Show Me the Amenity: Are Higher-Paying Firms Better All Around?

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The findings, conclusions, views, and opinions are solely those of the author and do not necessarily represent the views of the U.S. Department of the Treasury or the United States government. **Gap in the Literature**: Unknown empirically whether wages and bundle of non-wage amenities positively or negatively correlated

- Positive relation \rightarrow Wages underestimate firm-level dispersion
- Negative relation \rightarrow Wages *overestimate* firm-level dispersion
- Theoretically either is possible Firm-maximization problem

Approach: Estimate two-way fixed effects (AKM) models for wages and amenities to obtain firm-specific differences in both

- Capture amenities through machine learning with text
- Hard-to-measure aspects, e.g. coworkers, autonomy, stress

Data: Panel of workers' wages and workers' amenities who transition between firms.

Contribution to the Literature: Firms and Amenities

- 1) Growing literature on how workers value job attributes
 - Bartel (1982), Gronberg and Reed (1994), Akerlof et al. (1998), Sullivan and To (2014), Mas and Pallais (2017), Wiswall and Zafar (2017), Hall and Mueller (2018), Maestas et al. (2018), Chen et al. (2019), Le Barbanchon et al. (2020), Liu et al. (2021), He et al. (2021)

Contribution: Can speak directly to how firms set amenities, and incorporate more extensive amenity bundle Maestas et al.

- 2) Compensating differentials in amenities and the role of firms
 - Rosen (1986), Hwang et al. (1998), Pierce (2001), Mortensen (2003), Bonhomme and Jolivet (2009), Lavetti and Schmutte (2018), Sorkin (2018), Song et al. (2019), Bonhomme et al. (2020), Taber and Vejlin (2020), Jäger et al. (2021), Lamadon et al. (2021), Lachowska et al. (2021)

Contribution: Directly measure amenities across firms, identification of amenities not reliant on wage changes Sorkin

Data Sources: Glassdoor (2008–2020)

- Job Satisfaction Ratings Panel
 - 1.3 million observations (employer-job-year)
 - Overall rating (1–5 stars, integral)
 - Free-response descriptions (pros and cons sections)
 - External validity: industry-occupations in NLSY97 (NLSY97), ASEC (ASEC ratings) and AWCS (AWCS)
- Log Wages Panel
 - 2.0 million observations (employer-job-year)
 - Total salary (annualized, full-time, base + variable pay)
 - External validity: industry and region [Kabarbounis & Pinto 2019], colleges [Martellini et al. 2021], industry-occupations (ASEC pay)
- Can match workers and firms between the two with unique IDs.
- Workers incentivized to contribute by give-to-get mechanism.

Use Job Satisfaction and Isolate Component Directly Attributable to Non-Wage Amenities

Empirical Inputs:

- Firm job satisfaction premium (in stars of 5-scale ranking)
- **2** Dollar-equivalent of job satisfaction (stars \rightarrow \$)
- **3** Non-pay amenities' share of job satisfaction

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Then (average) firm-specific amenity value equals



Use Job Satisfaction and Isolate Component Directly Attributable to Non-Wage Amenities

1 Firm job satisfaction premium (stars)

- Two-way fixed effects regressions
- One standard deviation greater wage premium ightarrow 0.10 standard deviations greater job satisfaction premium

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 - Jobseeker application rates to postings showing stars & wage
 - Low-earners: \$3,000/star vs. High-earners: \$12,500/star

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 - Machine learning pros/cons text ightarrow 50 amenities ~
 - Regress non-pay-related amenities on satisfaction, take R²
 - Amenities explain 32-43% of satisfaction across firms

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Missing Dispersion from Amenities: For 68k firms,

- (Mean) compensation: Wage Premium (\$) + Amenity Value (\$)
- 90–10 gap widens with amenities, driven by the upper tail

Most Amenities Positively Correlated with Wages High-paying firms offer better managers, culture, and respect, but worse job security

Amenity	Correlation	Partial R^2
Pay	0.069***	0.4
Residual	0.055***	4.3
Residual II	0.039***	2.0
Pay growth	0.035***	0.1
Industry	0.034***	1.6
Respect / abuse	0.033***	6.7
Managers	0.032***	2.5
Short breaks	0.032***	0.2
Culture	0.032***	1.7
Teleworking	0.030***	0.1
Free food	0.028***	0.2
Leadership	0.025***	2.8
Office politics	0.025***	0.1
Teams	0.024***	0.6
Safety	0.023***	0.2
Difficulty	-0.002	0.1
Skill development	-0.002	0.1
Change	-0.003	0.1
Stress	-0.007*	0.1
Job security	-0.018***	0.1

- Reassuringly, pay satisfaction strongly positively related
- Partial *R*² reflects amenity's explanatory power for job satisfaction
 - Positively correlated ones drive satisfaction, e.g., respect/abuse, leadership

Residual Amenities

Findings Robust to Alternative Specifications/Explanations

- Not driven by any particular subset of workers
 - Can restrict to only males, females, current employees, industry switchers, low-earners, high-earners, low tenure, high tenure, job title stayers, workers in both panels
- Results hold for more connected sets with many movers
 - Account for limited mobility bias Limited mobility
- Observed across and within industries Across
- Not attributable to a warm glow effect (Warm glow)
- Not capturing strategic choice of wage or review
- Can relax the linearity assumption of star ratings





Concluding Remarks and Implications

1 Higher-paying firms offer better amenities.

- **2** Workers, especially high-earners, value amenities.
- 3 Taken together, amenities widen compensation dispersion across firms by elongating the upper tail.
- Rethink why firms set amenities? Strategic decision for employee retention/attrition?
- Can amenities help explain sorting behavior between workers and firms? Attract top talent? Pool top talent?

APPENDIX

A Simple Model of Wages and Amenities

Suppose a firm with marginal product of labor z is looking to hire a worker who supplies one unit of labor.

• Firm offers (w, a), where cost of a is c(a), with c'(a) > 0.

Suppose worker has utility U(w, a) where $\frac{\partial U}{\partial w} > 0$ and $\frac{\partial U}{\partial a} > 0$.

Firm maximizes profits subject to a worker participation constraint:

$$\max_{w,a\geq 0} z - w - c(a)$$

s.t. $U(w,a) \geq U_0$

(Interior) Solution:

$$c'(a) = rac{rac{\partial U}{\partial a}}{rac{\partial U}{\partial w}}$$

Under perfect competition, z = w + c(a).

Let
$$U(w, a) = log(w) + \beta log(a)$$
 and $c(a) = ca$.
 $\Rightarrow a = \frac{\beta z}{(1+\beta)c}$ and $w = z - c(a) = \frac{z}{1+\beta}$

Positive correlation (Mortensen 2003)

• Firm productivity: $\frac{\partial w}{\partial z} > 0$ and $\frac{\partial a}{\partial z} > 0$

Negative correlation (Rosen 1986)

• Worker's preferences: $\frac{\partial w}{\partial \beta} < 0$ and $\frac{\partial a}{\partial \beta} > 0$

Both are possible...depends which dominates.

Productivity and FEs

Experimental survey (N=1,815) of workers' preferences between jobs with differing attributes.

Workers have to make complex comparisons, but without actual consequences to their decisions.

Job is a wage and 9 attributes: schedule flexibility, telecommuting, physical job demands, pace of work, autonomy at work, paid time off, working in teams, job training, meaningful work.

Crucially: Cannot at all speak to the role of firms.

My approach: Uses actual job transitions workers have made, allow workers to tell me what attributes better/worse, allows for many more amenities, and can identify firms.

Administrative employee-employer matched data for the U.S. economy, can track workers across firms.

Uses AKM approach, infers the value of non-wage aspects through worker's transitions between firms.

Finds compensating differentials quite large by looking at variation in firm-level wages holding utility constant (Rosen motive).

Crucially: Cannot speak to Mortensen motive, i.e. how amenities differ between firms offering different utility levels, and relies on interpretation of accepted job transitions.

My approach: Directly measure firm amenities rather than imputing non-wage quality from wage changes

Stronger Wage Growth among Job Transitions to Higher-Satisfaction Firms Back to main slides

Figure: Δ Workers' Wages vs. Δ Firms' Rating Premia



Greater Sales Per Worker \rightarrow Larger FE (Compustat Firms) More productive firms offer better wages and better amenities Back to model

Figure: Firm Fixed Effects vs. Average Labor Productivity



Amenity: Residual I

Anchor words: none

 work, make, like, tell, say, time, know, job, come, working, want, way, day, place, use, start, ask, month, expect, things

Amenity: Residual II

Anchor words: none

 company, employee, business, role, create, new, result, process, focus, provide, level, truly, idea, individual, opportunity, continue, success, bring, allow, means

Glassdoor Wages Broadly Representative Across Industry-Occupation Pairs Back to data section

Correlations of 0.92-0.93 for the first moment of wages, 0.48-0.52 for the second moment.

		ASEC earnings statistic							
	Mean log earnings	Median log earnings	Standard deviation log earnings	Interquartile range log earnings					
Glassdoor wage statistic	1.272***	1 198***	0.390***	0.555***					
	(0.025)	(0 026)	(0.035)	(0.046)					
Industry-occupations	408	408	408	408					
R ²	0.86	0.84	0.23	0.26					
Mean ASEC weight	18818	18818	18818	18818					
Correlation	0.930	0.917	0.481	0.515					

Glassdoor Ratings Capture Differences Between Industries and Occupations (Back to data section)

Figure: Comparison of Glassdoor and NLSY97 Satisfaction Levels



satisfaction from Glassdoor 3.3 3.4 3.5 3.6 3.7 3.8 Life, physical, and social science Computer and mat Business and finance Education OLegal Engineering Food services Building Managemen cleaning Arts Personal care Healthcare support Sales service Social Office service administration average s 3.1 3.2 Transportation Maintenance roduction ÷. 3.6 37 3.8 3.9 4.2 4.3 3.5 41 average satisfaction from NLSY97

(b) By occupation

Glassdoor Amenities Trace Related Patterns Across Industry-Occupations in ASEC Back to data section

			I	Measure calcul	lated from ASE	с		
Standardized Glassdoor amenity	Share offers pension (%)	Share offers insurance (%)	Share using paid time off (%)	Share absent due to layoff (%)	Share employment white-male (%)	Mean	weekly time (hours)	at work
Retirement contributions	0.098*** (0.011)							
Health insurance		0.040*** (0.010)						
Paid time off			0.003*** (0.001)					
Job security				-0.010*** (0.002)				
Diversity/inclusion					-0.069*** (0.017)			
Work-life balance						-0.821*** (0.175)		
Hours							1.348*** (0.172)	-0.916*** (0.167)
Employment status controls				✓	~	√		✓
Industry-occupations	439	439	439	439	439	439	439	439
Painwise correlation	0.385	0.180	0.142	-0.184	-0.080	-0.185	0.352	0.352
R ²	0.15	0.03	0.02	0.18	0.22	0.59	0.12	0.60
Mean ASEC weight	17699	17699	17699	17699	17699	17699	17699	17699
Mean ASEC measure	0.480	0.430	0.033	0.030	0.452	38.80	38.80	38.80

Glassdoor Amenities Capture Meaningful Differences in Working Conditions in AWCS (Back to data section)

The 2015 American Working Conditions Survey designed to capture differences in hard-to-measure job attributes.

Calculate amenities that mirror ours from their survey questions, and aggregate to industry x occupation pairs.

		Amenity in AWCS								
	Short breaks	Safety	Work schedule	Autonomy/ responsibility	On-the-job training	Support	Work-life balance	Pay	Recognition	Communic ation
Amenity in Glassdoor	0.442***	0.335***	0.241***	0.216***	0.208***	0.133***	0.131***	0.122**	0.111**	0.085**
	(0.047)	(0.057)	(0.040)	(0.053)	(0.053)	(0.041)	(0.044)	(0.047)	(0.046)	(0.043)
Industry-occupations	203	204	204	204	204	203	204	204	203	204
Pairwise correlation	0.552	0.385	0.395	0.275	0.266	0.224	0.203	0.177	0.167	0.139
R ²	0.30	0.15	0.16	0.08	0.07	0.05	0.04	0.03	0.03	0.02
Mean AWCS weight	7.589	7.588	7.588	7.588	7.588	7.620	7.588	7.588	7.620	7.588

Heterogeneity in MWP Across Firms Back to main slides

Since high-wage workers increasingly value job satisfaction, high-paying firms increasingly employ workers with greater MWP.

Let ξ_k^l = share of firm k's workers with wages in the l^{th} quintile.





Origin	Destination Firm Decile									
Firm Decile	1	2	3	4	5	6	7	8	9	10
1	-0.04	-0.15	-0.23	-0.31	-0.38	-0.42	-0.49	-0.57	-0.71	-0.88
2	0.09	-0.05	-0.09	-0.14	-0.19	-0.22	-0.26	-0.32	-0.44	-0.62
3	0.18	0.02	-0.03	-0.08	-0.11	-0.15	-0.18	-0.21	-0.29	-0.54
4	0.25	0.08	0.02	-0.03	-0.07	-0.09	-0.11	-0.15	-0.22	-0.43
5	0.34	0.16	0.07	0.01	-0.02	-0.05	-0.07	-0.09	-0.15	-0.29
6	0.39	0.22	0.11	0.07	0.00	-0.05	-0.04	-0.07	-0.11	-0.24
7	0.47	0.27	0.17	0.10	0.04	0.00	-0.03	-0.04	-0.07	-0.20
8	0.59	0.35	0.25	0.17	0.11	0.06	0.04	-0.01	-0.03	-0.12
9	0.74	0.47	0.34	0.25	0.18	0.13	0.09	0.06	-0.01	-0.06
10	0.92	0.67	0.52	0.40	0.32	0.26	0.21	0.15	0.10	-0.01

Back to main slides

Origin	Destination Firm Decile									
Firm Decile	1	2	3	4	5	6	7	8	9	10
1	-0.2	-0.8	-1.2	-1.5	-1.8	-2.0	-2.3	-2.6	-2.9	-3.4
2	0.7	-0.2	-0.3	-0.7	-0.9	-1.2	-1.3	-1.7	-2.2	-3.1
3	1.2	0.4	-0.2	-0.2	-0.5	-0.7	-0.9	-1.3	-1.7	-2.7
4	1.6	0.7	0.4	-0.2	-0.2	-0.4	-0.6	-0.9	-1.4	-2.4
5	1.8	1.0	0.6	0.3	-0.2	-0.2	-0.4	-0.7	-1.1	-2.1
6	2.2	1.2	0.8	0.5	0.2	-0.2	-0.2	-0.5	-0.9	-1.9
7	2.3	1.5	1.0	0.7	0.5	0.2	-0.2	-0.2	-0.7	-1.6
8	2.6	1.8	1.4	1.0	0.8	0.6	0.4	-0.1	-0.3	-1.3
9	3.1	2.3	1.9	1.5	1.3	1.1	0.8	0.5	-0.2	-0.8
10	3.6	3.0	2.7	2.4	2.1	1.9	1.7	1.3	0.9	-0.1

Positive Correlation of Wages and Amenities Robust to Share of Movers Used in Identification (Back to main slides)

Bonhomme et al. (2020) show that variance across firms from AKM varies depending on the firms' number of job switchers.

Re-estimate firm FE by randomly shrinking sample size for each firm



Find Positive Compensating Differential After Conditioning on Worker/Firm Productivity Back to main slides

Follow TWFE approach of Lavetti and Schmutte 2018.

Calculate $\bar{R}_{\iota\sigma t}$ as the three-year rolling average at year t of overall rating in industry ι and two-digit SOC occupation σ .

$w_{ik\sigma t} = \beta R_{\iota\sigma t} + \text{fixed}$	$effects + \varepsilon$
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	Hedonic Specification							
		+Industry and						
	Pooled	Occupation	+Worker	+ Firm				
	(1)	(2)	(3)	(4)				
Overall rating (3-Yr MA)	0.649***	0.159***	-0.064***	-0.038***				
	(0.032)	(0.016)	(0.013)	(0.007)				
Observations	1180512	1180512	1180512	1180512				
R ²	0.25	0.44	0.90	0.93				
Mean wage	79691	79691	79691	79691				
MWP one additional star	51751	12658	-3506	- 301 6				
95% MWP confidence interval	[46707,56795]	[10193,15122]	[-4739,-2273]	[-4120,-1913]				

Job Satisfaction Improves as Firms Raise Pay (Back to main slides)

Firm fixed effects explicitly capture time invariant firm differences. But what if the firm raises/lowers wages?

Re-estimate AKM with firm x year (Lachowska et al. 2021):

$$R_{ikt} = \lambda_i + \lambda_{kt} + \gamma X_{it} + \varepsilon_{ikt}$$
$$w_{ikt} = \lambda_i + \lambda_{kt} + \gamma X_{it} + \varepsilon_{ikt}$$

Then estimate:

$$\hat{\lambda}_{kt}^{w} = \beta \hat{\lambda}_{kt}^{R} + \xi_{k} + \xi_{t} + \nu$$

	Overall rat	ing premia
Wage premia	0.353*** (0.024)	0.085*** (0.026)
Year FE	\checkmark	\checkmark
Firm FE		\checkmark
Firm-years	77556	77556
Adjusted R ²	0.01	0.31

Higher-Paying Industries Offer Greater Job Satisfaction

Education services though an outlier Back to main slides

If industry-wage differentials compensated for worse working conditions, should see a negative relation, but we do not.



Positive Wage-Satisfaction Relation Seen in Most Industries

Education services reveals the inverse Back to main slides

The postive relation between wages and amenities observed across firms not driven by the composition of firms in the sample.



Choice in Submission Type Back to main slides

Workers can provide a wage report, an employer review, or benefits rating to satisfy give-to-get mechanism.

Possible concern that high firm rating could reflect, rather than lower quality, omission of negative reviews vis-a-vis providing wages.

	Wage premia	Overall rating premia		
Share of respondents volunteer wage only	0.075*** (0.002)	0.241*** (0.026)		0.365*** (0.036)
Wage premia			0.463*** (0.020)	0.450*** (0.023)
Average share wage only	0.455	0.313	0.356	0.356
Std. dev. share wage only	0.240	0.151	0.123	0.123
Mean respondents per firm	157	156	229	229
Firms	117346	103054	67679	67679
Adjusted R ²	0.01	0.00	0.01	0.01

Notes: This table displays the coefficients from regressions of the firm fixed effects for job satisfaction on the firm fixed effects for wages incorporating the rates at which firms' workers submit only wage reports.

MWP from Jobseekers' Application Behavior (Back to main slides)

A vacancy being displayed to the user constitutes an "impression" and if the jobseeker initiates an application, that constitutes an "apply."

- I calculate each posting's ApplyRate, or applies per 100 impressions.
- Each posting displays a wage estimate w
- Each posting displays the employer's weekly overall rating R

For posting p of job j(p) at firm k(p) in metro m(p) posted on day t(p),

$ApplyRate_{p} = \beta_{R}R_{k(p),t(p)} + \beta_{w}w_{p} + \lambda_{k(p)} + \lambda_{j(p)} + \lambda_{m(p)} + \lambda_{t(p)} + \lambda_{$	ε_{p}
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	1st Wage Tercile	2nd Wage Tercile	3rd Wage Tercile
Employer rating	0.094*** (0.007)	0.103*** (0.007)	0.041*** (0.008)
50th percentile wage estimate (\$10000s)	0.302*** (0.008)	0.177*** (0.006)	0.033*** (0.002)
Mean application rate	0.59	0.83	0.80
Observations	2007887	2030997	2133685
Mean wage	30792	52151	97815
MWP one additional star	3118	5835	12512
R ²	0.07	0.14	0.19

Wage-Satisfaction Relation Not Driven by Warm Glow

Use difficulty of interview process to proxy for baseline sentiment Back to main slides

Workers at higher-paying firms may report greater job satisfaction levels because they have a higher initial reference point

• Perhaps a sense of pride or accomplishment if its more difficult for workers to obtain a high-paying job

Use data on interview difficulty and probability of offer through Glassdoor

• Employee-employer matches; use AKM approach

	Wage premia	Overall rating premia		
Probability of offer premia	-0.055***	-0.122***		-0.083***
	(0.005)	(0.018)		(0.019)
Interview difficulty premia	0.049***	0.116***		0.081***
	(0.002)	(0.008)		(0.010)
Wage premia			0.786***	0.714***
0 F			(0.036)	(0.036)
Average movers from wages	92	92	92	92
Average movers from overall ratings	57	57	57	57
Average movers from interviews	9	9	9	9
Std. dev. probability of offer	0.324	0.324	0.324	0.324
Std. dev. interview difficulty	0.693	0.693	0.693	0.693
Firms	13847	13847	13847	13847
Adjusted R ²	0.04	0.02	0.04	0.05

Amenity: Pay

Anchor words: pay, salary, base, money

• offer competitive, quite low, ridiculously low, make ton, way market, discrepancy, disparity, making much, low ball, peanuts

Interpretable (Hard-To-Measure) Amenities (Back to main slides)

Amenity: Pay

Anchor words: pay, salary, base, money

• offer competitive, quite low, ridiculously low, make ton, way market, discrepancy, disparity, making much, low ball, peanuts

Amenity: Coworkers

Anchor words: coworkers, people, friend, family, colleague

 coworkers become, become close, meet best, meet awesome, generally nice, good hard working, meet great, meet wonderful

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Amenity: Short breaks

Anchor words: break, rest, bathroom, lunch

• minute break, take lunch, long lunch, half hour, two minute, take lunch, min break, use bathroom, hour long, get break, break time

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• minute break, take lunch, long lunch, half hour, two minute, take lunch, min break, use bathroom, hour long, get break, break time

Amenity: Autonomy/responsibility

Anchor words: autonomy, independence, responsibility

• give lot, take additional, shirk, many responsibility, minimal supervision, lots freedom, variety task