Why Workers Stay: Pay, Beliefs, and Attachment*

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Abstract

Workers often remain with their employer even when outside firms offer higher pay. This may reflect information frictions or preferences. We use a large-scale survey of full-time German workers, linked to Social Security records, to elicit pay expectations and preferences over specific outside firms. Workers believe outside pay varies across firms and direct their search toward higher-paying employers. Expected pay premia are highly correlated with administrative pay measures observed and with workers' amenity valuations. Yet most workers would not switch firms—even for substantial raises at named destination firms. Implied switching costs range from 7 to 18% of annual pay. Attachment varies across firms and is not explained by amenities or switching costs, suggesting residual firm-specific factors shape mobility.

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"...The basic difficulty is that satisfactorily employed workers are almost entirely uninterested in employment conditions in other companies. This lack of interest is an even more serious obstacle than the difficulty of compiling accurate job information."
–Reynolds (1951)

1 Introduction

The willingness of workers to switch firms in response to changes in relative pay can affect the wages firms offer (Manning, 2011). A growing literature documents that, on average, a firm which lowers its wage by 10% can expect 30% of its workers to leave (Sokolova and Sorensen, 2018; Kline, 2025).[1] This limited response gives firms monopsony power, enabling them to set wages below the competitive level.

Workers may fail to search for—or move to— jobs that offer higher pay for different reasons. In one class of models, limited mobility stems from information frictions: workers may not switch firms if they have incomplete or incorrect knowledge of outside pay (Manning, 2003). In another class of models, fully informed workers stay because of preferences (Card et al., 2018; Berger, Herkenhoff and Mongey, 2022). These preferences may include switching costs or idiosyncratic tastes—such as for non-wage amenities or relationships with colleagues and managers.

Empirically distinguishing between information and preference-based explanations is challenging. While a large literature documents that firms differ in wage premia, existing data do not reveal whether—and to what extent—workers are aware of those differences (Card, Heining and Kline, 2013; Song et al., 2019). Workers who believe there is a single market wage for their skill may be less inclined to search than those who expect pay to vary across potential employers. Those who expect pay to vary, but do not know the pay policies of specific firms, will search differently than those who have firm-specific information on pay. If preferences are the main barrier to mobility, then accurate information or outside offers may not induce job-to-job mobility.

Understanding the sources of limited firm-to-firm mobility is important for both theory and policy. Information- and preference-based models yield different predictions for the welfare gains from increased labor market competition. In preference-based models, expanding access to outside opportunities is always beneficial to workers; in models with information frictions, more competition need not improve outcomes (Caldwell, Dube and Naidu, 2025). If information frictions dominate, transparency policies may enhance mobility (Council of Economic Advisors, 2016); if preferences dominate, such policies may be ineffective.

We provide new evidence linking workers' beliefs about and preferences over outside firms to

[1] The idea that quit rates are less than perfectly elastic goes back nearly a century (Robinson, 1933).

their search and mobility. We fielded a novel survey through the German Institute for Employment Research (IAB), and obtained responses from nearly 10,000 full-time German workers aged 25 to 50. A key innovation of this survey is that it includes questions about specific outside firms. For a set of firms named by respondents as potential destinations, and a second set of firms randomly assigned in our research protocol, we elicit (1) whether workers would apply to the firms if considering a job change, (2) what they expect the firm would pay them, and (3) how they would rank hypothetical offers from these firms relative to each other and relative to the opportunity to stay at the incumbent firm given researcher-randomized raises. We link survey responses to administrative data on the workers and to administrative and public-use data on the provided firms including firms' pay premia, median pay, and industry. This dual linkage allows us to compare workers' expectations to objective benchmarks and to compare workers' stated preferences with observed outcomes.

Our results indicate that preferences, rather than beliefs, are the key driver of limited mobility. Workers expect both pay and non-pay factors to vary across firms and perceived pay premia are positively correlated with administrative pay measures and with workers' valuations of non-wage amenities. Workers direct search toward higher-pay firms. However, when asked to rank offers from firms—including firms named as potential destinations—workers often prefer to remain at their current firm. When asked why they believe workers are reluctant to switch firms, respondents cite a general reluctance to undergo change, firm amenities, and social connections. Pay is the fourth most cited reason; lack of opportunities is not a major factor.

We frame the empirical analysis with a partial equilibrium search model in which workers have beliefs about the pay provided by outside firms and heterogeneous preferences across these firms. The model clarifies how workers' beliefs about the pay provided by outside firms shape search behavior—both on the extensive margin (whether to search) and on the intensive margin (where to apply). Pessimistic beliefs about outside options reduce search. But when workers expect pay to vary across firms, they are less likely to forgo profitable search. Preferences also affect workers' search and mobility. Workers facing high switching costs search and move less, even when outside firms offer higher pay. These switching costs may reflect tangible barriers or a general aversion to change—something highlighted by surveyed workers.

The empirical analysis proceeds in three parts. In the first part, we examine workers' firm-specific pay information. Guided by the model, we first assess whether workers expect their pay to vary across potential employers. We find that nearly one half of workers had firm-specific information on pay when they applied to their current firm. Most workers do not believe they face a uniform outside option. Only 20% say that they would earn the same pay at each of the three

firms that we randomly provided to them (researcher-provided firms). We see a similar pattern when we examine workers' pay expectations at the firms they provided as potential destinations (worker-provided firms). The within-worker variation in expected pay does not only reflect expected differences in pay across industries or regions. Instead, there appears to be a strong firm component, with workers expecting pay to vary across firms within the same industry and region.

We use a two-way fixed effects model to summarize workers' expectations at researcher-provided firms. From a list of 30 large German employers, we randomly selected three firms to provide to each worker. We identify the firm-specific effects from within-worker deviations in expected pay at these firms. Workers expect pay to vary significantly: the firm-specific estimates range from -0.25 (25 percentage points less than the base firm) to 0.05 (5 percentage points more). Workers' expected pay premia are positively correlated with objective measures of firm pay premia ($\rho = 0.42$) and of firm median ($\rho = 0.54$) and mean ($\rho = 0.56$) pay. We also find strong agreement across demographic groups in their expected pay rankings, suggesting a widely shared perception of the pay hierarchy among large German firms. Taken together, these findings indicate that workers have substantial information about firm-specific pay.

In the second part of the paper, we examine how workers' beliefs shape search. Our primary design leverages within-worker, within-firm variation in expectations, thereby controlling for both across-worker differences in general knowledge about firm pay or willingness to move and across-firm differences in non-wage amenities. A 10% increase in expected pay is associated with a 3 percentage point increase in the probability a worker will consider applying to a firm. The average application-wage elasticity is 1. Two complementary designs—which use different portions of the questionnaire—confirm that high-pay firms (both in workers' perceptions and in the administrative data) receive more overall interest. These findings suggest that workers use prior beliefs about firm pay to guide their search and view higher-pay firms as more attractive overall. The application-wage elasticity is somewhat lower for workers who are more risk averse or who report hesitancy to apply because they perceive a low probability of receiving an offer.

In the final part of the paper, we turn to the role of preferences using a set of firm-specific discrete choice experiments. We find that many workers are unwilling to switch firms—even to firms they explicitly identified as application targets—even for sizable wage increases. 39% of workers would prefer to remain in their current job over a 20% raise at a firm they indicate. The implied separation elasticity is between 2 and 4. Translating the required raise for workers to consider moving into a "switching cost", we estimate that a typical worker faces switching costs equivalent to 7 to 18% of their annual pay. When we specify that a worker's commute would not change, we obtain only slightly lower estimates of switching costs (in the range of 6-11%)

suggesting that the switching costs are not solely driven by the costs of physically moving locations (Kennan and Walker, 2011; Koşar, Ransom and Van der Klaauw, 2022).

Workers do not prefer to stay at their firm because they believe higher pay is offset by worse amenities. A large share of workers expect higher-pay firms to offer better amenities (29%), and most (71%) believe that higher-pay firms offer at least as good amenities as lower-pay firms in the same market. When we use the choice experiments to estimate the total value workers assign to the amenity bundle at each firm, we find that amenity valuations are of similar magnitude to—and are positively correlated with—firm-specific expected pay premia (Wiswall and Zafar, 2018). There is evidence of sorting: workers who report being willing to consider a firm value it more than those who would not apply. In addition, firm insiders (incumbent workers) differ in valuations from both outsiders who are uninterested in the firm and outsiders who are interested in the firm. The latter fact is hard to rationalize with standard models of the labor market in which the utility a worker receives from working at a firm (other than a switching cost) is independent of whether a worker already works at that firm. One possibility is that ex post valuations of amenities differ because workers develop firm-specific human capital or social ties (e.g. with coworkers or managers).

Our results contribute to four distinct literatures. First, our approach was inspired by, and modeled after, an earlier ethnographic literature that used worker surveys to shed light on the labor market (Myers and Shultz, 1951; Reynolds, 1951; Rees and Shultz, 1970). We adapted many of our survey questions—such as those eliciting the names of specific outside firms—from this literature. We leverage the modern survey infrastructure of the IAB to field our survey to workers across multiple distinct labor markets, and to link workers' responses to administrative measures.

Second, we contribute to a large literature documenting heterogeneity across firms in pay and amenities (e.g., Rosen, 1986; Abowd, Kramarz and Margolis, 1999; Card, Heining and Kline, 2013; Song et al., 2019; Sorkin, 2018). Our approach is fundamentally distinct in focusing on workers' beliefs. However, this literature shaped both our design and our empirical strategy.[2] Our finding that workers believe firms differ in pay premia—and that these beliefs are correlated with administrative wage data—helps rationalize the high degree of sorting documented in prior work (e.g., Card, Heining and Kline, 2013; Song et al., 2019; Lamadon, Mogstad and Setzler, 2022). Our analysis of firm amenities is also closely related to Holzer, Katz and Krueger (1991), who found a spike in applications at the minimum wage, consistent with the idea that workers perceive such jobs as offering rents.

Third, this paper speaks to the theoretical literatures on imperfect competition and job search. Models of monopsony often explain upward-sloping labor supply curves using information fric-

[2]For example, we developed the wording and randomization of firm-specific pay questions to allow for estimation of two-way fixed effects models comparable to those in the wage-setting literature.

tions or preference heterogeneity (Azar and Marinescu, 2024; Caldwell, Dube and Naidu, 2025; Kline, 2025). Our results suggest that models emphasizing preferences may better capture worker behavior. Our findings that workers use firm-specific information about pay to guide search and associate higher pay with higher overall utility support central assumptions of directed search (Wright et al., 2021). Moreover, the broad agreement in perceived pay rankings—and the belief that high-wage firms receive more qualified applicants per vacancy—aligns with models in which search generates congestion externalities.[3]

Finally, this paper contributes to a growing literature on workers' information and beliefs about the labor market (see summary in Cullen, 2023). This literature documents mixed effects of providing workers with pay information (e.g., Caldwell and Harmon, 2019; Jäger et al., 2024; Cullen, 2023). Several papers document that telling workers, e.g., what their coworkers make, or what other prospective applicants ask for, can improve their outcomes (Card et al., 2012; Roussille, 2024). However, other papers have shown that blanket policies of information provision do not always benefit workers (Cullen and Pakzad-Hurson, 2023).[4] Relative to this literature, our contribution lies in documenting what workers know about specific outside firms. Our results suggest that lack of information about outside pay is not the central friction preventing mobility, echoing previous work by Fox (2010) on Swedish engineers, as well as early work by Reynolds (1951).

The rest of the paper proceeds as follows. Section 2 presents a simple partial equilibrium model that motivates our empirical analysis. Section 3 describes the survey design and data linkages. Section 4 examines workers' firm-specific pay expectations. Section 5 analyzes how these beliefs affect search. Section 6 uses a series of discrete choice experiments to estimate amenity valuations and switching costs. Section 7 concludes.

[3]The reduced form evidence for directed search largely comes from settings where pay information is public (e.g., Belot, Kircher and Muller, 2022; Marinescu and Wolthoff, 2020). A notable exception is Banfi and Villena-Roldan (2019). However, it is rare in many settings for firms to provide pay information in job ads (Batra, Michaud and Mongey, 2023; Caldwell, Haegele and Heining, 2024). Further, a large share of positions are filled without a formal vacancy (Davis, Faberman and Haltiwanger, 2013).

[4]There is mixed evidence on whether workers systematically misestimate their outside options. Jäger et al. (2024) use a module embedded in the German-Socioeconomic Panel to document that a large share of workers anchor beliefs about the pay changes associated with transitions to their current wage. Appendix C describes how our elicitations—which isolate beliefs about pay separate from job arrival rates—differ from those in previous studies. This appendix also documents that workers at low-wage firms receive fewer job offers than comparable workers at high-wage firms and discusses how survey-based anchoring and question order effects could have influenced previous studies.

2 Empirical Framework

We present a simple partial equilibrium search model that motivates the empirical analysis in Sections 4-6.[5] Appendix D provides details and proofs.

2.1 Setup

Consider a labor market populated by a unit mass of infinitely lived workers indexed by i who can work at any of J firms. Workers derive utility from pay and non-pay amenities provided by firms. Worker i's flow utility from employment at firm k is:

$$u_{ik} = \beta w_{ik} + a_k + \epsilon_{ik}, \tag{1}$$

where $\beta > 0$ is the marginal utility of log pay, w_{ik} is the log pay of worker i at firm k, a_k is the total value of non-pay amenities provided by firm k, and ϵ_{ik} is an idiosyncratic preference shock drawn independently and identically across workers and firms from a type 1 extreme value distribution. The non-pay amenities may encompass a variety of factors, such as a firm's corporate culture, childcare policies, or health insurance policies. We denote worker i's employer in period t by $j(i,t)$. If a worker is not employed, $j(i,t) = 0$ and they receive flow utility $u_{i0} = a_0 + \epsilon_{i0}$ where a_0 is the value of non-employment.

Beliefs. Workers hold beliefs $\tilde{w}_{ik}$ about pay at potential outside employers, which may differ from actual pay, w_{ik}. We assume that beliefs are given by:

$$\tilde{w}_{ik} = w_{ik} + b_i + \eta_{ik}, \quad \mathbb{E}[\eta_{ik}|b_i, w_{ik}] = 0,$$

where b_i captures worker i's systematic optimism (if $b_i > 0$) or pessimism (if $b_i < 0$) relative to true pay and η_{ik} allows beliefs to vary across firms arbitrarily. Workers form beliefs based on all available information, including networks, online platforms, or past applications.[6] Worker i learns the true pay at firm j after receiving an offer.

Dynamics, Search, and Mobility. In period t worker i receives their flow utility. They then decide on a set of firms $A \subseteq \mathcal{J} \backslash j(i,t)$ to apply to where $\mathcal{J}$ is the set of all firms. They then pay an

[5] A natural extension would embed this setup in a general equilibrium framework. In equilibrium, firms' wages and hiring selectivity would adjust endogenously to worker behavior and allowing workers' beliefs to update dynamically in response to these adjustments. We do not present this version because our empirical focus is on how workers' existing perceptions shape their individual search decisions, rather than on equilibrium wage determination.

[6] We remain agnostic about the belief formation process as we focus on elicited beliefs rather than learning.

application cost κ for each application, regardless of whether this application is successful: if they apply to $|A|$ firms, they pay $\kappa|A|$. The probability of receiving an offer from firm k is p_k.[7]

Worker i then simultaneously receives job offers and learns whether their current match will be exogenously destroyed (which occurs with probability λ). After learning about their offer set, worker i chooses the best offer in their option set. If their match was destroyed, this option set includes non-employment and any firms which made them an offer. Otherwise it also includes their current firm. If the worker moves to a new firm, they pay a one-time cost s_i. We refer to s_i as a switching cost, noting that it can encompass a broad set of frictions that reduce the attractiveness of going to a new employer, including uncertainty about new environments, disruption to established commuting patterns, and the cost of developing social ties with managers and coworkers.

Search is forward-looking and workers discount the future at rate $\delta \in (0,1)$. Worker i applies to outside firms if the benefit of doing so exceeds the cost. We use A to denote the set of firms a worker applies to and $B(A)$ to represent the set of firms which make an offer to individual i (a subset of A). Because there is uncertainty about what firms will offer the worker employment, workers make decisions on the basis of expected utility, accounting for uncertainty in whether an application will be successful. Worker i's perceived value of employment at firm k is:

$$\begin{aligned}\tilde{V}_{ik} \;=\; & \underbrace{\beta\tilde{w}_{ik} + a_k + \epsilon_{ik}}_{\tilde{u}_{ik}} \\ & + \max_{A\subseteq\mathcal{J}\setminus\{k\}} \Bigg\{ -\kappa\,|A| + \delta\,\mathbb{E}_{B(A)}\Big[(1-\lambda)\,\max\Big\{\overbrace{\tilde{V}_{ik}}^{\text{stay}}\,,\,\overbrace{\max_{m\in B(A)}\big(\tilde{V}_{im}-s_i\big)}^{\text{switch employers}}\Big\}\Big] \\ & + \lambda\,\max\Big\{\underbrace{V_{i0}}_{\text{unemployed}}\,,\,\underbrace{\max_{m\in B(A)}\big(\tilde{V}_{im}-s_i\big)}_{\text{switch employers}}\Big\}\Big]\Bigg\}. \end{aligned} \tag{2}$$

where we use $\tilde{V}_{ik}$ to indicate that the value function depends on the vector of perceived wages $\widetilde{\mathbf{w}}_i = (\widetilde{w}_{i1}, \ldots, \widetilde{w}_{iJ})$, rather than the vector of actual wages. We define V_{ik} similarly, except the true wage at firm k is known.

For worker i, employed at firm j, the expected utility of not searching (not applying to any firms) is

$$V_{ij}^{\text{no search}} = u_{ij} + \delta\left[\lambda V_{i0} + (1-\lambda)\tilde{V}_{ij}\right],$$

[7]This is firm-specific but worker-invariant. This implies that all workers face the same probability of success when they apply to firm k. Allowing p_k to vary across workers complicates the notation and does not change the predictions.

and the expected utility of applying to a non-empty set of firms, A, is

$$V_{ij}^{\text{search}}(A) = u_{ij} - \kappa|A| + \delta\mathbb{E}\left[\tilde{V}_i|A\right],$$

$$\begin{aligned}\text{where } \mathbb{E}\big[\tilde{V}_i|A\big] \;=\; & \mathbb{E}_{B(A)}[(1-\lambda)\,\max\Big\{\underbrace{V_{ij}}_{\text{stay}},\ \underbrace{\max_{m\in B(A)}\big(\tilde{V}_{im}-s_i\big)}_{\text{switch}}\Big\} \\ & +\lambda\,\max\Big\{\underbrace{V_{i0}}_{\text{unemployed}},\ \underbrace{\max_{m\in B(A)}\big(\tilde{V}_{im}-s_i\big)}_{\text{switch}}\Big\}].\end{aligned}$$

Definition of Directed Search. Formally, we say that search is directed if there exists at least one pair of firms (k, l) with $\tilde{w}_{ik} \neq \tilde{w}_{il}$ such that altering these beliefs, while holding aggregate distributions constant, changes the worker's applications. This behavior requires that: (1) workers believe their own pay would vary across firms ($\tilde{w}_{ik} \neq \tilde{w}_{il}$ for some $k \neq l$) and (2) workers can link their beliefs $\tilde{w}_{ik}$ and the values of amenities a_k to the identity of the firm k.

2.2 Firm-Specific Knowledge of Pay and Search

The model yields several predictions about the relationship between workers' beliefs and switching costs and their search and mobility. Formal proofs are in Appendix D.

1. The Probability of Search is Increasing in a Worker's Perceived Outside Options and Decreasing in $\mathbf{s_i}$. Worker i at firm j searches in period t if there exists at least one firm for which the expected gain exceeds the cost:

$$\max_k \Big\{\delta p_k[(1-\lambda)\text{max}(\tilde{V}_{ik} - s_i - V_{ij}, 0) + \lambda\text{max}(\tilde{V}_{ik} - s_i - V_{i0}, 0)]\Big\} > \kappa \tag{3}$$

The left side of this expression is increasing in perceived outside options ($\tilde{V}_{ik}$) and decreasing in the switching cost s_i. Perceived outside options depend on the wages other firms offer ($\mathbf{w}_i$), on worker optimism about outside pay (where $b_i > 0$ increases search), and on firm-specific bias η_{ik}. Workers may choose not to search even when they believe other firms offer better wages and amenities if they have a large switching cost s_i.

2. Mistaken Non-Search is Less Likely With Firm-Specific Pay Beliefs. We say that there is mistaken non-search whenever a worker does not search, but would if they were to base their

decision on actual wages $\mathbf{w}_i = (w_{i1}, ..., w_{iJ})$ rather than perceived wages $\widetilde{\mathbf{w}}_i = (\widetilde{w}_{i1}, \ldots, \widetilde{w}_{iJ})$.

Consider two hypothetical scenarios in which workers believe firms vary in pay. In the first scenario, the worker can map these beliefs to firm identities (directed search). They search if there is at least one firm for which the value of applying to that firm exceeds the cost (equation 3). In the second scenario, the worker cannot map their beliefs to firm identities (non-directed search). They search if the expected benefit of a random application exceeds the cost:

$$\delta \frac{1}{J} \sum_k p_k[(1-\lambda)\text{max}(\tilde{V}_{ik} - s_i - V_{ij}, 0) + \lambda \text{max}(\tilde{V}_{ik} - s_i - V_{i0}, 0)] > \kappa. \tag{4}$$

Targeting the firm with the maximum expected gain (the left side of equation 3) yields an expected value at least as high as applying randomly (the left side of equation 4) because the worker can avoid firms with low or negative expected gains. Therefore, mistaken non-search is less common if workers have firm-specific pay beliefs.

3. Directed Searchers Apply More to Firms with Higher Perceived Wages. Third, if workers direct their search, the probability that worker i applies to firm k is an increasing function of their perceived wage at that firm $\tilde{w}_{ik}$. By contrast, if workers do not perceive wage variation across firms—or if they cannot link a given wage to a specific firm—the probability worker i applies to firm k is uncorrelated with its wage.

For simplicity, suppose worker i considers whether to apply to firm k, taking the rest of their applications as given. Their decision depends on whether the gains exceeds the cost:

$$\text{Apply}_{ik} := 1\{p_k \cdot \tilde{V}_{ik} > \kappa_i\},$$

where κ_i is an individual-specific threshold which depends on the per-firm application cost κ, the worker's switching cost s_i, the worker's current employer and set of applications, the probability of job destruction, and the discount factor. Each is independent of $\tilde{w}_{ik}$. Treating the worker's application threshold κ_i as a random variable with differentiable distribution function F, we can examine how the probability the worker i applies to firm k responds to changes in perceived wages:

$$\frac{d\,P(\text{Apply}_{ik}=1)}{d\,\tilde{w}_{ik}} = f_{\kappa_i}(p_k \tilde{V}_{ik}) \left(\underbrace{\beta p_k}_{\text{direct utility gain}} + \underbrace{p_k \frac{\partial\, a_k}{\partial\, \tilde{w}_{ik}}}_{\text{amenities}} + \underbrace{\tilde{V}_{ik} \frac{\partial\, p_k}{\partial\, \tilde{w}_{ik}}}_{\text{selectivity}} + \underbrace{p_k \frac{\partial\, U_k(A^*)}{\partial\, \tilde{w}_{ik}}}_{\text{gains from optimal applications}} \right). \tag{5}$$

There are four channels through which applications respond to $\tilde{w}_{ik}$: (1) the direct utility gain from higher pay, (2) the relationship between wages and amenities, (3) the relationship between wages and offer probabilities, and (4) the gains associated with changes to future application behavior.[8]

4. A Firm's Application-Wage Elasticity is Increasing in the Share of Directed Searchers. Because only workers who direct their search respond to a particular firm's wage, the responsiveness of a firm's applications to changes in its own wage is increasing in the share of directed searchers. In many models, firms' markdowns are decreasing (wages are increasing) in the elasticity of applications to wages (Manning, 2003; Dal Bó, Finan and Rossi, 2013).

To see this, decompose the number of applicants to firm j, n_j, into the contributions from two groups of workers:

$$n_j = N \times \left[\underbrace{\alpha \times \mathcal{D}_j(a_j, \{\tilde{\mathbf{w}}_i\}, \{\kappa_i\})}_{\text{directed portion}} + \underbrace{(1-\alpha) \times \mathcal{R}_j(\{\tilde{\mathbf{w}}_i\}, \{\kappa_i\})}_{\text{non-directed portion}} \right],$$

where $\alpha \in [0,1]$ is the share of workers who direct their search, and $\mathcal{D}_j$ ($\mathcal{R}_j$) is the share of workers who direct (do not direct) their search who apply to j. The wage elasticity of applications η^j is

$$\eta^j = \frac{\partial n_j}{\partial w_j} \times \frac{w_j}{n_j} = \frac{w_j}{n_j} \times N \times \left[\alpha \frac{\partial \mathcal{D}_j}{\partial w_j} + (1-\alpha) \underbrace{\frac{\partial \mathcal{R}_j}{\partial w_j}}_{\approx 0} \right] \approx N \times \alpha \times \frac{w_j}{n_j} \left[\underbrace{\frac{\partial \mathcal{D}_j}{\partial w_j}}_{+} \right], \tag{6}$$

where $\partial \mathcal{D}_j / \partial w_j > 0$ as long as $\partial \tilde{w}_{ij} / \partial w_j > 0$ because the probability each worker who directs their search applies is increasing in their own beliefs (prediction 3).[9]

5. The Probability of a Job Switch is Increasing in a Worker's Perceived Outside Options and Decreasing in s_i. Finally, incumbent workers' decisions to search and move are shaped both by their beliefs about outside option pay, and by their costs of switching employers. While workers learn the actual wage of an outside firm before they accept an offer from that firm, a worker can only switch jobs if they receive an offer. Workers switch jobs when they (1) apply to another job,

[8] Intuitively, after moving to a higher wage firm a worker may apply less because the gains to moving are lower. In Appendix D, we show a similar expression arises when workers can construct application portfolios. Even then, an increase in $\tilde{w}_{ik}$ raises the expected payoff of any set of applications that includes firm k. This preserves the core intuition: higher perceived wages lead to a higher probability of applying to k, all else equal.

[9] If firm j is small, $\partial \mathcal{R}_j / \partial w_j \approx 0$ because a wage change at firm j will influence workers' overall search behavior only through its influence on their beliefs about the overall wage distribution; any increase in applications will be spread across all firms.

(2) receive an offer, and (3) decide that offer is good enough to overcome the switching cost.

A worker's probability of searching is increasing in their perceived outside options and decreasing in s_i (prediction 1). Conditional on their applications, the probability worker i receives an offer does not depend on either their beliefs or s_i. Given that worker i has an offer from outside firm k, they prefer it to the option of remaining at their incumbent firm if:

$$V_{ik} - s_i > V_{ij} \tag{7}$$

where we use V_{ik} rather than $\tilde{V}_{ik}$ as we assume that a worker learns a firm's wages upon receiving an offer. All else equal, a worker is less likely to accept the outside offer if their switching costs are higher and more likely to accept if the firm offers them a higher wage.

2.3 Identifying the Barriers to Mobility

We use these predictions to guide our analysis of workers' beliefs and the relationship between these beliefs—and switching costs—and workers' search and mobility. Section 4 examines whether workers have firm-specific beliefs about pay and whether these beliefs are correlated with objective predictions. Section 5 tests prediction 3 by estimating models where the dependent variable is an indicator for worker i reports they would apply to firm k, and the key independent variable is $\tilde{w}_{ikt}$.

Our model indicates that both beliefs and preferences (including switching costs) affect observed search and mobility. Section 6 uses a series of discrete choice experiments in which we asked workers to rank offers from specific outside firms with randomized and specified pay to isolate the role of preferences. We estimate switching costs (s_i) and to examine the role of firm-specific amenities (a_k) in explaining limited mobility.[10] We also consider the possibility that attachment varies across firms. We do so by considering an augmented version of the model in which workers' valuations of non-wage attributes differ once they have joined a firm. This allows for the possibility that workers develop firm-specific attachment over time through the accumulation of match-specific capital or social ties (e.g., with managers or coworkers). This is not incorporated in standard models which assume that, even if firms vary in the utility they provide, this variation exists before a match is formed (e.g., Moen, 1997).

[10] As detailed in Section 3, our primary discrete choice experiments identify switching costs and valuations of firm-specific amenities by asking workers to choose between offers at named firms with specified, randomized wage increases. In a more general model in which wages grow over time and firms also differ in growth rates, workers' preferences over the outside firm and the incumbent depend on an additional term: the discounted difference in growth rates. In most of the paper, we follow the literature in considering firm-specific amenity values as a bundle, without decomposing them into their constituent parts. However, in some of our analysis, we leverage a set of additional discrete choice experiments we conducted in which we told workers that future promotions and wage trajectories would not differ from their incumbent firm.

Throughout our empirical tests, we leverage our ability to directly measure workers' beliefs about outside options, rather than inferring them from observed behavior, and our ability to isolate preferences from beliefs. Our approach allows us to distinguish between: (1) information frictions, where workers hold inaccurate beliefs about outside options; (2) preferences, including both switching costs and firm-specific attachment. Switching costs and firm-specific attachment provide mechanisms through which workers, who are informed and actively consider outside opportunities, may nevertheless remain with their current employer.

3 Data and Survey Design

We designed a survey to elicit workers' information about pay, search behavior, and preferences. We fielded the survey through the German Institute for Employment Research (IAB), a group within the German Employment Agency with a statutory mandate to study the labor market. We linked workers' responses to their Social Security records. We also developed a linkage between workers' responses about specific firms and public and administrative data on those firms.

3.1 Survey Implementation and Descriptive Statistics

We fielded the initial wave of the survey to 134,995 full-time German workers in the fall of 2022. We selected workers for inclusion in the survey from the set of full-time employed workers between the ages of 25 and 50 who had been at their establishment for fewer than eight years. We over-sampled workers from the firms included in the firm survey conducted by Caldwell, Haegele and Heining (2024). This design allows us to produce estimates that are representative of the full-time German workforce (after re-weighting), but also gives us the ability to estimate firm-specific valuations among insiders (those currently employed at a firm) for a large set of firms. We weight responses according to this explicit dimension of over-sampling; this is considered a best practice in the survey literature (Solon, Haider and Wooldridge, 2015).

We designed the survey so that it was similar to other worker surveys fielded by the IAB. We sent invitations to the survey—which were signed by the director of the IAB—by mail; respondents completed the survey online. We received 13,680 total responses, for an effective response rate of 11.4%. Our response rate compares favorably to other IAB surveys targeting first-time respondents (Haas et al., 2021) and to other recent surveys that invited participants electronically (Caplin et al., 2023). The high completion rate (74%) and moderate median response time (9 minutes) suggest that survey fatigue and limited attention are not major concerns.[11] Throughout the paper, we pool

[11] We define a response as complete if a respondent clicked through to the second to last question, which elicited

data from the initial survey wave with data from a follow-up survey we conducted in the spring of 2024. The follow-up response rate (fifty-one percent) is similar to those of other panel surveys (Haas et al., 2021). In both the initial and follow-up surveys, we randomized incentives to respond (Caldwell, Haegele and Heining, 2024).

The key innovation in our survey design is that we asked workers questions about specific firms, and linked these responses to public and administrative data on those firms. While these questions form the basis of most of our analysis, we also collected additional characteristics not observed in the Social Security records—such as collective bargaining coverage and hours worked—as well as general information on search.[12]

Table 1 describes the 9,756 employed workers who completed the initial wave of the survey and provided their consent to link their responses to the administrative records. The average individual in our sample is around 30 years of age, and 53% are male. Most are German citizens, and roughly 60% have a college degree. The majority of respondents have been at their jobs for more than two years. The average daily pay is roughly 136 euros, and half of workers are covered by a collective bargaining agreement (CBA).[13] Because we only invited full-time workers to participate, our population earns more than the average German worker. However, our final sample includes thousands of workers at the lowest-paying firms. Appendix B.1 confirms our results are robust to weighting our sample to match the overall population of full-time workers in Germany.

3.2 Firm-Specific Questions

We designed two survey modules to elicit firm-specific information from workers. The *researcher-provided firm module* posed a series of questions about randomly drawn subsets of 30 large German employers. This approach ensures that the identity of the firms about which a given worker answers questions is not endogenous to the worker. Appendix Tables E1 and E2 confirm that the randomization was successful.

The *worker-provided firm module* first asked workers to provide the names of three firms they would consider applying to. It then posed a series of follow-up questions, analogous to those in the researcher-provided module, about these firms. The worker-provided firm module allows us to focus on firms that—by construction—are most relevant for a given worker. We were initially concerned that workers would provide the names of firms which they would like to work at, but

consent for participating in a follow-up survey. We do not require respondents to have answered every question.

[12]The survey also contained modules on workers' bargaining behavior (Caldwell, Haegele and Heining, 2024). The questionnaires and information on field logistics can be found at https://sydneec.github.io/Website/CHH_Survey_Appendix.pdf.

[13]Pay is top-coded at the Social Security maximum. We impute the upper tail of the wage distribution. To calculate daily pay, we divide the imputed total earnings by spell duration.

which were out of reach. However, workers provided a large number (more than 2,800 unique) of firms which fall throughout the pay distribution (Appendix Figure A2) and which workers from their firm have historically moved to (Appendix Figure E2). Appendix E.1.5 describes these firms.

Most of our analysis relies on the responses in the researcher-provided firm module. To avoid priming, we asked workers to complete the worker-provided firm module first. Both modules unfolded similarly, as outlined below and depicted in Figure 1.[14]

Search. We first asked workers where they would consider applying if they wanted to switch firms. In the researcher-provided firm module, we elicited this information by providing workers with seven potential firms and asking them:

> "Suppose you planned to move to a new company in the next {one/three/six} months. Would you consider applying to any of these firms? Please select all that apply."

In the worker-provided firm module, we asked workers to name three firms they would consider applying to. We randomized the listed time frame. We asked about applications conditional on wanting to move so that our question would be applicable to workers without immediate job search plans. The measure we elicit is similar to the measures of interest used in many empirical studies of directed search but has the added advantage of not requiring firms to have open vacancies or to recruit via online job boards.

Pay. We then asked workers what they believed they would earn at each of three firms:

> "What do you think your gross annual pay would be if you worked at these companies in a position similar to your most recent position?"

In the researcher-provided firm module, the three firms were chosen at random from the set of seven firms included in the search question. In the worker-provided firm module, the three firms were those previously provided by the worker. To reduce the burden of the survey, we only posed this and the following question on preferences to a random 50% of workers in the researcher-provided firm module. We posed these questions to all workers in the worker-provided firm module.[15]

[14] We included the researcher-provided firm module in both the initial and follow-up surveys. However, in the follow-up survey, we did not present the worker-provided firm module to workers who completed this module in the initial survey. To avoid contamination from potential learning effects, we exclude worker-provided firm responses from the follow-up wave.

[15] Given that the median respondent completed the survey—which included several background questions, a module on bargaining, and both worker-provided and researcher-provided firm modules—in just 9 minutes, it is unlikely that respondents had enough time to look up the listed firms. Further, we do not see bunching in the provided salary expectations for each firm; bunching would be consistent with workers looking up this information.

The goal of this question was to elicit information on what workers thought they would make at outside firms, not what it would take to get them to move to these firms. We focused on annual pay because our sample consists of full-time workers. We told workers to assume they had the same position at each firm to ensure within-worker comparability of pay across firms. We process the raw expectations data by winsorizing workers' pay expectations at the 90% level. This processing may, if anything, lead us to slightly understate the variation in workers' expectations (and bias us against our finding that workers have firm-specific information). Appendix Section E.1.6 provides more details on the data processing and describes robustness checks which confirm our results are not driven by this choice.

Preferences. Finally, we asked workers to rank hypothetical job offers from the same three firms under researcher-randomized raises. We told workers:

> "Suppose you can remain at your current company or switch to any of the companies listed below and immediately receive the raise specified below. Please rank the following job offers from 1 to 4 where 1 is the offer you are most likely to take and 4 is the offer you are least likely to take."

We provided three hypothetical job offers with raises that ranged from 5% to 20% in the initial survey, and -5% to 15% in the follow-up survey. We chose 5% increments to simplify comparisons. We asked workers to rank these options relative to each other and to the option of remaining at their current firm at a specified raise. We specified the incumbent firm's pay to avoid the concern that some workers may anticipate the incumbent firm would renegotiate.

We use these discrete choice experiments (DCEs) to estimate switching costs and to estimate the value of firm-specific amenities. We chose to elicit workers' preferences using DCEs—rather than eliciting the pay changes that would lead a worker to leave their current firm or to join specific outside firms—because take-it-or-leave-it experiments are a more reliable way to measure preferences than contingent valuation approaches (Hausman, 2012; Mas, 2025). For instance, recent work by Rodemeier (Forthcoming) found stated willingness to pay estimates that were 1388% larger than experimental estimates from the same population. DCEs are commonly used to estimate the value of workplace amenities (Wiswall and Zafar, 2018; Mas, 2025) because they yield estimates consistent with actual job market behavior (Mas and Pallais, 2017).

3.3 Researcher-Provided Firms

A goal of our study was to shed light on workers' perceptions of outside firms and the linkage between these perceptions and their search and mobility. A key challenge in designing the survey

was selecting the set of researcher-provided firms, which needed to meet five distinct criteria.

First, for respondents' answers to be meaningful, respondents needed to be at least somewhat familiar with the provided firms. Second, for it to be reasonable to ask workers for their expected pay at each of the outside firms (conditional on holding the same position they currently hold), the included firms needed to employ workers in a wide variety of occupations. Further, for workers to find the firms reasonable, they could not be overly associated with a single occupation. Third, because we estimate firm-specific pay effects and valuations, we needed to focus on a relatively small number of firms to guarantee precision. Fourth, to ensure our findings were broadly relevant, we needed to select firms that were important in the German labor market. Lastly, to ensure relevance we also needed to include firms that represented realistic employment options for workers, rather than aspirational "dream" firms that were clearly desirable but out of reach to most respondents.

Based on these criteria, we selected 30 researcher-provided firms from a pool of the top publicly traded and top family-owned firms in Germany.[16] We included 20 firms in the initial wave of the survey and all 30 firms in the follow-up wave. We focused on private sector firms, rather than including public sector employers, since our sampling frame consists of workers in Social Security-covered employment, which excludes much of the public sector in Germany. Selecting from the sets of publicly traded and family-owned firms allows us to analyze a range of well-known firms that employ a large share of the German work force, but which differ in a range of characteristics, including pay. Appendix E.1 provides more details on the selection criteria.

The final set of 30 researcher-provided firms are important employers in Germany and are relevant for our respondents. Together, they employ over 1.8 million German workers and have received more than 39.1 million page views on Germany's leading employer rating platform, Kununu. They capture six major industries in Germany and vary in characteristics such as firm age and location (Table 2; Appendix Table E3). Nearly one quarter of respondents have worked at least at one of the 30 firms in the past ten years and 47% of the researcher-provided firms were among the top 100 firms named by respondents. The fact that the firms have similar median pay and pay premia as the firms respondents currently work at (Panel A of Appendix Figure A2) weighs against the concern that these firms may be out of reach.

[16] An alternative approach would have been to select firms on the basis of firm-to-firm flows or networks, but this was infeasible. Although we could link survey responses to the administrative data by linking firm names we provided to establishment identifiers, we were not permitted to retrieve firm names from the establishment identifiers.

3.4 Linkages to Firm-Level Datasets

We linked workers' firm-specific responses to firm-level information. Most of this information comes from administrative data collected by the IAB. Following IAB linkage procedures, we linked the researcher-provided and the worker-provided firms to the establishment panel (BHP) and to the employment records of workers at these firms (IEB). We constructed employment-weighted averages to create firm-level characteristics from the establishment-level data. Some specifications include controls for the distance between a worker's current workplace and the indicated firm. Our baseline measure is the driving distance between a worker's current workplace and the 7-digit municipality of a firm's headquarters.[17]

We supplement IAB data with Orbis and hand-collected data on firm size, age, and worker ratings. Orbis provides us with firm age and financial characteristics. Most of our hand-collected data come from an employer review platform, Kununu, and from a variety of firm rankings, which we detail in Appendix Section E. We also hand-collected the number of employees in Germany.

4 Workers' Firm-Specific Pay Expectations

We begin our empirical analysis by presenting several novel facts about workers' firm-specific pay expectations, guided by the model in Section 2.

4.1 Workers Believe Firms are Heterogeneous in Pay

In the model presented in Section 2, workers can direct their search only if they expect firms to vary in pay and if they possess firm-specific information on pay. The first bar of Figure 2 shows that about half of workers had firm-specific information about pay when they applied to their current firm. Eighteen percent of workers say they knew the exact pay they would earn when they applied; a further 27% had a rough idea of what that specific firm would offer them. The remaining workers said they had no idea, or only knew pay in their region or industry.

As in the United States, it is rare for job ads in Germany to include pay information (Batra, Michaud and Mongey, 2023; Caldwell, Haegele and Heining, 2024). However, workers may obtain pay information from other sources, such as both public pay aggregators or social networks.[18] Consistent with the idea that workers obtain information through informal networks, nearly 60% of workers who knew a current or former employee when they applied to their firm report that they

[17] In robustness checks (See Appendix Tables A3 and A4), we use an alternative measure of distance based on the distance between a worker's current workplace and the closest establishment of the outside firm.

[18] Pay data from Kununu, a widely used online aggregator, are positively correlated with administrative records.

had firm-specific information on pay. Less than 40% of unconnected workers had such information. Workers covered by collective bargaining agreements, which specify pay ranges for covered employees, are more likely to report that they had firm-specific information.[19]

Workers do not believe firms would offer them the same pay. Rather, most workers believe firms would offer them different pay for the same position. The first column of Table 3 shows the fraction of workers who report that they would earn the same pay at each of the three researcher-provided firms (first two rows) or at the firms they provided (remaining rows). The first two rows indicate that less than a third of workers expect the same pay for the three researcher-provided firms in each of the initial and follow-up surveys. Because we told workers to assume that they hold the same position at each of these firms, the within-worker variation in expected earnings does not reflect the fact that workers believe they will be engaged in different tasks at each employer. Because we focus on within-worker comparisons, the variation in expected earnings is also not driven by unobserved differences in worker ability.[20] The remaining rows of the table confirm that—for the firms workers themselves provided (their perceived outside option firms)—workers also perceive significant heterogeneity in pay.

The within-worker variation in expected pay could reflect a variety of firm-specific factors, including differences in amenities and hours worked. However, it does not simply reflect the fact that workers expect pay to vary across geographic regions or sectors. Rather, workers believe that pay varies across firms within a detailed labor market. Rows 3 to 6 of Table 3 show the fraction of workers who provide the same expected pay for each of the three firms in the worker-provided firm module. For a subset of these workers, we collected additional information on the specific location they had in mind when listing the worker-provided firms. We find similar results when we focus on workers who indicated that the three firms they provided were in the same state, district, or municipality (Rows 4 to 6). Further, Appendix Table A1 shows that firm fixed effects have explanatory power beyond sector fixed effects, state fixed effects, or sector-by-state fixed effects.[21]

[19] Because bargaining groups are not always indicated in job ads, we would not expect all covered workers to have specific information on pay when they apply (Caldwell, Haegele and Heining, 2024).

[20] Standard concerns with survey elicitations—such as anchoring bias—would lead us to understate the true amount of variation in workers' expectations. As we describe in Appendix E.1.6, we winsorize workers' firm-specific expectations to reduce the influence of outliers. If anything, this procedure biases against detecting firm-level variation.

[21] We selected the researcher-provided firms to ensure sufficient overlap to estimate these effects. Many workers provided firms in the same sector and state.

4.2 Workers' Pay Expectations are Firm-Specific

We summarize workers' firm-specific pay expectations using a two-way fixed effect model,

$$\log \tilde{w}_{ij} = \alpha_i + \psi_j + \epsilon_{it}, \tag{8}$$

where $\tilde{w}_{ij}$ is worker i's expected pay at firm j. This specification provides us with estimates of workers' perceived pay premia, $\tilde{\psi}_j$, up to a normalization; we normalize $\tilde{\psi}_1 = 0$. For instance, we interpret $\tilde{\psi}_2$ as the average log difference in pay workers expect to receive at firm 2, relative to (the arbitrarily chosen) firm 1. If $\tilde{\psi}_2 = 0.2$, workers expect firm 2 to pay 20% more than firm 1.

This specification is similar to the two-way fixed effects models often used in the wage-setting literature (Abowd, Kramarz and Margolis, 1999). However, we identify the firm-specific pay premia using within-worker variation in expectations, rather than job-to-job mobility. Our baseline specification includes data from the researcher-provided firm module in both the initial and follow-up surveys. Because we randomly assigned workers to firms, there is no mechanical correlation between workers' characteristics and their firm-specific pay expectations (Appendix E.1.2).

To understand the stability and range of estimates, we split the sample into two random samples and plot the estimates for each sample in Figure A3. This figure shows that the estimates range from -0.2 to 0.05: the lowest-pay firm (in workers' view) in our sample pays about 25% less than the highest-pay firm in our sample. This figure also shows that the estimates do not simply reflect noise: the correlation between the estimates from two random samples is 0.88. Workers simply believe some firms pay more than others.

Appendix Table A2 presents a variance decomposition of workers' pay expectations. Column 1 shows that most of the variation in workers' expectations can be explained by variation in the person effects α_i. However, both informed and uninformed workers see a role for firms in wage-setting. Columns 2 and 3 split the sample according to whether a worker knew pay when they applied to their current firm and Columns 4 and 5 split the sample according to whether the worker recently engaged in job search. Even for workers who are less informed according to these definitions, we see that there is a role for firm effects and we can reject the hypothesis that the firm effects are jointly zero. Further, the between-group gap in the standard deviation of firm effects is small. Column 6 describes the objective predictions for these firms. A comparison of Columns 1 and 6 suggests that, relative to the objective predictions, workers' perceived firm effects are about a third as variable as the firm effects observed in the data.

4.3 Workers' Pay Expectations are Correlated with Objective Predictions

Workers' firm-specific pay expectations are positively correlated with objective predictions. For each worker-firm pair in the researcher-provided firm module, we construct an objective prediction (ω_{ik}) by taking the logarithm of an individual's current total annual pay, subtracting the pay premium of her current place of work, and adding the pay premium of the specified outside firm:

$$\omega_{ik} := \underbrace{\log(w_i)}_{\text{observed earnings}} - \underbrace{\psi_{\mathbf{j}(i)}}_{\text{current firm}} + \underbrace{\psi_k}_{\text{provided firm}} .$$

The firm premia come from Bellmann et al. (2020), who fit two-way fixed effect models to 2010–2017 population data. By exchanging the firm effects, we are able to account for the fact that pay may vary across workers for observed (e.g., education, labor market experience) and unobserved (e.g., bargaining ability, skill) reasons.[22] We asked workers to assume they hold the same position in each of the outside firms so that these unobserved factors would not vary within worker.

Figure A4 shows that there is a strong positive relationship between the objective predictions ($y-$axis) and workers' pay expectations ($x-$axis). A simple regression shows that workers' firm-specific expectations explain about 20% of the variation in the objective predictions. Further, Figure 3 shows that workers' expected pay premia ($\tilde{\psi}_j$) are correlated with firms' objective pay policies: there is a correlation of 0.42 with the objective pay premia and of 0.54 (0.56) with firms' median (mean) pay.[23] Workers' expected pay premia are more positively correlated with observed firm characteristics such as age and size than the objective premia are.

Heterogeneity in Perceived Premia. A natural question is whether the perceived pay premia vary across demographic groups, and whether some groups have beliefs which are more correlated with objective firm pay policies. To answer this question, we re-estimate equation 8 for different subsamples of workers. We report the correlation between the estimates for each sample, as well as p-values from formal tests of equality in Columns 1-2 of Table 4. To assess the stability of the perceived pay ranking of firms, we use a rank-ordered logit model to fit workers' firm-specific pay expectations and report analogous results from this model in Columns 3 and 4 of Table 4.

We find that, even when groups disagree on the pay premia of these firms (when a formal

[22] We use the firm pay premia from Bellmann et al. (2020) rather than estimating firm pay premia ourselves with observed pay data, because we do not have access to full population records.

[23] Because there is substantial noise in our measurement of firms' objective pay premia, not all deviations can be interpreted as reflecting bias in workers' beliefs. Rather, we interpret the positive correlation with objective premia as a sign that workers have information on the pay policies offered by different firms. We refrain from taking a stand on whether workers who deviate from our prediction are overly optimistic (in the case of over-prediction) or overly pessimistic (in the case of under-prediction).

test of equality suggests the estimates are distinct), the estimates are similar in magnitude and highly correlated. For instance, we can reject the hypothesis that men and women have the same perceived pay premia at each of the 30 researcher-provided firms. However, there is a correlation of 0.73 between the pay premia men and women associate with the researcher-provided firms. We find a similar relationship when we analyze the correlation between the estimates of workers with and without a CBA or workers with and without a college degree. Column 4 of Table 4 shows that we cannot reject equality of estimates when we use the rank-based model.[24]

4.4 Discussion

We find that many workers have information on the pay provided by outside firms.

Interpreting Survey Elicitations. A natural concern is that respondents might have looked up pay information during the survey. However, we clearly indicated respondents should provide their best guess and did not incentivize accuracy. As noted in Section 3.2, respondents spent an average of only 9 minutes on the survey, and we observe no bunching in the reported salaries—both facts weigh against such a concern. That we obtained similar results from the follow-up survey suggests workers did not use time between waves to obtain additional information. Because the survey was conducted by a government agency with an explicit mandate to understand the functioning of the labor market, respondents were likely aware of the importance of providing truthful responses.[25]

Relationship With Other Work. The descriptive facts contrast with work in Germany which suggests workers anchor beliefs to their current wages—low-wage workers underestimate and high-wage workers overestimate outside pay (Jäger et al., 2024). In that study, 41% of workers said they would earn "the same" pay if they were forced to leave their firm; 40% said their coworkers who switched firms would earn "the same" pay (rather than "higher" or "lower" pay). Both facts are consistent with the idea workers are uninformed about their outside options and assume their outside option is identical to their inside option. However, our respondents do not uniformly report identical outside wages, as would occur if they lacked firm-specific information about their outside options. Further, we find workers at low-wage firms are more optimistic about their outside

[24] In unreported results we find that men, younger tenured workers, and workers covered by a collective bargaining agreement have perceived premia which are somewhat more correlated with objective measures. We do not find that workers at low-wage firms have perceived premia which are less correlated with objective measures.

[25] In a paper that analyzes the bargaining modules included in the survey, we document that workers' answers are correlated with the policies of their current firm (Caldwell, Haegele and Heining, 2024). After we fielded the survey, the IAB received e-mails from respondents who were interested in receiving a summary of our findings, which suggests they expected others to provide truthful responses.

options than workers at high-wage firms (Appendix Figure C4), despite the fact they receive offers at lower rates, both with and without active job search (Appendix Table C1).

Appendix C reconciles these differences. We highlight that we elicited beliefs about pay, rather than beliefs about expected pay changes following voluntary or involuntary transitions. The latter depend on beliefs about pay, as well as beliefs about offer probabilities and preferences. These differences, combined with differences in questionnaire design, can reconcile differences in findings. Our results align with other recent work suggesting workers are informed about their employment and earnings risk (Guo, 2025; Caplin et al., 2023). Further, as we illustrate in Section 2, whether workers search depends on their systematic optimism or pessimism, on whether they have firm-specific information, and on their preferences. In Section 6 we show that many workers are reluctant to move even when told they could have higher pay elsewhere.

5 Firm Pay and Worker Search

Workers use their firm-specific information to direct their search to firms with higher perceived pay. Our estimates imply an average application-wage elasticity of 1. The fact that workers direct their search to firms with higher perceived pay reflects the fact that workers value pay, and the fact that workers believe higher pay firms have better non-wage amenities.

5.1 Relationship Between Pay and Consideration

The model in Section 2 suggests that a worker's application decisions depend on perceived wages, firm-specific amenity values, and offer probabilities. Our primary design which links workers' beliefs to their search behavior leverages the fact that, in the researcher-provided firm module, we observe both whether a worker would consider applying to the specified firm and what the worker believes they would earn at that firm.

We regress an indicator for whether worker i says they would consider applying to the randomly provided firm j on the worker's expected pay at that firm $(\log \tilde{w}_{ij})$, on an indicator for whether the data come from the follow-up survey $(\zeta_{t(i)})$, and on worker (λ_i) and firm (γ_j) fixed effects. Some specifications include additional worker-firm covariates X_{ij}:

$$\text{Consider}_{ij} = \eta^s \log \tilde{w}_{ij} + X_{ij} + \gamma_j + \lambda_i + \zeta_{t(i)} + \epsilon_{ij}. \tag{9}$$

We cluster the standard errors at the worker level. Given the large number of fixed effects, we estimate this equation by OLS instead of using a nonlinear model.

The coefficient of interest, η^s, identifies the link between workers' pay expectations and consideration using only the deviations between workers' firm-specific expectations and what would be predicted based on invariant worker and firm characteristics. The worker fixed effects account for differences in workers' overall level of pay expectations (including systematic optimism) and for heterogeneity in workers' switching costs (s_i). The firm fixed effects account for the fact that firms vary along multiple dimensions, including amenities (a_j) and offer probabilities (p_j).[26]

Main Estimates. The estimate in Column 1 of Table 5 suggests that a 10% increase in workers' firm-specific pay beliefs leads a worker to be 3% more likely to consider applying. Columns 2 and 3 show that this estimate is stable when we add a control for the logarithm of the driving distance between the provided firm and the worker's current place of work (Column 2), and when we additionally control for whether the provided firm is in the same sector as the worker's current firm (Column 3). The positive semi-elasticity confirms prediction 3: workers with firm-specific information on pay are more likely to apply to firms they believe pay higher wages.

We obtain the application-wage elasticity by dividing η^s by the baseline consideration rate. As reported at the bottom of Table 5 our estimates imply an application-wage elasticity of roughly 1. Of course, these models do not control for firm-worker specific offer probabilities. If workers believe higher pay is associated with lower offer probabilities (as suggested by Appendix Figure A5), their application behavior may be less responsive to pay.[27] Columns 4 to 7 of Table 5 split the sample according to workers' risk tolerance (Columns 4 and 5) or whether the worker says they would be reluctant to apply to a position if the probability of an offer were low (Columns 6 and 7). While we see smaller estimates and elasticities among workers who are less tolerant of risk (Column 4 relative to Column 5) or who are more sensitive to competition (Column 7 relative to Column 6), we cannot reject equality of estimates or elasticities across groups.[28]

Robustness. Appendix Table A3 shows that our results are robust to a variety of alternative specifications and weighting schemes. We obtain similar estimates when we use a alternative specifications or measures of distance (Columns 1 to 3). Columns 4 and 5 show stability across survey waves, mitigating concerns that respondents acquired new pay information after the initial wave. Columns 6 and 7 show robustness to alternative weighting schemes.

[26]The firm fixed effects also account for the possibility that workers may (as a group) have misperceptions about the pay of specific firms.

[27]In many models of directed search, workers anticipate that the probability they will receive a job will be lower at high-pay firms because these firms receive more applicants per vacancy (see Wright et al., 2021, for a review of the literature). Workers trade off the probability an application is successful with the value of a successful application.

[28]In unreported results, we analyzed demographic heterogeneity. While we found somewhat larger estimates for male workers, workers who are unmarried, and workers without children, none of the differences were significant.

5.2 Robustness to Alternative Designs

Because our primary design includes firm fixed effects it does not identify whether high-pay firms receive more overall consideration. We use two alternative designs that allow us to examine whether, within a market, high-pay firms receive more overall consideration. These designs do not hold fixed the non-wage characteristics of firms and use non-overlapping subsets of the data that differ from the data used in our main within-worker, within-firm design.[29]

Alternative Design 1: Consideration without Pay Expectations. The first design shows that there is a positive correlation between whether a worker considers applying to a firm and the pay premia other workers associate with that firm (as well as with the firm's observed pay premium). This design uses data on consideration for the four researcher-provided firms per worker-wave for which we elicited consideration, but not pay expectations.[30] We regress an indicator for whether worker i said they would consider applying to firm j if they wanted to switch firms on a measure of the firm's pay policy (Pay_j), on worker fixed effects, on the (log) driving distance between the worker and firm j, and on the additional covariates and fixed effects listed in Appendix Table 6,

$$\text{Consider}_{ij} = \beta^{RP}\text{Pay}_j + \lambda_i + X_{ij} + \epsilon_{ij}. \tag{10}$$

Our baseline specification in Column 1 of Table 6 mimics the specification in Column 4 of Table 5, but exchanges the firm fixed effects—which would be collinear with Pay_j—with dummies for sector, along with a control for the log number of employees at the firm. The coefficient β identifies whether, within a sector, firms that have higher pay—or firms that workers believe have higher pay—receive more interest. We cluster the standard errors at the worker level.

Column 1 of Table 6 shows that there is a strong positive relationship between both the subjective pay premia (Panel A) and objective pay (Panels B) of these firms, and the probability a worker says they would consider applying to that firm. The estimate in Column 1 suggests that, relative to firms in the same sector and with the same size, workers are 1% more likely to consider applying to a firm with 10% higher pay. We obtain similar estimates after controlling for a firm's brand recognition (Column 2) and for CBA coverage (Column 3).

Alternative Design 2: Free-Text Provision of Firm Names. The second design illustrates that the positive link between consideration and pay also emerges when we consider workers' free-

[29]Together with our main design, the data subsets used in each of the alternative designs span the data collected in the researcher-provided and worker-provided firm modules.

[30]To reduce the survey burden for respondents, we elicited consideration for seven firms, but only asked for their pay expectations for three (randomly chosen) of the seven firms.

text responses. For each worker, we construct a dataset that has one observation for each of the researcher-provided firms we did not provide to them in the initial survey's researcher-provided firm module. For each worker-firm pair, we construct an indicator for whether the worker independently provided the name of that firm.[31] For workers who did not provide any firm names, this indicator is zero for each firm. We regress this indicator on the same measures of firm pay policies and worker-firm covariates as in our first alternative design, again clustering the standard errors at the worker level,

$$\text{List Firm}_{ij} = \beta^{WP}\text{Pay}_j + \lambda_i + X_{ij} + \epsilon_{ij}. \tag{11}$$

Columns 4 to 6 of Table 6 shows there is a strong positive relationship between the objective and subjective pay premia of these firms and the probability a worker lists the firm. The effect sizes are an order of magnitude smaller in this design, reflecting the fact that workers could name any firm they wanted in this module: on average 1.7% of the observations correspond to researcher-provided firms. However, the ratio of the effect size to the mean of the dependent variable is similar across the two designs.

Robustness. The alternative designs confirm that high-wage firms receive more overall consideration and serve as robustness checks for our main design. Because neither design controls for firm fixed effects, the estimates are not directly comparable to those from our primary design. Workers may direct their search to higher wage firms because of the pay offered by those firms or because of non-wage characteristics of those firms.[32] Appendix Table B4 shows these results are robust to reweighting and to using a firm's log mean pay, rather than pay premium.

5.3 Discussion and Implications

Our central estimate of an application-wage elasticity of 1 is similar to estimates of the application-wage elasticity from studies in which posted pay is randomized within a position. This includes estimates from observational and experimental studies of jobseekers applying on online job boards

[31] Workers completed the worker-provided firm module before the researcher-provided firm module. We only use data from the initial survey because we asked all workers to provide the names of firms in this survey. In the follow-up survey, we only asked workers to provide the names of firms if they failed to in the initial survey. Our main dataset includes one observation for each of the 17 firms we did not provide to the worker (of the 20 firms included in the initial survey). We probe the robustness of our findings by adding 10 observations, 1 for each of the 10 researcher-provided firms added in the follow-up survey.

[32] Because they leverage differences in perceived pay across firms, the estimates in Panel A produce elasticities which are most comparable to our main design. Columns 1-3 suggest an implied overall application elasticity with respect to perceived wage premia on the order of 3; Columns 5-6 suggest an elasticity closer to 5. That these exceed the estimates of our preferred design suggests that workers believe high-wage firms also offer better non-wage amenities; Figure A5 confirms this.

(Marinescu and Wolthoff 2020 and Belot, Kircher and Muller 2022 obtain elasticities of 0.8) and from the public sector experiment by Dal Bó, Finan and Rossi (2013).

This similarity is surprising. Our sample consists of full-time employed workers, many of whom are not actively searching. Further, our variation comes from workers' own beliefs about firm pay, not from posted wage differences. Many firms do not provide pay in job ads; when required to do so by law, many choose to provide large ranges (Batra, Michaud and Mongey, 2023). Our estimates contribute to a literature examining the responsiveness of applications to wages (see, e.g., Belot, Kircher and Muller, 2022).[33]

6 Attachment and Mobility

Workers use firm-specific pay beliefs to direct their search to higher-paying firms. Yet many do not search, even when they believe they could earn more. We use discrete choice experiments to show that most workers are unwilling to switch employers for even sizable raises. Our estimates imply separation elasticities of 2-4 and switching costs of 7–18% of annual pay. Firm attachment varies across firms and is not fully explained by amenities.

6.1 Most Workers Would Not Search or Switch Firms for Modest Pay Raises

There are many reasons workers may not search for outside employment—even when outside firms offer higher wages. Equation 3 in Section 2 shows that a worker will be less likely to search if application costs are high, if the probability an application is successful is low, or if they have high switching costs.

In the follow-up survey we asked workers how likely they would be to search for outside employment if they learned pay was 5%, 10%, or 20% higher at other firms (randomized across workers). Panel A of Figure 4 plots the average response for each level of the randomized outside pay. There is a clear positive relationship between the stated outside pay and the probability a worker would begin searching. However, the average probability of search is far from 100%, even when the specified outside pay is significantly higher than what the worker currently makes. Further, there is a plateau: at a certain level of wage change, further wage changes do not lead to

[33]While we provide evidence in support of the core assumptions of directed search models—that workers have firm-specific information on pay to direct their search—we do not take a stand on whether the data are most consistent with all of the standard predictions of random or directed search models. While most directed search models feature wage posting, in previous work we documented that workers reject a substantial share of the offers they receive and that bargaining is common (Caldwell, Haegele and Heining, 2024).

more stated mobility: a sizable fraction of workers are unresponsive to outside pay. The implied market search-wage elasticity is 7.14 (Table 7).[34]

We isolate the role of switching costs using the discrete choice experiments described in Section 3.2. These experiments reveal a similar pattern: even when offered a significant raise pay, many workers say they would prefer to stay at their incumbent firm (with no raise). Panel B of Figure 4 shows a positive relationship between the randomized outside pay and the share of workers saying they would prefer the outside job offer at one of the researcher-provided firms (navy line). However, the share selecting the outside offer is far from 100%, even for relatively large raises (20%). We see a similar pattern when we examine workers' preferences over outside firms they listed in the worker-provided firm module when we asked where they would apply if they wanted to switch firms (maroon circles) and when we focus on workers' preferences over the same firms under the assumption that their commute would not change (red diamonds) or that their future career path would not change (pink triangles).[35]

The monopsony literature often emphasizes separation elasticities, which quantify how responsive workers are to wage changes at their current employer or outside firms. Table 7 presents results from ordinary least squares regressions of stated mobility on the randomized outside pay, and the separation elasticities implied by these models. Columns 3-5—which use data from the module in which workers rank the incumbent relative to potential destination firms—suggest separation elasticities on the order of 2-4. These estimates are strikingly similar to the typical estimate in the monopsony literature (between 3 and 5).[36]

Because we provide pay—and indicate that this is an offer—these elasticities are not shaped by workers' beliefs about outside pay. Because we specify that the worker has an offer, these elasticities are also not shaped by workers' beliefs about the likelihood firms would make the worker an offer. Rather, our estimated separation elasticities reflect a preference on the part of workers to remain at their incumbent firm, even when attractive alternatives offer more pay. When we asked workers why they thought people might be reluctant to switch firms, the most commonly selected reasons were (in order) personal ties, a general reluctance to undergo change, and location (Figure 5). Pay ranked fourth; lack of opportunities was the least cited reason.

In our remaining analysis we use the discrete choice experiments to estimate switching costs.

[34]In unreported results we find a similar elasticity for workers who would not be deterred by low offer probabilities suggesting that low search rates are not driven by the perception it is difficult to obtain outside offers, consistent with the results in Section 5.1.

[35]In the initial survey, we asked a random 50% of workers to re-rank the hypothetical offers from worker-provided firms under two scenarios: (1) if their location and route to worker would not change and (2) if their career growth (future raises and promotions) would be identical across options.

[36]In unreported subgroup analysis we find somewhat larger separation elasticities for men (relative to women), for workers at high-wage (relative to low-wage) firms, and for workers without a college degree.

We also examine whether workers are reluctant to move to higher wage employment because they perceive that higher wage firms are worse on non-wage dimensions. To accommodate the possibility that social ties—which are likely developed or deepened on the job—affect workers' willingness to leave their firm, we finally examine whether firm-specific attachment can be predicted based on ex ante wage and non-wage factors specific to a firm.

6.2 Perceived Switching Costs are Sizable

The model in Section 2 indicates that whether worker i prefers an offer from firm k to the option of remaining at the incumbent firm j depends on (1) the gap in log wages, (2) the gap in firm-provided amenities, and (3) the switching cost. Under the standard assumption that workers' idiosyncratic preferences are identically and independently distributed and follow a type 1 extreme value distribution we can estimate the parameters of workers' utility functions using a rank-ordered ("exploded") logit (Luce and Suppes, 1965).

Our discrete choice experiments generate exogenous variation in the offered log wage at the outside firm, which is, by construction, uncorrelated with worker and firm characteristics. Our initial specification therefore includes two parameters: (1) the randomized raise associated with firm k and (2) an indicator for whether firm k is the incumbent.[37] Because we have workers rank multiple outside firms (including their incumbent firm), our rank-ordered logit specification naturally accounts for firm-invariant worker-specific heterogeneity.

Table 8 shows that switching costs are large. The table reports the marginal effects, as well as estimates of switching costs expressed in monetary terms (s/β). The average implied cost to get a worker to move to one of the researcher-provided firms is 18% of their annual pay. By contrast, it costs 7% of their annual pay to get workers to switch to one of the firms they listed in the worker-provided module. The lower estimates for worker-provided firms likely reflect both the fact that these firms are more appealing to workers for non-wage factors (amenities) and that these firms are typically physically closer to the worker's current workplace.

Switching costs are not simply moving costs. We augment the model in Column 1 with the log distance between the worker and firm to allow the switching cost to have both a fixed component and a cost which is proportional to distance: $s = \phi + \mu \log d_{ij}$. Column 2 shows that this shrinks the switching costs to 11%. We can also remove moving costs by using the follow-up discrete choice experiments we posed to 50% of workers in the initial survey's worker-provided firm module. We asked these workers to re-rank the opportunities under the assumption that the location of and their

[37] We do not multiply the randomized raise by the worker's current wage as this does not change the comparison of utilities within a worker: $\beta \log w_{ij} - \beta \log w_{ik} = \beta \log(w_{ij}/w_{ik}) = \beta \log(1 + r_{ij}) - \beta \log(1 + r_{ik})$.

route to work would stay constant. Column 4 of Table 8 shows that we obtain results similar to those presented in Column 3 when we focus on these data (switching costs of 6%). This similarity between the overall estimates for worker-provided firms and the estimates in Column 4 arises because workers often provide firms which are close to their current location.

Robustness. Appendix Table A4 confirms we obtain similar estimates of switching costs under alternative weighting schemes (Columns 7-8). We also obtain similar results under alternative specifications of distance (Columns 2-4) and alternative samples (Columns 5-6). Appendix Section B.3 shows that the workers who did not provide firm names are somewhat less responsive to outside pay, weighing against concerns that these workers would be most responsive to information; if anything, we may understate switching costs. In unreported results we find that switching costs are somewhat larger larger for long-tenure workers, and for workers covered by a collective bargaining agreement. Consistent with the findings of Topel and Ward (1992), switching costs are lower for workers at the beginning of their career (with less than four years of experience) than for older workers.

6.3 Some Firms are More Attractive Than Others, Regardless of Pay

Even if workers believe outside firms offer higher pay, they may be reluctant to search for or move to this outside employment if they believe that higher wage firms are worse on non-wage dimensions. We can allow amenities to influence workers' preferences by augmenting our rank-ordered logit model to include a full set of firm dummies. Because we asked workers for their preferences over a defined set of outside firms, we start by using only data on workers' preferences over these firms, excluding their rank of the incumbent firm. For consistency with our analysis in the next section—which investigates whether firm-specific amenity values can explain why workers do not want to leave their current employers—our main analysis sample consists of data from the researcher-provided firm module for workers who work at one of the 30 researcher-provided firms. This is the set of firms for which we can plausibly estimate both insider and outsider valuations.

Estimating this model using only workers' choices across outside firms confirms that workers expect firms to vary in the overall value of amenities they provide ($a_j \neq 0$), and that they expect high-pay firms to offer better overall bundles of amenities ($\text{cov}(a_j, \tilde{\psi}_j) > 0$). Columns 1 and 2 of Table 9 show that the p-value from a test that all of the firm dummies are zero is well below 0.01. Figure 6 graphs the estimates of a_j/β (estimated using data on all workers) against the estimates of ψ_j from Section 3. We present estimates of a_j/β rather than a_j so that the estimates can be interpreted as monetary equivalents.

Figure 6 shows that the perceived variation in firm-specific amenity values is significant and that workers expect higher-pay firms to offer better bundles of amenities. The point estimates suggest a range of 0.25 percentage points, which is larger than the range in our estimates of firm pay premia. The lowest-amenity firms offer values which are 25-30% lower than that of the base firm, while the highest-amenity firms offer values that are 1-2% higher. This finding suggests that amenities are just as important—if not more important—than pay in explaining workers' choices across firms. A 10% increase in the perceived firm pay premia is associated with an 11% increase in the amenity value. Of course, these valuations capture all non-wage characteristics which vary across firms; they do not imply that high-wage firms are better on every dimension. They also do not allow us to identify the valuation of specific amenities, such as the value of childcare facilities or remote work.[38] Instead they are comparable to estimates of the overall value of a firm provided in the macro-labor literature (Hall and Mueller, 2018; Sorkin, 2018; Volpe, 2024). Appendix B.5 shows that we obtain similar results when we fit a random coefficient rank-ordered model, which allows workers to have heterogeneous valuations of wages and distance.

While our estimates of non-wage amenities are specific to the set of 30 large German firms included in our researcher provided firm module, workers generally believe that higher wage firms are not worse on non-wage dimensions. In the follow-up survey asked workers whether they thought a firm paying 30% above market offered amenities that were better, the same, or worse than those offered by a firm paying 10% above market. The top two bars of Appendix Figure A5 show that the majority of workers (71%) believe that the higher-paying firm offers at least as good amenities; a large share (29%) believe that it offers strictly better amenities.[39]

6.4 Insiders and Outsiders Differ in their Valuations of a Firm

We conclude our analysis by examining whether firms differ in how attached their workers are. Intuitively, gaps in valuations between firm insiders and outsiders could take two forms. First, insiders may value firms differently than outsiders due to simple switching or search costs. If this were the case, we would expect a level shift in firm valuations among firm insiders, captured by

[38] A large literature has discussed how wage regressions cannot isolate amenity values; a similar logic implies that regressions of amenity valuations on firm characteristics does not yield the price of each amenity (Wiswall and Zafar, 2018). To obtain these prices a researcher would need to cross-randomize wages with each possible amenity. In the follow-up survey, we asked workers to re-rank researcher-provided firms under the assumption they would have the same training and learning opportunities. While we have less precise estimates for this subsample, we continue to reject the null that all of the firm effects are zero when we use this question (Appendix Section B.4).

[39] Our results indicate that at most 29% of workers believe there is a negative relationship between pay and non-wage amenities. Because workers who believe that the higher-pay firm offers lower amenities may not believe that these fully offset the value of pay, this estimate is an upper bound on the percentage of workers who believe that utility is not equalized across firms.

ϕ. Alternatively, the gap between the valuations of firm insiders and outsiders may vary across firms, reflecting differences in firm-specific attachment. One way this could emerge is if some firms are more successful than others in generating the personal connections workers highlight as a key reason not to switch firms (Figure 5).

We can differentiate between these two possibilities by fitting two models, one which includes only an indicator, ι_j, for whether worker i is an incumbent at firm j, and one which additionally includes interactions between this indicator and firm dummies. The model with interactions corresponds to the model in which there is heterogeneity in firm-specific valuations; the model without interactions corresponds to the model with simple switching costs. Formally, we augment our rank-ordered logit model with a full set of firm dummies which are interacted with whether worker i currently works at the firm. This specification allows for the gap in valuations between insiders and outsiders to vary arbitrarily across firms. We then test whether these interactions (which are identified up to a constant) are heterogeneous.

Column 3 of Table 9 shows that we can reject the hypothesis that $\iota_j = 0 \; \forall j$, suggesting that simple switching costs cannot explain our results: the gap in valuations varies across firms. There are two leading explanations for this. First, insider and outsiders may differ in valuations because of sorting. Standard models of the labor market assume that because firms vary in the amenities they provide and workers sort into firms based on their preferences.

We do find evidence of sorting. When we re-estimate the model using data only on firm outsiders for consistency with the analysis in Section 6.3—and allow valuations to vary between workers who would and would not consider applying to each firm (as elicited in a previous question), we find that there are significant differences in valuations (Column 2 of Table 9). Appendix Figure A6 shows that outsiders who would apply to a firm have higher valuations than outsiders who are uninterested in applying to the same firm.

However, insiders and outsiders who want to move to that firm also differ in their valuations. To allow for switching costs and sorting, and for the possibility that workers' valuations change after joining a firm, we estimate a model that allows valuations to differ between three groups of workers: (1) outsiders who would not consider applying to the firm, (2) outsiders who would consider applying to the firm, and (3) insiders. Columns 4 and 5 of Table 9 show that firm-specific valuations differ not just between firm insiders and the average outsider, but between firm insiders and outsiders who say they would consider applying to the firm if they wanted to switch firms.

Because we control for a dummy for whether a worker is an incumbent, the difference in valuations between insiders and workers who would consider applying to that firm cannot be explained by a level shift (switching costs). Rather, the between-group gap in valuations is heterogeneous

across firms. One explanation for this is that firms are experience goods and that workers' valuations change dynamically after they have joined, potentially due to the development of firm-specific skills or relationships. This is consistent with the fact that personal connections are one of the most cited reasons workers highlight they believe people are reluctant to switch firms (Figure 5).

6.5 Information Frictions versus Preferences

Our results suggest that preferences better explain limited mobility than information frictions. We identify switching costs and separation elasticities from stated preferences over offers with fully specified pay. While biased beliefs could in principle affect whether a worker searches or considers an offer, they cannot explain why a worker rejects a higher-pay job at a firm they themselves named as a desirable destination, once pay is fixed. We also find similar estimates in robustness checks where we hold commute length constant or remove variation in career progression, suggesting that attachment reflects stable preferences rather than mistaken expectations about specific job attributes.

Of course, a direct implication of the fact that workers face substantial switching costs is that information provision—even when it substantially shifts workers' beliefs about outside pay—is not likely to lead to large shifts in search or mobility. Appendix B.6 uses our estimates to benchmark the potential impacts of information treatments among low-pay workers and shows that the predicted effects of providing information are small. Because our data come from Germany—where workers' health insurance membership does not change when they switch employers—switching costs likely do not reflect job lock driven by health care or health insurance considerations. In other settings, these considerations could have a significant impact on switching costs (Madrian, 1994; Garthwaite, Gross and Notowidigdo, 2014). Switching costs give firms market power over incumbent workers, as they do over consumers in the product market.

7 Conclusion

Why do many workers stay with their employer despite higher pay elsewhere? Using novel survey data from nearly 10,000 full-time German workers linked to administrative records, we examine the roles of beliefs and preferences in shaping mobility. We show that workers expect firms to vary in pay and that perceived pay premia are correlated with observed wage premia. Workers direct their search to firms they believe more (with an average application-wage elasticity of 1), and expect higher-wage firms to offer better non-wage values. For a set of large German employers, there is substantial agreement in the perceived pay rankings for different demographic groups.

Among these firms, a firm with a 10% perceived wage premium has, on average, 11% higher non-wage amenities (in money-metric terms).

Yet even when offered a raise at a firm they identified as desirable, most workers prefer to stay. Implied separation elasticities are between 2 and 4 and implied switching costs are 7–18% of annual pay. When asked why other workers might be reluctant to switch firms, respondents cite factors such as a general reluctance to undergo change, amenities, and social ties. Pay ranked fourth and lack of opportunities was not a major factor. Attachment varies across firms and is not fully explained by amenities or uniform switching costs, suggesting wage changes may differentially affect separation and recruitment.

Our analysis contributes to the literature on competition in the labor market by examining the sources of firm monopsony power. Our results suggest that worker preferences, rather than information frictions, are the primary constraint on mobility. However, our sample is limited to full-time private sector workers and does not capture beliefs about public sector jobs or the behavior of labor market entrants. Beyond extending the analysis to these samples, one potential direction for future work is to examine why attachment differs across firms. Our results suggest personal ties may play a role.

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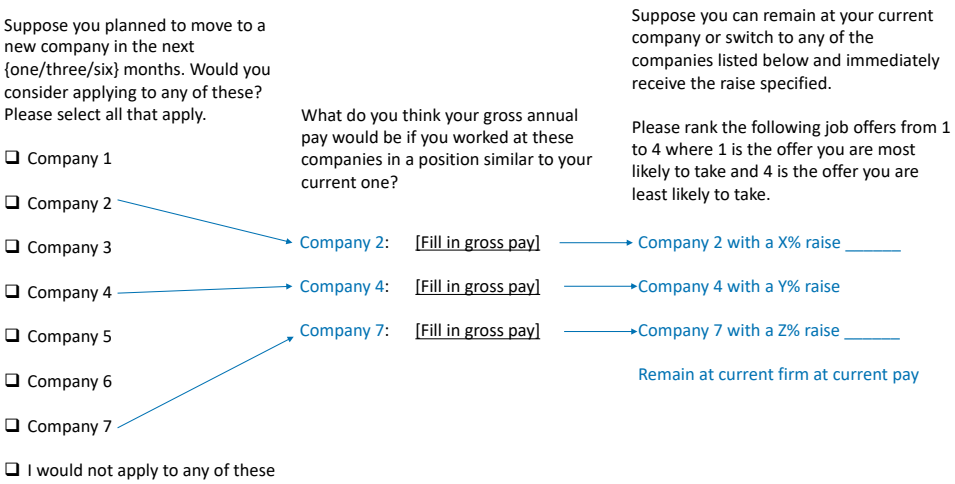
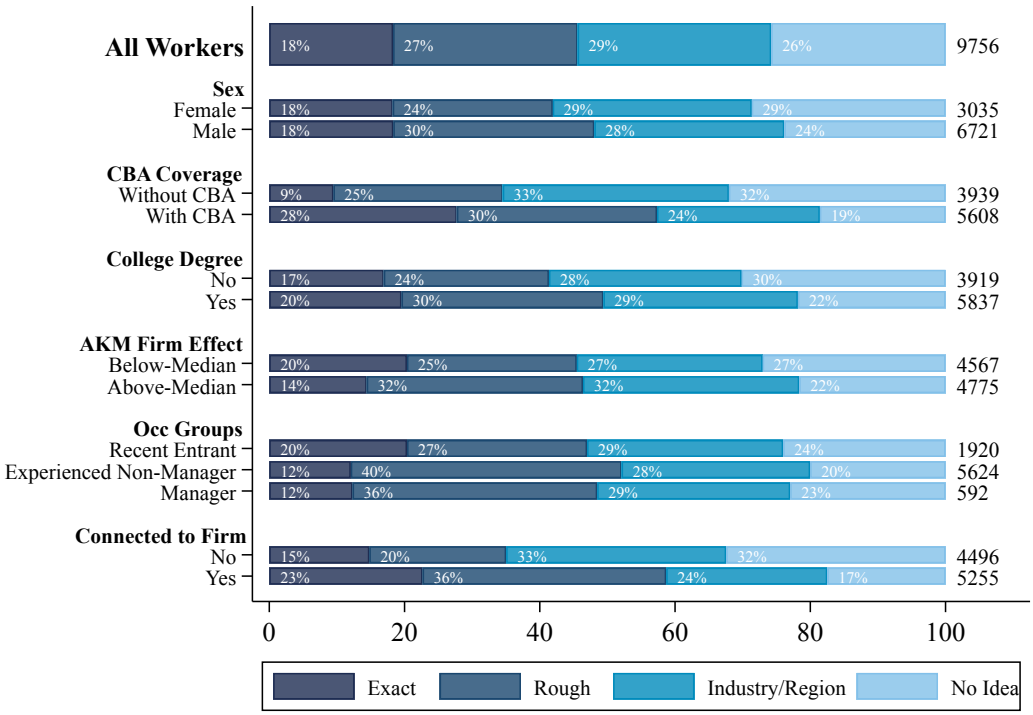
8 Figures and Tables

Figure 1: Researcher-Provided Firm Module



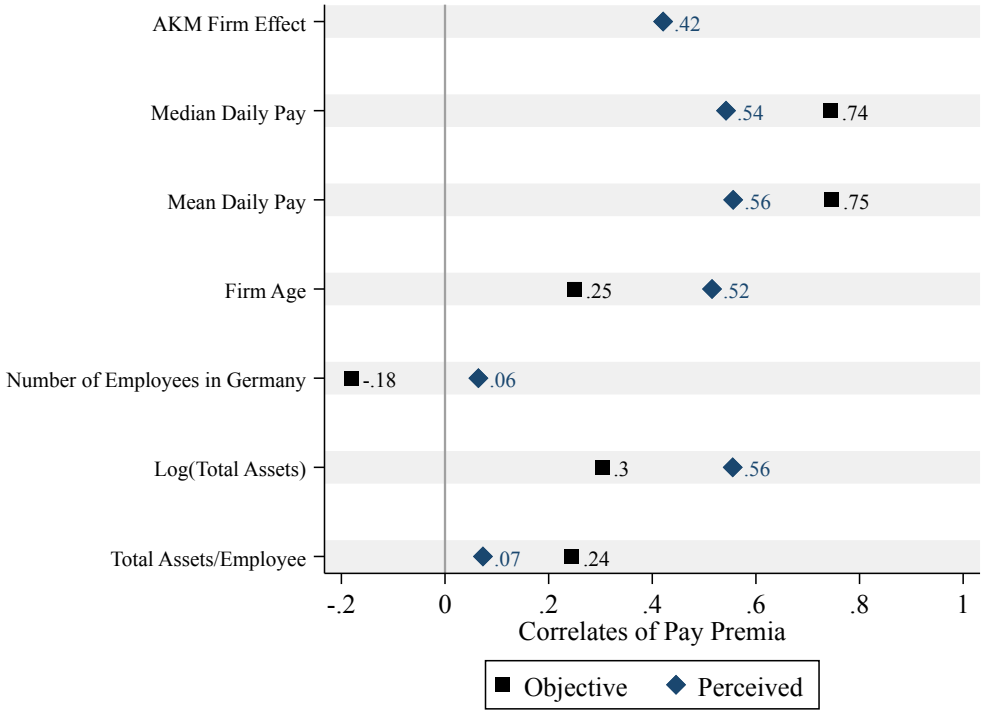
Note: This figure shows how survey respondents transitioned through the researcher-provided firm module. See Appendix Section E.1 for additional information on this module.

Figure 2: Stated Knowledge at Time Worker Applied to Current Firm



Note: Respondents could choose one of four responses: exact knowledge of how much the position pays, a rough idea of how much the position pays, a rough idea of pay in the industry/region, and no or very little idea. Results are weighted using sampling weights. Appendix Table B2 presents additional specifications. The number of observations is listed at the end of each row.

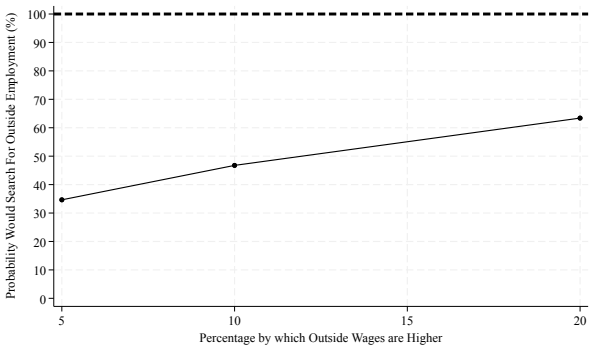
Figure 3: Correlates of Workers' Expected Pay Premia



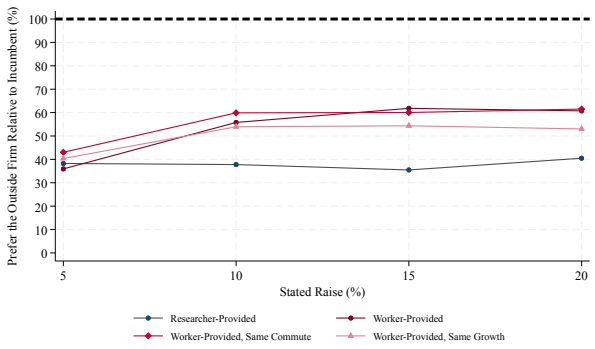
Note: This figure presents correlations between our baseline estimates of ψ_j (navy), objective measures of pay premia from Bellmann et al. (2020) (black), and different firm-specific characteristics as indicated on the y-axis. More information on the data is in Appendix E.

Figure 4: Stated Search and Mobility and Outside Pay

A. Search and Outside Pay

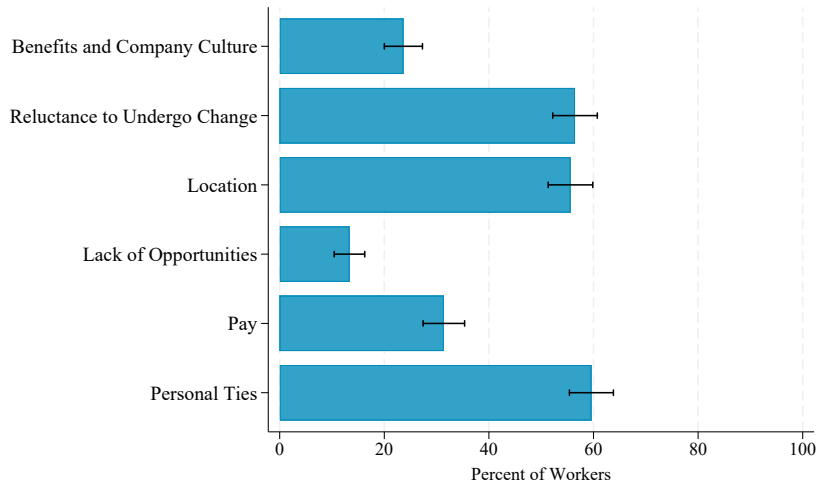


B. Mobility and Pay at Outside Firms



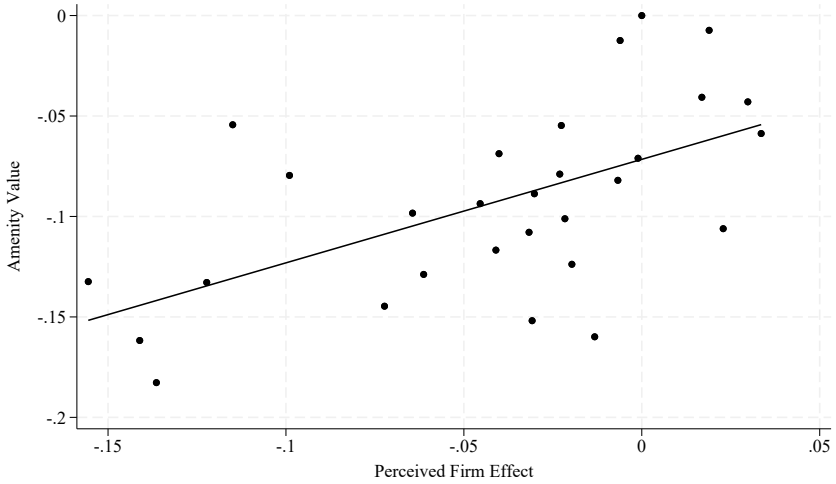
Note: This figure examines workers' propensity to search or move as a function of outside pay. Panel A shows the average probability a worker says that they would start searching for outside employment if they discovered that pay was 5%, 10%, or 20% higher in their market. Panel B shows the share of workers selecting the outside firm over the inside firm in the researcher-provided module (blue) or worker-provided module (shades of red) as a function of the randomized outside pay. Results are weighted using sampling weights.

Figure 5: Why Respondents Believe Workers are Reluctant to Switch Firms



Note: This figure shows the reasons that workers report for why people may be reluctant to switch firms. We asked respondents to select the top two reasons. This figure presents the share of respondents who selected each option. Whiskers present 95% confidence intervals. Results are weighted using sampling weights.

Figure 6: Relationship Between Perceived Firm Pay Premia and Amenity Valuations



Note: This figure compares estimates of the perceived value of firm-specific amenities and the perceived pay premia for each of the researcher-provided firms. The perceived pay premia (ψ_j) come from estimating equation 8 and controlling for whether a firm was provided in the follow-up survey. The amenity valuations come from estimating a rank-ordered logit model using workers' preferences across the researcher-provided firms. We plot estimates of a_j/β rather than a_j so that the results are directly comparable. Both models are fit using sampling weights. The line is a simple line of best fit. After accounting for the reliability in our estimates of the perceived firm effects, the slope of a regression between amenity values and perceived pay premia is 0.585 with a standard error of 0.147.

Table 1: Characteristics of Surveyed Workers

	Initial Wave		Initial and Follow-Up	
	Mean	Std. Dev.	Mean	Std. Dev.
	(1)	(2)	(3)	(4)
Demographics				
Female	0.40	(0.49)	0.37	(0.48)
Age	31.13	(5.18)	31.31	(5.19)
German Citizen	0.89	(0.32)	0.92	(0.28)
College Degree	0.53	(0.50)	0.61	(0.49)
Apprenticeship	0.37	(0.48)	0.31	(0.46)
Employment				
Daily Pay (Imputed)	143.42	(50.40)	150.77	(50.24)
Censored Pay	0.06	(0.24)	0.07	(0.25)
Hours (Survey)	149.13	(49.78)	155.96	(47.97)
CBA Covered (Survey)	0.01	(0.10)	0.01	(0.10)
Manufacturing Sector	40.36	(6.47)	40.43	(5.90)
Retail Sector	0.48	(0.50)	0.45	(0.50)
Professional Sector	0.22	(0.41)	0.23	(0.42)
Observations	9756		3575	

Note: Columns 1 and 2 include workers who completed the initial survey; Columns 3 and 4 include the subset who also completed the follow-up survey. Statistics are weighted using sampling weights.

Table 2: Characteristics of Researcher-Provided and Worker-Provided Firms

				Worker-Provided Firms				
	Researcher-Provided Firms			Unweighted			Weighted	
	Mean	Std. Dev	N	Mean	Std. Dev	N	Mean	Std. Dev
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Number of Employees								
1-10	0.00	(0.00)	30	0.04	(0.19)	479	0.05	(0.23)
11-50	0.03	(0.18)	30	0.07	(0.25)	479	0.10	(0.30)
51-200	0.00	(0.00)	30	0.10	(0.29)	479	0.04	(0.19)
201-1000	0.00	(0.00)	30	0.22	(0.41)	479	0.12	(0.32)
1001-10000	0.03	(0.18)	30	0.34	(0.47)	479	0.18	(0.39)
10001+	0.93	(0.25)	30	0.24	(0.43)	479	0.51	(0.50)
Sector								
Manufacturing	0.57	(0.50)	30	0.31	(0.46)	565	0.38	(0.49)
Retail	0.07	(0.25)	30	0.12	(0.32)	565	0.10	(0.30)
Professional Services	0.10	(0.31)	30	0.13	(0.33)	565	0.15	(0.36)
Information Services	0.10	(0.31)	30	0.07	(0.26)	565	0.08	(0.27)
Finance	0.10	(0.31)	30	0.07	(0.25)	565	0.05	(0.21)
Other Firm Characteristics								
HQ in Eastern Germany	0.07	(0.25)	30	0.07	(0.25)	565	0.07	(0.26)
Year of Incorporation	1936	(49)	30	2008	(835)	476	1960	(337)

Note: Columns 1 to 3 (4 to 8) describe the researcher-provided (worker-provided) firms. Columns 7 and 8 weight by the number of times each firm was provided in the initial survey wave. The number of employees, sector, headquarters location, and year of incorporation come from Orbis. We include all worker-provided firms mentioned at least twice, for which we hand-collected characteristics (Appendix E.1).

Table 3: Variation in Expected Pay at Other Firms

	Fraction Identical	Std. Deviation	Max/Min	N
	(1)	(2)	(3)	(4)
A. Researcher-Provided Firms				
Initial Survey	0.26	5673	1.18	3715
Follow-Up Survey	0.30	5294	1.15	3163
B. Worker-Provided Firms				
All Workers	0.25	5863	1.19	4433
All in Same State	0.22	4869	1.18	509
All in Same District	0.26	4701	1.19	173
All in Same Municipality	0.22	5084	1.21	159

Note: Column 1 provides the share of workers that provided the same pay at each of the provided firms. Columns 2 and 3 provide the average standard deviation and range. Column 4 provides the number of workers. Panel A presents data from the researcher-provided firm module. As described in Appendix E.1.2, we asked a random 50% of surveyed workers to provide pay information in the initial wave; in the follow-up survey we asked all workers to provide pay information. Panel B presents analogous results for workers who provided the names of specific outside firms they would consider in the initial survey wave. We use workers' provided location information for sub-group analysis in Panel B; we asked a random 25% of workers to provide this information. Results are weighted using sampling weights.

Table 4: Between-Sample Agreement in Estimates of ψ_j

	Baseline Model		Rank-Ordered Logit	
	Correlation	Test of Equality (p-value)	Correlation	Test of Equality (p-value)
	(1)	(2)	(3)	(4)
Split-Sample	0.83	0.74	0.91	0.73
Sex	0.74	0.11	0.82	0.94
CBA	0.80	0.13	0.88	0.73
College Education	0.57	0.01	0.87	0.44
Current Firm AKM Effect (Split at Median)	0.72	0.03	0.87	0.43
Searched in Past 6 Mo.	0.70	0.05	0.87	0.73
Knew Wages at Application	0.73	0.23	0.90	0.67
Easy to Get a Better Job	0.76	0.47	0.92	0.98
Tenure (Split at 2 Years)	0.80	0.36	0.92	0.50

Note: This table examines the agreement in the estimates of ψ_j for different subsamples of workers. The first row uses a random, non-overlapping split of workers; the remaining splits are based on the listed characteristic. Columns 1 and 2 are based on estimating equation 8 and controlling for whether a firm was provided in the follow-up survey. Columns 3 and 4 are based on estimates from fitting a rank-ordered logit model to workers' firm-specific pay expectations. All regressions use sampling weights.

Table 5: Relationship Between Pay Expectations and Consideration

	All Workers			Risk Tolerance		Would be Reluctant to Apply if P(Success) Were Low	
				Low	High	No	Yes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Own Pay Expectation	0.341***	0.313***	0.309***	0.256***	0.441***	0.297***	0.240***
	(0.050)	(0.050)	(0.050)	(0.056)	(0.103)	(0.084)	(0.087)
Distance Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Same-Sector Control	No	No	Yes	Yes	Yes	Yes	Yes
Observations	21272	21272	21272	14967	6305	5392	6507
Number of Workers	6440	6440	6440	4519	1921	1476	1781
Test of equality (p-value)	---	---	---	.116		.64	
Mean of Outcome	0.311	0.311	0.311	0.310	0.313	0.274	0.305
Implied Elasticity	1.097***	1.007***	0.993***	0.827***	1.406***	1.082***	0.788***
	(0.161)	(0.161)	(0.161)	(0.182)	(0.330)	(0.307)	(0.286)

Note: This table presents estimates of equation 9. Each regression controls for worker and firm fixed effects, survey wave, and the listed controls. Appendix Table A3 presents alternative specifications. Regressions use sampling weights. Standard errors are clustered by worker. Elasticities are evaluated at the mean of consideration, are given at the bottom of the table. Levels of significance: * 10%, ** 5%, and *** 1%.

Table 6: Alternative Designs Linking Pay Expectations and Consideration

	Stated Consideration			Free-Text Responses		
	(1)	(2)	(3)	(4)	(5)	(6)
Mean of Dependent Variable	0.254			0.017		
	A. Perceived Firm Effect (Split-Sample)					
Firm Premium (Split-Sample)	0.953***	1.055***	1.059***	0.089***	0.091***	0.093***
	(0.110)	(0.127)	(0.127)	(0.011)	(0.013)	(0.013)
Observations	89742	89742	89742	224388	224388	224388
Number of Workers	9756	9756	9756	9756	9756	9756
	B. Observed Firm Effect					
Firm Premium (Observed)	0.174***	0.165***	0.173***	0.014***	0.014***	0.014***
	(0.033)	(0.033)	(0.035)	(0.005)	(0.005)	(0.005)
Observations	89258	89258	89258	214632	214632	214632
Number of Workers	9756	9756	9756	9756	9756	9756
Firm Characteristics	Size	Size, Brand Recognition	Size, Brand Recognition, CBA	Size	Size, Brand Recognition	Size, Brand Recognition, CBA
Fixed Effects	Worker, Sector	Worker, Sector	Worker, Sector	Worker, Sector	Worker, Sector	Worker, Sector

Note: Each regression controls for logarithm of driving distance, survey wave, whether the firm is in the same sector as the worker, the listed firm characteristics, and indicators for whether the listed controls are missing. Regressions use sampling weights; other specifications are in Appendix Table B4. Standard errors are clustered by worker. Levels of significance: * 10%, ** 5%, and *** 1%.

Table 7: Firm-Specific Labor Supply Elasticities

		Move to a Researcher-Provided Firm	Move to a Worker-Provided Firm		
	Search		Baseline	Same Commute	Same Growth
	(1)	(2)	(3)	(4)	(5)
Outside Pay	1.880***	0.391***	1.566***	1.288***	0.945**
	(0.146)	(0.133)	(0.236)	(0.364)	(0.368)
Constant	0.263***	0.321***	0.359***	0.425***	0.408***
	(0.020)	(0.018)	(0.033)	(0.042)	(0.043)
Implied Elasticity	7.139***	1.219**	4.364***	3.031***	2.320**
	(1.058)	(0.477)	(1.037)	(1.139)	(1.130)
Observations	3557	21872	12217	6264	6272

Note: This table presents OLS estimates of the relationship between stated mobility and (randomized) outside pay. Column 1 uses data from the search question. Column 2 uses the baseline discrete choice experiment in the researcher-provided firm module, Columns 3 to 5 use the experiments in the worker-provided firm module. We present the slope, intercept, and implied elasticity (slope/intercept). Standard errors are clustered at the worker level. Regressions use sampling weights. Levels of significance: * 10%, ** 5%, and *** 1%.

Table 8: Switching Costs

	Move to a Researcher-Provided Firm		Move to a Worker-Provided Firm		
	Baseline	Distance Controls	Baseline	Same Commute	Same Growth
	(1)	(2)	(3)	(4)	(5)
Log Raise	6.172***	6.251***	8.112***	12.323***	10.207***
	(0.492)	(0.495)	(0.824)	(1.283)	(1.207)
Incumbent	1.132***	0.703***	0.596***	0.771***	0.774***
	(0.074)	(0.129)	(0.106)	(0.134)	(0.135)
Observations	29961	29961	17539	8821	8782
Number of Workers	7735	7735	4796	2400	2385
Implied Switching Cost	0.183***	0.112***	0.074***	0.063***	0.076***
	(0.009)	(0.019)	(0.008)	(0.007)	(0.008)

Note: This table presents estimates of equation 1. Columns 1 and 2 use data from the researcher-provided firm module. The model in Column 1 includes only the randomized raise, an indicator for whether the firm is the worker's current place of work, and a control for the survey wave. Column 2 adds a control for the log driving distance between the firm and the worker's current place of work. Columns 3 to 5 use data from the worker-provided firm module. Regressions use sampling weights. Appendix Table A4 presents additional specifications. Levels of significance: * 10%, ** 5%, and *** 1%.

Table 9: Firm-Specific Preferences

	Outside Firms Only		All Firms		Consider or Incumbent Only
	(1)	(2)	(3)	(4)	(5)
Log Raise (β)	9.723***	15.561***	7.008***	9.594***	16.260***
	(3.131)	(3.235)	(2.461)	(2.247)	(4.157)
Observations	4217	4217	5671	5671	3001
Number of Workers (Clusters)	1177	1177	1200	1200	1192
Test: Ex Ante Firm Effects are Zero					
p-value	<.001	<.001	<.001	<.001	<.001
Chi-Squared Statistic	207.258	187.988	188.388	131.007	70.891
Degrees of Freedom	29	29	29	29	29
Test: Ex Ante Effects For Those Who Would and Would Not Apply Are Equal					
p-value		<.001		<.001	
Chi-Squared Statistic		164.417		209.519	
Degrees of Freedom		30		30	
Test: Ex Post Effects = Ex Ante Effects					
p-value			<.001	<.001	<.001
Chi-Squared Statistic			7244.552	5500.808	6557.928
Degrees of Freedom			17	17	16
Test: Ex Post Effects = Ex Ante Effects For Those Who Would Apply					
p-value				<.001	
Chi-Squared Statistic				51603.366	
Degrees of Freedom				80	

Note: This table presents logit coefficients (first row) and p-values (remaining rows) from fitting a rank-ordered logit model to workers' stated preferences over researcher-provided firms. Each regression controls for the randomized raise, and includes the firm fixed effects indicated in the relevant column. The baseline sample includes workers who currently work at any of the 30 researcher-provided firms. The data include workers' choices over outside firms (Columns 1 and 2) or over all firms (Columns 3 and 4). Column 5 restricts the sample to worker-firm observations in which the worker currently works at the firm or in which the worker has said he/she would consider applying to the firm if he/she wanted to switch firms. Regression use sampling weights. Standard errors are clustered at the worker level.