A. Tests of alternative explanations

A.1. Wage compression

In this section we assess mechanisms other than communication about pay per se that could explain the wage equalization we observe when workers are co-located. Chief among them are productivity spillovers, either observed or perceived. Under a pay-for-performance framework, an employer may assign more compressed wages to workers if their performance converges or if the employer cannot attribute the output to individual workers.

Perceived productivity differences, as the explanation for the wage compression we observe, requires that (1) employers compensate workers according to their on-the-job assessed performance and (2) assessed performance of co-workers is less dispersed when workers are together.

We find evidence that a component of pay reflects on-the-job performance using a measure of performance constructed from back-end administrative data (effective percent positive score (EPP), detailed in Nosko and Tadelis (2015)). However, we do not find empirical evidence to support (2). Performance measures are no more dispersed or compressed when workers are co-located. In Table A3, the dependent variable is the dispersion of ratings given to workers at the conclusion of the job, expressed as the Gini coefficient. An indicator variable of whether these workers operate together or separately, including an interaction between ex-ante dispersion in the performance (effective percent positive lifetime rating) and co-location, adds minimal explanatory power for the final dispersion of ratings for a job. Without evidence that employer evaluations (or ex-post ratings) converge among workers when they are together, it is unlikely that perceived productivity drives the wage compression we observe.

More generally, there is a small and statistically insignificant correlation between bids and productivity. Theoretically, the relationship is ambiguous as well, a high productivity type might have both lower costs of effort and higher opportunity costs. While our private measures of individual productivity on TaskRabbit are strong predictors of real outcomes (eg. return customers, Table A1) they do not explain much of the variance in bids and market wages, which are determined in the absence of information about life-time effective percent positive scores (Table A2 Col.1). As a result, any systematic pattern of spillovers does not necessarily raise the performance of the low bidder or the pay of the low bidder per se. In other words, a model of positive spillovers where the most productive worker pulls up the performance of the least productive worker, would not imply that the lowest bidder improves performance per se and hence compressed performance pay. When we can observe productivity directly in our field experiment we find a small and insignificant relationship between output and bids.

Another potential channel consistent with the pattern of compression that we observe is employer preferences for equity specifically when workers are co-located (and not when they
are separated). We collect survey evidence (Sec.J.1) of how likely workers are to talk to and ask about another worker’s pay on-the-job, among the co-located jobs, and find significant variation (mean 40%, variance 24%) as a function of the extent of collaboration required, amount of noise and other activity in the environment, and length of time together. The frequency of renegotiation and compression is correlated with the probability of communication even within co-located jobs.

**TABLE A1:** Hidden administrative measure of worker quality (EPP) predicts employer satisfaction, TaskRabbit

<table>
<thead>
<tr>
<th>Dep. Var.</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employer returns</td>
<td>Positive rating</td>
<td></td>
</tr>
<tr>
<td>EPP (Effect Percent Positive Rating)</td>
<td>1.591***</td>
<td>5.858***</td>
</tr>
<tr>
<td></td>
<td>[6.154]</td>
<td>[20.19]</td>
</tr>
<tr>
<td>Ex-Ante mean rating</td>
<td>0.955**</td>
<td>0.876***</td>
</tr>
<tr>
<td></td>
<td>[-2.456]</td>
<td>[-5.611]</td>
</tr>
<tr>
<td>Prior # closed offers</td>
<td>1.075***</td>
<td>0.857***</td>
</tr>
<tr>
<td></td>
<td>[6.562]</td>
<td>[-11.72]</td>
</tr>
<tr>
<td>Constant</td>
<td>0.168</td>
<td>1.035</td>
</tr>
<tr>
<td></td>
<td>[-1.156]</td>
<td>[0.0261]</td>
</tr>
<tr>
<td>Category FE</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Worker characteristics</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Job Characteristics</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Observations</td>
<td>&gt; 100k</td>
<td>&gt; 100k</td>
</tr>
</tbody>
</table>

Exponentiated coefficients; t statistics in brackets

Notes: Each model is estimated using maximum likelihood assuming extreme value type-1 distributed errors (logistic regression). An observation is a matched worker-job in TaskRabbit. In Col. 1 the dependent variable equals 1 if the employer returns to the platform after the job is completed, giving her the option to rate the worker. The dependent variable in Col. 2 is equal to 1 if the worker receives a positive review after the job is complete, 0 otherwise. Positive review is defined as either a 4 or 5 on the 5 star scale. Standard errors are clustered at the job level. T-statistics are reported in brackets beneath the point estimate. Job characteristic controls include category fixed effects and proxies for transparency of the job requirements, including the length of description and frequency of posts in same category. We also include the number of bidders (log) and equipment requirements.
### TABLE A2: Worker quality measure (EPP) predicts ex-post pay but not ex-ante pay, TaskRabbit

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dep Var:</strong></td>
<td>Bid (log)</td>
<td>Raise (%)</td>
</tr>
<tr>
<td>Ex-ante EPP</td>
<td>0.00960</td>
<td>0.0771*</td>
</tr>
<tr>
<td></td>
<td>[0.0461]</td>
<td>[0.0431]</td>
</tr>
<tr>
<td><strong>Entry Month FE</strong></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Category FE</strong></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Worker characteristics</strong></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Job Characteristics</strong></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Mean Dep. Var.</strong></td>
<td>3.63</td>
<td>0.129</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td>&gt;100k</td>
<td>&gt;100k</td>
</tr>
<tr>
<td><strong>$R^2$</strong></td>
<td>0.238</td>
<td>0.00583</td>
</tr>
</tbody>
</table>

Notes: All models are estimated by OLS. An observation is the bid from a worker assigned to a job on TaskRabbit. The dependent variable is the log bid in Col. 1 and percentage raise above the initial bid in Col. 2. Standard errors are clustered at the level of the worker.
TABLE A3: Dispersion in Perceived Worker Performance, TaskRabbit

<table>
<thead>
<tr>
<th>Dep. Var.</th>
<th>Final Worker Performance Ratings (Gini)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparent (Co-located)</td>
<td>-0.00955 0.0142 0.0238 0.0800</td>
</tr>
<tr>
<td>(Co-located)</td>
<td>[0.0371] [0.0366] [0.0413] [0.108]</td>
</tr>
<tr>
<td>Ex-ante EPP (Gini)</td>
<td>0.455*** 0.384*** 0.364*** 0.688***</td>
</tr>
<tr>
<td></td>
<td>[0.122] [0.123] [0.135] [0.242]</td>
</tr>
<tr>
<td>Transparent × EPP (Gini)</td>
<td>-0.0437 -0.122 -0.146 -0.387</td>
</tr>
<tr>
<td></td>
<td>[0.167] [0.140] [0.155] [0.313]</td>
</tr>
<tr>
<td>No. workers (log)</td>
<td>0.142*** 0.185*** 0.254</td>
</tr>
<tr>
<td></td>
<td>[0.0509] [0.0484] [0.166]</td>
</tr>
<tr>
<td>Mean bid (log)</td>
<td>0.0483** 0.0427* -0.00807</td>
</tr>
<tr>
<td></td>
<td>[0.0208] [0.0232] [0.0452]</td>
</tr>
<tr>
<td>Constant</td>
<td>0.226*** -0.0171 -0.0332 0.194</td>
</tr>
<tr>
<td></td>
<td>[0.0332] [0.112] [0.133] [0.249]</td>
</tr>
</tbody>
</table>

Category FE ✓ ✓ ✓
Duration > 1hr ✓ ✓
Jobs with bonuses ✓

Mean Outcome 0.30 0.30 0.30 0.23
Std. Dev. Outcome 0.28 0.28 0.28 0.28
Observations 658 658 537 118
Clusters 421 421 356 110
$R^2$ 0.0492 0.133 0.144 0.249

Notes: Each model is estimated by OLS. An observation is a multi-worker job in TaskRabbit. The dependent variable is the dispersion in ratings received after work is completed, measured by a Gini coefficient. Ex-ante ratings are measured as the share of positive ratings at the time of hire. Standard errors are clustered at the employer level.
B. Pay Spillovers (Compression) at Worker-Bid Level with Performance Controls

In this section we estimate the causal impact of a co-worker’s private bid amount on one’s own final pay. The specification is another way of measuring compression, and we do so at the level of an individual worker-bid, which allows for additional controls for the perceived performance of a worker. The dependent variable is the raise a worker receives, as a percent above the initially agreed to bid. The key explanatory variable is relative bid distance, specifically the amount below the highest bidder accepted the initial bid is in percentage terms.

We run the specification in Equation 8. Each accepted bid placed by worker $i$ is one observation. The subscript $s$ refers to the job and $j$ to the employer.\(^{44}\) The dependent variable is the difference between ex-post payment and ex-ante bid, $\Delta y_{ijs}$, expressed as a percentage raise above $i$’s initial bid. The difference between $i$’s initial bid and that of the highest selected bidder is also expressed as the percentage above $i$’s initial bid, $T_{ijs}$.\(^{45}\) We interact difference between bids with an indicator for whether workers are separated on the job.

$$
\Delta y_{ijs} = \alpha_0 + \alpha_j + \beta \bar{X}_i + \phi \bar{X}_s + \epsilon_{ijs} \\
+ \gamma_1 T_{ijs} + \gamma_2 T_{ijt} \mathbb{1}_{\text{Separate}}
$$

(8)

These results can be seen in Table B4. Among the workers in co-located jobs hired by employers who return to the platform after the job is complete (as required to actively adjust pay) we find an additional 10% gap between a worker’s initial bid and that of the highest bidder will result in a 4% increase in final pay on average. The effect of the difference between co-worker bids on the final pay when workers are separated physically cannot be statistically distinguished from 0. Col. 4 demonstrates this finding is robust within employer.

\(^{44}\) We include employer fixed effects in our analysis, which also includes characteristics of the task itself.

\(^{45}\) We are confident that there is negligible measurement error in the bids, and are therefore comfortable normalizing both the dependent and independent variables by the initial bid.
<table>
<thead>
<tr>
<th>Dep. Var.</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Pay (% over bid)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amt. under top bid (%) (i)</td>
<td>0.437**</td>
<td>0.440**</td>
<td>0.441**</td>
<td>0.370**</td>
</tr>
<tr>
<td></td>
<td>[0.181]</td>
<td>[0.182]</td>
<td>[0.183]</td>
<td>[0.184]</td>
</tr>
<tr>
<td>Separate \times Amt. under top bid (%) (ii)</td>
<td>-0.444**</td>
<td>-0.445**</td>
<td>-0.443**</td>
<td>-0.362**</td>
</tr>
<tr>
<td></td>
<td>[0.181]</td>
<td>[0.184]</td>
<td>[0.183]</td>
<td>[0.184]</td>
</tr>
<tr>
<td>Virtual \times Amt. under top bid (%) (iii)</td>
<td>-0.350*</td>
<td>-0.338*</td>
<td>-0.339*</td>
<td>-0.251</td>
</tr>
<tr>
<td></td>
<td>[0.190]</td>
<td>[0.191]</td>
<td>[0.191]</td>
<td>[0.197]</td>
</tr>
<tr>
<td>Separate</td>
<td>0.00958</td>
<td>0.0585</td>
<td>0.0588</td>
<td>0.0605</td>
</tr>
<tr>
<td></td>
<td>[0.0532]</td>
<td>[0.0539]</td>
<td>[0.0538]</td>
<td>[0.0769]</td>
</tr>
<tr>
<td>Virtual</td>
<td>-0.0122</td>
<td>0.0718</td>
<td>0.0670</td>
<td>-0.135</td>
</tr>
<tr>
<td></td>
<td>[0.0631]</td>
<td>[0.0926]</td>
<td>[0.0914]</td>
<td>[0.103]</td>
</tr>
<tr>
<td>Years experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0236</td>
<td>0.0236</td>
<td>0.0236</td>
<td>0.0285</td>
</tr>
<tr>
<td>No. workers (log)</td>
<td>-0.118***</td>
<td>-0.117***</td>
<td>-0.0781</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0449]</td>
<td>[0.0426]</td>
<td>[0.0539]</td>
<td></td>
</tr>
<tr>
<td>Mean bid (log)</td>
<td>-0.0257</td>
<td>-0.0311</td>
<td>-0.168**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0361]</td>
<td>[0.0333]</td>
<td>[0.0718]</td>
<td></td>
</tr>
<tr>
<td>Effective percent positive overall</td>
<td>0.00457</td>
<td>0.00456</td>
<td>-0.00830</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0116]</td>
<td>[0.0113]</td>
<td>[0.0103]</td>
<td></td>
</tr>
<tr>
<td>No. reviews</td>
<td>-0.00865</td>
<td>-0.00824</td>
<td>-0.00830</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.00852]</td>
<td>[0.00843]</td>
<td>[0.0101]</td>
<td></td>
</tr>
<tr>
<td>Mean rating</td>
<td>0.0232</td>
<td>0.0246</td>
<td>0.0133</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0614]</td>
<td>[0.0604]</td>
<td>[0.0623]</td>
<td></td>
</tr>
<tr>
<td>Mean rating in category</td>
<td>-0.0585</td>
<td>-0.0533</td>
<td>-0.127</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.103]</td>
<td>[0.0883]</td>
<td>[0.104]</td>
<td></td>
</tr>
<tr>
<td>No rating</td>
<td>0.113</td>
<td>0.121</td>
<td>0.0198</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.306]</td>
<td>[0.301]</td>
<td>[0.309]</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.0396</td>
<td>0.279</td>
<td>0.261</td>
<td>1.353</td>
</tr>
<tr>
<td></td>
<td>[0.0497]</td>
<td>[0.724]</td>
<td>[0.648]</td>
<td>[0.885]</td>
</tr>
</tbody>
</table>

Performance w/in Cat. ✓ ✓ ✓ ✓
Category FE ✓ ✓ ✓
Employer FE ✓

P-value Test: \(H_0: - (i) = (ii)\) 0.211 0.652 0.776 0.533
P-value Test: \(H_0: - (i) = (iii)\) 0.133 0.994 0.994 0.108

Mean Outcome 0.11 0.11 0.11 0.11
Std. Dev. Outcome 0.27 0.27 0.27 0.27
Observations 1,313 1,313 1,313 1,313
Clusters 440 440 440 440
\(R^2\) 0.243 0.274 0.274 0.581

Notes: Each model is estimated by OLS. An observation is an accepted worker-bid for a multi-worker job on TaskRabbit. We restrict the sample to employers who ever re-visit the platform (required to enter a rating or adjust pay). The dependent variable is the size of the raise, as percent above the worker’s initial bid. The primary explanatory variable, amount under the maximum bid, is equal to \((\text{bid}^{\text{max}} - \text{bid}_i)/\text{bid}_i\) for person \(i\). Separate refers to jobs that are local but where workers are separated physically. Virtual refers to jobs carried out entirely online. "Performance w/in Cat." refers to the inclusion of the covariates capturing overall performance on the platform, replicated within each category. Because virtual jobs are, on average, much lower paying jobs, we expect some additional compression in the presence of efficiency wage incentives and minimum wage norms. Standard errors are clustered at the level of the job.
B.1. Strategic bidding, worker selection, and unanticipated transparency

For a causal interpretation of the effect of co-location on ex-post relative wages in our TaskRabbit population, we must show the composition of workers is similar across settings as are worker’s bids. Prima facie evidence supports these assumptions. Multi-worker tasks comprise fewer than 5% of posted jobs and workers are often unaware that more than one vacancy exists even when it does. Additionally, employers rarely have more offers that the number necessary to complete a multi-worker job. Here we offer more empirical tests.

We observe that the mean and dispersion of bids received are similar across job settings. We also find that dispersion in selected offers is no different across setting. Irrespective of work setting, employers select bids that exhibit roughly one-third of the dispersion of offers received.

As another test of our assumptions that workers, in this particular environment, do not bid strategically in anticipation of learning pay, we split a sample of co-located jobs by whether or not the employer explicitly mentions that the tasks require multiple people (e.g. “we need two people to load boxes” vs “load boxes between 12-2p”). 35% of job postings for co-located, multi-worker jobs do not reveal to workers that there are other workers on the job. In these jobs, workers are unlikely to be able to anticipate transparency. We find almost all worker characteristics are not statistically different (Table B5) with the exception of a 7 share point different in the gender of the applicants. Table B6 shows we cannot reject that bids are similar among those bidding on postings that do and do not reveal multiple workers are required. However, we may not have the specification or power required to detect many forms of strategic bidding.
TABLE B5: Comparison of worker characteristics for job postings that do or do not mention multiple workers required, TaskRabbit

<table>
<thead>
<tr>
<th>Applicant Characteristics</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the Multi-Worker Job Mention More than One Required?</td>
<td>No</td>
<td>Yes</td>
<td>T-Statistic</td>
</tr>
<tr>
<td>Years experience</td>
<td>0.44</td>
<td>0.46</td>
<td>-0.84</td>
</tr>
<tr>
<td>(0.02)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0.49</td>
<td>0.42</td>
<td>3.73</td>
</tr>
<tr>
<td>(0.01)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective percent positive overall</td>
<td>33.03</td>
<td>38.09</td>
<td>-1.32</td>
</tr>
<tr>
<td>(3.10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior # closed jobs</td>
<td>0.64</td>
<td>0.71</td>
<td>-1.59</td>
</tr>
<tr>
<td>(0.03)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean rating (=0 if none)</td>
<td>4.21</td>
<td>4.28</td>
<td>-1.06</td>
</tr>
<tr>
<td>(0.05)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No rating (=1 if none)</td>
<td>0.14</td>
<td>0.12</td>
<td>1.27</td>
</tr>
<tr>
<td>(0.01)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># Applicants</td>
<td>1,086</td>
<td>2,133</td>
<td></td>
</tr>
<tr>
<td># Jobs</td>
<td>131</td>
<td>240</td>
<td></td>
</tr>
</tbody>
</table>

Notes: An observation is a worker-bid. We selected a random sample of multi-worker jobs for MechanicalTurk workers to read through and manually classify. Results are similar if workers only enter a comparison group once, as a unique worker who bids at least once in the comparison group.
<table>
<thead>
<tr>
<th>Dep. Var.</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any Mention</td>
<td>0.0282</td>
<td>0.0296</td>
<td>0.0380</td>
<td>0.0404</td>
<td>0.0276</td>
</tr>
<tr>
<td></td>
<td>[0.0616]</td>
<td>[0.0620]</td>
<td>[0.0424]</td>
<td>[0.0427]</td>
<td>[0.0606]</td>
</tr>
<tr>
<td>No. workers (log)</td>
<td>-0.0189</td>
<td>0.0397</td>
<td>0.0443</td>
<td>0.00869</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0880]</td>
<td>[0.0625]</td>
<td>[0.0618]</td>
<td>[0.0783]</td>
<td></td>
</tr>
<tr>
<td>Duration (hours)</td>
<td>0.0721***</td>
<td>0.0722***</td>
<td>0.0638***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0188]</td>
<td>[0.0189]</td>
<td>[0.0173]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years experience</td>
<td>0.131***</td>
<td></td>
<td></td>
<td>2.618</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0217]</td>
<td></td>
<td></td>
<td>[2.004]</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>-0.0936***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0237]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective percent positive overall</td>
<td>0.0000831</td>
<td>-0.0000509</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.000140]</td>
<td>[0.000222]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior # closed jobs</td>
<td>-0.00399</td>
<td>-0.0162</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0174]</td>
<td>[0.0353]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. reviews</td>
<td>-0.00377</td>
<td>0.0115</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.00977]</td>
<td>[0.0361]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean rating</td>
<td>-0.0443</td>
<td>-0.292</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0543]</td>
<td>[0.216]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No rating</td>
<td>-0.183</td>
<td>-1.372</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.276]</td>
<td>[1.082]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>3.962***</td>
<td>3.974***</td>
<td>4.068***</td>
<td>3.875***</td>
<td>8.148***</td>
</tr>
<tr>
<td></td>
<td>[0.0676]</td>
<td>[0.0840]</td>
<td>[0.122]</td>
<td>[0.366]</td>
<td>[2.358]</td>
</tr>
</tbody>
</table>

Performance measures w/in Cat. ✓ ✓
Category FE ✓ ✓
Worker FE ✓

Mean Outcome 3.96 3.96 3.96 3.96 3.96
Std. Dev. Outcome 0.71 0.71 0.71 0.71 0.71
Clusters 371 371 371 371 371
R² 0.078 0.078 0.252 0.273 0.790

Notes: All models are estimated using OLS. The dependent variable is the log bid of bids received. The sample is randomly selected from multi-worker co-located jobs. The key explanatory variable “any mention” is equal to 1 if readers of the job description report multiple workers are required to complete the job, and 0 otherwise. “No workers” refers to the actual number of workers that the employer requested directly to the platform (whether or not it is mentioned in the job description), so that the platform knows not to close the job until the number is reached or the post expires. Performance measures also include overall (in addition to category) measures of ratings and prior experience. Standard errors are clustered at the level of the job.
B.2. Market Unraveling

We find evidence that TaskRabbit markets unravel toward the use of posted price by more employers in Section IV.H, which supports the finding of Theorem 4.

We discuss possible alternative explanations for this market trend toward posted price, and why we do not believe these to be plausible explanations of our observations.

One alternative explanation for this trend is that employers initially accept bids to learn about workers’ outside options and in subsequent tasks use a posted price. We do not believe this to be a convincing explanation for this observation because employers are short-lived in TaskRabbit. Over half of employers only post a single task on the platform, and only 10% post more than 6 tasks in their lifetime on the platform. Nearly 80% of employers who participate in the platform do not experiment, that is, they use either posted price or bid acceptance for all of their tasks. The pattern of a linear move toward posted prices, therefore, seems unlikely to be due to experimentation.

Another alternative is put forth by Einav et al. (2018). They find that eBay’s auction format became much less used than its posted price format between 2003 and 2009. They argue that this is primarily driven by a change in user preferences. In 2003 there were not many exciting internet alternatives, and so buyers preferred the fun associated with bidding in auctions. But by 2009 with the advent of Web 2.0 websites like youtube.com and facebook.com, there were better avenues for entertainment on the internet. Could a similar phenomenon be occurring in TaskRabbit? Again, we do not believe so. Our data sample (albeit for a different service) begins around the time that the sample of Einav et al. (2018) ends, certainly after the popularization of Web 2.0 and plenty of entertainment websites. Second, our time horizon is relatively short compared to theirs, and we observe a large move toward posted prices. Only a drastic change in preferences over a short period of time could explain this. Third, TaskRabbit staggers entry into different markets, and therefore, we observe wide variance in market age. Despite this, we observe a strong linear trend toward posted price in markets of different ages. This is on display in Figure IV. Fourth, and perhaps most convincing, the “fun” workers can have through static bidding on TaskRabbit is more limited than on eBay—workers are unable to track their bids and update their offers over time in response to others. Although changing preferences cannot completely be ruled out in TaskRabbit data, a mechanism such as Einav et al.’s does not seem likely to lead to the move toward posted price in TaskRabbit.

Finally, there is potential for the types of jobs to change as the platform matures in each city, particularly toward standardized tasks that may lend themselves to a universal price on and off the platform, and hence a posted price. Empirically we do not see a trend toward standardization - if anything the platform launched in several cities with a strong association with one or two key tasks, especially deliveries, but over time the platform diversified somewhat. We include in our regression controls for the composition of tasks in each marketplace. Our findings are robust to the inclusion of variation in the types of tasks posted in each marketplace (Col. 2 Table B11).


<table>
<thead>
<tr>
<th>Dep. Var.</th>
<th>Proportion of Jobs with Posted Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market age (months)</td>
<td>0.0109*** 0.00894* 0.0119*** 0.0102**</td>
</tr>
<tr>
<td>City FE, Month FE</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>Number of posts per month (thousands)</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>Share of jobs in each category</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Observations</td>
<td>417 417 417 417</td>
</tr>
<tr>
<td>Clusters</td>
<td>19 19 19 19</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.668 0.731 0.717 0.734</td>
</tr>
</tbody>
</table>

Notes: Each model is estimated by OLS. An observation is a city-month in TaskRabbit. The dependent variable is the proportion of tasks that use the transparent posted price scheme. Standard errors are clustered at the city level.
Additional Figures and Table

Figure B1: Expectations of learning co-worker pay on-the-job

Notes: This figure is a kernel density constructed from 5,000 responses from online workers who read through job descriptions on TaskRabbit and answered questions about the likelihood that two co-workers would compare notes about their pay after meeting for the first time on-the-job. We randomized whether the description of the task involved two strangers meeting on the job with female names or male names. “Female co-workers” refers to a vignette with two people named Samantha and Alexis, and “male co-workers” refers to a vignette with two people names Sam and Alex.
### TABLE B8: Summary Statistics, Experiment

<table>
<thead>
<tr>
<th>Transparency Treatment</th>
<th>Negotiable</th>
<th>Non-Negotiable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Transp (mean)</td>
<td>Transp (mean)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workers</td>
<td>Age</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Share female</td>
<td>0.56</td>
</tr>
<tr>
<td></td>
<td>Share w/ at least some college</td>
<td>0.96</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>163</td>
</tr>
<tr>
<td>Managers</td>
<td>Age</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Share female</td>
<td>0.57</td>
</tr>
<tr>
<td></td>
<td>Share w/ at least some college</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>53</td>
</tr>
<tr>
<td>Employer Budget</td>
<td>Transparent &amp; Negotiable ($v = 5$)</td>
<td>(mean)</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Share female</td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td>Share w/ at least some college</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>132</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Share female</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td>Share w/ at least some college</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>46</td>
</tr>
</tbody>
</table>

Notes: Treatment groups are of different sizes as all subsamples are not utilized equally in our analysis, and some treatments are more costly to conduct than others (both in terms of logistics and money). The top panel is a sample restricted to treatment arms with a fixed budget of $5 per transcription page, and to subjects who completed the Becker-Degroot-Marshak procedure to assess outside options. Bottom sample includes all employees in the negotiable treatment arms. Demographic information was only solicited for half of the workers in the non-negotiable, $v = 9$ treatment. Therefore, the worker count was twice as large and ratio of workers per manager was comparable across all groups. Experimental findings are robust to excluding demographics controls.
### TABLE B9: Endogenous Selection of Transparent Pricing, TaskRabbit

<table>
<thead>
<tr>
<th>Dep. Var.</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employer Lower Income</td>
<td>0.0622** [0.0269]</td>
<td>0.0641** [0.0272]</td>
<td>0.0456* [0.0270]</td>
<td>0.0452* [0.0270]</td>
<td>0.0579* [0.0329]</td>
</tr>
<tr>
<td>Employer Age</td>
<td>-0.00147*** [0.000557]</td>
<td>-0.000511 [0.000524]</td>
<td>-0.000536 [0.000528]</td>
<td>-0.00109 [0.000672]</td>
<td></td>
</tr>
<tr>
<td>Empl. Gender (Fem = 1)</td>
<td>-0.0130 [0.0148]</td>
<td>-0.00901 [0.0130]</td>
<td>-0.00921 [0.0129]</td>
<td>-0.0144 [0.0163]</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.323*** [0.0259]</td>
<td>0.390*** [0.0359]</td>
<td>0.221*** [0.0538]</td>
<td>0.256*** [0.0602]</td>
<td>0.215*** [0.0720]</td>
</tr>
<tr>
<td>Category FE</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City FE, Month FE, Mkt. Age</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exclude 1st time users</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Dep. Var.</td>
<td>0.423</td>
<td>0.423</td>
<td>0.423</td>
<td>0.423</td>
<td>0.423</td>
</tr>
<tr>
<td>Observations</td>
<td>&gt;20k</td>
<td>&gt;20k</td>
<td>&gt;20k</td>
<td>&gt;20k</td>
<td>&gt;20k</td>
</tr>
<tr>
<td>Clusters</td>
<td>&gt;5k</td>
<td>&gt;5k</td>
<td>&gt;5k</td>
<td>&gt;5k</td>
<td>&gt;5k</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.000432</td>
<td>0.00177</td>
<td>0.100</td>
<td>0.102</td>
<td>0.112</td>
</tr>
</tbody>
</table>

Notes: All columns are linear probability models estimated by OLS. An observation is a job post on TaskRabbit. The sample is restricted to jobs posted by household employers with observable earnings. The dependent variable is equal to 1 if the employer chose to post the job using a transparent (public) posted price, and 0 if the employer chooses to accept private bids. The primary explanatory variable, low income, is an indicator equal to 1 if the employer earns less than the median earning household in each city. Standard errors are clustered at the level of the employer. Observation numbers are intentionally obscured at the request of TaskRabbit.
Figure B2: Distribution of Jobs Across Job Category, by Price Mention

Notes: Along the X-axis categories are ordered according to the mean hourly wage across all jobs posted within the category with hourly contract. The y-axis is the percentage of jobs, which either do or do not have a price mention in the job description, which are posted in each category. The difference in hourly wages at the category level is $3 (28 vs. 31) and statistically significant (T-statistic equal to 3.0). The statistical test Epps-Singleton (E-S) rejects the two underlying independent samples are identical.
<table>
<thead>
<tr>
<th></th>
<th>Posted Price (mean)</th>
<th>Priv. Auction (mean)</th>
<th>T-Stat (Public−Auct.)</th>
<th>Acct. Bids (or Tasks) (48% (41%) posted)</th>
<th>Acct. Bids (or Tasks) (48% (41%) posted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial wages ($)</td>
<td>40.72</td>
<td>64.08</td>
<td>-122.64</td>
<td>&gt;50,000</td>
<td>&gt;50,000</td>
</tr>
<tr>
<td>Length of Task Description</td>
<td>798</td>
<td>736</td>
<td>18.90</td>
<td>&gt;50,000</td>
<td>&gt;50,000</td>
</tr>
<tr>
<td>LDA 1 (%) (eg. “would like,” “hoping”)</td>
<td>2.69</td>
<td>2.64</td>
<td>0.45</td>
<td>&gt;50,000</td>
<td>&gt;50,000</td>
</tr>
<tr>
<td>LDA 2 (%) (eg. “feedback,” “review”)</td>
<td>3.28</td>
<td>3.13</td>
<td>1.09</td>
<td>&gt;50,000</td>
<td>&gt;50,000</td>
</tr>
<tr>
<td>LDA 3 (%) (eg. “assistance,” “shopping”)</td>
<td>10.69</td>
<td>10.41</td>
<td>1.88</td>
<td>&gt;50,000</td>
<td>&gt;50,000</td>
</tr>
<tr>
<td>LDA 4 (%) (eg. “planning,” “evening”)</td>
<td>4.96</td>
<td>4.96</td>
<td>-0.07</td>
<td>&gt;50,000</td>
<td>&gt;50,000</td>
</tr>
<tr>
<td>LDA 5 (%) (eg. “moving,” “pickup”)</td>
<td>6.63</td>
<td>6.92</td>
<td>-2.45</td>
<td>&gt;50,000</td>
<td>&gt;50,000</td>
</tr>
<tr>
<td>LDA 6 (%) (eg. “documents,” “photos”)</td>
<td>8.39</td>
<td>8.45</td>
<td>-0.79</td>
<td>&gt;50,000</td>
<td>&gt;50,000</td>
</tr>
</tbody>
</table>

Notes: Summary statistics of all jobs. Observation numbers are intentionally obscured at the request of TaskRabbit. LDA (Latent Dirichlet Allocation) text components are included to compare the content of job descriptions. LDA is an unsupervised bag-of-words machine learning method. The algorithm assumes every document contains a mixture of topics and every topic is a mixture of words. Topics are assumed to have a Dirichlet prior, which intuitively means that each job description is likely to only contain a small set of topics and each topic frequently uses a small set of words. Words can belong to multiple topics and LDA estimates the probability that a particular word belongs to a particular topic. Using the probabilities that given words belong to given topics in combination with the Dirichlet priors, it is then possible to construct the probabilities that each document contains each topic.
Figure B3: TaskRabbit Online Interface for Workers

Notes: Panel (a) displays a list of job postings that a worker can see. Panel (b) gives the details posted by the employer about one of the jobs from the job listings page. Screenshots taken on December 14th, 2013. Faces and identifiable information have been intentionally blurred. A similar figure appears in Cullen and Farronato (2016).
### TABLE B11: Share of Jobs with Posted Price, TaskRabbit

<table>
<thead>
<tr>
<th>Dep. Var.</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of Jobs with Posted Price</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market age (months)</td>
<td>0.0109***</td>
<td>0.00894*</td>
<td>0.0119***</td>
<td>0.0102**</td>
</tr>
<tr>
<td></td>
<td>[0.0000198]</td>
<td>[0.00426]</td>
<td>[0.00103]</td>
<td>[0.00383]</td>
</tr>
<tr>
<td>City FE, Month FE</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Number of posts per month (thousands)</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Share of jobs in each category</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Observations</td>
<td>417</td>
<td>417</td>
<td>417</td>
<td>417</td>
</tr>
<tr>
<td>Clusters</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.668</td>
<td>0.731</td>
<td>0.717</td>
<td>0.734</td>
</tr>
</tbody>
</table>

Notes: Each model is estimated by OLS. An observation is a city-month in TaskRabbit. The dependent variable is the proportion of tasks that use the transparent posted price scheme. Standard errors are clustered at the city level.
TABLE B12: Bonuses Among Co-located Workers*, TaskRabbit

<table>
<thead>
<tr>
<th>Dep. Var.</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amt. below top bid (%)</td>
<td>0.0116</td>
<td>0.0137</td>
<td>0.0191</td>
<td>0.745***</td>
<td>0.922***</td>
<td>0.848***</td>
</tr>
<tr>
<td></td>
<td>[0.0113]</td>
<td>[0.0115]</td>
<td>[0.0156]</td>
<td>[0.146]</td>
<td>[0.0869]</td>
<td>[0.230]</td>
</tr>
<tr>
<td>Years experience</td>
<td>-0.00305</td>
<td>0.0279</td>
<td>-0.107</td>
<td>0.00933</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0243]</td>
<td>[0.0170]</td>
<td>[0.0858]</td>
<td>[0.126]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% positive rating overall</td>
<td>0.00186</td>
<td>-0.00559</td>
<td>0.0459</td>
<td>0.0242</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.00607]</td>
<td>[0.00561]</td>
<td>[0.0309]</td>
<td>[0.0272]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% positive rating in cat.</td>
<td>0.0288</td>
<td>-0.00978</td>
<td>-0.0741</td>
<td>-0.0754</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0180]</td>
<td>[0.0178]</td>
<td>[0.0801]</td>
<td>[0.0929]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. reviews</td>
<td>-0.00448</td>
<td>-0.00162</td>
<td>0.0311</td>
<td>0.00970</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.00708]</td>
<td>[0.00448]</td>
<td>[0.0311]</td>
<td>[0.0334]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. reviews cat.</td>
<td>0.0442</td>
<td>-0.0194</td>
<td>-0.307*</td>
<td>-0.0235</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0624]</td>
<td>[0.0434]</td>
<td>[0.177]</td>
<td>[0.204]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean rating</td>
<td>-0.0294</td>
<td>0.0342</td>
<td>0.0575</td>
<td>-0.179</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0559]</td>
<td>[0.0493]</td>
<td>[0.393]</td>
<td>[0.236]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean rating in category</td>
<td>0.0883***</td>
<td>0.0845</td>
<td>-0.321</td>
<td>0.0156</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0331]</td>
<td>[0.0533]</td>
<td>[0.379]</td>
<td>[0.198]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No rating</td>
<td>-0.189</td>
<td>0.0895</td>
<td>1.506</td>
<td>-1.104</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.277]</td>
<td>[0.235]</td>
<td>[1.797]</td>
<td>[1.200]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No rating w/in cat.</td>
<td>0.412***</td>
<td>0.391</td>
<td>-1.768</td>
<td>0.0671</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.159]</td>
<td>[0.259]</td>
<td>[1.858]</td>
<td>[0.970]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. workers (log)</td>
<td>-0.113***</td>
<td>-0.127</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0233]</td>
<td>[0.0925]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean bid (log)</td>
<td>0.0409**</td>
<td>-0.304*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0176]</td>
<td>[0.175]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.207***</td>
<td>-0.154</td>
<td>0.216</td>
<td>2.906*</td>
<td>1.121</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.0146]</td>
<td>[0.241]</td>
<td>[0.312]</td>
<td>[1.585]</td>
<td>[1.039]</td>
<td></td>
</tr>
</tbody>
</table>

> 1 hour overlap | ✓ | ✓ | ✓ | ✓ | ✓ |
Job FE | ✓ |

Mean Outcome | 0.21 | 0.20 | 0.20 | 0.41 | 0.41 | 0.41 |
Std. Dev. Outcome | 0.41 | 0.40 | 0.40 | 0.38 | 0.39 | 0.39 |
Observations | 1,862 | 1,539 | 1,539 | 392 | 317 | 317 |
Clusters | 731 | 599 | 599 | 233 | 178 | 178 |
$R^2$ | 0.001 | 0.053 | 0.828 | 0.443 | 0.575 | 0.970 |

Notes: Each model is estimated by OLS. Col. 1 through 3 are linear probability models. An observation is an accepted worker-bid for jobs with co-located workers. All co-located jobs across all categories are included, not just the sample of jobs from overlapping categories used in the main body of the paper. The dependent variable equals one if the particular worker earns more than their agreed to bid, and 0 otherwise. Col. 4 through 6 are restricted to those workers that do receive more than their bid. The dependent variable is the size of the raise, as percent above bid. The primary explanatory variable, amount below maximum bid, is equal to $(bid^{max} - bid_i)/bid_i$ for person $i$. Reviews are in units of 1000. Standard errors are clustered at the level of the job.
Figure B4: Bids as function of Willingness to Accept

Notes: Each panel plots the outside option of a participant (horizontal axis) as measured by our BDM procedure against the participant’s bid on the job for completion of a page of transcription (vertical axis), both at a minimum accuracy of 95%. In the first panel, we fit the data to a best linear fit of outside option, and in the second, we display the quadratic function that best fits the data.
Proof of Proposition 1:

It is easy to see that for all times $t \geq 0$ there exists at least one worker earning $\tilde{w}$. Therefore, conditional on receiving wage information, every worker will offer the highest wage visible which equals $\tilde{w}$. It remains to prove that in equilibrium no worker will ever renegotiate without the arrival of wage information. Without loss of generality, let an arbitrary worker enter the market at $t = 0$ and (in an abuse of notation) let $\omega_t$ denote the wage the worker offers at time $t$, which equals $\hat{w} > 0$. It remains to prove that in equilibrium no worker will ever renegotiate further. Let $U(\omega, t)$ represent the ex-ante expected utility.

Towards a contradiction, suppose $\omega^*$ is not a constant sequence. In equilibrium it must be the case that $u(\omega^*|t) \geq 0$ for all $t > 0$. First, let us consider the case in which $u(\omega^*|t) > 0$ for all $t > 0$ in which $\omega^* > \lim_{t \to \infty} \omega^*_t$. Construct an alternative sequence $\hat{\omega}(t_1)$ that provides the same ex-ante expected utility to the worker as sequence $\omega^*$ where

$$\hat{\omega}(t_1)_t = \begin{cases} \omega^*_t & t \in [0, t_1) \\ \omega^*_t & t \geq t_1 \end{cases}$$

for some $t_1 > t_2 > 0$ such that $\omega^*_1 > \omega^*_0$. Note that $\hat{\omega}(t_1)$ has three requirements: first, that it is constant before time $t_1$, second, that the value it takes before time $t_1$ is achieved by sequence $\omega^*$ at some time $t_2$, and third, that the sequence yields the same utility as the original optimal sequence. The following lemma states that such a sequence always exists.

**Lemma 1.** For any optimal sequence $\omega^*$ there exists a sequence $\hat{\omega}(t_1)$ satisfying the required conditions.

**Proof of Lemma:** Take some $t_2 > 0$ and consider a sequence $\omega'$ that equals $\omega^*_t$ for all $t \geq 0$. Both $U(\omega', t)$ and $U(\omega^*, t)$ are clearly continuous in $t$. Since $u(\omega^*|t) > 0$ for all $t$ by assumption, then there are two possibilities. First, there exists a unique $t_1 > t_2$ such that $U(\omega', t_1) = U(\omega^*, t_1)$, with $U(\omega', t) < U(\omega^*, t)$ for all $t > t_1$, in which case we have found the sought after $t_1$ for the specified $t_2$. Second, it could be that $U(\omega', t) > U(\omega^*, t)$ for all $t > 0$, in which case $\omega^*$ is not an optimal sequence.

Now define a new sequence $\tilde{\omega}(t_1)$ that takes on the pointwise maximum value of sequences $\hat{\omega}(t_1)$ and $\omega^*$, that is,

$$\tilde{\omega}(t_1)_t = \begin{cases} \hat{\omega}(t_1)_t & t \in [0, t_2] \\ \omega^*_t & t > t_2 \end{cases}$$

C. Omitted proofs
As \( \tilde{\omega}(t_1)_t = \hat{\omega}(t_1)_t \) for all \( t \leq t_2 \), \( U(\tilde{\omega}(t_1), t) = U(\hat{\omega}(t_1), t) \) for all \( t \leq t_2 \). Since \( u(\omega^*|t) > 0 \) for all \( t \), \( U(\tilde{\omega}(t_1), t) > U(\hat{\omega}(t_1), t) \) for all \( t > t_2 \). Therefore, \( u(\tilde{\omega}(t_1)) > u(\hat{\omega}(t_1)) = u(\omega^*) \), which contradicts the optimality of sequence \( \omega^* \).

**Figure C1: Sequences used in proof**

(a) \( \omega^*_t \)

(b) \( \hat{\omega}_t \)

(c) \( \tilde{\omega}_t \)

Notes: This figure shows the construction of sequences to prove the desired result. Panel (a) shows the conjectured optimal sequence \( \omega^* \). Panel (b) shows \( \hat{\omega}(t_1) \), a sequence that is constant before time \( t_1 \) and gives the same utility as \( \omega^* \) (sequence \( \omega^* \) is plotted with dotted lines for comparison). Panel (c) shows sequence \( \tilde{\omega}(t_1) \) which equals the pointwise maximum of \( \omega^* \) and \( \hat{\omega}(t_1) \). Since utility is increasing along \( \omega^* \) by assumption, \( \tilde{\omega}(t_1) \) yields higher expected worker utility than the other sequences.

By the above logic, WLOG we restrict ourselves to worker strategies that never renegotiate wage along equilibrium path without the arrival of wage information. Letting
\[ F(x) = P(\bar{w} \leq x), \text{ for all } \lambda < \infty \text{ worker } i \text{ negotiates at the first moment she is hired to solve:} \]

\[ w_i^* \in \arg \max_{w_i} \left( \frac{w_i}{\rho + \delta + \lambda} + \frac{\lambda}{\rho + \delta + \lambda} \frac{\mathbb{E}(\bar{w}|\bar{w} \geq w_i)}{\delta + \rho} \right) (1 - \bar{F}(w_i)) + \frac{\theta_i}{\delta + \rho} \bar{F}(w_i) \]  

(11)

where the first term represents the expected discounted wage the worker receives, given the arrival rate of information, and the second term is the profit made from workers manipulating the objective as with the worker problem:

For \( \lambda \in [0, \infty) \) the firm solves:

\[ w_i^* \in \arg \max_{w_i} \left( \frac{w_i}{\rho + \delta + \lambda} + \frac{\lambda}{\rho + \delta + \lambda} \frac{\mathbb{E}(\bar{w}|\bar{w} \geq w_i)}{\delta + \rho} \right) (1 - \bar{F}(w_i)) \]  

\[ \iff \ w_i^* \in \arg \max_{w_i} \left( \frac{w_i}{\rho + \delta + \lambda} + \frac{\lambda}{\rho + \delta + \lambda} \mathbb{E}(\bar{w}|\bar{w} \geq w_i) \right) (1 - \bar{F}(w_i)) + \theta_i \bar{F}(w_i) \]  

\[ \iff \ w_i^* \in \arg \max_{w_i} \left( \frac{w_i}{\rho + \delta + \lambda} + \frac{\lambda}{\rho + \delta + \lambda} \mathbb{E}(\bar{w}|\bar{w} \geq w_i) - \theta_i \right) (1 - \bar{F}(w_i)) \]  

\[ \iff \ w_i^* \in \arg \max_{w_i} \int_{w_i}^{\Lambda} ((1 - \Lambda) w_i + \Lambda \mathbb{E}(\bar{w}|\bar{w} \geq w_i) - \theta_i) f(x) dx \]  

(12)

where \( \Lambda = \frac{\lambda}{\rho + \delta + \lambda} \). When \( \lambda = \infty \), the scheme is equivalent to a posted price in which \( \Lambda = 1 \) (workers receive \( \bar{w} \) if they remain at the firm). Therefore, for any \( \rho, \delta > 0 \) there is a bijection between \( \Lambda \) and \( \Lambda \) with higher \( \Lambda \) corresponding to more transparency.

For \( \lambda < \infty \) the firm solves:

\[ \bar{w} \in \arg \max_{w} \int_{0}^{x} (v - y) \bar{g}(y) dy + \bar{G}(w) \frac{\lambda}{\rho + \delta + \lambda} \frac{1}{\rho + \delta + \lambda} (v - w) \]  

(13)

where \( \bar{G}(x) = P(w_i^* \leq x) \). The first term gives the total discounted profits made by the firm given the arrival rate of information and the second term is the profit made from workers after renegotiating their wages to \( \bar{w} \) over the rest of their lifetimes in the firm. When \( \lambda = \infty \) the firm will hire every worker \( i \) with \( \theta_i \leq \bar{w} \) at a constant wage \( \bar{w} \). We can similarly manipulate the objective as with the worker problem:

\[ \bar{w} \in \arg \max_{w} \int_{0}^{w} (v - (1 - \Lambda) y - \Lambda w) \bar{g}(y) dy \]  

(14)

These manipulations collapse the set of equilibria of our problem into that of the well-known Chatterjee and Samuelson (1983) double auction in which a seller (worker) with a private value for a good \( (\theta_i) \) and a buyer (firm) with a private value for a good \( (v) \) submit sealed bids. If the bid of the buyer is at least as large as that of the seller, the
good switches hands at a price set be a predetermined convex combination of the two bids (determined by Λ). The first order conditions for workers and the firm are, respectively:

\[ w_i^* - \theta_i = (1 - \Lambda) \frac{1 - F(w_i^*)}{f(w_i^*)} \quad (15) \]

\[ v - \bar{w} = \Lambda \frac{G(\bar{w})}{g(\bar{w})}. \quad (16) \]

We know from Satterthwaite and Williams (1989) that the set of equilibria corresponds to solutions of the first order equations, and that the set of solutions to these equations, and therefore equilibria, is non-empty. Furthermore, given the equilibrium strategies of the firm (workers), workers (the firm) have a unique best response.

It now remains to consider the case in which \( u(\omega^*|t) = 0 \) for some \( t > 0 \). Let \( t = \inf \{ t | u(\omega^*|t) = 0 \} \). We can create a new sequence \( \omega^{**} \) such that

\[ \omega^{**}_t = \begin{cases} \omega^*_t & t \in [0, t) \\ \omega^*_t & t > t \end{cases} \quad (17) \]

Since \( u(\omega^*|t) = 0 \), \( \omega^{**} \) is also an optimal sequence. If \( t > 0 \) then replacing \( \omega^* \) with \( \omega^{**} \) in the earlier parts of this proof gives the desired result. If however, \( t = 0 \), we must take a different approach. Since \( u(\omega^*|t) \geq 0 \) for all \( t \geq 0 \), it must be the case that \( u(\omega^*|t) = 0 \) for all \( t \geq 0 \), i.e. that the worker is indifferent between ever renegotiating. Similarly to above, we can construct a sequence \( \hat{\omega}(t_1) \) that is constant over the first \( t_2 \) periods and ex-ante payoff equivalent to \( \omega^* \). But since \( u(\omega^*|t) = 0 \) for all \( t \) then it must also be optimal to never renegotiate from \( \hat{\omega}(t_1) \)0 = \( \omega^* \). In other words, this says that the agent is indifferent between initially asking for \( \omega^*_0 \) or \( \omega^*_t \) and never renegotiating, and moreover, both such sequences are optimal. But the right hand side of Equation 15 is strictly decreasing in the initial offer, meaning there cannot be two optimal constant sequences. Contradiction.

\[ \blacksquare \]

**Proof of Proposition 2:**

Let \( \bar{w} = \beta(v) \) and let \( w_i^* = \gamma(\theta) \) and assume that a linear equilibrium exists. Workers are hired at initial wages in some range \([a, h]\) where \( 0 \leq a \leq h \leq 1 \). By the linearity hypothesis, it must be the case that

\[ \bar{w} = \begin{cases} v & 0 \leq v < a \\ a + \frac{h-a}{1-a}(v-a) & a \leq v \leq 1 \end{cases} \quad (18) \]

\[ w_i^* = \begin{cases} a + \frac{h-a}{h} \theta_i & 0 \leq \theta_i \leq h \\ \theta_i & h < \theta_i \leq 1 \end{cases} \]

Furthermore, by definition \( \bar{F}(x) = P(\beta(v) \leq x) = F(\beta^{-1}(x)) \), and similarly \( \bar{G}(x) = G(\gamma^{-1}(x)) \). Inverting the functions in Equation 18 and plugging in to the distributions in
Equation 5 yields

\[
\tilde{F}(x) = 1 - \left(1 - a + \frac{(x-a)(1-a)}{h-a}\right)^r \quad a \leq x \leq h
\]

\[
\tilde{G}(x) = \left(\frac{x-a}{h-a}\right)^s \quad x \leq a
\]

Equations 3 and 4 give another set of equations for \(\gamma^{-1}(\cdot)\) and \(\beta^{-1}(\cdot)\). Plugging these in to the distributions in Equation 5 yields

\[
\tilde{F}(x) = 1 - \left(1 - x - \Lambda \frac{G(x)}{g(x)}\right)^r \quad a \leq x \leq h
\]

\[
\tilde{G}(x) = \left(x - (1 - \Lambda) \frac{1-F(x)}{f(x)}\right)^s \quad a \leq x \leq h
\]

Solving Equations 19 and 20 simultaneously results in a unique solution in which

\[
a = \frac{(1-\Lambda)s}{(s+\Lambda)r+(1-\Lambda)s} \quad h = \frac{(1-\Lambda)s+rs}{(s+\Lambda)r+(1-\Lambda)s}
\]

As \(\bar{w}\) and \(w_i^*\) are pinned down by \(a\) and \(h\) due to linearity, there is a unique linear equilibrium.

\[\blacksquare\]

**Proof of Proposition 3:**

We first show \(\bar{w}\) is strictly decreasing in \(\Lambda\) for all \(v \in [a, 1]\). Using Equations 18 and 21, we see that

\[
\bar{w} = a + \frac{s}{s+\Lambda}(v-a) \quad \text{for all } v \in [a, 1]
\]

Differentiating with respect to \(\Lambda\) yields

\[
\frac{\partial \bar{w}}{\partial \Lambda} = \frac{\partial a}{\partial \Lambda} \left(1 - \frac{s}{s+\Lambda}\right) - \frac{s}{(s+\Lambda)^2}(v-a)
\]

Noting that \(\frac{s}{s+\Lambda} \in (0, 1]\) and that from Equation 21

\[
\frac{\partial a}{\partial \Lambda} \text{ sign} = -r(s+1) < 0
\]

implies that \(\frac{\partial \bar{w}}{\partial \Lambda} < 0\) for all \(v \in [a, 1]\). From Equation 19 we see that \(\tilde{G}(x) = \frac{x-a}{s}\) for all \(x \in [a, h]\). Therefore, from Equation 4 we see that \(\bar{w} \to v\) for all \(v \in [0, 1]\) as \(\Lambda \to 0\).

By virtue of the fact that \(\bar{w}\) is decreasing in \(\Lambda\), it must also be the case that \(h\) is decreasing in \(\Lambda\). (It is possible to directly verify this by computing \(\frac{\partial h}{\partial \Lambda}\).) From Equation 19 we calculate
\[
\frac{1-F(x)}{f(x)} = \frac{h-x}{r} \quad \text{for all } x \in [a, h].
\]
Since \( h \) is decreasing in \( \Lambda \), \( \frac{1-F(x)}{f(x)} \) is also decreasing in \( \Lambda \) over this range. Therefore, from Equation 3 we see that \( w^*_i \) is strictly decreasing for \( \theta_i \in [0, h] \), and \( w^*_i \to \theta_i \) for all \( \theta_i \in [0, 1] \) as \( \Lambda \to 1 \).

\[\blacksquare\]

**Proof of Theorem 1:**

1. For all \( \theta_k < h \) we have from Equation 18 that \( w^*_k = a + \frac{h-a}{h} \theta_k \). Therefore, for any relevant workers \( i \) and \( j \), we have that

\[
w^*_i - w^*_k = \frac{h-a}{h} (\theta_i - \theta_j).
\]

From Equation 21 we see that the derivative of this function is increasing in \( \Lambda \), completing the claim.

2. Recall from Equation 12 that the expected lifetime earnings of a worker with outside option \( \theta_i \) is

\[
T(\Lambda, v, \theta_i) = (1 - \Lambda) w^*_i + \Lambda \bar{w} - \theta_i.
\]

A sufficient condition for \( T(\cdot, v, \theta_i) - T(\cdot, v, \theta_j) \) being strictly decreasing in \( \Lambda \) is that

\[
\frac{\partial^2 T(\Lambda, v, \theta)}{\partial \theta \partial \Lambda} < 0 \quad \text{for all } \Lambda, \theta \in [0, 1) \text{ and all } v \in [0, 1].
\]

From Equations 12 and 18 we see that

\[
\frac{\partial^2 T(\Lambda, v, \theta)}{\partial \theta \partial \Lambda} = \frac{\partial^2 T(\Lambda, v, \theta)}{\partial \theta \partial \Lambda} = \frac{\partial^2 (1 - \Lambda) \frac{h-a}{h}}{\partial \Lambda}.
\]

From Equation 21 we see that

\[
\frac{\partial (1 - \Lambda) \frac{h-a}{h}}{\partial \Lambda} = \frac{\partial (1 - \Lambda) \frac{r_1}{r_2}}{\partial \Lambda} = \frac{-r}{r + 1 - \Lambda}.
\]

Since \( \Lambda, r > 0 \) we see that \( \frac{\partial^2 T(\Lambda, v, \theta)}{\partial \theta \partial \Lambda} < 0 \) as desired. To show that \( T(\cdot, v, \theta_i) - T(\cdot, v, \theta_j) \to 0 \) in \( \Lambda \), we note that \( T(\cdot, v, \theta_i) = (1 - \Lambda) w^*_i + \Lambda \bar{w} \). Since \( w^*_i \) is bounded below by \( \theta_i \) then \( T(\cdot, v, \theta_i) \) converges to \( \bar{w}(\Lambda) \) for any \( \theta_i \).

\[\blacksquare\]

**Proof of Theorem 2:**

1. To see the equilibrium hiring rate of the firm, we calculate the probability that a worker is hired by the firm ex-ante. Let \( E(r, s, \Lambda) \) be the expected equilibrium hiring rate in a market with distribution parameters \( r \) and \( s \) and transparency \( \Lambda \). Then

\[
E(r, s, \Lambda) = \int_0^h \Pr (\bar{w} \geq w^*_i(\theta)) g(\theta) d\theta
\]

\[
= \int_0^h \Pr (v \geq a + \frac{h-a}{h} \theta) g(\theta) d\theta
\]

\[
= s \cdot (1-a)^r \int_0^h \left(1 + \frac{h-a}{h} \right)^r \theta^{s-1} d\theta
\]

\[
= (1-a)^r \frac{h^s \Gamma(r+1) \Gamma(s+1)}{\Gamma(r+s+1)}
\]

\[26\]
where the first equality comes from substituting in Equation 18, the second equality comes from substituting in the distribution of outside options from Equation 5 and the third from \( \Gamma(x) \equiv \int_0^\infty y^{x-1}e^{-y}dy \). As we see, transparency affects the hiring rate through changing \( a \) and \( h \). We know from Equation 27 that

\[
\argmax_\Lambda \mathbb{E}(r, s, \Lambda) = \argmax_\Lambda (1 - a)^r h^s
\]  

Substituting in from Equation 21 and taking the first order condition with respect to \( \Lambda \) yields

\[
\Lambda^* = \frac{r + 1}{r + s + 2}
\]  

It remains to show that the maximization problem in Equation 28 is concave in \( \Lambda \) over \([0,1]\). Taking the first order condition of Equation 28 we see that

\[
\frac{\partial (1 - a)^r h^s}{\partial \Lambda} = -\frac{r^2 s^2 (1 - a)^{r-1}h^{r-1}(r(\Lambda - 1) + (2 + s)\Lambda - 1)}{(s(1 - r - \Lambda) + r\Lambda)^3}
\]  

From this, since \( r, s > 0 \) and \( a < 1 \) we see that the first order condition in Equation 29 holds. Substituting in from Equation 5 gives us the particular form of \( \Lambda^* \) in the theorem. We further can calculate

\[
\frac{\partial^2 (1 - a)^r h^s}{\partial \Lambda^2} \geq -rsh^s(1 - a)^r \left( s^3(r^2 + r(2 - \Lambda^2) + (1 - \Lambda^2)) \right) \\
-\frac{r\Lambda (r^2(2 - \Lambda) + 2r(\Lambda^2 - 3\Lambda + 2) + (4\Lambda^2 - 5\Lambda + 2))}{(s(1 - r - \Lambda) + r\Lambda)^3} \\
-s^2 \left( r^3 + r^2 (-2\Lambda^2 + 2\Lambda + 2) + r (-2\Lambda^2 + 4\Lambda + 1) + 2\Lambda (1 - \Lambda^2) \right) \\
-s \left( v^3 (-\Lambda^2 + 2\Lambda + 1) + r^2 (3 - 2\Lambda^2) \right) \\
-s \left( v(6\Lambda^2 - 6\Lambda + 3) + (-4\Lambda^3 + 7\Lambda^2 - 4\Lambda + 1) \right)
\]

A sufficient condition for \( \frac{\partial^2 (1 - a)^r h^s}{\partial \Lambda^2} < 0 \) for all \( \Lambda \in (0, 1) \) is that each of the polynomial terms involving \( \Lambda \) be strictly positive for \( \Lambda \in (0, 1) \). It is easy to check each of these polynomials separately to see that this sufficient condition is indeed satisfied. Therefore, extreme point \( \Lambda^* \) is the global maximizer of expected employment.

2. In equilibrium, there is an outside option cutoff for employment \( \theta^* \) such that all workers with outside options weakly less than \( \theta^* \) negotiate wages that are acceptable to the firm. Then the hiring rate is equal to \( G(\theta^*) \). Noting that a worker \( i \) with outside option \( \theta^* \) sets \( w_i^* = \bar{w} \) it must be the case that \( G(\theta^*) = \bar{G}(\bar{w}) \). We show that \( \bar{G}(\bar{w}) \) is submodular in \( v \) and \( \Lambda \), and rely on monotone comparative statics techniques from Topkis (1998) to complete the result. From Equations 18 and 19 it is the case that for all \( v \geq a \)
\[ \bar{G}(\bar{w}) = \left( \frac{h}{1-a} (v-a) \right)^s \] (31)

We can use a monotonic transformation of \( \bar{G}(\bar{w}) \) to complete the claim, that is, we show submodularity of \( \frac{h}{1-a} (v-a) \) in \( v \) and \( \Lambda \).

\[ \frac{\partial}{\partial v} \frac{h}{1-a} (v-a) = \frac{h}{1-a} = \frac{(1-\Lambda)s+rs}{(s+\Lambda)r} \] (32)

Which is clearly decreasing in \( \Lambda \). Therefore, \( \bar{G}(\bar{w}) \) is submodular in \( v \) and \( \Lambda \).

**Proof of Theorem 3:**

We show that the expected equilibrium profit of the firm is strictly increasing in \( \Lambda \). That the expected equilibrium profit of an arbitrary worker is strictly decreasing in \( \Lambda \) follows a similar calculation. We invoke the law of iterated expectations by first finding the firm’s profit for a particular draw \( v > a \) which we denote by \( \pi(v, \Lambda) \).

\[ \pi(v, \Lambda) = \int_a^{\bar{w}} (v - (1-\Lambda)y - \Lambda \bar{w}) \bar{g}(y) dy \]

\[ = \int_a^{\bar{w}} (v - (1-\Lambda)y - \Lambda \bar{w}) s \left( \frac{h}{h-a} \right)^s (y-a)^{s-1} dy \] (33)

\[ = \frac{(\bar{w} - a)^s}{s+1} \left( \frac{h}{h-a} \right)^s (a (\Lambda - 1) - \bar{w}(\Lambda + s) + sv + v) \]

where the second equality comes by using Equation 19. The ex-ante expected profit of the firm can be expressed as \( \pi(\Lambda) = \int_a^1 \pi(v, \Lambda) f(v) dv \). A tedious, but straightforward calculation shows that \( \frac{\partial \pi(\Lambda)}{\partial \Lambda} > 0 \) for all \( r, s > 0 \) as desired.

The proof that expected discounted wages are decreasing in \( \Lambda \) follows from Theorem 2 and the earlier part of the current proof. Let \( \Lambda^* \) be the expected employment maximizing level of transparency as defined in Equation 6. From Theorem 2 we know that the expected hiring rate is increasing in \( \Lambda \) on \([0, \Lambda^*] \) and we have just shown that expected worker surplus is decreasing in \( \Lambda \) on \([0, \Lambda^*] \). Therefore, it must be the case that expected discounted wages, conditional on employment, must be decreasing in \( \Lambda \) on \([0, \Lambda^*] \). Similarly, from Theorem 2 we know that the expected hiring rate is decreasing in \( \Lambda \) on \([\Lambda^*, 1] \) and we have just shown that firm surplus is increasing in \( \Lambda \) on \([\Lambda^*, 1] \). Therefore, it must be the case that expected discounted wages, conditional on employment, must be decreasing in \( \Lambda \) on \([\Lambda^*, 1] \). Combining these two arguments, we see that expected discounted wages, conditional on employment, are decreasing in \( \Lambda \) on \([0, 1] \), as desired.
Example 1. Increasing transparency does not increase profits for all firm types:

Let \( v = 1 \) and let \( \mathbb{E}(\theta) = \mathbb{E}(v) = \frac{1}{2} \). This implies that \( r = s = 1 \). We can calculate the profit \( \pi(v, \Lambda) \) of the firm using Equation 33. We see that \( \pi(1, 1) = \frac{1}{2} \) while \( \pi(1, \frac{1}{2}) = \frac{9}{16} \).

Proof of Theorem 4:

To see that the desired equilibrium in which all firm types select \( \Lambda = 1 \) exists, suppose two distinct firm types \( v \) and \( v' \) both select the same \( \Lambda < 1 \) in equilibrium. Let \( V(\Lambda) \) denote the set of firm types that select \( \Lambda \) according to equilibrium strategies, and let \( v_L(\Lambda) = \inf V(\Lambda) \). Upon observing \( \Lambda \), no worker \( i \) will set her initial offer \( w_i^* < w(v_L(\Lambda)) \). We show that there exists some \( \epsilon > 0 \) such that workers with \( \theta_i \in [\bar{w}(v_L(\Lambda)) - \epsilon, \bar{w}(v_L(\Lambda))] \) will set \( w_i^* > \bar{w}(v_L(\Lambda)) \). Therefore firm type (arbitrarily close to) \( v_L(\Lambda) \) has a profitable deviation to set \( \Lambda = 1 \) and keeping the same maximum wage, \( \bar{w}(v_L(\Lambda)) \), and hiring all workers with \( \theta_i \leq \bar{w}(v_L(\Lambda)) \) at wage \( \bar{w}(v_L(\Lambda)) \). We show this for two exhaustive cases.

1. \( \inf \{ V(\Lambda) \setminus \{ v_L(\Lambda) \} \} = v_L(\Lambda) \). Following Equation 3, each worker \( i \) will set \( w_i^* \geq \bar{w}(v_L) \) to solve

\[
 w_i^* - \theta_i = (1 - \Lambda) \frac{1 - \bar{F}(w_i^*|v \in V(\Lambda))}{f(w_i^*|v \in V(\Lambda))} \tag{34}
\]

Given our continuity and full support assumptions on \( F(\cdot) \), that \( \Lambda < 1 \), and the premise of this case, there exists \( \Delta > 0 \) such that for all \( \delta < \Delta \), the RHS of Equation 34 is bounded away from zero. So as \( \theta_i \rightarrow \bar{w}(v_L(\Lambda)) \) from the left, it cannot be the case that \( w_i^* \not\rightarrow \bar{w}(v_L(\Lambda)) \), as this would fail to satisfy Equation 34. Therefore, the firm fails to hire a positive mass of workers with \( \theta_i \leq \bar{w}(v_L(\Lambda)) \) that it could hire by deviating to \( \Lambda = 1 \).

2. \( \inf \{ V(\Lambda) \setminus \{ v_L(\Lambda) \} \} = v_2 > v_L(\Lambda) \). Each worker who observes transparency level \( \Lambda \) in equilibrium prescribes some probability \( p_\geq > 0 \) that \( \bar{w} \geq \bar{w}(v_2) \). Suppose worker \( i \) places initial offer \( \bar{w}(v_2) \) instead of \( \bar{w}(v_L(\Lambda)) \). From the fourth line of Equation 12 we see that a worker loses flow surplus \( \Lambda(\bar{w}(v_L(\Lambda)) - \theta_i)(1 - p_\geq) \) if she offers \( w_i^* \) instead of \( w_i^* \). On the other hand, she gains flow surplus \( (1 - \Lambda)(\bar{w}(v_2) - \bar{w}(v_L(\Lambda)))p_\geq \). As \( \theta_i \rightarrow \bar{w}(v_L(\Lambda)) \), the expected gain outweighs the expected loss for any \( \Lambda < 1 \). Therefore, workers with outside options sufficiently close to \( \bar{w}(v_L(\Lambda)) \) will offer strictly more than \( \bar{w}(v_L(\Lambda)) \). Therefore, the firm fails to hire a positive mass of workers with \( \theta_i \leq \bar{w}(v_L(\Lambda)) \) that it could hire by deviating to \( \Lambda = 1 \).
To complete the proof of the theorem, suppose for contradiction that some firm type $v_1 < 1$ selects some $\Lambda^1 < 1$ and sets $\bar{w} = w_1$. By assumption A2 then worker $i$ who observes $\Lambda$ in equilibrium offers

$$w_i^* = \begin{cases} w_1 & \theta_i \leq w_1 \\ \theta_i & \theta_i > w_1 \end{cases} \quad (35)$$

Consider any firm type $v_2 > v_1$, that sets $\bar{w} = w_2$. In equilibrium, as above, worker $i$ offers

$$w_i^* = \begin{cases} w_2 & \theta_i \leq w_2 \\ \theta_i & \theta_i > w_2 \end{cases} \quad (36)$$

Now suppose that firm type $v_2$ deviates and selects transparency level $\Lambda^1$ and keeps $\bar{w} = w_2$. Instead of receiving offers as in Equation 36 it receives offers as in Equation 35. By assumption A4 firm type $v_2$ matches with all the same workers as it did according to the prescribed strategies, but pays lower wages. Contradiction with the premise that any firm type $v_1 < 1$ selects some $\Lambda^1 < 1$.

Proof of Proposition 4:

Suppressing time and worker indices, suppose a worker has negotiated a flow wage of $w$. Then in addition to her other choices, she must choose $e$ to solve $\max_{e \in [0,1]} w \cdot e - \theta \cdot e$. For any $w \geq \theta$ the maximizer is $e = 1$ (if $w = \theta$ any $e \in [0,1]$ is a maximizer and we select $e = 1$ in this case, although, as we see, in equilibrium this will only affect a zero measure set of workers). Therefore, when $w \geq \theta$ the equilibrium flow utility to the worker is $w - \theta$, as in the initial model. But by A1 a worker would never agree to a wage $w < \theta$. So in equilibrium, $e = 1$ and payoffs are the same as the original model. It is easy to see that given this, all other equilibrium choices will be unchanged.

Proof of Proposition 5:

⇐ If $w \cdot e - \theta \cdot e - m(e, d) \leq 0$ for any $e \in [0,1]$ and any $d \in (0,1]$ then as soon as any worker learns $\bar{w}$ the firm can either choose to increase her wage to $\bar{w}$ and receive flow profits $v - \bar{w} \geq 0$ or receive flow profits of 0 otherwise from the worker who will put in zero effort. It is easy to see that given this, all other equilibrium choices will be unchanged.

⇒ Clearly it cannot be the case that $m(e, d) = 0$ for some $d > 0$, or else the firm would never fully equalize wages. Suppose for contradiction that $w \cdot e - \theta \cdot e - m(e, d) = \epsilon > 0$ for some $e, d$. Let $e^*(d, w^*_i, \bar{w})$ be the optimal effort selected by worker $i$ upon learning $\bar{w}$ when receiving wage $w^*_i$. Note that since $m(e, d)$ is non-decreasing in $d$, $e^*(d, w^*_i, \bar{w})$ is non-increasing in $d$. The firm must solve
\[
\max_{w - w_i \leq d \leq 0} e^\ast(d, w_i, \bar{w})(v - \bar{w} + d) \tag{37}
\]

The premise that the firm immediately sets \(i\)'s wage to \(w_{i,t} = \bar{w}\) if \(i\) learns \(\bar{w}\) at time \(t\) implies that \(d = 0\) is optimal, inducing \(e = 1\). This implies that

\[
v - \bar{w} \geq e^\ast(d, w_i, \bar{w})(v - \bar{w} + d) \quad \forall d > 0 \tag{38}
\]

which holds if and only if

\[
v - \bar{w} \geq d \cdot \frac{e^\ast(d, w_i, \bar{w})}{1 - e^\ast(d, w_i, \bar{w})} \quad \forall d > 0 \tag{39}
\]

We need to show that Equation 39 cannot hold for all \(\Lambda\). By sending \(\Lambda \to 0\), the LHS of Equation 39 converges to 0, while by assumption there exists some \(d\) such that for all \(d' \in (0, d]\), the RHS is strictly greater than 0. Contradiction.

\[\blacksquare\]

**Proof of Proposition 6:**

Taking the first order condition of \(\Lambda_m - \Lambda_f\) with respect to \(\lambda\) yields

\[
\frac{\alpha_m}{\alpha_f} = \frac{(\rho + \delta + \alpha_m \lambda)^2}{(\rho + \delta + \alpha_f \lambda)^2} \tag{40}
\]

The LHS of Equation 40 is constant in \(\lambda\) while the RHS is increasing in \(\lambda\) as \(\alpha_m > \alpha_f\). Therefore, there is a unique solution \(\lambda_c\) to this first order equation and thus a unique interior extreme point. As \(\Lambda_m - \Lambda_f > 0\) for all \(\lambda \in (0, \infty)\) and it is continuously differentiable over this domain, the fact that \(\Lambda_m - \Lambda_f = 0\) for \(\lambda \in (0, \infty)\) it must be that \(\lambda_c\) is a maximizer, and that \(\Lambda_m - \Lambda_f\) is single-peaked.

\[\blacksquare\]

**Proof of Proposition 7**

We have already explained that workers with \(2\bar{W}_v + \bar{W}_V > \theta_i\) will offer a wage of \(\bar{W}_v\) and those with \(\bar{W}_V \geq \theta_i \geq 2\bar{W}_v + \bar{W}_V\) will offer a wage of \(\bar{W}_V\). Therefore, the firm maximizes:

\[
\left(\frac{1}{2}v + \frac{1}{2}V - \bar{W}_v\right) \max\{0, G(2\bar{W}_v + \bar{W}_V)\} + \frac{1}{2} (V - \bar{W}_V) \left[G(\bar{W}_V) - \max\{0, G(2\bar{W}_v + \bar{W}_V)\}\right]
\]

We solve this maximization problem under the assumption that \(G(2\bar{W}_v + \bar{W}_V) > 0\) and later verify that this is true for the given solution. From Equation 5 we know that \(G(x) = x^s\) over the region we are considering.

31
The first-order conditions for $\bar{W}_V$ and $\bar{w}_v$, respectively, are:

$$\frac{s}{2} (V - \bar{W}_V) (\bar{W}_V^{s-1} + (2\bar{W}_v + \bar{W}_V)^{s-1}) - \left(\frac{1}{2} (v + V) - \bar{W}_v\right) s (2\bar{W}_v + \bar{W}_V)^{s-1} - \frac{1}{2} (\bar{W}_V^{s-1} - (2\bar{W}_v + \bar{W}_V)^s) = 0$$

and

$$2s \left(\frac{1}{2} v + \frac{1}{2} V - \bar{W}_v\right) (2\bar{W}_v + \bar{W}_V)^{s-1} - (2\bar{W}_v + \bar{W}_V)^s - s (V - \bar{W}_V) (2\bar{W}_v + \bar{W}_V))^{s-1} = 0$$

Solving these equations simultaneously yields

$$\bar{W}_v = \frac{1}{2} s \left(\frac{v + V}{1+s}\right)$$

$$\bar{W}_V = \frac{V s}{1+s}$$

We make note of three points. First, $2\bar{W}_v > \bar{W}_V$ which validates our decision to drop the “max” term from the objective function. Second, the second-derivative test can be shown to verify the above solution as a maximizer of firm surplus. Third, as we point out in the main body, for any $V$ and $s$, as $v$ becomes sufficiently small $\bar{W}_v > v$.

Proof of Proposition 8

To calculate the profit when workers cannot observe their productivity type, we plug the solutions from Equation 42 into Equation 41. From Equation 22 we know that $\bar{w}(v) = \frac{sv}{1+s}$. Therefore, firm profit when workers can observe their productivity types for the same draws of $V$ and $v$ is $\frac{1}{2} (v - \frac{sv}{1+s}) (\frac{sv}{1+s})^s + \frac{1}{2} (V - \frac{sV}{1+s}) (\frac{sV}{1+s})^s$. Canceling terms reveals that these two profit values are identical.

Similarly, we can calculate the difference in the hiring rate between the two schemes:

$$(2\bar{W}_v + \bar{W}_V)^s + \frac{1}{2} (2\bar{W}_v + \bar{W}_V)^s - (2\bar{W}_v + \bar{W}_V)^s - \frac{1}{2} (\frac{sv}{1+s})^s - \frac{1}{2} (\frac{sV}{1+s})^s = 0$$

Proof of Proposition 9

Let $\bar{W}_V^\gamma$ and $\bar{W}_v^\gamma$ represent the maximum acceptable wage for type $V$ and type $v$ workers, respectively, when workers place $\gamma$ weight on being type $V$ upon observing the wage profile within the firm. Compare profits under $\gamma < \gamma'$. Then firm profit must be higher under $\gamma$ because the firm could set $\bar{W}_V = \bar{W}_V^\gamma$ and $\bar{W}_v = \bar{W}_v^\gamma$ and have more workers select to offer $\bar{W}_v$ than $\bar{W}_V$ than under $\gamma'$, increasing profits. Therefore, the maximizing values $\bar{W}_V^\gamma$ and $\bar{W}_v^\gamma$ must give no lower profit.

32
Theoretical Appendix

D. Multiple firms

In this section, we embed our analysis of pay transparency into a search model by including multiple firms, and show that many of the insights of the main model carry over to this setting. For tractability, we study only the cases of full privacy and full transparency. Let $N = \{1, 2, \ldots, N\}$ be the set of firms, each with a value for labor $v^n$ drawn iid from distribution $F$. As before, workers have outside options drawn iid from distribution $G$. Workers negotiate with firms in a predetermined order without the possibility of returning to an earlier firm. Without loss of generality, we assume that workers first meet with firm 1, then firm 2, and so on.

If a firm rejects a worker’s offer the two are ineligible to match at any point in the future, and the worker (instantly) moves to the next firm in the sequence. Although we do not do so for simplicity of exposition, it is possible to embed a search friction in this formulation without affecting the qualitative findings. A worker whose offer is rejected by firm $N$ becomes unemployed for her duration in the market and consumes her outside option. Workers continue to expire at rate $\rho$ at which time they leave the market. A worker whose offer is accepted by firm $n < N$ is replaced with a worker of identical outside option who moves on to firm $n + 1$ as if her offer had been rejected at firm $n$.

Each firm $n$ selects a maximum wage it is willing to pay for a worker $\bar{w}^n(v^n) \in [0, 1]$, where the choice of $\bar{w}^n$ is not immediately observed by workers. As before, each worker bargains for wages by making TIOLI offers to firms at any point during her employment, potentially renegotiating infinitely often. Workers who at anytime offer a wage greater than $\bar{w}^n$ to firm $n$ are permanently unmatched with the firm. Let $W^n_t$ denote the set of wages firm $n$ is paying to its employed workers, where $W^n_0 = \{\bar{w}^n\}$. We model transparency as a random arrival process; at time $t$, workers matched to firm $n$ observe $W^n_t$ according to an independent Poisson arrival process with rate $\lambda \in \{0, \infty\}$, where we take $\lambda = \infty$ to mean that the process arrives whenever a worker first matches with a firm, and at every instant while she is employed.

The timing of the stage game is as follows at each time $t \geq 0$:

1. Entry: New workers enter the market. Initialize $m = 1$, and $\ell_i = 1$ for each new worker.

---

46 Each time a worker’s offer is rejected, we could instead make the worker unable to meet with subsequent firms with probability $\zeta \in (0, 1)$. Similarly to the relation between $\lambda$ and $\Lambda$ in the main body of the paper, the equilibrium consequences of this probabilistic search friction are identical to a friction which governs the (average) length of time it takes for a worker to find the next firm; in this context $\zeta$ close to 0 corresponds to near-instant discovery of the next firm, while $\zeta$ close to 1 corresponds to near-infinite time required to discover the next firm. Including such a search friction does not meaningfully change the remainder of the analysis.

47 This assumption is made for tractability as this “cloning” greatly simplifies equilibrium characterization in our context, and is frequently adopted in the search literature (see, for example, Burdett and Coles (1999), Bloch and Ryder (2000), and Chade (2006)). This assumption may be even more defensible in a setting like TaskRabbit, in which jobs are short-term, and therefore, we can interpret a “cloned” worker as merely a worker who has completed a given task and is not eligible to re-complete it.
2. Search and Bargaining:

(a) Unmatched workers match with firm \( m \) if \( \ell_i = m \).

(b) Each matched worker \( i \) learns \( W^m_t \) independently with arrival rate \( \lambda \).

(c) Newly entering workers must bargain with the firm and any existing, matched worker can initiate bargaining. Any worker \( i \) who engages in bargaining makes a TIOLI offer \( w_{i,t}^m \in [0, 1] \) to firm \( m \). If \( w_{i,t}^m \leq \bar{w}^m \) then firm \( m \) pays \( i \) a flow wage \( w_{i,t}^m \) until \( i \) departs or attempts to renegotiate. If \( w_{i,t}^m > \bar{w}^m \) then worker \( i \) becomes unmatched.

(d) For any \( i \) such that \( w_{i,t}^m > \bar{w}^m \), increase \( \ell_i \) by 1.

(e) If \( m < N \), for all \( i \) such that \( w_{i,t}^m \leq \bar{w}^m \), create a new worker \( j \) with \( \theta_j = \theta_i \) and \( \ell_j = \ell_i + 1 \), increase \( m \) by 1 and repeat Step 2.

3. Exit: Existing workers depart at rate \( \rho \).

D.1. Equilibrium

We work backward to solve for the unique equilibrium. Workers meeting firm \( N \) face the same decision as workers in the base model: they face a firm with value \( v^N \) drawn from distribution \( F \) and are among an incoming cohort with outside options determined by distribution \( G \). We know from Equations 3 and 4 that under full privacy each worker \( i \) will offer firm \( N \) an initial amount \( w_i^N \) solving

\[
w_i^N - \theta_i = \frac{1 - F(w_i^N)}{f(w_i^N)}
\]

and firm \( N \) will set \( \bar{w}^N = v^N \). Workers will not attempt to renegotiate. Under full transparency, \( N \) will set \( \bar{w}^N \) to solve

\[
v^N - \bar{w}^N = \frac{G(\bar{w}^N)}{g(\bar{w}^N)}
\]

and worker \( i \) will be employed at flow wage equal to \( \bar{w}^N \) if and only if \( \bar{w}^N \geq \theta_i \). Denote by \( \theta_i^{n,\lambda} \) the expected equilibrium lifetime utility (under transparency level \( \lambda \)) of a worker with outside option \( \theta_i \) immediately upon matching with firm \( n \) (before making an offer or learning wages through the transparency process), and denote by \( G^{n,\lambda} \) the distribution of \( \theta_i^{n,\lambda} \). Then, when facing firm \( N - 1 \), workers face will face the same decision but with \( \theta_i \) replaced with \( \theta_i^{N,\lambda} \), and firm \( N - 1 \) will face the same decision as firm \( N \) but with distribution \( G \) replaced with \( G^{N,\lambda} \). Inducting up toward the first firm, we can characterize the equilibrium actions of agents as the following:

\[
\lambda = 0 : 
\]
Workers:

\[ w^n_i - \theta_i^{n+1,0} = \frac{1 - F(w^n_i)}{f(w^n_i)} \quad \text{for } n < N \]  

(43)

Firms:

\[ v^n = \bar{w}^n \quad \text{for } n \leq N. \]  

(44)

\[ \lambda = \infty: \]

Workers:

\[ w^n_i = \bar{w}^n \mathbf{1}_{\{\bar{w}^n \geq \theta_i^{n+1,\infty}\}} \quad \text{for } n < N \]  

(45)

Firms:

\[ v^n - \bar{w}^n = \frac{G^{n+1,0}(\bar{w}^n)}{g^{n+1,0}(\bar{w}^n)} \quad \text{for } n < N \]  

(46)

As \( \theta_i \) is constant over time, \( \theta_i^{\lambda} \) is a non-increasing sequence, and strictly decreasing for workers with \( \theta_i < 1 \). Therefore, \( \frac{G^{\lambda}}{g^{\lambda}}(x) \) is non-increasing in \( n \). In words, workers’ outside options, which include the option value of bargaining with future firms, decreases as they move along the sequence of firms. Realizing this, under full transparency, earlier firms accept higher wages to incentivize workers to accept their offers rather than wait to meet future firms. We now provide results that are similar to the theorems in the main text.

**Proposition 10.** The expected average utility of workers is higher in equilibrium with \( \lambda = 0 \) than \( \lambda = \infty \). The expected utility of firms is higher in equilibrium with \( \lambda = \infty \) than \( \lambda = 0 \).

**Proof:**

We prove this result for workers, and the converse for firms is similar. By Myerson (1981) the expected utility of any worker who reaches firm \( N \) is higher under \( \lambda = 0 \) than \( \lambda = \infty \). Therefore, \( \theta_i^{N,0} > \theta_i^{N,\infty} \) for all \( \theta_i \). When meeting firm \( N - 1 \), worker \( \theta_i \) is in expectation better off setting offering \( \bar{w}_i^{N-1} \) solving

\[ \bar{w}_i^{N-1} - \theta_i^{N,\infty} = \frac{1 - F(\bar{w}_i^{N-1})}{f(\bar{w}_i^{N-1})} \]  

(47)

than receiving the equilibrium offer under full transparency by the same Myerson (1981) argument. That worker \( i \) is able to offer \( \bar{w}_i^{N-1} \) but instead chooses \( w_i^{N-1} \) that solves Equation 43 indicates that worker \( i \) is better off in expectation by revealed preference under full privacy. By induction, we see that worker \( i \) is better off at every firm she meets under full privacy.

\[ \blacksquare \]
Below are three analogues of the remaining theorems in the body of the paper. The proofs are omitted as the logic follows the proofs of the main theorems.

**Proposition 11.** When \( \lambda = \infty \) there is no wage dispersion between workers at the same firm in equilibrium.

**Proposition 12.** The ex-post employment maximizing level of transparency is weakly decreasing in \( v \).

**Proposition 13.** When each firm can select \( \lambda \in \{0, \infty\} \) as a function of \( v \) there is an essentially unique equilibrium outcome. In equilibrium, each firm selects \( \lambda = \infty \) for all \( v > 0 \).

### E. Firm Acceptance or Rejection of Each Offer

We introduce the game as one in which the firm selects a single \( \bar{w} \) and is bound to that for all time. More realistically, the firm may be able to accept offers on a case-by-case basis. In this section, we show that generalizing the game and restricting our attention to a class of time consistent equilibria does not change the analysis.

Amendments to the timing of the stage game are straightforward. Instead of selecting \( \bar{w} \) at \( t = 0 \), the firm selects “accept” or “reject” for each offer as it receives it. By accepting, the firm is locked in to paying the agreed upon wage until the worker departs or makes another offer, and if the firm rejects, then the worker is ineligible to work at the firm.

As we are interested in the effect of transparency on wage negotiation, learning about the wages of others must convey information about the wage a worker can request. Intuitively, we want to use an equilibrium refinement like Markov perfection, as this includes subgame perfection (so that the firm cannot make non-credible threats of refusing to accept certain wage offers) and time consistency (seeing the wage of a higher paid co-worker means that a worker knows she can receive that wage if she offers it to the firm). Unfortunately, Markov perfect equilibria are not well-defined in our setting.\(^{48}\) Formally, we study equilibria satisfying \( A_0, A_1-3, A_4', \) and \( A_5 \). We define \( A_0 \) and \( A_4' \) below.

**A0** The firm selects some function \( \bar{w}(v) \), and accepts all offers \( w_{i,t} \leq \bar{w} \) for any worker \( i \) and any time \( t \), and rejects all others.

**A4'** Let \( w_{i,\text{sup}} \) be the highest wage paid by the firm at time \( t \) if the worker observes wages at time \( t \), and 0 otherwise. Off path, each worker \( i \) believes with probability 1 that the firm will accept any offer she makes that is no more than \( \max\{w_i^*, w_{i,\text{sup}}\} \) and will reject all greater offers.

**A0** restricts attention to firm strategies that set a maximum wage \( \bar{w} \) that is constant across workers and over time within worker. This assumption that the firm’s strategy is time-consistent within worker is a Markovian restriction; a firm can condition its acceptance strategy on \( v \), previous offers made by the worker, and the history of the game. Note however, that given the constant inflow and outflow of workers, the only payoff relevant

\(^{48}\)Watson (2017) discusses some issues of equilibrium refinement in games with infinite action spaces.
factor determining the state of the game from the firm’s point of view is $v$. Furthermore, this Markovian assumption is necessary to understand the effects of pay transparency and worker bargaining. Because each worker is infinitesimally small, without any restriction, the firm could essentially negate pay transparency by refusing to renegotiate with workers. For example, the firm could play a strategy that defines some $\bar{w}_{i,t}(v)$, which is the maximum wage it will accept from each $i$ at time $t$. The firm could set $\bar{w}_{i,t} = v$ and $\bar{w}_{i,t'} = \bar{w}_{i,t}$ for all $t' > t$, which corresponds to the “full privacy” world of $\lambda = 0$ we present later. Without this restriction, it is also possible to construct “sun spot” equilibria in which $\bar{w}_t(v)$ is a step function in $t$, that is at some time $t'$ the firm’s maximum willingness to pay jumps upward.

The restriction that the maximum accepted offer is equal across workers is motivated by the assumption that the firm cannot wage discriminate against workers as it does not observe outside options. As we have limited our study to equilibria in which the firm’s willingness to pay is constant over time within worker, if the firm had a different willingness to pay across workers, it would imply that the firm has a different willingness to pay for two workers $i$ and $j$ at the moment each of these workers enters the market. Due to lack of information about outside options, the firm cannot discriminate in this fashion over a positive measure set of workers in equilibrium. We formally include the assumption that the maximum accepted offer is equal across workers here to rule out equilibria which vary only upon a measure zero set of workers.

$A4'$ is a special case of $A4$ and states that off path, conditional on learning the wages of co-workers, workers believe they can receive no more than $w^\text{sup}_t$ and will not be rejected if they offer $w^\text{sup}_t$. In other words, workers believe that even off path the firm plays a time consistent strategy as in $A0$. Such beliefs are potentially reasonable in the presence of equal pay laws.

All of the results in the paper go through under this expanded game if we restrict attention to equilibria satisfying the above conditions. Indeed, all of the results until those in Section III.D go through if we relax off path beliefs in $A4'$ to workers believing that with probability 1 that any offer weakly less than $w^\text{sup}_t$ will be accepted. Nevertheless, this relaxed version of $A4'$ can create an additional equilibrium outcome in the game with endogenous firm selection of transparency in which all firm types pool on $\Lambda = 0$. Further details are available from the authors upon request.

**F. Dynamic Rebargaining with Low Frictions**

We study the game introduced in Appendix E with the following adjustment: any renegotiation offer a worker makes at any time $t$ that the firm rejects results in the worker consuming her outside option for $\Delta$ periods and the firm receiving no utility from that

---

49Massachusetts recently passed a law prohibiting firms from asking potential employees their current salaries during job interviews (http://www.nytimes.com/2016/08/03/business/dealbook/wage-gap-massachusetts-law-salary-history.html accessed 11/7/2016) and employers often have little information on workers’ outside options in online labor markets such as TaskRabbit. Even if firms are able to observe demographic factors associated with high or low outside options (perhaps such as gender), and would optimally set a different maximum wage for these groups, any such strategy would be in violation of the Equal Pay Act of 1963, opening up the firm to litigation. Therefore, the analysis would be unchanged if instead the firm could observe the demographics of workers but could not select separate wage policies for different groups.
worker for $\Delta$ periods. At time $t + \Delta$, the worker must make a renegotiation offer to the firm. This process continues, with $\Delta$ periods of loss of employment in between rejected renegotiation offers until the firm accepts an offer or the worker exogenously departs. This extension captures the notion that rejection of the initial offer terminates communication between worker and firm (as in TaskRabbit, where rejection of a worker’s bid results in the pair never meeting) whereas failed renegotiation attempts on the job are costly but do not result in immediate firing. We show that the equilibrium outcome studied in the body of the paper is an equilibrium outcome of the game with low rebargaining frictions.

**Proposition 14.** For all $\Delta > 0$ and all $\Lambda$ there exists an equilibrium of the dynamic rebargaining with low frictions model that has the same outcome for all agents as the equilibrium of the base model.

**Proof:**

We construct equilibrium strategies that will support the given outcome. First, we consider the case of $\Lambda < 1$. The firm accepts the initial offer $w_i^*$ of any worker $i$ if and only if $w_i^* \leq \bar{w}$. The firm accepts a renegotiation offer $w_{i,t} > w_i^*$ from worker $i$ at time $t$ if and only if $w_{i,t} = \bar{w}$. Each worker $i$ only renegotiates at time $t'$ when she first learns $\bar{w}$ through the transparency process, and offers $w_{i,t'} = \bar{w}$. If $i$ ever makes a renegotiation offer before observing the transparency process and the offer is accepted, the worker believes that $v = 1$ and she offers $\bar{w}(1)$ at every opportunity until she learns that actual $\bar{w}$ through the transparency process. If $i$ ever makes a renegotiation offer before observing the transparency process and the offer is rejected, she believes with probability 1 that $\bar{w} = w_i^*$ and she will offer $w_i^*$ at every opportunity until she learns the actual $\bar{w}$ through the transparency process.

Let us discuss how the off-path beliefs and actions support the equilibrium outcome. Suppose a worker $i$ whose initial offer has been accepted by the firm makes a renegotiation offer $w_{i,t} > w_i^*$ where $w_{i,t} \neq \bar{w}$. From $i$'s point of view, the probability of guessing the exact value of $\bar{w}$ given acceptance of her initial offer is 0, due to the continuum of values $\bar{w}$ can take. Therefore, according to equilibrium strategies, she will be unwilling to make an uninformed offer as she will lose $\Delta$ periods of surplus with no possibility of gain.

Similarly, when the firm sees an offer $w_{i,t} \neq \bar{w}$ it believes with probability 1 that $i$ has not yet seen the wages of other workers. Furthermore, the firm believes that if the current offer is rejected, $i$ will offer $w_i^*$ in $\Delta$ periods assuming she does not learn the wages of her peers in that time. If instead the firm accepts the offer, which happens with zero probability according to equilibrium strategies, we let the worker believe $v = 1$, meaning she will immediately offer $\bar{w}(1)$ and continue to do so, even if the firm rejects these offers (until she learns the wages of her peers). As $\bar{w}(1)$ is strictly more than almost any firm type is willing to pay, nearly every firm type will strictly prefer to reject this offer, given these beliefs. Therefore, the firm will not have a profitable deviation, unless $v = 1$.

As a result, and given that the ex-ante probability of $v = 1$ is zero, workers will never attempt to renegotiate without observing the transparency process, and the equilibrium outcome is as in the base model.

In the case that $\Lambda = 1$ the firm’s strategy is to accept any renegotiation offer $w_{i,t} \leq \bar{w}$ at any time $t$ from any worker $i$. Given this, workers have no incentive to attempt renegotiation
as they learn \( \bar{w} \) on equilibrium path before their initial negotiations, and they offer exactly this amount.

G. Extensions of Bargaining Protocol

In this section, we discuss alternative bargaining protocols that generate qualitatively similar findings as the TIOLI bargaining scheme studied in the body of the paper. The first two cases consider situations in which workers are not able to rebargain as effectively as in the base model, either by being unable to capture the entire difference between their initial offers and \( \bar{w} \), or sometimes being unable to rebargain. There is an injection between the equilibria of these games and the game studied in the body of the paper, in which the additional bargaining friction results in de facto lower levels of transparency. The third extension shifts the bargaining power from the workers to the firm probabilistically, giving the firm the ability to propose wages to a fraction of workers.\(^{50}\) We show that the equilibrium outcome for workers receiving wage offers is independent of the level of transparency, and the equilibrium outcome for workers proposing wages is identical in this extended game to that of the original game. Therefore, transparency has the same equilibrium effects in this game, just affecting a smaller portion of the workers. The final extension allows employers to make a counteroffer. When workers initiate bargaining and can commit to a wage below which they will walk away, firms make counteroffers that, in equilibrium, target this walk-away wage. We show that workers make high offers in the first round, and anticipate receiving a counteroffer that is equal to the TIOLI offer they make in equilibrium in the original game. This leads to the same equilibrium outcome.

G.1. Workers can only rebargain for part of surplus

There are a number of possibilities as to why workers may not be able to fully close the gap between their initial wage and \( \bar{w} \). This could arise from a game in which workers and firm engage in alternating offer bargaining with disagreement amounts set to \( w^*_i \). It could even occur under a worker TIOLI offer scheme under a "non-Markovian" (i.e. does not satisfy condition A0 in Section E) equilibrium in which the firm’s strategy is equilibrium is to reject rebargaining offers that request more than a fixed proportion of the difference between a worker’s initial bid and \( \bar{w} \). Formally, suppose that the firm selects \( \bar{w} \) which is the maximum wage it accepts from any worker in the initial period a worker is hired. At any subsequent period, the firm rejects any renegotiation offer from \( i \) strictly greater than \( w^*_i + \alpha(\bar{w} - w^*_i) \) where \( \alpha < 1 \).

**Proposition 15.** The (unique) linear equilibrium of the game in which workers can only rebargain for \( \alpha \in [0, 1) \) fraction of the difference between \( \bar{w} \) and \( w^*_i \) and transparency level \( \Lambda < 1 \) is equivalent to that of the original game with transparency level \( \alpha \Lambda \).

\(^{50}\)This extension is similar to a modeling choice in Halac (2012) which changes the effective bargaining power of two parties by varying the probability of each agent making a TIOLI offer.
Proof:

For any \( \alpha \) the equilibrium outcome of this game is clearly equivalent to that of the original game when \( \lambda = \infty \) (\( \Lambda = 1 \)). When \( \lambda < \infty \), following the same logic as the main case, workers negotiate at most twice in equilibrium, once when they are first hired, and once when they learn \( \bar{w} \) through the transparency process. Letting \( \bar{F}(x) = P(\bar{w} \leq x) \), worker \( i \) negotiates at the first moment she is hired to:

\[
\arg\max_{w_i^*} \left( \frac{w_i^*}{\rho + \delta + \lambda} + \frac{\lambda}{\rho + \delta + \lambda} \cdot \frac{1}{\delta + \rho} \left[w_i^* + \alpha (\mathbb{E}(\bar{w}|\bar{w} \geq w_i^*) - w_i^*) \right] \right) (1 - \bar{F}(w_i^*)) + \frac{\theta_i}{\delta + \rho} \bar{F}(w_i^*)
\]

where the first term represents the weighted (by \( \lambda \)) expected wage the worker receives if matched with the firm, and the second term represents the lifetime earnings of the worker if she exceeds \( \bar{w} \) and instead consumes her outside option for her lifetime.

As before, we modify the objective function without affecting the maximizer, and show that this is equivalent to solving:

\[
\arg\max_{w_i^*} \int_0^1 \left( (1 - \Lambda) w_i^* + \Lambda (w_i^* + \alpha (x - w_i^*)) - \theta_i \right) \bar{f}(x)dx
\]

where \( \Lambda = \frac{\lambda}{\rho + \delta + \lambda} \) for all \( \lambda \in [0, \infty) \). In equilibrium, the firm sets \( \bar{w}(v) \) to solve

\[
\arg\max_{\bar{w}} \int_0^\bar{w} (v - (1 - \alpha \Lambda) y - \alpha \Lambda \bar{w}) \bar{g}(y)dy
\]

where \( G(x) = P(w_i^* \leq x) \). The first term gives the total discounted profits made by the firm before the workers experience an event (seeing the wage profile or perishing) and the second term is the profit made from workers after renegotiating their wages to the maximum allowable level over the rest of their lifetimes in the firm. We can similarly manipulate the objective as with the worker problem:

\[
\arg\max_{\bar{w}} \int_0^\bar{w} (v - (1 - \alpha \Lambda) y - \alpha \Lambda \bar{w}) \bar{g}(y)dy
\]

Comparing Equations 49 and 51 to Equations 1 and 2, respectively, completes the proof.

The results presented in the body of the paper go through in this setting with minor notational changes. The only significant difference is Theorem 2. When \( \alpha \) is sufficiently small, the employment maximizing level of transparency may no longer be in the interior. It is possible to show that there exists \( \epsilon > 0 \) such that for all \( \alpha < \epsilon \) full transparency maximizes...
expected employment if and only if full transparency yields higher expected employment than full privacy. Intuitively, when $\alpha$ is small, workers are unable to effectively rebargain, creating the possibility that full transparency (which requires no rebargaining in equilibrium) maximizes employment.

G.2. Workers are probabilistically able to rebargain

Now suppose that each worker is able to rebargain with probability $\alpha$ after the first moment she is matched with the firm. Workers who are able to rebargain can take the same actions as in the standard game, while the $1 - \alpha$ fraction of workers who cannot rebargain can take no further strategic actions after specifying $w^*_i$. Workers do not ex-ante know which type they are, and only realize their type after they make the initial offer to the firm (simultaneously with acceptance or rejection of offer).

**Proposition 16.** The (unique) linear equilibrium of the game in which each worker can independently rebargain with probability $\alpha \in [0, 1)$ and transparency level $\Lambda < 1$ is equivalent to that of the original game with transparency level $\alpha \Lambda$.

**Proof:**

Similar to the proof of Proposition 15.

Just as with the extension in Appendix G.1, the results from the body of the paper go through with appropriate modification to Theorem 2.

G.3. Two types of workers, receivers and proposers

For this case, suppose that some known fraction of workers are receivers (we can think of these as workers who are bad at bargaining) who are unable to make wage offers to the firm and receive a wage offer from the firm when they are first hired. If a receiver accept the offer, she is locked in to working at the specified wage until she perishes. If she rejects, she is permanently unmatched from the firm. The remaining workers operate as before, and make TIOLI offers (potentially infinitely often) to the firm upon matching. The type of each worker is independent of $\theta_i$, and is known to both the worker and the firm.

**Proposition 17.** The (unique) linear equilibrium of the game in which some fraction of workers are receivers and others are proposers is as follows:

1. The firm offers all receivers an initial wage of $\bar{w}$ which is the same as $\bar{w}$ in the original game with $\Lambda = 1$.
2. The (unique) linear equilibrium outcome for proposers with transparency level $\Lambda$ is equivalent to that of the original game with transparency $\Lambda$. 


Proof:

1. This point follows immediately from the fact that the worker type (proposer or receiver) is independent of \( \theta_i \) and that \( \theta_i \) is privately known by each worker.

2. As \( \bar{w} \) is the optimal posted price wage, the firm cannot maximize profits if it sets \( \bar{w} < \bar{\bar{w}} \). Therefore, when any proposer receives wage information through the transparency process, in equilibrium she will learn \( \bar{w} \geq \bar{\bar{w}} \) and will successfully demand a flow wage of \( \bar{\bar{w}} \). Therefore, a proposer’s information is not affected by the presence of receivers, and the unique linear equilibrium choices of firm, \( \bar{w} \), and proposer, \( w^*_i \), are unchanged from the base model.

G.4. Bargaining with a counteroffer

Suppose that instead of making TIOLI offers, anytime bargaining occurs workers make the first offer, and (privately) commit to a minimum acceptable wage. In response, the firm can either unmatch with the worker or make a counteroffer as a function of the initial worker offer. If the counteroffer is strictly less than the minimum acceptable wage, then the worker and firm unmatch. Otherwise, the counteroffer is accepted by the worker, who can then initiate re-bargaining at any point in the future. As before, unmatching results in no further contact between the worker and the firm. The timing of the bargaining stage is formalized below for any time \( t \) that any worker \( i \) and the firm renegotiate.

1. \( i \) makes a first offer \( w^1_{i,t} \) and simultaneously picks a minimum acceptable bid \( w^\text{min}_{i,t} \leq w^1_{i,t} \).

2. The firm observes only \( w^1_{i,t} \) and elects to either terminate negotiations or make a counteroffer \( w^2_{i,t} \).

3. If the firm makes a counteroffer and \( w^\text{min}_{i,t} < w^2_{i,t} \), or if the firm elects to terminate negotiations, then \( i \) and the firm unmatch and \( i \) consumes her outside option until she exogenously departs the market. If the firm makes a counteroffer and \( w^\text{min}_{i,t} \geq w^2_{i,t} \), then the firm employs \( i \) at a flow wage of \( w^2_{i,t} \) until \( i \) departs or attempts to renegotiate.

Note that if we restrict \( w^1_{i,t} = w^\text{min}_{i,t} \) for all \( i \) and \( t \), then the firm cannot make a meaningful counteroffer, and essentially can either accept \( w^1_{i,t} \) as is or unmatch with the worker. This is the same choice that the firm makes in Appendix E. We argue that there is an equilibrium in which \( w^1_{i,t} = w^\text{min}_{i,t} \) whose outcome is identical to that of the base game we study. Moreover, we show that there is an equilibrium whose outcome matches that of our base game anytime \( w^\text{min}_{i,t} \) is a continuous function of \( w^1_{i,t} \), and the ratio of \( w^\text{min}_{i,t} \) and \( w^1_{i,t} \) is bounded away from 0 for all \( i \) and \( t \).

**Proposition 18.** Suppose there exists \( \epsilon \in (0,1] \) such that for \( \epsilon \) and any \( i \) and \( t \) \( w^\text{min}_{i,t} \) is a continuous function of \( w^1_{i,t} \) and \( w^\text{min}_{i,t} \geq \epsilon \cdot w^1_{i,t} \). Then there is an equilibrium outcome of the bargaining with counteroffer game that matches the equilibrium outcome of the base game.
Proof:

To construct such an equilibrium, let \( w_{i,t}^{\text{min}} = w_{i,t} \), the wage that worker \( i \) asks for at time \( t \) in the initial game. Upon receiving an offer, the firm either rejects if the expected realization of \( w_{i,t}^{\text{min}} \) upon observing \( w_{i,t}^{1} \) and equilibrium strategies is greater than \( \bar{w} \) (where \( \bar{w} \) is the maximum wage the firm accepts in the initial game), and otherwise sets \( w_{i,t}^{2} \) equal to her expectation of \( w_{i,t}^{\text{min}} \). We need to show that for any \( i \) and \( t \) and any \( x \in [0,1] \) there is some \( w_{i,t}^{1} \) such that \( w_{i,t}^{\text{min}}(w_{i,t}^{1}) = x \). If this holds, then no party has an incentive to deviate: the worker can achieve any relevant minimum acceptable value in a negotiation by specifying the correct initial ask, and the firm will either reject the negotiations or make the least acceptable counteroffer, which is then accepted. If the firm deviates by making a more aggressive counteroffer, then it unmatches with the worker. Similarly, a worker who tries to set a higher minimum wage will unmatch with the firm. Let the firm believe that any offer \( w_{i,t}^{1} \) that does not occur on equilibrium path results in \( w_{i,t}^{\text{min}} = 0 = w_{i,t}^{2} \). Then the worker does not want to deviate and offer an unexpected initial wage.

Therefore, we show that any \( x \in [0,1] \) is achievable, as described above. By assumption \( w_{i,t}^{\text{min}} \leq w_{i,t}^{1} \) and \( w_{i,t}^{\text{min}} \geq \varepsilon \cdot w_{i,t}^{1} \). The second inequality requires that \( w_{i,t}^{\text{min}} \) is non-negative and the first requires that if \( w_{i,t}^{1} = 0 \) then \( w_{i,t}^{\text{min}} \) is non-positive. Therefore, if \( w_{i,t}^{1} = 0 \) then \( w_{i,t}^{\text{min}} = 0 \). Furthermore, by assumption \( w_{i,t}^{\text{min}} \geq \varepsilon \cdot w_{i,t}^{1} \) so if \( w_{i,t}^{1} = \frac{1}{\varepsilon} \) then \( w_{i,t}^{\text{min}} \geq 1 \). Therefore, since \( w_{i,t}^{\text{min}} \) is a continuous function, the intermediate value theorem implies that any \( x \in [0,1] \) is achievable for all \( i \) and \( t \) by some initial offer \( w_{i,t}^{1} \in [0, \frac{1}{\varepsilon}] \).

\[ \blacksquare \]

H. Transparency of Worker History

Between 2016 and 2018, 9 states and municipalities passed laws that prohibit employers from requesting past salary information of potential employees during the hiring process (Cain et al., 2018). On the other hand, internet labor platforms have moved in the opposite direction: eLance and UpWork now include explicit accounts of each worker’s past contract payments and hours worked visible to all users. What are the equilibrium effects of disclosing previous worker wage history to potential employers?

Ruling out the ability of workers to learn the wages of others within the firm (i.e. assuming \( \Lambda = 0 \)) the equilibrium effects of this form of transparency depends crucially on who has the bargaining power. If workers have bargaining power (they are the ones making TIOLI offers), then from a pure bargaining perspective, publicizing previous wages plays no role in equilibrium outcomes–workers demand a wage that the firm accepts if and only if it is below \( v \). Indeed, if tasks are standardized, workers may not be able to price discriminate, leading to uniform offers over time, generating constant wages overtime anyway.

If the firm makes TIOLI offers, the policy of exposing past worker salaries affects outcomes in equilibrium. Consider a model in which a worker meets with a new firm at each time \( t \). As before, we assume that the value of each firm, \( v_{t} \) and the outside option of the worker, \( \theta \) are distributed according to distributions with strictly increasing virtual values, i.e. \( v + \frac{F(v)}{f(v)} \) is strictly increasing in \( v \) and \( \theta - \frac{1-G(\theta)}{g(\theta)} \) is strictly increasing in \( \theta \). If the worker accepts an offer \( w_{t} \) at time \( t \), she receives a flow payoff of \( w_{t} - \theta \), and otherwise receives a flow payoff
of \( \theta \). Without a visible work history, the worker will accept any wage weakly above \( \theta \), and each firm will make a monopsonistic TIOLI offer. If instead work histories are observable, the worker can commit to accepting offers only above a threshold \( \bar{w} \), set monopolistically.

The notation above, especially \( \bar{w} \), is particularly chosen to mirror that in the main body of our paper exactly because, by flipping both the side of the market over which there is transparency and the side of the market with the bargaining power, our theoretical results are also flipped: transparency increases expected wages and worker surplus while decreasing firm profits. This suggests that platforms that provide worker history are improving worker outcomes.

Of course, there are institutional features of traditional labor markets that may lead to negative effects of transparency to workers. Due to the relative infrequency of taking a new job in traditional labor markets, a worker–for example, a recent graduate with debt–may be unable to commit to rejecting an offer that pays above her outside option. Therefore, a low wage early on may follow her and, having revealed information about her outside option, will never receive higher wages in future jobs.

Nevertheless, even if transparency of previous wages has negative effects on (some) workers, we have reason to believe laws prohibiting employers from asking about pay history will be ineffective. Since receiving previous high wages indicates a high outside option, workers with the highest wages will find it in their interests to disclose their work history to new potential employers. The unraveling logic of Theorem 4 holds, and all workers should always voluntarily reveal their previous wages in equilibrium. Indeed, workers even have an easy, credible way to do so–by bringing a copy of a recent paycheck to wage negotiations for a new job.
I. Experimental Appendix

Here, we show the experimental interface for workers and managers in our experiment. We show the following treatment: $5 manager budget per page, per worker; common chatroom (pay transparency); manager is instructed to accept all worker bids below budget without bargaining. Other treatments are similar, with changes on Page 5 of these instructions as described in the main text. Note that we did not actually complete any of the transcription task for the purposes of this illustration, and so the accuracy on Page 11, Workers is calculated at 0.0% for all pages.

Page 1, All Subjects

Introduction

There are 4 people simultaneously assigned to this group. You will either manage or carry out a transcription task. Those who successfully complete this task earn over $10 on average, some earn more than $20.

First, we’ll ask you some questions. Then you will interact with other participants. Please do this first part promptly so other participants do not have to wait for you. But read questions carefully because you will not be able to return to your answers after proceeding to the next page.

The transcription part, for the bonus, can be done any time in the next 36 hours.

Next
Example of Transcription Work

Transcription Example

Text Image:

<table>
<thead>
<tr>
<th>1,996</th>
<th>9</th>
<th>581</th>
<th>186</th>
<th>8</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>3</td>
<td>6</td>
<td>8</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>727</td>
<td>428</td>
<td>95</td>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Transcription:

1996, 5, 9, 581, 186, 8, 7
5, 3, ...
35, 1, 6, 8, 1.
727, 1, 428, 95, 6, 7

Now look at the sample page below. How many minutes do you think it would take you to transcribe the page below? This information will not affect your eligibility for a bonus in any way.

How many minutes?

[Input Field]

Next
Cash Preferences

Below you are presented with 5 scenarios. In each you will be given the choice between being paid for completing a page of transcription at 95% accuracy within 48 hours, or receiving $9 without having to do any transcription, also 48 hours from now.

If you are one of 20 survey respondents selected at random, we will randomly select one of your choices and enact it. You should answer honestly, because one of your choices might happen. (Note, information on this page will be kept private from all participants.)

Which would you prefer?
- $15, for 5 pages transcribed ($3 per page, 95% accuracy)
- $9, no transcription required

Which would you prefer?
- $20, for 5 pages transcribed ($4 per page, 95% accuracy)
- $9, no transcription required

Which would you prefer?
- $25, for 5 pages transcribed ($5 per page, 95% accuracy)
- $9, no transcription required

Which would you prefer?
- $30, for 5 pages transcribed ($6 per page, 95% accuracy)
- $9, no transcription required

Which would you prefer?
- $35, for 5 pages transcribed ($7 per page, 95% accuracy)
- $9, no transcription required
Bid for Work

Now tell us your single page bid (the price for ONE page) to do up to 6 pages just like the example (with 55% accuracy).
The manager will start with this information to negotiate a price for your services.

How much is your bid price per single page?

$  

Next
Manager - Chat Room

You are the Manager. Please chat with the 3 employees below. They should be here now.

You have a maximum budget of $5 per page. The employees were not aware of your budget when they bid. Please confirm each employee’s bid amount in the chat window and accept any that were $5 or less. If, and only if, the worker agrees to the original bid will the budget be split between you accordingly. You are not able to renegotiate.

After this chat employees will be taken to a screen to transcribe scanned pages, which will be checked for accuracy. For each page completed above 95% accuracy, they will receive their bid and you will receive the difference between $5 and the confirmed price. If the work is not submitted, or does not achieve at least 95% accuracy, no one will be paid for that page. For example, if you confirm $4 per page for all three workers, who then complete the work, you will be paid: ($5-$4) x (3 people) x (5 pages each) = $15

If some of the employees bid too high, you can still profit from your other agreements, and you will still be paid for the HIT. Decline bids above your $5 budget. Do not renegotiate.

Chat Room:

<table>
<thead>
<tr>
<th>Employee</th>
<th>Sample text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee 1</td>
<td>Sample text 1</td>
</tr>
<tr>
<td>Employee 2</td>
<td>Sample text 2</td>
</tr>
<tr>
<td>Employee 1</td>
<td>Sample text 3</td>
</tr>
<tr>
<td>Manager (Me)</td>
<td>Sample text 4</td>
</tr>
</tbody>
</table>

Enter the per-page amounts here.

Employees 1 bid $4.00 for each page
Did you confirm the bid in the chat room? If you did, and it’s not higher than $5, enter it here. (Enter 0 if too high) $ Did you agree the worker would do the transcription at this price? Yes

Employees 2 bid $5.00 for each page
Did you confirm the bid in the chat room? If you did, and it’s not higher than $5, enter it here. (Enter 0 if too high) $ Did you agree the worker would do the transcription at this price? Yes

Employees 3 bid $5.00 for each page
Did you confirm the bid in the chat room? If you did, and it’s not higher than $5, enter it here. (Enter 0 if too high) $ Did you agree the worker would do the transcription at this price? Yes

If there is a discrepancy between what you enter and what the employee enters, then neither party will receive any additional bonus for work completed. Please make sure you confirm!

You will receive any payment owed via an MTurk Bonus

Done
### Separated chatroom interface, Manager

<table>
<thead>
<tr>
<th>Worker 1</th>
<th>Worker 2</th>
<th>Worker 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manager</strong> (Me)</td>
<td>Sample message 1</td>
<td>Sample message 2</td>
</tr>
<tr>
<td>Worker 1</td>
<td>Sample message to</td>
<td></td>
</tr>
</tbody>
</table>

Send | Send | Send
Employee 1 - Chat Room

Everyone is here. You, 2 other employees, and a manager.
Your initial bid to the manager was $4.00 for each page. The manager is here to discuss it with you. You must agree to a price in order to submit the transcription work for a bonus. It is okay to disagree and exit. You will still be paid for the HIT.

Employee 3  Sample text 1
Employee 2  Sample text 2
Employee 1 (Me)  Sample text 3
Manager  Sample text 4

If there is a discrepancy between what you enter and what the manager enters, then you will not receive a bonus for work completed. Please make sure you agree!
Enter the amount you confirm here. Enter 0 if you cannot agree:

You and the manager must agree on your per-page price before you proceed! If your work does not achieve at least 95% accuracy, you will not be paid for that page. Selecting Deny will end your chat session, you cannot come back.
Transcription task 1/5

You will be shown 5 pages of transcription, one on each screen. When you click next, your transcription of the first page will be submitted and you will be presented with a fresh link to a second page of transcription and a blank text box, and so on until the fifth page. After you submit the fifth page we ask a few basic demographic questions and give you a code to submit your HIT.

Please transcribe the numbers from the table in the image into the box below.

You will be paid $5.00 for this page if you submit work that is at least 95% accurate, and if $5.00 matches the price the manager confirms. Thank you!

Click here to open image for transcription (opens in new tab or window)

You should only enter the NUMBERS from the table, none of the row or column headings. (No words)

Next

Do not click until you have finished the transcription!

Hint if you prefer to work in a different format such as an Excel spreadsheet, simply export to csv (comma separated delimited) copy and paste results here.

Do not complete this transcription if you did not actively AGREE with the manager about the per-page price.
## Summary

<table>
<thead>
<tr>
<th>Transcription #</th>
<th>Length of assigned text</th>
<th>Length of text entered</th>
<th>Levenshtein distance</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1232</td>
<td>0</td>
<td>1232</td>
<td>0.0 %</td>
</tr>
<tr>
<td>2</td>
<td>524</td>
<td>0</td>
<td>524</td>
<td>0.0 %</td>
</tr>
<tr>
<td>3</td>
<td>508</td>
<td>0</td>
<td>508</td>
<td>0.0 %</td>
</tr>
<tr>
<td>4</td>
<td>1001</td>
<td>0</td>
<td>1001</td>
<td>0.0 %</td>
</tr>
<tr>
<td>5</td>
<td>888</td>
<td>0</td>
<td>888</td>
<td>0.0 %</td>
</tr>
</tbody>
</table>

You transcribed 0 pages better than 95% accuracy.
Your agreed price per-page was $5.00
Therefore your bonus is $0.00
Survey

Enter your year of birth:

What is your gender?
please select

Next
Survey

How much experience do you have managing others?
- Please select

How much experience do you have doing transcription work?
- Please select

What is your highest level of education?
- Please select

On an average work day, how much money does your household earn from employment? (Don’t count government payments or other sources):
- $ [Input field]

Next
Thank You

You're done, thank you. Click next to complete the HIT.

Next
J. Survey materials

J.1. Survey about job descriptions

We present individual jobs descriptions to approximately 5,000 Mechanical Turk workers to read between 1 and 10 descriptions and answer the following questions.

Instructions:

The following survey is for research purposes and will be used to understand interactions during short-term work arranged online.

Please read the job description(s) and describe the nature of the job by answering short questions. If the job description does not clearly indicate the answer to the question, please provide your best guess based on the information available to you.

When we ask how likely it is that something will occur, please use a scale of 0 through 10. A value of 0 means they definitely will not. A value of 1 means the odds are 1 in 10. In other words, if the job were carried out 10 times, the event would most likely occur on one of those occasions. A value of 10 means that it would happen every time.

[Insert job description]

1. How many people are being requested for this job?

2. How many hours will each worker be required to work in order to complete this job? (please provide the average duration if multiple workers are required)

3. How many hours is it necessary for workers to overlap in the same place at the same time in order to complete this job?

4. How likely is it that workers will talk to each other on the job?

5. How likely is it that any one worker will learn what another worker is being paid for the same job?