2)	(3)
Panel C: Regressions of firms' overall rating			
ln(*Assets*)	0.007***	0.006***	0.079***
	(0.002)	(0.001)	(0.008)
ln(*IndustryMedianAssets*)	-0.000	0.111***	0.071***
	(0.004)	(0.024)	(0.017)
Industry FE		✓	
Firm FE			✓
Observations	4,747	4,747	4,747
R^2	0.015	0.128	0.298
Panel D: Regressions of firms' work-life balance rating			
ln(*Assets*)	0.004*	0.003**	0.056***
	(0.003)	(0.001)	(0.005)
ln(*IndustryMedianAssets*)	0.024***	0.076***	0.048***
	(0.005)	(0.016)	(0.011)
Industry FE		✓	
Firm FE			✓
Observations	4,698	4,698	4,698
R^2	0.062	0.080	0.226

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Assignment Model with Non-Pecuniary Preferences

- Standard assignment model for the labor market, ∼the one for CEOs by Gabaix and Landier ('08, *QJE*) & Tervio ('08, *AER*)
  - workers with heterogeneous skills: $s'(i) = B(1-i)^{-\beta-1}$
  - firms with heterogeneous productivity or asset size: $a(k) = a_L(1-k)^{-\frac{1}{\pi}}$
- Allow for workers' non-pecuniary preferences with

$$u(\mathbf{x}) = \prod_{n=0}^{N} x_n^{\alpha_n}$$

  - x_0 is wage, x_1 flexible hours, x_2 telecommute, etc.
  - $\alpha_n \in (0,1)$ and $\sum_{n=0}^{N} \alpha_n = 1$
- Each firm fills a number of positions $L(a)$, specified so that a position's productivity is Pareto too, with a tail index $\pi - m$

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Assignment Model with Non-Pecuniary Preferences

- Standard assignment model for the labor market, ∼the one for CEOs by Gabaix and Landier ('08, *QJE*) & Tervio ('08, *AER*)
  - workers with heterogeneous skills: $s'(i) = B(1-i)^{-\beta-1}$
  - firms with heterogeneous productivity or asset size: $a(k) = a_L(1-k)^{-\frac{1}{\pi}}$
- Allow for workers' non-pecuniary preferences with

$$u(\mathbf{x}) = \prod_{n=0}^{N} x_n^{\alpha_n}$$

  - x_0 is wage, x_1 flexible hours, x_2 telecommute, etc.
  - $\alpha_n \in (0,1)$ and $\sum_{n=0}^{N} \alpha_n = 1$
- Each firm fills a number of positions $L(a)$, specified so that a position's productivity is Pareto too, with a tail index $\pi - m$

A firm's decisions

- Each firm hires an $l(s)$ amount of workers of type s to produce

$$a^{\theta}\left(\int sl(s)ds\right)$$

1. $\theta \geq 0$: **complementarity** between asset size and skill
2. **additive separability** across workers' types + **multiplicative separability** within their types
   $\Rightarrow$ in a competitive equilibrium: a firm with productivity a hires only type s workers

- Provides amenity n at a linear cost $x_n \cdot (c_n a^{-\kappa_n}) \cdot L(a)$
  - For wage, $\kappa_0 = 0$ and c_0=1, so total wage bill is $x_0 \cdot L(a)$
  - $\kappa_n > 0$: larger firms incur a lower marginal cost of amenity n per position (economies of scale) than the smaller firms
  - $\kappa_n < 0$: smaller firms have the advantage (e.g., lack of coordination within a firm's network as its size increases)

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Competitive labor market equilibrium

Given any lower bound of firms' productivity (a_L) and any lower or upper bound of workers' skills (s_L or s_H), the **equilibrium** consists of:

- the optimal worker types $s^*(a)$ for the firm with type a
- the compensation bundle $\mathbf{x}^*(a)$
- workers' equilibrium utility $U(s)$

such that:

1. firm a with $L(a)$ positions maximizes its profit per position

$$V(a) = L(a) \cdot \max_{s,\mathbf{x}} \left\{ a^{\theta} s - \sum_{n=1}^{N} x_n \cdot c_n(a)^{-\kappa_n} \mid u(\mathbf{x}) \geq U(s) \right\}$$

2. the labor market clears

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Positive (or negative) sorting

Lemma

If $\theta + \sum_{n=1}^{N} (\kappa_n \alpha_n) > 0$, *the larger the size of a firm, the higher the skill of the workers it hires, i.e., there is positive assortative matching (PAM). Otherwise, a firm with smaller size hires more skilled workers, i.e., there is negative assortative matching (NAM).*

- In the classic assignment model with only wages $\alpha_0 = 1$, $\alpha_n = 0$ for any $n = 1, \ldots, N$, and $\kappa_0 = 0$
  $\Rightarrow$ PAM always holds since $\theta > 0$
- But here it depends also on which firms have an advantage in the provision of amenities
- Below we assume PAM, and then check it in the data

See Appendix

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Inferring $\sum_{n=1}^{N} \kappa_n \alpha_n$ using firm overall ratings and assets

Corollary (1)

Suppose that a workers' overall rating of their firms is a noisy proxy for their utilities, $TotRating\,[i] = \exp(\epsilon)\,(U\,[i])^{\lambda}$*, where* $\lambda > 0$ *is a constant and* ϵ *the error term. Proposition 1 implies that:*

$$
\begin{aligned}
\ln\left(TotRating\,[i]\right) = \zeta - \lambda\left(\frac{\beta}{\gamma}\right)\ln\left(a\,[i^*]\right) \\
+ \lambda\left(\theta + \sum_{n=1}^{N}(\kappa_n\alpha_n) + \frac{\beta}{\gamma}\right)\ln\left(a\,[i]\right) + \epsilon
\end{aligned}
$$

where i^* *is the ranking of the reference firm (e.g., the median) and* ζ *is a defined constant.*

Inferring θ and $\frac{\beta}{\gamma}$ using firm wages and assets

Corollary (2)

Denoting the wage as $w[i] \equiv x_0[i]$, Proposition 2 implies that:

$$\ln(w[i]) = \delta - \frac{\beta}{\gamma}\ln(a[i^*]) + \left(\theta + \frac{\beta}{\gamma}\right)\ln(a[i]), \quad (1)$$

where i^* is the ranking of the reference firm (e.g., the median) and δ is a defined constant.

For the quantity of amenity n, for any $n = 1, ..., N$, Proposition 2 also implies that:

$$\ln(x_n[i]) = \eta - \frac{\beta}{\gamma}\ln(a[i^*]) + \left(\theta + \frac{\beta}{\gamma} + \kappa_n\right)\ln(a[i]), \quad (2)$$

where η is another constant.

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Comparative statics in firms' equilibrium profits

Proposition (2)

$$\frac{\partial \ln\left(e\left[i\right]\right)}{\partial \ln\left(\alpha_n\right)} = \frac{\partial \ln\left(e\left[i\right]\right)}{\partial \ln\left(\kappa_n\right)} = -\frac{\kappa_n \alpha_n}{\theta + \sum_{n=1}^{N}\left(\kappa_n \alpha_n\right) + \frac{\beta}{\gamma}}.$$

Moreover, if either (i) all workers' non-pecuniary preferences increase by $\varepsilon\%$ (thereby becoming $\hat{\alpha}_n = \left(1+\varepsilon\%\right)\alpha_n$ for any $n = 1, ..., N$), or (ii) all firms' advantages in the provision of amenities increase by $\varepsilon\%$ (thereby becoming $\hat{\kappa}_n = \left(1+\varepsilon\%\right)\kappa_n$ for any $n = 1, ..., N$), then the percentage change in firm i's equilibrium expenditure is:

$$\%\Delta\left(e\left[i\right]\right) = -\frac{\varepsilon\% \sum_{n=1}^{N}\left(\kappa_n \alpha_n\right)}{\theta + \left(1+\varepsilon\%\right)\sum_{n=1}^{N}\left(\kappa_n \alpha_n\right) + \frac{\beta}{\gamma}}.$$

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Changes in firms' profits (for percentage increase in $\sum_{i=1}^{N} \kappa_n \alpha_n$, either through the κ's or the α's)

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- We estimate $\sum_{n=1}^{N}\left(\kappa_n \alpha_n\right) = 0.066$ and $\theta + \frac{\beta}{\gamma} = 0.045$
- $\sum_{n=1}^{N}\left(\kappa_n \alpha_n\right) > 0$ captures the relative advantage for providing amenities that larger firms have
- This gets stronger if workers have stronger non-pecuniary preferences $\Rightarrow \downarrow$ firms' expenditures and $\uparrow$ profits
- A 1% increase in all the α's $\Rightarrow$ 0.6% decrease in expenditure

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Inferring α_0, and so the extent of non-pecuniary preferences

Proposition (3)

Propositions 5 and 6 imply that:

$$\frac{\overline{V}[i]}{(a[i])^{\theta}} = \phi + \tau \frac{w[i]}{(a[i])^{\theta}}, \tag{3}$$

where $\phi \equiv \begin{cases} 0 \text{ if } \beta > 0 \\ s_H \text{ if } \beta < 0 \end{cases}$ and $\tau \equiv \frac{1}{\alpha_0}\left(\frac{\theta + \sum_{n=1}^{N}(\kappa_n \alpha_n)}{\frac{\beta}{\gamma}}\right)$ are two newly defined constants.

The less workers care about wages ($\downarrow \alpha_0$), the more compressed the distribution of firm positions' wage expense ratios relative to the distribution of their profitability ratios ($\uparrow \tau$).

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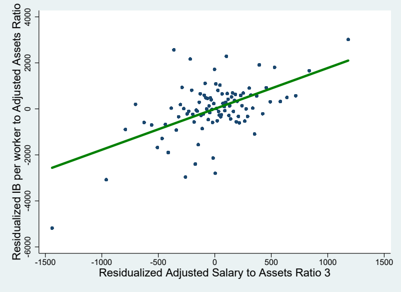
Profit-per-worker to Adjusted-Assets Ratio $\frac{Profits_{i,t}}{EMP_{i,t}}/Assets_{i,t}^{\hat{\theta}}$ vs. Wage to Adjusted-Assets Ratio $\frac{\hat{\theta}}{\beta/\gamma}Wage_{i,t}/Assets_{i,t}^{\hat{\theta}}$

(a) Resid. IB-per-worker to adjusted assets (w.r.t. firm and year FE) vs. resid. adjusted-wages-to-adjusted-assets ratio



(b) Resid. NI-per-worker to adjusted assets (w.r.t. firm and year FE) vs. resid. adjusted-wages-to-adjusted-assets ratio

The x-axis shows 100 bins of the residualized firm i's adjusted-wage-to-adjusted-assets ratio in year t.

Second stage of the non-pecuniary preferences' estimation: Regressions of a firm's profits per worker to adjusted assets ratio $\frac{Profits_{i,t}}{EMP_{i,t}} / Assets^{\hat{\theta}}_{i,t}$ on its adjusted wage to assets ratio

	(1)	(2)
	Profit-per-worker to adjusted-assets ratio	
	IB	*NI*
$\frac{\hat{\theta}}{\widehat{\beta/\gamma}} Wage_{i,t} / Assets^{\hat{\theta}}_{i,t}$	1.778***	1.842***
	(0.579)	(0.587)
Firm FE	✓	✓
Year FE	✓	✓
Observations	8,436	8,436
R^2	0.247	0.263

Bootstrapped se's clustered by firm and stratified by the number of years in a firm is observed (in parenthesis).
*, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Regressions used to estimate the model's auxiliary parameters

Panel A: Pareto fit of firm assets	
$\ln(IndustryRank - \frac{1}{2})$	-1.158***
	(0.034)
Industry FE	Yes
Year FE	Yes
Observations	8,534
R^2	0.837
Panel B: Regression implied by the functional form of $L(a)$	
$\ln(Assets)$	0.662***
	(0.033)
Industry FE	Yes
Year FE	Yes
Observations	8,459
R^2	0.583

Two-way clustered standard errors at the firm and year level (in parenthesis). *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Summary of the model's calibration

(1) Parameters	(2) Values	(3) Firm-level Data and Equations
α_0	0.818	*IB* per worker to model-adjusted *Assets* & model-adjusted *Wage* to assets ratio
	0.790	*NI* per worker to model-adjusted *Assets* & model-adjusted *Wage* to assets ratio
θ	0.145	Firm *Wage* and *Assets*
λ	0.710	Firm *TotRating* and *Assets*
$\sum_n \kappa_n \alpha_n$	0.066	Firm *TotRating* and *Assets*
π	1.158	Firm *Assets*
m	0.662	Firm *EMP* and *Assets*
γ	0.496	$\hat{\gamma} = \hat{\pi} - \hat{m}$
β	-0.050	$\hat{\beta} = \hat{\gamma} \cdot \widehat{\beta/\gamma}$

Conclusion

- Firms compete for talented employees by offering non-wage amenities, such work-life balance
- Glassdoor data indicate that larger firms offer both higher wages and more workplace amenities
- The stylized facts can be explained by a matching model with non-wage competition
- Our estimates suggest that:
    - Large firms benefit significantly more from non-wage competition than small firms
    - Workers' preference weight for wages is about 80%, and so workers' preference weight for non-pecuniary amenities is 20%

Outline of the Characterization

In a competitive matching equilibrium:

- the equilibrium utility $U(s)$ of a worker with skill s
- the equilibrium profit $V(a)$ of a firm position with productivity a

are uniquely determined by those ranked below them *given* a provided initial value $U(s_L)$ [and consequently $V(a_L)$] for the bottom-ranked worker-firm position pair

- Within any given worker-firm position pair, a worker receives a higher utility if her next best competitor becomes less skilled (i.e., as talent heterogeneity increases)
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Outline of the Characterization Cont'd

- We impose an initial condition for the equilibrium utility of the least skilled worker which entails that in equilibrium:
  1. workers' utilities and workers' compensation bundles, as well as firms' expenditures, have a Pareto quantile function
  2. firms' profits have either a pure Pareto quantile function or a Pareto-like one with a modifying non-linear term

  This feature comes in handy for the calibration of the model

- Alternatively & for robustness: Following Gabaix and Landier ('08, *QJE*), we consider the domain of very large firms, and show that workers' equilibrium utilities and compensation bundles, along with firms' equilibrium expenditures and profits, can still be approximately expressed as power functions of the corresponding firm size

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