Pushing the Envelope

The Effects of Salary Negotiations

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Abstract

Salary negotiations are a widespread phenomenon that can shape important labor market outcomes such as worker welfare, inequality, and the gender pay gap. Using survey and experimental data from job seekers in the U.S. tech sector, we investigate the role of information frictions in salary negotiations. We find that many workers refrain from negotiating due to uncertainty about whether employers are open to bargaining. A light-touch information treatment significantly increases negotiation attempts and compensation gains, particularly among those who underestimate how common negotiations are. A second treatment arm shows that negotiation expertise is less important for understanding why some individuals do not attempt to negotiate. We develop a theoretical model incorporating risk and information frictions, which rationalizes our empirical findings and provides insights into welfare and policy implications. Our results suggest that policies promoting negotiation could enhance labor market efficiency and pay equity.

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1 Introduction

Salary negotiations are a widespread phenomenon in labor markets. They can significantly impact employees seeking fair compensation and help employers attract and retain talent in a competitive market. On a broader scale, salary negotiations influence important labor market outcomes, such as income inequality and the gender pay gap. Despite their recognized importance, limited research examines how salary negotiations actually unfold in practice. Although workhorse models of negotiation under full information (e.g., Mortensen and Pissarides, 1994; Postel-Vinay and Robin, 2002; Cahuc et al., 2006) have notable merits, they typically cannot rationalize some basic facts about negotiations. In this paper, we aim to bridge that gap by providing novel empirical and theoretical insights. Using survey and experimental data from active job seekers in the U.S. tech sector, we discover new facts about negotiations. Moreover, we develop a theoretical model that can fit those new facts and also provide counterfactual and policy analysis.

A key motivation for this paper is that, while some people negotiate job offers, others do not. Some workers negotiate certain offers but not others. Those who negotiate often succeed in improving their compensation. This raises a central question: why don't all workers attempt to negotiate every time?

A factor missing from existing labor bargaining models may help explain a reluctance to negotiation: fear—real or perceived—that negotiating carries risks. Survey data show that many workers worry that asking for more could backfire, leading to a rescinded offer or a strained employer relationship. Even if workers hear success stories, they may still have uncertainty about which offers are take-it-or-leave-it, and which are negotiable. Such uncertainty is noteworthy because it can impose welfare costs. In a world with full information, workers who choose not to negotiate might be right not to – for instance, recognizing that without leverage, they have nothing to gain. With information frictions, workers who forgo negotiation may leave money on the table, unaware that the employer is open to a counteroffer.

To better understand how negotiations unfold in practice, we designed a survey to track the behavior of a large sample of professionals in the U.S. tech sector actively engaged in the job market. Our panel data comprises two surveys: a baseline survey and a follow-up survey.

These surveys provide detailed information on the evolution of the careers of participants. Among other factors, we track their employment status, current compensation, job offers received, whether they attempted to negotiate each offer, changes in offer terms from initial to final, and the offer they ultimately accept.

To explore information frictions, we included two field experiments at the end of the survey. The first treatment arm, called *information treatment*, targets what we call *extensive-margin uncertainty*: some people may refrain from negotiating simply because they think the employer is not open to negotiating and doing so might have negative consequences. This treatment consists of a light-touch informational intervention that encourages participants to negotiate the terms of their job offers. In addition to a narrative that encourages negotiations, the message includes factual survey data on the proportion of individuals who attempt to negotiate and the share of those who are successful in raising compensation. Before the information-provision stage, we elicited beliefs about the share of individuals attempting to negotiate and their success rate. This data allows us to explore heterogeneity by prior beliefs.

Even if candidates know that negotiation is an option, they may hesitate to negotiate because they believe that they lack what we call the *negotiation expertise*, that is, the information and skills necessary to conduct a successful negotiation. For example, they may be unsure about what to negotiate, how much to ask for, how to draft an email, or the confidence to send that email. We explore the role of negotiation expertise with a second treatment arm, called *coaching treatment*. We partner with levels.fyi, a company that provides detailed compensation data and career services to individuals in the tech sector. The firm offers negotiation coaching services, where experienced coaches help individuals maximize their job offers by providing personalized advice and strategies. The service, costing $1,250 for the mid-level package and $2,450 for the senior package, is designed to equip candidates with the knowledge and confidence needed to secure the best possible compensation package during the hiring process. In this treatment arm, the service is described in both the treatment and control groups. However, only the treatment group receives a deep discount (80%+ off) to join the service. Before the offer-provision stage, we elicited the willingness to pay for the coaching service, using an incentive-compatible method. This data allows us to explore heterogeneity by individuals with higher vs. lower willingness to pay for the service.

To evaluate whether the results were surprising or predictable, we conducted a forecast prediction survey. Specifically, we recruited 117 academic experts with relevant publications, described the experiment to them, and asked them to predict the treatment effects. On average, experts anticipated that the coaching treatment would positively impact negotiations and compensation, while the information treatment would not.

We recruited subjects from a broad sample of professionals on the job market. We sent email invitations to individuals who had recently created an account on Levels.fyi. We recruited 1,552 subjects who completed the surveys. The average subject in our sample makes $221,347 per year in total compensation and has 7 years of work experience.[1] Some of the most common positions include Software Engineer, Product Manager, Data Scientist, and Director, and some of the most popular employers include Meta, Google and Apple. Most subjects (73%) were currently employed but looking into switching jobs. Around 82% received at least one job offer. Conditional on getting an offer, around 46.5% attempted to negotiate its terms in the control group. Among those who attempted to negotiate, 51.3% see an increase in the total compensation terms. Around 61.2% accept one of the offers from the prospective employers.

Gender differences in negotiations are often cited as a contributing factor to the persistent gender gap in compensation. This happens to be a particularly interesting sample for looking at gender differences, as the tech sector is a male-dominated industry. For example, Deloitte Insights reports that women held approximately 25% of technical roles in large U.S. tech companies. This male domination is reflected in our subject pool, where 19.5% of the subjects are female. On average, women receive offers that are 5.9% less competitive than men. Relative to men, women are on average 2.5 pp less likely to attempt negotiating and their compensation improves 3.5 pp less.

The results of the information treatment arm indicate that extensive margin uncertainty is a significant barrier to negotiations. Compared to the control group that did not receive the information treatment, subjects who receive the information treatment were significantly (7.6 pp) more likely to attempt to negotiate their offers. The effects of the information treatment

[1]This and other statistics are restricted to subjects in the control group (i.e., who did not receive any of the two treatment arms).

are concentrated in the expected group: individuals who underestimated the frequency and success rate. Moreover, the marginal person who decided to negotiate due to the treatment was leaving money on the table, as their compensation terms improved. Lastly, we find some suggestive evidence that the information treatment was relatively more effective for women than for men.

By contrast, the negotiation expertise is less important than the extensive margin frictions in explaining why people don't negotiate more often. First of all, there is a low willingness to pay for the coaching service (median WTP of $250, relative to the $1,250–$2,450 full price tag). Consistent with that evidence, there was low take-up of the service: 1.3% in the control group (who faced full price) vs. 7.1% in the treatment group (who faced the 80%+ discount). Compared to subjects who did not receive the offer, subjects who received the discount were not significantly more likely to attempt to negotiate the offer. In other words, the marginal individual who took up coaching due to the treatment would have attempted to negotiate anyway.

One limitation with the evidence is that, due to the low interest in the service, we cannot say much about the effects of coaching. To answer that additional question, we collected a second wave of data. We devised a recruitment method that targets the individuals with the highest interest in the coaching service. We included an organic link to our survey on the Levels.fyi website. Specifically, on the webpage describing the negotiation service, right below the "Book Now" button, they added another button inviting them to participate in the survey and highlighting that they could be eligible for a significant discount. We recruited 1,057 subjects in this second wave. Relative to the first wave, the second wave is similar in some dimensions, such as the average earnings, experience, the types of companies and positions. However, and consistent with the recruitment method, the second wave is very special in that it focuses on a sample with a much higher willingness to pay for coaching (median above $600 in wave 2 versus just $150 in wave 1).

Consistent with the higher willingness to pay, we find a much greater acceptance of coaching in the second wave: 12.1% take coaching in the control group (who was not offered the discount) versus 36.4% in the treatment group (who was offered the discount), with the difference being highly statistically significant (p-value<0.001). We find that, consistent with

wave 1, the marginal individual that takes up coaching would have attempted to negotiate anyways, and received similar compensation. However, this average effect masks meaningful heterogeneity: for women, the treatment did increase the probability of negotiating and also improved their compensation terms.

In sum, our evidence suggests that *extensive-margin uncertainty* can be a significant barrier to negotiations. Motivated by the evidence, we propose a theoretical model of salary negotiations which we use as a lens to interpret our empirical results and to explore welfare and policy implications. Although existing workhorse models of labor market bargaining have their strengths, our model introduces three key features that are jointly necessary to explain our findings. First, we propose that negotiations involve "pushing the envelope," that is, negotiating a job offer entails risk for the worker. For example, if an employee attempts to negotiate, the employer may choose to delay or withdraw the offer. Second, we allow information frictions, that is, uncertainty about whether the firm is open to negotiations.[2] Third, workers can receive multiple job offers, so bargaining under risk becomes a portfolio choice problem á la Chade and Smith (2006): the worker optimizes the risk versus reward from negotiating with one firm given her decision to bargain with other firms. For example, a worker may negotiate with one firm only if she has a sufficiently compelling "safety" offer from another firm that she does not negotiate.

Upon receiving job offers from a set of firms, a worker elects to negotiate by making counteroffers to any subset of the firms. Extensive-margin uncertainty may dissuade the worker from attempting to negotiate: the worker has (potentially misspecified) beliefs about whether the firm will "allow" her to negotiate, or if doing so will damage the relationship such that the offer is no longer viable. When she perceives a risk to negotiating, the worker must jointly optimize her counteroffers given the entire portfolio of initial offers she receives. We characterize the optimal bargaining strategy of the worker, and show that it follows a "top down" construction: the worker initiates bargaining with a set of firms with the highest match value, and determines which firms to bargain with if the expected upside of doing so

[2]While many incomplete information bargaining models feature a risk to negotiating (e.g., Chatterjee and Samuelson, 1983; Myerson and Satterthwaite, 1983; Fuchs and Skrzypacz, 2010), we propose a novel form of uncertainty: individuals have *extensive-margin* uncertainty—they do not know if they are allowed to ask for more—as opposed to *intensive-margin* uncertainty—they know they are allowed to ask for more, but they are not sure how much more they should ask for.

is higher than the "inside option" she receives from the rest of her portfolio in expectation. We construct the optimal portfolio via an inductive argument in which the "inside option" is generated from the "bottom up," in which the least-preferred firm serves as the inside option for the second least-preferred firm, and so on.

Our model can rationalize our experimental findings. Consistent with the results from the information treatment, the model predicts that workers with downward biased beliefs about the success rate of bargaining will, upon learning the truth, choose to negotiate and realize gains in compensation terms on average. Moreover, the model can fit a series of non-experimental findings that are puzzling in the context of alternative models: a worker may optimally bargain with a strict subset of firms in her portfolio, not all of her negotiation attempts are guaranteed to be successful, and the worker seeks out a markup over her inside option with each counteroffer she makes (i.e. counteroffers do not result in "matching the best offer + ϵ").

We use the model to explore welfare and policy implications. Given the positive effects of our information treatment, a natural question arises: what would be the impact of scaling up such an intervention across the market? Naturally, the answer depends on firm responses. In our experimental setting, we are treating a negligible share of workers (as a share of the universe of workers), so it is safe to treat firm wage-setting strategies as fixed. However, if the treatment were scaled-up market wide, negotiation attempts would become more common and firms may optimally adjust their wage-setting strategies accordingly (see Cullen and Pakzad-Hurson, 2023).

To study equilibrium effects, we embed the worker negotiation problem into a richer framework which endogenizes firm responses. Firms make wage offers and select whether these offers are negotiable, in order to maximize profit. In equilibrium, worker beliefs about negotiability matches firm decisions. Given an initial distribution of worker beliefs, in which direction should a policy maker move the beliefs? For example, a policy maker could seek to increase workers' willingness to negotiate by fining firms that rescind offers within a time frame (in other words, inhibiting exploding offers). Folk wisdom is mixed; for example, in order to improve pay equity, Kray (2015) proposes banning negotiations—"leaning out"—while Enwemeka (2016) discusses encouraging more negotiations—"leaning in." Our model

demonstrates how "lean in" policies benefit workers by removing both their misperceptions and uncertainty about extensive-margin frictions. Therefore, these policies reduce firms' de facto bargaining power, and induce an equilibrium in which firms concede the maximum surplus to workers, improving efficiency and equity across the set of all labor market equilibria. Overall, our model suggests that policies that promote negotiations have desirable effects.

Our paper relates and contributes to multiple strands of literature. First, we contribute to the literature on bargaining in labor markets. We make both empirical and theoretical contributions. On the empirical side, there is scarce evidence on the role of salary negotiations in labor markets. A seminal study, Hall and Krueger (2012), uses survey data to document that one third of workers bargain their wages in the U.S. More recently, Caldwell et al. (2024) provides comprehensive survey data from Germany on the role of bargaining in labor markets. We contribute to this literature by providing novel insights showing that fear of employer backlash and information frictions play a key role in negotiations.

On the theoretical side, our model builds on existing frameworks while incorporating key features that we believe are essential for explaining key patterns in the negotiation data. Although existing workhorse models of negotiations have their merits, they struggle to fit some basic findings. For example, models based on Nash's reduced-form bargaining solution (e.g., Mortensen and Pissarides, 1994) or Rubinstein (1982)'s alternating-offer model (e.g., Gentile Passaro et al., 2024) predict that we should not observe workers pro-actively making counteroffers to firms beyond sharing outside offers. Models in which employers engage in Bertrand-like competition for workers (e.g., Postel-Vinay and Robin, 2002; Cahuc et al., 2006) predict outside offer matching. Moreover, these full information bargaining models predict that our experimental, information provision treatments should have no impact on observed outcomes. Bargaining models with incomplete information (e.g.s Myerson and Satterthwaite, 1983; Chatterjee and Samuelson, 1983; Fudenberg et al., 1985; Fuchs and Skrzypacz, 2010) typically assume intensive-margin frictions on the worker side, rather than extensive-margin frictions, meaning that the central tension agents must resolve is *how much* to ask for, not *whether* to ask for more.

Last but not least, our study relates to and contributes to the literature on the gender pay gap in negotiations – for a recent review, see Recalde and Vesterlund (2023). While

negotiations are often blamed for contributing to the gender pay gap, the evidence is more mixed, however. For example, while there is evidence that women negotiate less in laboratory experiments (e.g., Babcock and Laschever, 2003), survey data suggests that, among professionals, women are as likely as men to negotiate (e.g. Recalde and Vesterlund, 2023; Caldwell et al., 2024). Furthermore, there is laboratory evidence that when women lean in, it can result in costly impasse Exley et al. (2020); Dannals et al. (2021). We contribute by providing evidence that, at least in our male-dominated context, the information and coaching treatments are particularly effective for women and help close the gender pay gap.

The remainder of the paper proceeds as follows. Section 2 describes the institutional context, research design and implementation details. Section 3 presents the results from the information experiment. Section 4 presents the results from the coaching experiment. Section 5 presents the model. The last section concludes.

2 Research Design

2.1 Overview of the Research Design

We collected panel data, consisting of a baseline survey and a follow-up survey. The surveys typically took between 5 and 10 minutes to complete.[3] To encourage subjects to participate in the study, and as a token of appreciation for their participation, we give each subject $50 in the form of an electronic gift card.[4]

2.2 Baseline Survey

The baseline survey was designed around three key objectives. First, it is supposed to identify those individuals who were actively seeking job offers in the labor market, a condition for participation in our study. Second, the baseline survey allowed us to document the state of a subject's job market, including the financial and nonfinancial terms individuals held in their current or recent employment, and detailed terms for any job offer they have in hand.

[3]Among those who completed the baseline survey, the median time to completion was 8.38 minutes for the baseline survey and 5.25 minutes for the follow-up survey.

[4]There were some small changes to these financial incentives – see Appendix H for more details.

Third, the baseline survey allowed us to deliver our two treatments, which were embedded at the end of the baseline survey. In addition to these three main objectives, the baseline survey captured individuals' past experience with negotiation, confidence in negotiation, and perceptions about the rates and success of negotiations in the population.

A sample of the baseline and follow-up survey instruments are attached as Appendices I and J, respectively. The survey was largely adaptive—for example, if an individual reported to have an offer, we would ask additional questions about that offer, like the compensation terms and whether he or she attempted to negotiate it. The full survey logic is detailed in Figure H.1.

The respondents first input their contact information and the URL of their LinkedIn profile. We used that profile as a proof of identity, and to cross-check the information provided in the survey.[5] Respondents then answered screening questions about their location and job searching status. We selected respondents who 1) are located in the United States, 2) are 20 years old or older, 3) have at least a college degree, 4) either received an offer or were actively searching for jobs (i.e., if they had any interviews with companies in the last 30 days and expected a 50% probability of receiving a job offer in the next 30 days.)

We then asked for the company, title, and compensation of their current or most recent employment, depending on whether they were currently employed. The respondents also filled in the current terms of their existing offers if they had any. When collecting information about terms, we separately ask the respondent to share details about the financial terms, including base-salary,[6] equity,[7] annual bonuses,[8] and relocation and sign-on bonuses.[9] We also collected some data on non-financial terms, such as remote and hybrid work-from-home.

We elicited subjects' beliefs about negotiation. We asked subjects about their past

[5]Originally we were manually matching the respondents to their LinkedIn profiles. Starting in the second wave of the survey, we decided to ask for that information directly in the survey.

[6]We asked, "What is the annual base salary in the offer?"

[7]We asked, "What is the value of your average annual stock-based compensation in the offer? (i.e., your expected annual earnings in Restricted Stock Units or Stock Options. If the stock-based compensation change from year to year, please report the per-year average.)"

[8]We asked, "What is the average annual bonus compensation in the offer? (excluding sign-on or relocation bonuses)"

[9]We asked, "What is the relocation bonus in the offer? What is the year 1 sign-on bonus in the offer? What is the year 2 sign-on bonus in the offer?"

experience with negotiation,[10] their confidence in negotiating,[11] and their education about negotiation.[12] We also ask them about the percentage of Americans who attempt to negotiate their offers,[13] and their success rate conditional on negotiating.[14]

Finally, we describe the negotiation coaching service offered by Levels.fyi. The description includes details on the format and the duration of service provision, such as individual calls and ongoing email support, the expertise of the coaching team, and the typical cost range.[15] We provide additional details on the coaching service in Section 2.2.1 when we describe experimental treatments.

After introducing all subjects to the Levels.fyi negotiation coaching service, we asked them whether they would prefer the coaching service over Amazon gift cards ranging from \$100 to \$600. Following the Becker et al. (1963) method, we introduce real stakes for the choice: we stated that we would randomly choose 10 participants to implement one of their six choices. We use their answers as our measure of willingness to pay for the negotiation coaching service.

At the very end of the baseline survey, all subjects stated their intent to negotiate in their job searching process and the expectations for compensation improvement.[16] We also collected their demographic information, including gender, ethnicity, and current level of financial stress.

[10]We asked, "Do you have past experience negotiating your compensation?"

[11]We asked, "On a scale of 1 to 10, how confident do you normally feel when you have to negotiate?"

[12]We asked, "Have you ever received any training or information on how to negotiate? Please select all that apply. (I took a course on negotiations, I read a book on negotiations, I hired a negotiations coach, I read an article on negotiations, I received mentorship on negotiations from a colleague)."

[13]We asked, "What percent of people do you think try to negotiate the compensation terms after receiving a job offer?"

[14]We asked, "Among individuals who attempt to negotiate, what percentage of them do you think were successful? In other words, what percentage got at least some of what they asked for?"

[15]The message read, "Levels.fyi offers a negotiation coaching service that includes an initial 30 minute 1-on-1 call with your coach, up to 2 follow up calls, and unlimited email support for a duration of up to 90 days. Your coach will be a tech recruiter from the industry who has experience approaching these conversations from the other side. The team of recruiters has negotiated thousands of offers and regularly increase offers by \$30k+. They will help you strategize the best negotiation process for your situation and provide guidance through your interactions. The service costs \$1,250-\$2,450."

[16]We asked, "Do you plan to negotiate the terms of any current offers or offers that you may receive soon? (Yes, almost surely; Yes, probably; Yes, but unlikely; No)."

2.2.1 Embedded Treatments

At the end of the baseline survey we cross-randomized subjects equally across our two treatment arms and their corresponding control arms.

Half of our subjects were assigned to our extensive-margin *information treatment* arm. The purpose of this treatment was to increase our subjects' willingness to *attempt* negotiation by reducing the perceived risk to initiating negotiations. While we did not have factual information to share with them on precise risks associated with a negotiation, we did have factual information about how common negotiation was among a similar sample of American professionals from a Fidelity Investments survey (Fidelity, 2022), as well as the success rate of those negotiations. We include these statistics from this survey as well as the hyperlinks for subjects in our treatment group to read the full study. In addition to these facts, we also include additional words of encouragement, including links to Harvard Business Review articles and cases around how employers anticipate negotiations and how the gains from negotiating amount to a lot of money over a lifetime. Subjects in the control group did not receive any of this additional information.

Half of our subjects were randomly assigned the *coaching treatment*.[17] The purpose of this treatment was to provide information and training for workers to determine *how* and *how much* to negotiate. Negotiation coaching is a service offered by Levels.fyi (Figure 2 shows a screenshot of the website for these coaching services). Levels.fyi negotiation coaches include a large pool of former recruiters who work together to advise a candidate on how to navigate the labor market. Collectively the coaches created a database on hundreds of employers, documenting which terms they've negotiated in the past, and final terms agreed to.

There are three packages for the coaching service, mid-level, senior-level, and leadership-level, which are tailored to candidates with varying experience and differ in their fixed fee as well as the size of their guarantee (a promise to return the fee if they cannot increase initial compensation by an amount greater than their fee). As part of the service, a subject will receive the contact information for a particular coach who will be available by video or phone

[17]We cross-randomized the two treatment arms, assigning one-quarter of the sample to the information treatment only, another quarter to the coaching treatment only, a third quarter to both treatments, and the final quarter to neither treatment.

for a three month period, during which they can help plan communications, draft emails and advise on outreach. The service is a core source of revenue for Levels.fyi and is rated very highly among users. In Appendix C shows a screenshot of a part of Levels.fyi's website that lists the customer reviews for the negotiation coaching service. Reviewers appreciate the responsive and professional demeanor of the coaches. They frequently mention personalized attention and tailored advice. And there are numerous mentions of the sessions being effective for aiding in the negotiation processes including identifying what can be used for leverage.[18]

Although all subjects received a description of the coaching service, only the treatment group received a message about their eligibility for a subsidy to cover between 80-90% of the cost of the negotiation coaching service. The exact percentage depended on whether they were eligible for the mid-level or senior package.[19] The control group received no mention of a subsidy. Of course, some in the control could still seek out negotiation coaching either through Levels.fyi or elsewhere; our expectation, however, was that the subsidy would increase the relative take-up of negotiation coaching among the treated, in particular among those with a willingness to pay for the service between the subsidized amount ($250) and the full cost of the service through Levels.fyi ($1,250).

2.3 Follow-Up Survey

Approximately 45 days after the baseline survey, we sent out follow-up surveys for individuals who completed the baseline survey. If a participant had not received any offer or did not respond the follow-up survey, we sent them another follow-up survey 45 days later. If a participant still had not received an offer or still had not responded, we sent them the final follow-up survey 4 weeks later.

We designed our follow-up survey to capture how an individual's labor market search went. Of particular relevance for our study are any new job offers received, any changes to offer terms, whether the worker initiated negotiations, and how the negotiations went.

The follow-up survey asked participants to describe any new offers they have received,

[18] Appendix C shows a screenshot of Levels.fyi's Frequently Asked Questions (FAQs) for the negotiation coaching service.

[19] Before August 17, 2023, the reduced price was $450; and thereafter it was $250.

and to update the terms of past offers they described in the baseline survey. We ask the participant first to list the initial terms of each offer,[20] and to then list the most current terms of the offer.[21] We directly ask if they negotiated the job offer[22], and if so, whether they provided information about their salary expectations.[23] We also elicit how they felt about the outcome of the negotiation[24] and how aligned the job is with their career goals[25] (a holistic measure of match quality). Finally, the follow-up survey also asked for the decision the candidate made over offers, or was planning to make.[26]

2.4 LinkedIn Data

The primary aim of incorporating LinkedIn data into our study was to cross-verify the employment history reported by respondents in the survey with their LinkedIn profiles. This process enabled the collection of detailed information about their job experiences, the transition timeline, and skill levels.

For the first wave of the survey respondents, we located the LinkedIn profiles of participants using the information they provided in the survey. Using their first name, last names, recent job positions, and educational backgrounds, we were able to find LinkedIn profiles for 88% of participants.[27] During the second wave, participants were asked directly to provide their LinkedIn profile as a verification method, which was provided by 98% of the participants.

After participants had completed the survey, we initiated the process of scraping their available LinkedIn profiles, beginning three months post-survey. We successfully scraped

[20]We asked, "For the latest offer, you reported an annual base salary of [base salary]. What was is the annual base salary in the original offer?"

[21]We asked, "We now want to ask you about the latest terms of your [offer position] offer from [offer company]. What is the annual base salary in the offer?"

[22]We asked, "Have you already negotiated, or attempted to negotiate, these compensation terms with the company?"

[23]We asked, "When [offer company] asked you for your prior salary or salary expectations, did you provide any information?"

[24]We asked, "How satisfied are you with your decision to negotiate this offer?" on a scale of 1 (not at all satisfied) to 5 (extremely satisfied).

[25]We asked,"On a scale of 1 to 5, with 1 being the lowest and 5 being the highest, how well do you think the job [offer position] at [offer company] aligns with your skills, interests, and career goals?'

[26]We asked, "Did you accept this offer?" and, "Do you expect to accept this offer in the future?" with possible responses: (Yes, almost surely; Yes, probably; Possibly, but unlikely; No).

[27]We believe the remaining subjects did not not have a LinkedIn account, although in a few instances we found multiple LinkedIn profiles that could not be disambiguated due to common names at large firms.

85% of LinkedIn profiles, obtaining employment history (including companies, roles, and start dates), education, location, skills and number of connections. Our primary focus was monitoring whether participants changed jobs within the first three months following the survey, determined by noting any job changes on their profiles. To enhance our analysis, we extended the observation period to up to 12 months post-survey completion, enabling us to accurately pinpoint the timing of job changes. Profiles that lacked recent activity, had very few connections, or were not based in the US were flagged and excluded.

2.5 Subject Recruitment

We designed our recruitment to target active job seekers from the United States i.e., individuals who received a new job offer recently and individuals who are interviewing and thus expecting to receive a job offer in the near future. We recruited subjects in two waves, each using a different strategy.[28]

The first wave of the baseline survey started on May 25, 2023 and ended on October 10, 2023. This wave consisted of reaching out to a sample of individuals who had registered an account on Levels.fyi's website.[29] The registration form includes information such as full names, email addresses and also a few additional questions. Using those responses, we restricted our survey invitations to individuals who reported to have U.S. work authorization and who declared to be active on the job market.[30] Every week, we sent out survey invitations to all of the individuals who signed up in the platform during that week. Additionally, we invited a random sample of individuals who signed-up during the previous 12 months.[31]

The recruitment for the second wave of the baseline survey started on September 21, 2023 and ended on February 10, 2025.[32] This recruitment was intended to better target individuals

[28]In order to check survey comprehension and fine-tune some features of the survey, we conducted a small pilot survey from May 12 to 24, 2023. The results of the pilot survey are not included in the analysis.

[29]For every survey invitation, if an individual did not respond, we would send them a reminder one week later and another reminder two weeks later.

[30]More precisely, individuals who, when asked about their job market status, picked one of the following options: "actively interviewing," "actively searching," or "offer in hand".

[31]From August 2, 2023 to August 15, 2023, we also sent invitations to subjects who expressed interests in the coaching service from a form embedded on Levels.fyi's website. A small minority (0.43%) of subjects were recruited in this way.

[32]The data for Wave 2 is still preliminary, as individuals who completed the baseline survey in the last three months have not yet had the opportunity to respond to the follow-up survey. However, they will be

who were most interested in the coaching service.[33] With this goal in mind, we embedded a link to the survey on levels.fyi's website. More precisely, there is a full page dedicated to the coaching service. At the middle of the page, there is a table with a link to buy each of the levels of the coaching service. Right below the button to book the service, we included a second button inviting subjects to fill out a survey, and in return they could earn a deep discount in the coaching service.[34]

We consider a baseline survey as complete if they reached the stage of the survey when they are randomized to see either a treatment or control screen.[35]

In the first wave, a total of 2,435 subjects completed the baseline survey, 1,552 of whom completed the follow-up survey, among which 1,336 received at least one offer.[36] In the second wave, an additional 1,581 subjects completed the baseline survey, 1,057 of whom completed the follow-up survey, among which 783 received at least one offer. As shown in Appendix C, and consistent with successful random assignment, the characteristics of our treatment and control groups are balanced at baseline.[37]

3 The Information Treatment

3.1 Descriptive Statistics

We begin by providing some descriptive statistics that are relevant to understand the results that follow.

By the time of the follow-up, 47% of those with an offer have negotiated, 34% successfully

invited to do so in the future.

[33]In the pilot that informed our power calculations, individuals expressed a high willingness to pay for the coaching service. However, when offered the opportunity to buy the product at the discounted price, they were following through at low rates. Thus, we designed a second recruitment strategy to better target individuals who would have a higher take-up of the coaching service.

[34]The link was originally only under the mid-level package. A new link under the Senior IC Package was added on October 19, 2023. A screenshot of the website with these links is attached in Appendix Figure 2. In wave 2, among all the subjects who paid for the coaching service, 59.2% used the mid-level package and 40.8% chose the senior package.

[35]The vast majority of subjects with incomplete surveys are those who were kicked out of the survey early due to our survey filters. More details about survey attrition are reported in Appendix I.

[36]We consider subjects as completing the follow-up survey if they responded it at least once.

[37]difference is statistically significant in our Wave 2 sample (p-value = 0.081), but one significant difference is expected just by chance given that we conduct dozens of tests.

improve the terms of at least one offer (including current employment terms), 34% improve the terms of their preferred offer, and 29% improve the terms of their current employment. Overall, compensation of accepted offers rises by 3.9% through negotiation.

Compensation is not the only offer term of importance to our subjects, but by revealed preference, compensation matters significantly and is the best predictor of which offer is accepted. 71% of participants accept the highest total compensation when accepting an external offer. If we allow for "ties", where top offers are considered a tie if they are within 5% of each other, the share accepting the offer with top terms rises to 79%.

3.2 Results

Before discussing the treatment effects, we begin by summarizing the prior beliefs. The data reveal systematic differences between these beliefs and the information presented in the experiment, a necessary condition for expecting an effect from the information. Figure 4 shows the distribution of prior beliefs, with panel (a) corresponding to the perceived share of individuals who negotiate and panel (b) corresponding to the share of those negotiations that are successful. A first finding is that there is large heterogeneity in prior beliefs. For instance, some subjects believe that nearly everyone negotiates, while other subjects believe that nearly nobody negotiates. This disagreement between subjects imply that *some* subject must be wrong. Most importantly, for the interpretation of the effects of information, what matters the most is whether the signal provided to subjects was above or below their prior beliefs, which determines the direction of the belief updating and therefore the direction of the expected effects. For example, individuals who, relative to the feedback, underestimated the share of people negotiating or their success, should react more positively to the information, becoming more open to negotiating themselves. In each panel of Figure 4, the feedback is denoted with a vertical line. Panel (a) shows that a majority of subjects (62%) had prior beliefs below the feedback provided in the message. In turn, panel (b) shows that, for the second belief, a vast majority (89%) of subjects fell below the feedback provided in the message.[38]

[38]For the analysis of the treatment effects, what matters is the comparison between the prior beliefs and the feedback provided. However, from the perspective of whether the prior beliefs were more or less accurate,

Figure 5 summarizes the treatment effects of the information treatment. Each panel corresponds to a different outcome. Within each panel, we show the average outcome in treatment and control group, along with the difference – that is, the average treatment effect. Within each panel, we present the results in the full sample first, and then the results broken down by prior beliefs.

Panel (a) of Figure 5 corresponds to the ex-post intention to negotiate, which was elicited toward the end of the baseline survey. Compared to individuals who did not receive the information treatment, those who did were more likely to report that they were almost certain they would negotiate future offers. Specifically, the probability of expressing this intention increased by 6.2 pp (p-value = 0.003), rising from 45.5% in the control group to 51.7% in the treatment group. In other words, the treatment effectively made individuals more enthusiastic about negotiating–at least in the short term.[39]

We should interpret the effect on the intention to negotiate with caution due to the hypothetical nature of the question and the potential influence of experimenter demand. While individuals may express a greater willingness to negotiate, they might not follow through when faced with real stakes. Therefore, the key outcome of interest is whether, months later, they actually attempted to negotiate. The results for this outcome are presented in panel (b) of Figure 5. By construction, this outcome is defined for individuals who responded to the follow-up survey and received at least one offer – otherwise, they would not have anything to negotiate in the first place. Specifically, this outcome measures whether, by the time of the follow-up, individuals had attempted to negotiate at least one offer.[40] The information treatment increased the probability of negotiation by 7.4 pp (p-value = 0.006), from 53.7% in the control group to 61.1% in the treatment group.

The natural next question is what happens to the marginal individuals who negotiated

we can also compare them to the results from our survey. We find that, among individuals with at least one offer, 54% of them attempted to negotiate it. Relative to this other benchmark, the prior beliefs were even more biased. On the other hand, our survey indicates that 50.8% of negotiation attempts were successful, which is significantly below the 85% estimate from the Fidelity survey. Relative to this alternative benchmark, the average bias in prior belief is smaller.

[39]In Appendix Figure D.1, we replicate Panel (A) of Figure 5 using an adjusted sample that matches the one used in Panels (B) and (C) of Figure 5.

[40]For individuals with multiple offers, this outcome captures whether they attempted to negotiate with any prospective employer. For those currently employed, it includes negotiation attempts with their current employer.

due to the treatment – that is, they would have not negotiated otherwise, but chose to do so because of the information. If their offer terms improve, this would suggest that not negotiating would have been a mistake. However, if their negotiation attempts were unsuccessful, it would indicate that they were right all along – that is, there was nothing to gain from negotiating. To explore this question, panel (c) of Figure 5 presents the negotiation improvement outcome. This outcome measures whether, by the time of the follow-up, the compensation terms had improved (from the initial offer to the final offer) for at least one of the individual's offers.[41] In the control group, 29.6% of offers experienced an improvement in compensation.[42]

Panel (c) of Figure 5 shows that the treatment increased the share of offers with compensation improvements by 6.5 pp (p-value=0.012), from 29.6% to 36.2%. The treatment effect on the share of people experiencing offer improvements (6.3 pp, from panel (c)) is almost as high as the treatment effect on the share of people who attempt to negotiate (7.4 pp, from panel (b)). Put together, these two findings suggest that a majority (87.8%= $\frac{6.5}{7.4}$) of the marginal negotiations induced by the treatment were successful.

As an important robustness check, we examine heterogeneity by prior beliefs, a standard practice in information-provision experiments (see, e.g., Cullen and Perez-Truglia, 2022). The information treatment consisted of multiple components, including factual information. If the factual information contributed to the treatment effects, we would expect stronger effects among individuals who initially underestimated these facts compared to those who overestimated them.

In each panel of Figure 5, the right side of the figure breaks down the results into two groups: the "low priors" group, consisting of individuals whose prior beliefs were below the feedback, and the "high priors" group, comprising the rest.[43] As shown in panel (a), 70.3%

[41] By construction, this outcome in panel (c) of Figure 5 is defined for the same sample as the negotiation outcome in panel (b)–that is, individuals with at least one offer. Similarly, following the definition of that outcome, for individuals with multiple offers, this measure indicates whether at least one of those offers saw an improvement in compensation terms. It also captures improvements in terms offered by the current employer.

[42] This average includes all individuals, regardless of whether they attempted to negotiate at least one offer or none at all. The share of improvements is higher when conditioned on attempting to negotiate.

[43] An individual is classified as having low priors if they underestimated both the share of people who negotiate and the share of negotiation attempts that are successful. However, since nearly everyone underestimated the latter, in practice, the variation is driven almost entirely by whether individuals underestimated or

of the subjects belong to the low priors group.

Consistent with the learning channel, the effects are heavily concentrated in the low-priors group. Compared to the high-priors group, for the low-priors group the treatment effects are larger in magnitude and more statistically significant on all three outcomes. Panel (a) shows that the treatment effect on the intention to negotiate is 7.0 pp (p-value = 0.004) for the low-priors group but only 4.5 pp (p-value = 0.232) for the high-priors group. Panel (b) shows that the treatment effect on the share of negotiation attempts is 8.9 pp (p-value = 0.006) for the low-priors group but only 3.5 pp (p-value = 0.488) for the high-priors group. Panel (c) shows that the treatment effect on the share of offers improved is 8.4 pp (p-value = 0.005) for the low-priors group but only 1.5 pp (p-value = 0.772) for the high-priors group. These findings indicate that the factual information included in the information treatment played a major role, and it is reassuring that the effects of the information treatment are real and not spurious.

Another robustness test, presented in the appendix, is a falsification exercise in the style of an event-study analysis. We examine a couple of pre-treatment outcomes, specifically whether individuals chose to negotiate offers before the baseline survey. Since the information was provided at the end of the baseline survey, it could not have influenced decisions made beforehand. As expected, we find effects that are close to zero and statistically insignificant, providing further reassurance that the observed treatment effects are real and not spurious.

One limitation of the data is that for certain outcomes (e.g., whether an individual attempted to negotiate an offer), we rely on responses to the follow-up survey. If the treatment influences either the response rate or the composition of respondents, it could introduce selection bias. We address this concern in two ways. First, Figure 5 (as well as other figures) includes Lee bounds to account for potential selection bias. The results remain robust; for example, in panel (b), the treatment effect for the low-priors group is 8.9 percentage points, with the corresponding Lee bounds ranging from 5.9 to 13.4 percentage points. Second, in the Appendix, we employ more sophisticated methods to refine the Lee bounds, and the results become even stronger. Additionally, we show that the findings remain consistent when using Inverse Probability Weighting.

overestimated the frequency of negotiation attempts.

Given that gender differences in negotiations are often cited as a contributing factor to the persistent gender gap in compensation, it is natural to explore whether the effects of the information treatment had differential effects for women versus men. These results are presented in Figure 6, is identical to Figure 5 only that it breaks down the sample in female versus male individuals. We find some suggestive evidence that, while the treatment had effect on both men and women, the effects are more pronounced for women.

4 The Coaching Treatment

4.1 Main Results

Going back to the question of why people do not always attempt to negotiate, another possible explanation is that they may feel they lack the necessary negotiation expertise. Conducting a successful negotiation involves multiple steps. First, they must determine what to ask for – should they negotiate for a higher base salary, a larger bonus, or more equity compensation? Or should they focus on non-compensation benefits instead? Even if they know what to ask for, pinpointing the right amount can be challenging, though websites like levels.fyi provide readily-available data. Additionally, crafting negotiation emails can feel intimidating to some people – what is the most polite yet effective way to make a request? And even if someone understands the basics, they may lack the confidence to attempt to negotiate, and ultimately choose to forgo negotiating altogether. Indeed, according to responses to a survey question, a significant share (47%) of individuals in our sample reported having no prior experience with salary negotiations. While some had received limited training, such as reading a book or taking a course, the majority had no formal preparation. For this reason, the lack of negotiation expertise – whether perceived or real – could be a significant barrier to negotiating.

The coaching service we study is designed to equip individuals with the negotiation expertise they need. If a lack of negotiation expertise were the primary reason preventing people from negotiating, we would expect a high willingness to pay for the service. While the full price tag may initially seem steep, it is far outweighed by the potential gains. As

a simple back-of-the-envelope calculation, individuals who attempt to negotiate receive, on average, an additional $7,377 in annual compensation. Under a few assumptions, we estimate the net present value of attempting to negotiate at approximately $15,000.[44] This figure is an order of magnitude higher than the full price of the coaching service ($1,250–$2,450).

In contrast, the willingness-to-pay data suggests limited demand for the service. Panel (e) of Figure 3 shows that, in Wave 1, the median participant was willing to pay only $150 for the negotiation coaching service—far below the full price of $1,250–$2,450. Moreover, only a small fraction (7.8%) exhibited high demand for the service, with a willingness to pay of $600 or more.

While incentive-compatible, this type of elicitation is not without limitations. For instance, the data may suffer from a house-money bias – meaning individuals might express a higher willingness to pay because the money comes from the experimenters, whereas they would be more frugal when spending their own money. Indeed, we find clear evidence of this exageration bias.[45] If anything, this house-money bias strengthens our conclusion: if the stated willingness to pay for coaching already appeared low, the true willingness to pay is likely even lower.

The findings from the coaching treatment reinforce the conclusions drawn from the willingness-to-pay data. If some individuals refrain from negotiating due to a perceived lack of expertise, significantly reducing the cost of the service should increase both its uptake and the proportion of individuals who attempt to negotiate. However, the evidence does not support this prediction. Figure 7 presents the results for the coaching treatment arm in Wave 1. Panel (a) shows that offering the coaching service led to a statistically significant increase in take-up (p-value < 0.001), but the effect size was modest, at just 1.9 pp. More specifically, the take-up rate rose from 1.1% in the control group (who faced the full price) to 3.0% in the treatment group (who received an 80%+ discount).

In panel (b) of Figure 7, the relevant outcome is the probability of attempting a negotiation. While the discount on the coaching service slightly increased the likelihood of negotiating,

[44]This calculation assumes the individual remains at the firm for only three years, that salary gains do not carry over to a new employer, a discount rate of 5%, and a marginal tax rate of 30%.

[45]Among individuals with a stated willingness to pay above $250, a literal interpretation of their responses would predict a 100% take up. In reality, only 13% of these individuals took up the offer (from panel (a) of Figure 7).

the effect is both statistically insignificant (p-value = 0.697) and small in magnitude (1.1 percentage points). In other words, not only did a small share of individuals take up the coaching offer due to the discount, but most of those who did would have attempted to negotiate on their own regardless.

In each panel of Figure 7, the right side of the figure presents a breakdown of results by two groups: individuals who reported a willingness to pay below $250, referred to as low-WTP, and those willing to pay above $250, referred to as high-WTP. We use $250 as the cutoff because this was the discounted price offered to individuals in the treatment group. In a world where WTP data perfectly reflected true preferences, the coaching treatment should have no effect on take-up in the low-WTP group (since the discount would not be sufficient to make the service worthwhile) but it should increase the take-up rate to 100% in the high-WTP group (because it would make the service worthwile for everyone). Panel (a) of Figure 7 shows that the data does not fit these predictions. This is not surprising, given that WTP data known to have measurement error and biases, such as the house-money bias. However, amongs all the noise, there is still a meaningful signal in the WTP data. As shown in Panel (a) of Figure 7, the treatment effect on service take-up is about four times as large for the high-WTP group compared to the low-WTP group – 4.5 pp versus 1.0 pp, respectively, with their difference being statistically significant (p-value<0.001). Due to the low willingness to pay in Wave 1, the heterogeneity split is quite unbalanced, with roughly 20% of observations in the high-WTP group and the remaining 80% in the low-WTP group. As a result, statistical power is limited, making it difficult to draw strong conclusions when examining other outcomes besides the take-up of the service.

Panel (c) of Figure 7 examines the effects of the coaching treatment on the probability of a compensation improvement. Given the minimal impact on take-up, we expect any effects on compensation to be small and statistically insignificant. At first glance, the results suggest a negative effect on compensation improvement that is statistically significant at the 10% level. However, this effect is very likely spurious, as it is concentrated in the low-WTP group, where the impact on take-up was minimal, making any meaningful effect on compensation highly unlikely. To be in a better position to say more about coaching, we turn to the wave 2.

4.2 Additional Results: Wave 2

To summarize, we established that among a general population of tech workers, a lack of negotiation expertise is unlikely to be a major factor preventing individuals from negotiating. The key evidence for this is that even when coaching services are offered at a deeply discounted price, take-up remains low, and there is no significant increase in the share of individuals attempting to negotiate. This finding stands in stark contrast to the effects of the information treatment, which not only increased the likelihood of negotiations but also led to compensation gains.

While these results apply to the *average* worker, it is still possible that for a minority of workers, negotiation expertise poses a significant barrier. To explore this, we would like to zoom into individuals with the highest willingness to pay. However, in Wave 1, this subgroup is small – for instance, only 7.8% were willing to pay $600 or more – limiting our statistical power. To address this, we recruited a separate sample in Wave 2, specifically targeting individuals expected to have a high demand for coaching, by recruiting them directly from the booking page of the coaching service.

The recruitment strategy was successful, as individuals in Wave 2 exhibited a significantly higher willingness to pay for coaching. Panel (e) of Figure 3 shows that while only 7.8% of subjects in Wave 1 were willing to pay $600 or more, the corresponding share in Wave 2 is 51.3%. As discussed in Appendix C, Wave 2 is similar to Wave 1 in several dimensions, such as average earnings, years of experience, and the positions and companies where individuals work. However, beyond their higher willingness to pay for coaching, there is another key difference between the samples: compared to subjects in Wave 1, those in Wave 2 have substantially higher baseline rates of negotiation and terms improvement – by about 33%.[46] The fact that individuals with the highest demand for coaching are also those most likely to negotiate aligns with the findings from the previous section: i.e., that those interested in coaching services already intend to negotiate and are primarily deciding whether to do so independently or with professional support.

[46]For example, 56.7% of subjects in the control group attempted to negotiate in Wave 1 (Panel (b) of Figure 5), while the corresponding share in Wave 2 is 75.4% (Panel (b) of Figure 8), representing a 33% increase.

Consistent with the higher willingness to pay, we find a much greater take-up of coaching in the second wave. Panel (a) of Figure 8 shows that the coaching treatment increases the take-up rate by 24.6 pp (p-value<0.001), from 12.2% in the control group (who faced the full price) to 36.8% in the treatment group (who faced the deeply discounted price).[47]

Panel (b) of Figure 8 shows the effects on the rate of negotiation attempts. Consistent with Wave 1, the marginal individual that takes up coaching would have attempted to negotiate anyways. The difference is that in wave 2 this result is more precisely estimated. While a 24.6 pp higher share of individuals take up the coaching service due to the treatment, the corresponding effect on the probability of attempting to negotiate is small (1.1 pp), statistically insignificant (p-value=0.732). In other words, the vast majority (95%= $\frac{24.6-1.1}{24.6}$) of the individuals who take up the coaching would have attempted to negotiate on their own anyways. Moreover, the results from figure 8 are precisely estimated – based on the 90% confidence interval, we can rule out an increase in the negotiation rate above 4.7%, meaning that *at least* 81% (= $\frac{24.6-4.7}{24.6}$) of the individuals who take up the coaching would have negotiated on their own.

Although the coaching treatment did not increase negotiation rates, it is possible that it still improved the rate of successful negotiations. That is, negotiations conducted with the support of a coach may have been more successful than if individuals had negotiated on their own. To shed light on this, Panel (c) of Figure 8 presents the effects on the rate of successful negotiations. While the coaching treatment increased this rate, the effect is small (0.5 percentage points) and statistically insignificant (p-value = 0.985). However, this result should be interpreted with caution, as it reflects an intention-to-treat effect and only captures the extensive margin of negotiation success. In Appendix C, we provide additional analyses to address these and other challenges. The evidence suggests that, relative to negotiating on their own, negotiating with a coach leads to larger compensation improvements, ranging from 0.1 to 2.4 pp depending on the specification. Additionally, the benefits from using a coach extend beyond compensation terms, with strong impacts on satisfaction with the negotiation process and an increased probability of switching employers.

[47] In Appendix Figure D.1, we replicate Panel (A) of Figure 8 using an adjusted sample that matches the one used in Panels (B) and (C) of Figure 8.

To examine whether the effects of the coaching treatment differed by gender, Figure 9 replicates Figure 8, but splits the sample by worker gender rather than willingness to pay. As noted earlier, women make up a minority of the sample, leading to imprecise estimates for this group that should be interpreted with caution. That said, we find some weak evidence suggesting gender differences in the effects of coaching.

Panel (b) of Figure 9 shows that for women, the coaching treatment had a large positive effect on the probability of negotiating (12.1 pp), though it is borderline insignificant (p-value = 0.107). Consistently, panel (c) of Figure 9 indicates that women experienced a substantial positive effect on the rate of successful negotiations (15.0 pp), which is statistically significant (p-value = 0.071). Panel (a) of Figure 9 shows that for women, the treatment effect on service take-up is 17.6%. Taken together, this evidence suggests that the majority of women who enrolled in coaching due to the treatment would not have attempted to negotiate otherwise and would have been less likely to see improvements in their compensation.

Notably, the effects of coaching for women in Figure 9 closely resemble those of the information treatment shown in Figure 6. In both cases, the intervention increased women's likelihood of negotiating, and these additional negotiations were largely successful. Taken together, this evidence suggests that in this male-dominated industry, negotiation frictions are particularly pronounced for women.

5 The Model

5.1 Motivating Facts

We being by discussing some experimental and non-experimental findings, and showing how they are difficult to square with the workhorse bargaining models.

Figure 3 shares some basic patterns about negotiation using our control group subjects. Panel (a) shows that, overall, 60% of our control group actively attempt to negotiate at least one of their job offers.

Negotiations typically increase dispersion in compensation across a workers' set of offers, rather than compressing them. To see this, panel (b) disaggregates our sample into those

that have exactly one or exactly two offers, and are not currently employed. Those with only one offer negotiate that offer 53% of the time. Those with two offers negotiate exactly one of them 54% of the time. Less commonly, they negotiate neither and both offers, 16% and 30% of the time, respectively.

Panel (b) also examines *which* offer is negotiated among those with exactly two offers. 60% of people attempt to negotiate the offer with the highest initial compensation. Most often, they *only* negotiate the highest offer. Indeed, panel (c) shows that negotiation leads the gap in final offers to be larger than the gap in initial offers, on average.

A worker's attempt to negotiate does not guarantee success at improving compensation terms. Some people who attempt to negotiate are unsuccessful and experience no change in initial terms. In panel (d), we show that conditional on attempting to negotiate, 44% of workers experienced an improvement in terms, averaging a 12% increase over the initial offer terms.

We summarize these observations in the following two stylized facts:

Stylized Fact 1 (Workers Pro-actively Exercise Bargaining Power)**.** *Workers often initiate negotiations after receiving firms' initial offers, and doing so is frequently successful at raising compensation terms beyond an outside offer.*

Stylized Fact 2 (Negotiation Surplus Exceeds Outside Options)**.** *Negotiation typically increases the dispersion between a workers offers, rather than equalizing final terms.*

Labor bargaining models are typically based on one of two underlying mechanisms. First, there are models in which workers individually negotiate with firms derived from seminal models by Nash (1950) and Rubinstein (1982) (e.g.s Mortensen and Pissarides, 1994; Gentile Passaro et al., 2024, respectively). These models fail to rationalize Stylized Fact 1, and instead predict that we should observe "passive" employees; a worker who takes a new job is never predicted to demand more than that firm's initial offer. Indeed, recent empirical papers studying bargaining use the observance of attempts to negotiate initial offers to reject the aforementioned models (Backus et al., 2020; Caldwell et al., 2024).

Second, there are models in which workers do not play an active role in wage setting and firms instead engage in Bertrand-like competition over workers (e.g.s Postel-Vinay and Robin,

2002; Cahuc et al., 2006). In principle, such models could rationalize Stylized Fact 1 if worker attempts at negotiation simply involved forwarding outside offers to interested employers, who then match competing terms. However, these models fail to rationalize Stylized Fact 2 because they predict a worker's two best offers will be "negotiated" such that they leave the worker with equal terms. In other words, Bertrand-like competition is predicted to compress the top offers available to workers. By contrast, only 5% of workers face final compensation packages that are within $3000 of one another.

Our facts and discussion thus far have been focused on total compensation, while in theory, what matters is how offers compare in utility terms. Indeed one could speculate whether the non-financial amenities are driving a wedge between packages that are equalized in utility terms. However, we consider this unlikely for at least two reasons. First, we have found that total compensation is the best predictor of which job offer a candidate chooses (in only approximately 21% of cases do candidates choose a lower paying offer); second, we ask candidates to describe the non-financial terms they leverage in the negotiation, including asking them to place a monetary value on those non-financial terms: in fewer than 6% of cases do candidates report leveraging non-financial aspects of the job in a negotiation, and overall the value placed on these non-financial amenities is small relative to pay.

We now turn to mechanisms behind when and which workers choose to negotiate. Our survey evidence finds large heterogeneities in worker beliefs about the propensity of other workers and firms to negotiate and the success rate of negotiations (see Figure 4).

Our experimental findings highlight the important role of worker beliefs. Both of our information treatments increase the propensity of workers to negotiate (as well as average compensation), especially among those with low prior beliefs about the market-wide negotiation rate and negotiation success rate.

Stylized Fact 3 (Information Leads to Successful Negotiations)**.** *Workers misperceive the rates at which other workers negotiate and improve wage offers. Providing information leads to additional successful negotiations, in particular among those who perceive rates to be low.*

Full information bargaining models—a class that includes the models described above—fail to rationalize Stylized Fact 3. These models assume all relevant information in the labor

market is common knowledge. Hence, they predict information provision about either sides' negotiation position will not affect equilibrium outcomes.

Our experimental treatments offer evidence that a fear of negotiating is a central friction. Free-response answers by subjects indicate their uncertainty as to whether initial job offers are take-it-or-leave-it. 7% of survey participants mentioned concerns of backlash when deciding to negotiation, some reflecting an anticipation of backlash that prevented a negotiation from occurring (e.g. one subject wrote, "I was scared of the offer being revoked for negotiating...") to backlash experienced from a failed negotiation attempt (e.g. one subject wrote, "My offer was rescinded due to 'business strategy change' a week later.").[48] Moreover, our information treatment has a sizable effect on worker negotiation rates and compensation, especially for those who were initially pessimistic about the rates and success of negotiations (Figure 5).

Stylized Fact 4 (Extensive-margin Uncertainty)**.** *Workers describe a fear that a job offer will be rescinded if negotiation is attempted. Shifting perceptions about whether negotiation is to be expected has a larger treatment effect than providing intensive-margin information about how to negotiate in our setting.*

In our setting, providing extensive-margin information about whether negotiations are "allowed" appears to drive significant gains in compensation, while additional gains from negotiation coaching were more modest.[49] We focus on the extensive margin because it is novel margin to study, and we have empirical support that this margin may be central in the negotiation process.

Existing bargaining models of incomplete information (e.g.s Myerson and Satterthwaite, 1983; Chatterjee and Samuelson, 1983; Fudenberg et al., 1985; Fuchs and Skrzypacz, 2010;

[48]We solicited free-response answers to the question, "Did you experience, or do you expect to experience, any negative consequences from your negotiation?" Answers from some subjects reflected different forms of experienced backlash to negotiations, ranging from damaged interpersonal relationships (e.g. one subject wrote, "The recruiter took it as a personal affront that I wanted to negotiate and got upset. I ended up having to apologize to her for hurting her feelings.") to delays (e.g. one subject wrote that negotiating, "Delayed hiring date.") to offer rescission.

[49]Note that the coaching service may provide value in additional ways not directly tied to the outcomes we measure. For example, the coaching service may reduce stress when workers negotiate; in response to a free response question asking subjects, "How satisfied are you with your decision to negotiate this offer?" one subject wrote, "With the coach I had confidence that I had nothing to lose. Even though I didn't get any more money, it was worth trying." and another commented, " It's very nerve wrecking but the coach knows the industry and where the limits are."

Cullen and Pakzad-Hurson, 2023) typically assume intensive-margin frictions on the worker side as well—a worker does not know *how much* she can demand—as opposed to extensive-margin frictions—a worker does not know *if* she can demand more.[50]

In the following section, we present a bargaining model in which workers with different portfolios of offers choose to (or not to) negotiate under extensive-margin uncertainty, but no intensive-margin uncertainty. Importantly, firms select whether their offers are nonnegotiable, which results in workers facing negative consequences from initiating a negotiation. Firm decisions can therefore deter workers from negotiating.

We describe in the following sections how this model rationalizes the above-presented empirical patterns and experimental findings. We also use the model to discuss the equilibrium effects of public policy that changes the perceived risk of negotiating in the overall labor market.

5.2 Outline of the Model

We propose a simple framework for negotiations. For external validity purposes, we make the minimum set of assumptions such that our model captures the stylized facts presented in the previous section. First, a worker receives potentially multiple job offers and can choose to negotiate job offers individually. Second, the worker has bargaining power, but perceives a risk to negotiating that varies at the worker-firm level. Third, the risk is at the extensive rather than intensive margin, that is, worker uncertainty comes in the form of not knowing if negotiations are "allowed" by the firm. From the worker's perspective, three parameters are needed to capture these modeling features per each offer i: an initial compensation package $w_i \in \mathbb{R}$, the worker's belief in how likely the firm is to consider counteroffers $\hat{\rho}_i \in [0, 1]$, and a match surplus that the worker and the firm making the offer generate $v_i \geqslant w_i$. As in

[50]The bargaining literature with one-sided incomplete information frequently separates out the "gap" case (i.e. the uninformed party knows there are gains from trade available) from the "no gap" case (i.e. the informed party believes with positive probability that there are no gains from trade). See Ausubel et al. (2002) for a summary of the literature and a discussion of these two cases. Our "extensive-margin" uncertainty is distinct from these two cases, which are fundamentally about "intensive-margin" uncertainty. The "gap" case ensures that there is no extensive margin uncertainty, in that it is known that bargaining can occur with probability one, but it includes intensive-margin uncertainty about the value of the relationship to the other party. The "no gap" case has both intensive- and extensive-margin uncertainty; the uninformed party does not know how much she can demand, or if she can even demand any surplus.

Abowd et al. (1999), match values potentially vary at the worker-firm level but are commonly known. The assumption of known match values cleanly embeds extensive-margin frictions: the maximum wage a worker can secure at a firm i is known—the match value v_i—but she perceives that making a counteroffer will result in offer rescission with probability $\hat{\rho}_i$.[51]

We first consider the negotiation decision of a worker who receives a portfolio of job offers and can elect to negotiate with any of the offering firms by making a counteroffer before selecting a job. We characterize the worker's optimal bargaining strategy as a function of her portfolio of offers and her beliefs.

We then use this model to predict the effects of policies that promote (or demote) negotiation. Because these policies affect the negotiation of workers market-wide, firms may change their wage offers in equilibrium. We show that inducing workers to "lean in" and negotiate with high probability has positive effects on efficiency, worker surplus, and equity in equilibrium.

In the Online Appendix, we show how our model rationalizes additional experimental findings.

5.3 Setup: Single Worker

There is a single worker with an outside option denoted $\varnothing$ with value θ normalized to zero. There is a set of firms $N := \{1, 2, ..., N\}$, each making the worker a job offer.[52] For ease of exposition, we refer to both the set of firms and its cardinality by N. For each firm $i \in N$, the worker and firm generate (a commonly known) match surplus $v_i \in \mathbb{R}$ if matched together, where we assume that $v_i \neq v_j$ for all distinct firms $i, j \in N$. Each firm i's wage offer w_i satisfies $w_i \leqslant v_i$.

Upon receiving her portfolio of offers $\{w_i\}_{i \in N}$ the worker engages in simultaneous ne-

[51] We do not take a stance on the genesis of each match value v_i, and it can depend on external market conditions. For example, it would represent the entire surplus generated from the worker's employment at firm i if the firm has no prospect of filling the position with another worker, or if firm i has an outside option of instead hiring a part-time worker at a known rate, v_i would represent the surplus over and above this outside option.

[52] We can interpret a currently employed worker as one with an additional firm in her portfolio of offers. Our results are unchanged if the worker is disallowed from negotiating with the incumbent firm, i.e. if she has already negotiated with her current employer in the past–such a model is equivalent to assuming the worker's outside option takes a higher value.

gotiations by making counteroffers. Formally, the worker simultaneously selects $o_i \geqslant 0$ for each firm $i \in N$. There are two potential costs associated with making a strictly positive counteroffer $o_i > 0$ to firm $i \in N$. First, i's offer may be "non-negotiable" in which case making a counteroffer results in i's job offer being withdrawn. Our results are qualitatively similar if a negotiation "failure" results in the offer value depreciating—potentially due to a delay in consummating the match, or because of negative interpersonal consequences—or if it results in the offer withdrawn probabilistically. Second, even if i's offer is "negotiable," i will reject a counteroffer and withdraw the offer if the worker demands more than the match value, $o_i > v_i - w_i$. We say that a worker *negotiates with firm* $i \in N$ if either $v_i = w_i$ (the firm initially capitulates and offers the worker the entire match value, thus obviating the need for the worker to make a counteroffer) or $o_i > 0$ (the worker makes a strictly positive counteroffer).

The worker has *extensive-margin* incomplete information, captured by vector $\hat{\rho} = (\hat{\rho}_1, ..., \hat{\rho}_N)$, where $\hat{\rho}_i$ specifies the worker's belief that firm i's offer is negotiable. For each firm $i \in N$ let $\tilde{w}_i$ be the final value of matching with firm i:

$$\tilde{w}_i = \begin{cases} w_i & \text{if } o_i = 0, \\ -1 & \text{if } o_i > v_i - w_i, \text{ and} \\ \begin{cases} w_i + o_i & \text{with probability } \hat{\rho}_i, \\ -1 & \text{with probability } (1 - \hat{\rho}_i) \end{cases} & \text{if } o_i \in (0, v_i - w_i] \end{cases}$$

Recalling that $\tilde{w}_\varnothing = 0$, the worker is employed by a firm $i^* \in \arg\max_{i \in S \cup \{\varnothing\}} \tilde{w}_i$ and receives a final payoff equal to her wage $\tilde{w}_{i^*}$.

This assignment procedure has the following interpretation. The worker accepts a job at (one of) the firm paying the highest wage. The wage a firm pays is equal to the initial wage offer ($\tilde{w}_i = w_i$) if $o_i = 0$. If $o_i > 0$ and $o_i > v_i - w_i$, then this offer drops in value below that of the worker's outside option ($\tilde{w}_i = -1$), either because the offer is rescinded, or the relationship with the firm depreciates.[53] Otherwise, the firm accepts the terms of the worker's counteroffer ($\tilde{w}_i = w_i + o_i$) if the offer is "negotiable," and otherwise the offer is rescinded or

[53]Therefore, the normalization that $\tilde{w}_i = -1$ if the offer is rejected is merely a mathematically convenient way to say the worker will never be assigned to a firm that rejects her counteroffer.

depreciates ($\tilde{w}_i = -1$).

Remark 5. *We have described a game in which all negotiations occur simultaneously, and a firm's acceptance of a worker's counteroffer does not oblige the worker to matriculate at that firm. More realistically, job offers need not be negotiated simultaneously, and negotiating plausibly commits the worker to accepting that job, i.e. the worker may need to declare, "if you accept my counteroffer, I'll sign on the dotted line right now," in order for the firm to take the counteroffer seriously.*

The outcome of our simultaneous-negotiation game is equivalent to a sequential-negotiation game in which the worker selects an order in which to negotiate with the firms, and she is matched to the first firm that either accepts her counteroffer, or to whom she makes no counteroffer (i.e. she accepts the firm's initial offer).

5.4 Optimal portfolio bargaining

We seek a solution which maximizes the worker's expected utility:

1. For a given portfolio of wage offers $\{w_i, v_i, \hat{\rho}_i\}_{i \in N}$, optimal counteroffers $\{o_i^*\}_{i \in N}$ maximize the worker's expected (given $\hat{\rho}$) payoff, and

2. If the worker has a zero probability of matching with a firm $i \in N$ according to criterion 1, then $o_i^* = 0$.[54]

An initial observation is that if a worker negotiates with a firm $i \in N$ (i.e. $o_i > 0$) then the optimal counteroffer equals $v_i - w_i$; demanding the entire match surplus maximizes the wage available at firm i conditional on the offer being "negotiable," because any weakly lower counteroffer is accepted by the firm, while any higher counteroffer ensures rejection.

Remark 6. *The optimal counteroffer for each firm* i *is* $o_i^* \in \{0, v_i - w_i\}$.

The optimal counteroffer portfolio trades off risk—captured by $\hat{\rho}_i$ values—and reward—captured by $v_i - w_i$ values. Intuitively, the larger is $\hat{\rho}_i$ and the smaller is $v_i - w_i$, the less

[54]There exists a multiplicity of optimal counteroffers in which $o_i \geqslant w_i$ if the worker has zero probability of matching with firm i. We restrict the worker to break her indifference by not making a counteroffer to such a firm. In a richer model in which the worker faced a positive cost for negotiating with a firm, optimality would require $o_i = w_i$ for any such firm i.

likely the worker is to make a counteroffer to firm i (i.e. she is more likely to set $o_i^* = 0$). For extreme values, this decision is simple: if $\hat{\rho}_i = 0$ then the worker is not willing to make a counteroffer to firm i regardless of the value $v_i - w_i$, because the worker perceives no chance of success. On the other hand, if $\hat{\rho}_i = 1$ then the worker is willing to negotiate with firm i regardless of the value $v_i - w_i$, because the worker perceives no risk of doing so.[55]

For values of $\rho_i \in (0, 1)$ an additional complication arises when constructing the optimal counteroffer to firm i: the risk versus reward calculation is affected by the presence of other offers, and negotiation choices for those offers. Intuitively, even given a relatively low value of both ρ_i and $v_i - w_i$, the worker will be willing to negotiate with firm i if she has a solid backup offer. For example, consider the case in which the worker has another offer from a firm $j \neq i$ with $\hat{\rho}_j = 0$ and $v_j = v_i + \epsilon$, $v_i - w_i >> 0$. In this case, the worker will optimally not negotiate with firm j because $\hat{\rho}_j = 0$, and is willing to "roll the dice" with firm i since her effective outside option, v_j is only slightly worse than what she gets with a successful negotiation with i. On the other hand, for any $\hat{\rho}_i < 1$ there exists a value $v_i - w_i$ large enough such that, if the worker has no or low value offers from other firms, she will not be willing to risk the potential of losing the job offer by negotiating. The remaining difficulty in characterizing the optimal counteroffers is that the reward from negotiating is endogenous to other negotiation decisions. That is, if the worker "risks it" by negotiating with firm i, she may optimally decide to not negotiate with firm j and instead keep it as a "back up option."

The following remark states that, for different parameter values, the worker may optimally negotiate with any subset of firms in her choice set. Specifically, from the point of view of an analyst who can observe a worker's collection of initial offers, negotiating with any subset of firms in her portfolio can be rationalized by some collection of match values and beliefs.

Remark 7. *Let N be a collection of firms, with initial offers $\{w_i\}_{i \in N}$. Let N' be an arbitrary subset of N. Then there exists a collection of match values and beliefs $\{v_i, \hat{\rho}_i\}_{i \in N}$ such that the worker optimally negotiates with all firms in the set N' and no firm in the set $N \setminus N'$.*

Remark 7 rationalizes Stylized Fact 1. We initially provide the following example, which

[55] Recall, that we break the agent's indifference to not make a counteroffer to firm i in two cases: if either $v_i - w_i = 0$ (i.e. the firm is already offering the full match value to the worker), or if the worker will not be assigned to the firm with positive probability given the remainder of the optimal portfolio of counteroffers.

demonstrates conditions under which it is optimal for the worker to negotiate with each subset of firms in its portfolio. As this example features a worker with two firms in her portfolio, it provides a theoretical analogue to the descriptive evidence in panels (a) and (c) of Figure 3. Formally, Remark 7 is implied by the proof of Proposition 9, which we will state shortly.

Example 8. *Let* $N = \{1,2\}$ *and let* $\nu_1 > \nu_2$*. To rule out uninteresting complexities, let* $w_1 < \nu_1$ *and* $w_2 < \nu_2$*, and let* $\hat{\rho}_1, \hat{\rho}_2 \in (0,1)$*. Given Remark 6, there are four potentially optimal portfolios to consider:* $o_1^* = \nu_1 - w_1$ *and* $o_2^* = \nu_2 - w_2$ *(the worker negotiates with both firms),* $o_1^* = \nu_1 - w_1$ *and* $o_2^* = 0$ *(the worker negotiates only with firm 1),* $o_1^* = 0$ *and* $o_2^* = \nu_2 - w_2$ *(the worker negotiates only with firm 2) and* $o_1^* = o_2^* = 0$ *(the worker negotiates either neither firm).*

Option 1: $o_1^* = \nu_1 - w_1,\ o_2^* = \nu_2 - w_2$**.** *Because* $\nu_1 > \nu_2$*, the worker will match with firm 1 if her offer is not rejected. Therefore, her expected payoff is* $\hat{\rho}_1\nu_1 + (1-\hat{\rho}_1)\hat{\rho}_2\nu_2$**.**

Option 2: $o_1^* = \nu_1 - w_1,\ o_2^* = 0$**.** *The worker's expected payoff is* $\hat{\rho}_1\nu_1 + (1-\hat{\rho}_1)w_2$**.**

Option 3: $o_1^* = 0,\ o_2^* = \nu_2 - w_2$**.** *By then assumption that the worker will never negotiate with a firm if she has zero probability of matching with that firm, it must be the case that* $\nu_2 > w_1$*. Therefore, the worker's expected payoff is* $\hat{\rho}_2\nu_2 + (1-\hat{\rho}_2)w_1$**.**

Option 4: $o_1^* = o_2^* = 0$**.** *By assumption that the worker will never negotiate with a firm if she has zero probability of matching with that firm, it must be the case that* $w_1 > w_2$**.** *Otherwise, if* $w_2 \geqslant w_1$*, because* $\hat{\rho}_1 > 0$*, the worker's expected payoff from setting* $o_1^* = o_2^* = 0$ *is* w_2 *while the worker's expected payoff from setting* $o_1^* = \nu_1 - w_1,\ o_2^* = 0$ *is* $\hat{\rho}_1\nu_1 + (1-\hat{\rho}_1)w_2 > w_2$*, where the inequality follows because* $\nu_1 > \nu_2$ *by the assumption of this example, and* $w_2 \leqslant \nu_2$ *by our ongoing assumption that initial offers are no greater than the match value.*

Because $w_1 > w_2$ *and* $o_1^* = 0$*, then the worker will optimally negotiate with firm 2 if* $\nu_2 > w_1$*. Therefore, this option is optimal only if* $w_1 \geqslant \nu_2 > w_2$*, and the worker's expected payoff is* w_1**.**

Holding fixed v_1, v_2, w_1, w_2, it is clear that Option 1 is optimal if the risk of negotiating with both firms is sufficiently low. Specifically, there exists $\rho^* < 1$ such that if $\hat{\rho}_1, \hat{\rho}_2 > \rho^*$, the worker will optimally negotiate with both firms.

Similarly, holding fixed v_1, v_2, w_1, w_2 such that $w_1 \geqslant v_2 > w_2$ (recall that these inequalities are necessary for the optimality of option 4), it is clear that Option 4 is optimal if the risk of negotiating with both firms is sufficiently high.

Option 2 is optimal if the risk of negotiating with firm 1 is low and the risk of negotiating with firm 2 is high. Specifically, suppose the worker negotiates with firm 1. Because $v_1 > v_2 \geqslant w_2$, the worker will be matched to firm 1 with probability $\hat{\rho}_1$, i.e. if her counteroffer to firm 1 is accepted. With the complementary probability, her offer is rejected. In the event she is rejected by firm 1, she earns $\hat{\rho}_2 v_2$ in expectation by negotiating with firm 2, and w_2 for sure if she does not negotiate. Therefore, for $\hat{\rho}_1$ sufficiently small, and $w_2 > \hat{\rho}_2 v_2$, option 2 is optimal, i.e. the worker will "risk it" with firm 1 and "play it safe" with firm 2.

Option 3 is similar to option 2, except that worker uses firm 1's offer as a safety, and negotiates instead with firm 2. Recall our previous argument that this option is optimal only if $v_2 > w_1$. Therefore, the worker will be matched to firm 2 with probability $\hat{\rho}_2$, and with the complementary probability, her offer is rejected. In the event she is rejected by firm 2, she earns $\hat{\rho}_1 v_1$ in expectation by negotiating with firm 1, and w_1 for sure if she does not negotiate. It is tempting, mirroring the argument surrounding the optimality of option 2, to reason that option 3 is optimal if $\hat{\rho}_2$ is sufficiently small, $v_2 > w_1$, and $w_1 > \hat{\rho}_1 v_1$.

However, an additional consideration is necessary here, because firm 1 is the highest-value firm that the worker will be matched to following a successful negotiation. In other words, the decision of whether or not to negotiate with firm 1 cannot be determined by only conditioning on rejection from firm 2 and "locally" optimizing. To "globally" optimize her portfolio, suppose the worker must consider negotiating with firm 1.[56] *If she does so, she would not negotiate with firm 2 only if $w_2 \geqslant \hat{\rho}_2 v_2$. Therefore, if $w_2 \geqslant \hat{\rho}_2 v_2$, she optimally selects option 3 if and only if her expected utility from option 3 exceeds that from option*

[56]Note that the maintained assumptions that $\hat{\rho}_1, \hat{\rho}_2 > 0$, $v_1 - w_1, v_2 - w_2 > 0$ and $v_1 > v_2$, means that the worker cannot optimally negotiate with neither firm if $v_2 > w_1$; she would be better off negotiating with only firm 1. Because we have previously argued that $v_2 > w_1$ is a necessary condition for the optimality of option 3, it must be that if option 3 is potentially optimal, then option 4 is not.

2: $\hat{\rho}_2 v_2 + (1-\hat{\rho}_2) w_1 \geqslant \hat{\rho}_1 v_1 + (1-\hat{\rho}_1) w_2$. *Similarly, conditional on negotiating with firm 1, she would negotiate with firm 2 if* $w_2 < \hat{\rho}_2 v_2$. *Therefore, if* $w_2 < \hat{\rho}_2 v_2$, *she optimally selects option 3 if and only if her expected utility from option 3 exceeds that from option 1:* $\hat{\rho}_2 v_2 + (1-\hat{\rho}_2) w_1 \geqslant \hat{\rho}_1 v_1 + (1-\hat{\rho}_1)\hat{\rho}_2 v_2$.

The above example demonstrates both that negotiation with any subset of firms in a worker's portfolio can be rationalized, but also that finding an optimal portfolio of counteroffers can be hard, as it is insufficient to "locally" optimize—negotiating with a firm has consequences on the marginal risk courted by the rest of the portfolio. Nevertheless, the following result shows that for (almost) any collection of parameter values, there is a unique optimal vector of counteroffers.[57]

Proposition 9. *For any given portfolio of offers, there generically (in the space of match-value vectors* v*) exists a unique optimal vector of counteroffers.*

Based on Proposition 9, we henceforth assume the existence of a unique optimal vector of counteroffers, and study its properties. Therefore, given Remark 6, the worker is not indifferent between any two job offers after negotiating (Stylized Fact 2). This stands in contrast to models in which firms engage in Bertrand-like competition for workers, where the worker is always left indifferent between at least two job offers.

Remark 10. *After negotiating, the worker has strict preferences over all job offers that are not rejected:* $\tilde{w}_i \neq \tilde{w}_j$ *for all* $i \neq j$ *such that* $w_i, w_j > -1$.

Furthermore, we can derive more patterns characterizing the optimal counteroffers. Upon inspection, optimal counteroffers follow a "top down," monotonic structure. Without loss of generality, we label the total potential of each job, given the optimal counteroffers, in descending order of index, i.e. $w_1 + o_1^* > w_2 + o_2^* > ... > w_N + o_N^*$. At optimum, there is some $m \in \{1, 2, ..., N, N+1\}$ such that the worker optimally negotiates with all firms $i < m$ and optimally does not negotiate with all firms $j > m$. That is, if o_j^* is positive (and therefore equals $v_j - w_j$), then so too is o_ℓ^* if and only if $\ell < j$. By construction, the worker will be

[57] As the proof of Proposition 9 reveals, there is always an optimal vector of counteroffers, with uniqueness occurring generically in the space of values $\{v_i\}_{i \in N}$.

employed at firm 1 if and only if her counteroffer at firm 1 is accepted, she will be employed at firm 2 if and only if her counteroffer at firm 1 is rejected and her counteroffer at firm 2 is accepted, and so on.

Although the optimal portfolio of counteroffers has a "top down" structure, finding it is less straightforward. We provide an algorithm in the appendix which finds the optimal portfolio of counteroffers, using a double induction argument to build the optimal portfolio from the "bottom up." One induction loop constructs the optimal counteroffer to a particular firm i given the outside option available, i.e., the worker's expected payoff from the portfolio of firms M with $v_m < v_i$ *given the already calculated optimal counteroffer* o^*_m, $m \in M$. Our construction demonstrates that each firm in M serves as an "inside" option that the worker considers when negotiating with firm i, where the value of the inside option depends on the values (across firms $m \in M$) of v_m and w_m (the reward), and on $\hat{\rho}_m$ (the risk). If the worker wishes, via this induction argument, to negotiate with all firms, then we have found the optimal portfolio of counteroffers. If not, then we consider the lowest-match-value firm i' where our inductive assumption breaks down. The breakdown of our inductive assumption indicates that the worker wants to keep firm i' as a safety option, given the optimal counteroffers constructed to this point. An important monotonicity condition obtains: the worker will not negotiate with i' even if her inside option from lower firms is decreased. Therefore, our algorithm restarts with the assumption that the worker does not negotiate with i'. We run the first induction loop again, and continue alternating between the induction loops. Importantly, we show that any time the second induction loop starts, it has advanced by at least one firm. Therefore, the algorithm must terminate, and does so at the optimal portfolio of counteroffers.

The following result characterizes features of the optimal counteroffers.

Proposition 11 ("Top down" monotonicity and Leverage)**.** *Fix a collection of initial offers, negotiation beliefs, and match values* $\{w_i, \hat{\rho}_i, v_i\}_{i \in N}$.

1. *Suppose* $\hat{\rho}_i > 0$ *for all* i*, and let* j *be the firm with the highest initial offer that the worker does not optimally negotiate with. The worker optimally negotiates with every firm* ℓ *such that* $v_\ell > v_j$.

2. *Let* θ_i *represent the expected value the worker receives in her optimal portfolio conditional on negotiating with, and being rejected from, all firms* j *such that* $w_j + o_j^* > v_i$*. Then she optimally negotiates with firm* i *if and only if* $\frac{\hat{\rho}_i v_i - w_i}{\hat{\rho}_i - 1} \geqslant \theta_i$*.*

This result speaks to the "top down" structure of optimal counteroffers, and the role of leverage in affecting the risk versus reward calculation governing whether a worker negotiates with a particular firm. Point 1 describes the "top down" structure, such that the worker picks a "threshold" firm and negotiates with only those with value larger than that of the threshold firm. Points 2 relates this top down structure to leverage. It finds that the "threshold" firm in part 1 is the highest initial offer firm such that a local optimization constraint fails: the worker finds the risk of negotiating too high compared to the inside option (represented by θ_i) given the remaining portfolio optimal counteroffers. The inside option θ_i can be thought of as a notion of leverage; the higher θ_i, the less to lose the worker has when negotiating with firm i. Point 2 therefore states that the higher the inside option, the more leverage the worker has in a negotiation, which increases her desire to negotiate.

5.5 Setup: Equilibrium

Thus far, our theoretical analysis has considered the decision problem from the perspective of a job seeker in the economy. In this section, we embed this single-worker decision problem into a strategic, equilibrium setting. This importantly allows us to consider general equilibrium effects of policy changes; that is, our field experiment considers the effects of changing the negotiation behavior of a small fraction of the workforce, and thus, our analysis is likely uncontaminated by the indirect effects of firm responses. By contrast, the equilibrium framework presented shortly will allow comparison of policy decisions which change the overall rate of bargaining, and therefore, will incur non-trivial firm responses.

Naturally, not all workers in the economy face the same fundamentals: workers differ in their observable characteristics (e.g. gender), in their unobservable characteristics (e.g. outside option), and in their success at search (e.g. number of job offers). We first introduce the setup and timing of our model, and then describe the interactions that our model allows.

A worker in our model is associated with a type composed of a group identity, either A or

B, an outside option $\theta \in \Theta \subset \mathbb{R}$ where Θ is a compact subset of $\mathbb{R}$, a subset of firms $N \subset \mathcal{N}$ she interacts with (we assume $|\mathcal{N}| \geqslant 1$ to rule out trivial cases), and a belief negotiation probability vector $\hat{\rho} \in [0,1]^{\mathcal{N}}$. Let $\underline{\theta}$ and $\bar{\theta}$ represent the minimum and maximum values, respectively, of $\theta \in \Theta$. We represent a generic worker type as $r \in \{A, B\} \times \Theta \times 2^{\mathcal{N}} \times [0,1]^{\mathcal{N}}$. All worker types have a common match value ν_i for each firm $i \in \mathcal{N}$. That is, we are considering a set of workers that are equally productive across firms, but are heterogeneous across other dimensions.

First, each firm $i \in \mathcal{N}$ commits to a menu of initial wage offers, and to a negotiation probability. Because we are considering a scenario in which firms observe a worker's group identity, we allow the initial wage offer of each depend on the worker's group identity, which we denote by w_i^g, $i \in \mathcal{N}$ and $g \in \{A, B\}$, thus allowing for the possibility of "wage discrimination." Simultaneously, each firm $i \in \mathcal{N}$ selects a negotiation probability ρ_i. We do not allow this negotiation probability to differ by group identity; mechanically, this means that we are not allowing "negotiation discrimination," however, as will become clear shortly, such a constraint does not affect our upcoming analysis.

Second, Nature selects a single worker to enter the labor market, given a commonly known distribution F over market fundamentals. We place little structure on this distribution, which allows us to explore correlation between different elements of the worker's type, e.g. it could be that B—group workers typically have low outside options. Similarly, distribution F captures the network of firm competition; it may be the case that with high probability either both firms i and j appear in a worker's portfolio, or neither appears. Our only requirement is that the distribution has full support over all $(g, \theta, N) \in \{A, B\} \times \Theta \times 2^{\mathcal{N}} \setminus \{\emptyset\}$—informally, it means there is positive probability of a worker of either group, with an outside option of "approximately" any value, who interacts with any non-empty subset of firms.

Third, the worker selected by Nature engages in the single-worker search problem: given the selected group identity g, the firm subset N, the worker outside option θ, and the worker's belief vector $\hat{\rho}$, the worker selects counteroffers for portfolio $\{w_i^g, \hat{\rho}_i, \nu_i - \theta\}_{i \in N}$.

Each worker's payoff is defined as before, and each firm i's payoff is zero if it does not employ the worker, and $\nu_i - w$ if it does, where w represents the final wage paid.

Collecting the primitives described above, we parameterize a *labor market* by $(\mathcal{N}, \Theta, F, \{\nu_i\}_{i \in \mathcal{N}})$,

where $\mathcal{N}$ is a set of firms, Θ is a compact set of possible outside options, F is a distribution (satisfying our regularity conditions) over fundamentals, and $\{\nu_i\}_{i\in\mathcal{N}}$ is a vector of match values. We continue to assume for ease of exposition that $\nu_i \neq \nu_j$ for all distinct $i, j \in \mathcal{N}$.

The following definition introduces our solution concept:

Definition 12 ((Partial) Equilibrium)**.** *Consider a labor market parameterized by* $(\mathcal{N}, \Theta, F, \{\nu_i\}_{i\in\mathcal{N}})$*. Consider the following three conditions:*

Worker optimization *Each worker type* r *in the support of* F *solves the optimal portfolio problem* $\{w_i^g, \hat{\rho}_i^r, \nu_i - \theta^r\}_{i\in\mathcal{N}^r}$*, where terms relating to the worker type are indexed by* r*,*

Firm optimization *Each firm* $i \in \mathcal{N}$ *sets* $w_i^A \in [-\bar{\theta}, \nu_i]$*,* $w_i^B \in [-\bar{\theta}, \nu_i]$*, and* $\rho_i \in [0, 1]$ *to maximize its expected payoff given* $(\mathcal{N}, \Theta, F, \{\nu_i\}_{i\in\mathcal{N}})$*, and*

Rational expectations *For each firm type* r *in the support of* F*,* $\hat{\rho}_i = \rho_i$*.*

We say that labor market $(\mathcal{N}, \Theta, F, \{\nu_i\}_{i\in\mathcal{N}})$ *is in* partial equilibrium *if it satisfies* ***Worker optimization*** *and* ***Firm optimization****. We say that labor market* $(\mathcal{N}, \Theta, F, \{\nu_i\}_{i\in\mathcal{N}})$ *is in* equilibrium *if it satisfies* ***Worker optimization****,* ***Firm optimization****, and* ***Rational expectations****.*

The first two conditions laid out in Definition 12 are standard optimization conditions: all firms and worker types maximize their expected utility given their beliefs. However, the beliefs of workers regarding negotiation risk do not have to be consistent with the actions of firms; partial equilibrium therefore captures our empirical finding that some workers' beliefs regarding negotiation risk are misspecified. By contrast, in equilibrium, rational expectations additionally requires belief consistency. Therefore, in equilibrium (but not in partial equilibrium) each firm i's choice on offer negotiability implies a differential deterrence effect; selecting a high value of ρ_i will, caeteris paribus, lead to fewer workers negotiating with i. Mechanically, worker beliefs are determined through the support of F—a labor market in equilibrium involves a distribution F that never selects "incorrect" beliefs.

The following result states that a partial equilibrium always exists for any F, and that an equilibrium always exists. Given the discussion in the previous paragraph, these points can be interpreted as follows: a partial equilibrium always exists for any belief vector $\hat{\rho}$ chosen by F,

whereas, because an equilibrium requires rational expectations to be satisfied, an equilibrium requires that the "correct" belief vector $\hat{\rho} = \rho$ is always chosen.

Finally, not all equilibria feature negotiation rates that match worker beliefs; it may be the case that workers believe a particular firm i has a large value $\hat{\rho}_i = \rho_i$, but it may be that only a small fraction of worker types actually negotiate with this firm in equilibrium. The relevance of negotiation rates matching beliefs comes from a messaging perspective: suppose a regulator wishes to change the equilibrium through a campaign to affect worker beliefs. However, the regulator is constrained by the truth (as were we in our experimental setting) and must reveal the actual rate of negotiations that occur at each firm. Moreover, the regulator does not know all of the details of the labor market (e.g. the match values), and does not want to give incorrect policy advice. For example, suppose a regulator wishes to enforce an equilibrium in which $\hat{\rho}_i = 0$ for all firms i. To do so, the regulator could potentially impose large fines on a firm i that sets $\rho_i > 0$. In order to persuade all worker types—regardless of other details of the labor market—not to make any counteroffers, it must be that no worker can learn (potentially from an external information source) that some firms do in fact receive counteroffers from a positive fraction of workers; otherwise, one worker r may believe it is possible to negotiate, implying $\hat{\rho}_i^r > 0$. We call a belief vector *robustly self enforcing* if the regulator can guarantee the negotiation rates match worker beliefs, as formalized by the following definition.

Definition 13. *For any* $(\mathcal{N}, \Theta)$ *we call a collection of beliefs* $\hat{\rho} \in [0,1]^{\mathcal{N}}$ robustly self-enforcing *if for all labor markets* $(\mathcal{N}, \Theta, F, \{\nu_i\}_{i \in \mathcal{N}})$ *such that* $\hat{\rho}$ *is the only belief vector in the support of* F*, there exists an equilibrium in which each firm* $i \in \mathcal{N}$ *negotiates with the selected worker with probability* $\hat{\rho}_i$*.*

The following result states the existence of partial equilibria, equilibria, and equilibria with robustly self-enforcing beliefs. Intuitively, each of these solution concepts places more restrictions than the latter: a partial equilibrium exists for any collection of worker beliefs, an equilibrium exists if all workers have the same "correct" beliefs, and robustly self-enforcing beliefs can be supported in equilibrium if and only if all workers believe each firm i makes a deterministic decision on whether or not to accept counteroffers.

Proposition 14.

1. *Any labor market* $(\mathcal{N}, \Theta, F, \{\nu_i\}_{i\in\mathcal{N}})$ *admits a partial equilibrium,*

2. *Any labor market* $(\mathcal{N}, \Theta, F, \{\nu_i\}_{i\in\mathcal{N}})$ *admits an equilibrium if and only if there is a single belief vector* $\hat{\rho}$ *in the support of* F*,*

3. *Any* $(\mathcal{N}, \Theta)$ *admits a robustly self-enforcing belief vector* $\hat{\rho} \in [0,1]^{\mathcal{N}}$ *if and only if* $\hat{\rho}_i \in \{0,1\}$ *for all* $i \in \mathcal{N}$*.*

The first two parts of this proposition follow straightforwardly. To see that a partial equilibrium exists, note that we have already established in Proposition 9 that for any portfolio of offers and beliefs $\{w_i, \nu_i, \hat{\rho}_i\}_{i\in N}$ (and for any outside option θ; recall that we initially normalized the outside option to zero, but this was merely a normalization) there exists an optimal portfolio of counteroffers for the selected worker. Therefore, any given strategy profile of firms generates a distribution over payoffs for each firm; it follows from established equilibrium-existence results (see, e.g. Reny, 2020, Theorem 3) that the truncated game which "automates" the portfolio bargaining problem and directly yields each firm the expected payoff given the selected strategies by all firms, contains a Nash equilibrium.[58] Our game, which is a concatenation of the firm-side decisions followed by the worker-side decisions, therefore always has a partial equilibrium, as rational expectations are not required. To see that an equilibrium exists if the support of F contains only the "correct" beliefs $\hat{\rho}$, we claim that each firm i's payoff is unaffected by the choice of ρ_i. This follows for two reasons: first, as can be seen in Part 2 of Proposition 11, each worker type's decision to make a counteroffer is affected by the belief $\hat{\rho}_i$ but not by the choice ρ_i. Second, given a worker with belief vector $\hat{\rho}_i$, an outside option θ, a set of encountered firms $N \subset \mathcal{N}$ and a collection of firm offers and match values, $\{w_i^A, w_i^B, \nu_i\}_{i\in N}$, the payoff of no firm $i \in N$ is zero if the worker negotiates (either the worker receives the entire match value, or the firm rejects the worker). Therefore, the same argument ensuring the existence of a partial equilibrium implies that, for a distribution F with a single belief vector, there is an equilibrium of the firm-side truncated game in which each firm selects $\rho_i = \hat{\rho}_i$.

[58] A similar "automation" argument used to show existence of equilibrium is presented in Gentile Passaro et al. (2024).

5.6 Comparison of (partial) equilibria

Different (partial) equilibria result in different outcomes. We study the efficacy of equilibria and partial equilibria across a number of measures. To do so, we introduce some notation.

Consider a non-empty family H of labor markets $\{(\mathcal{N}, \Theta, F^h, \{\nu_i\}_{i\in\mathcal{N}})\}_{h\in H}$ where for each $h \in H$, P^h is the set of belief vectors in the support of F^h, and the marginal distributions over all other components are constant across all $h \in H$. In words, we consider a family of labor markets which differ only in the belief vector of workers differs. Recalling Proposition 14, this formalization allows us to consider a set of equilibria and partial equilibria that vary only in their belief vectors; let E^h represent the set of equilibria and partial equilibria of the labor market indexed by h.

We define the following notation within this family of labor markets and their respective sets of (partial) equilibria. For any labor market $h \in H$ and any worker type r in the support of F^h with outside option θ^r and offers from firms $N^r \subset \mathcal{N}$, let $V^{N^r} := \max\left\{\{\nu_i : i \in N^r\} \cup \{\theta\}\right\}$ represent the highest achievable match value given offers from the set of firms N^r, including her outside option. For a given $N \subset \mathcal{N}$, let $R^{N,g,h}$ represent all worker types in the support of F^h that encounter set N of firms and are of group $g \in \{A, B\}$. In what follows, all probability statements are with respect to the distribution of primitives in the labor market indexed by h, and the (partial) equilibrium $e^h \in E^H$. Let $w^{e^h,r}$ and $v^{e^h,r}$ represent worker r's expected wage and the expected match value r generates, respectively, in (partial) equilibrium $e^h \in E^h$.

- The *efficiency* of a (partial) equilibrium e^h is equal to the expected fraction of the maximum match value generated:

$$\mathbb{E}(v^{e^h,r}/V^{N^r}).$$

- The *worker surplus* of a (partial) equilibrium e^h is equal to the expected fraction of the maximum match value captured by the worker:

$$\mathbb{E}(w^{e^h,r}/V^{N^r}).$$

- The *wage gap between groups* in a (partial) equilibrium e^h is equal to the expected

absolute difference in wages between workers from different groups with job offers from the same firms:

$$\sum_{N \subset \mathcal{N}} Pr(N) \cdot \left| \mathbb{E}\left(w^{e^h, r} : r \in R^{N,A,h} \right) - \mathbb{E}\left(w^{e^h, r} : r \in R^{N,B,h} \right) \right|,$$

where $Pr(N)$ represents the probability that $N \subset \mathcal{N}$ is the subset of firms the selected worker type encounters which is common across all F^h, $h \in H$.

An important point to note when measuring these three outcomes is that we are holding all aspects of the labor market fixed, except for the belief vector. That is, we are considering equilibrium outcomes assuming that the fundamentals of the labor market do not change when the belief vector changes. Moreover, all three definitions make comparisons involving the set of firms the worker encounters. Specifically, supposing the wage gap between groups is zero, it is possible that the expected wage of $A-$group workers differs from that of $B-$group workers if (and only if) workers of different groups encounter some subset of firms N with different probability.

The following proposition presents an evaluation of "lean in" equilibria in which $\hat{\rho}_i = 1$ for all $i \in \mathcal{N}$. Any such equilibrium is payoff equivalent, and compared to any other equilibrium or partial equilibrium outcome, a "lean in" equilibrium yields higher efficiency, higher worker surplus, and smaller wage gap between groups. Indeed, any "lean in" equilibrium maximizes the efficiency and worker surplus, and minimizes the wage gap between groups, within the set of feasible matchings.

Proposition 15 (Efficacy of "Lean in" Equilibria)**.** *Let* $(\mathcal{N}, \Theta, F, \{\nu_i\}_{i \in \mathcal{N}})$ *be a labor market such that such that* $\hat{\rho}_i = 1$ *for all* $i \in \mathcal{N}$ *is the unique belief vector in the support of* F*. Then in any equilibrium of this labor market: the efficiency and worker surplus is 1, while the wage gap between groups is 0.*

In fact, Proposition 15 is not a knife edge result—any equilibrium with a belief vector $\hat{\rho} \approx \vec{1}$ achieves nearly the same properties as "lean in" equilibria featuring $\hat{\rho} = \vec{1}$.

Proposition 16. *Consider an infinite sequence of labor markets* $\{(\mathcal{N}, \Theta, F^h, \{\nu_i\}_{i \in \mathcal{N}})\}_{h=1,2,\ldots}$ *where for each* h*, there is a single belief vector* $\hat{\rho}^h$ *in the support of* F^h*,* $\hat{\rho}^h \to \vec{1}$ *in* h*, and the*

marginal distributions over all other components are constant across all $h \in H$. *For any* $\epsilon > 0$, *there exists some* h^* *such that for all* $h > h^*$ *and in any equilibrium* $e^h \in E^h$, *the efficiency and worker surplus is no less than* $1 - \epsilon$, *while the wage gap between groups is no more than* ϵ.

6 Conclusions

Salary negotiations are widespread in some labor markets and have the potential to affect not only individual job choices and amenities, but also market level pay equity and match efficiency. In this paper, we set out to bridge the gap between canonical full-information models of bargaining with the realities we observe in the field. By leveraging a field experiment in the US technology sector, we uncover that uncertainty about offer negotiability (even more so than the uncertainty of *how* to negotiate) prevents workers from fully exercising their bargaining power.

Our empirical findings reveal that when workers are provided with information that encourages negotiation, rates of negotiation rise and so to does average compensation. This is especially true among women, who make up a minority of US tech workers.

Based on these empirical insights, we model negotiation choices over a portfolio of offers, allowing for uncertainty about the (potentially negative) response of the employer. This model predicts that workers negotiate their best offers first, making counterproposals that exceed their outside option. Indeed this prediction bears out in the observational data: compared to initial offers, final offers are more dispersed on average, rather than more equal, as predicted by Bertrand competition.

Our model allows us to consider policies that affect negotiation rates at the market level, allowing employers to strategically respond by adjusting their stance toward negotiations and also their initial wage offers. We compare the status quo with the "lean in" negotiation equilibrium where negotiations are encouraged by policies that reduce risks associated with negotiations (eg. offers stand for at least two weeks, or employers are fined). We find the "lean in" equilibrium maximizes worker welfare, efficiency and equity.

In summary, we believe that our study offers a unified framework that explains why

negotiation behavior varies across job candidates for the same job, and highlights the potential gains from promoting negotiation.

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Figure 1 Treatment Messages

Panel A: Negotiation Lessons Message

According to a survey conducted by Fidelity Investments, around 42% of Americans attempted to negotiate the initial offer that they received. There is evidence suggesting that people should attempt to negotiate even more often.

Don't feel guilty about negotiating. While it's natural to feel guilty or afraid about it, companies expect you to negotiate. In some cases, the person you are negotiating with has been hired precisely for that job. They'd be happy if you attempt to negotiate – that's what they were hired for! And negotiating the compensation can make the employment relationship stronger.

The success rate is quite high. According to the Fidelity survey, 85% of Americans who attempted to negotiate the compensation terms of their offer were successful – that is, they got at least some of what they asked for.

The gains from negotiating add up quickly. According to the Harvard Business School Negotiations Course, by age 65, the salary gap between those who did and did not negotiate when they were 30 rises to more than $30,000, totaling $1.6 million gains over the working years.

Panel B: Coaching Treatment Message

You have been randomly selected to receive a subsidy for the coaching service, paid for by the research team. This is your special offer:

Levels.fyi usually charges for the coaching service between $1,250 and $2,450. However, through this study, you have the opportunity to enroll in the coaching service for the reduced price of $250.

You have a money-back guarantee: if your negotiation does not lead to a compensation increase of at least $2,500, you will receive a full refund.

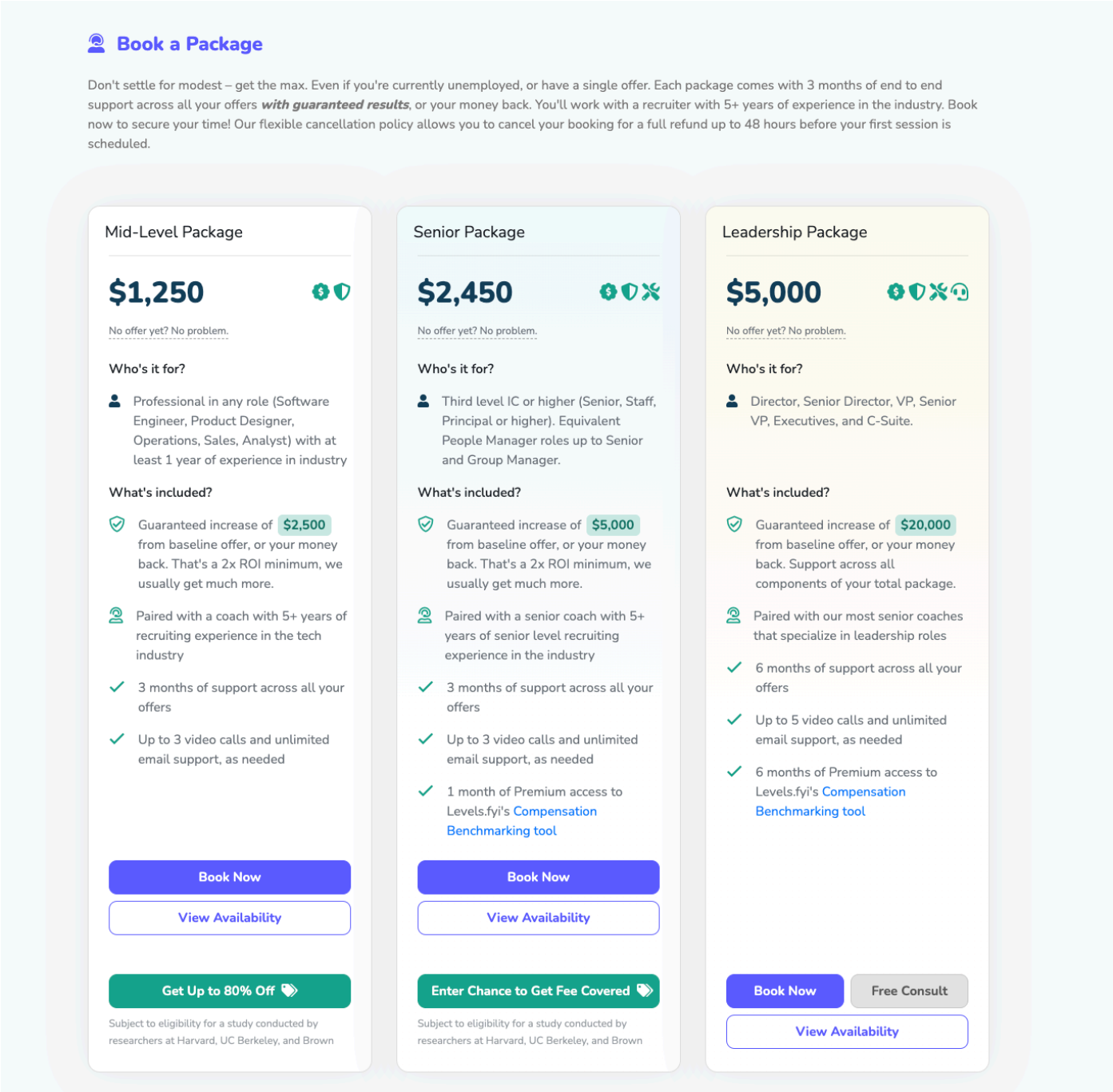
There is no need to provide your credit card information at this stage. To claim this special offer, you will schedule a complimentary consultation as part of this survey. You can use that opportunity to speak to one of the coaches and ask any questions you may have before you book the service.

Would you like to claim this special offer?

- ○ Yes
- ○ No

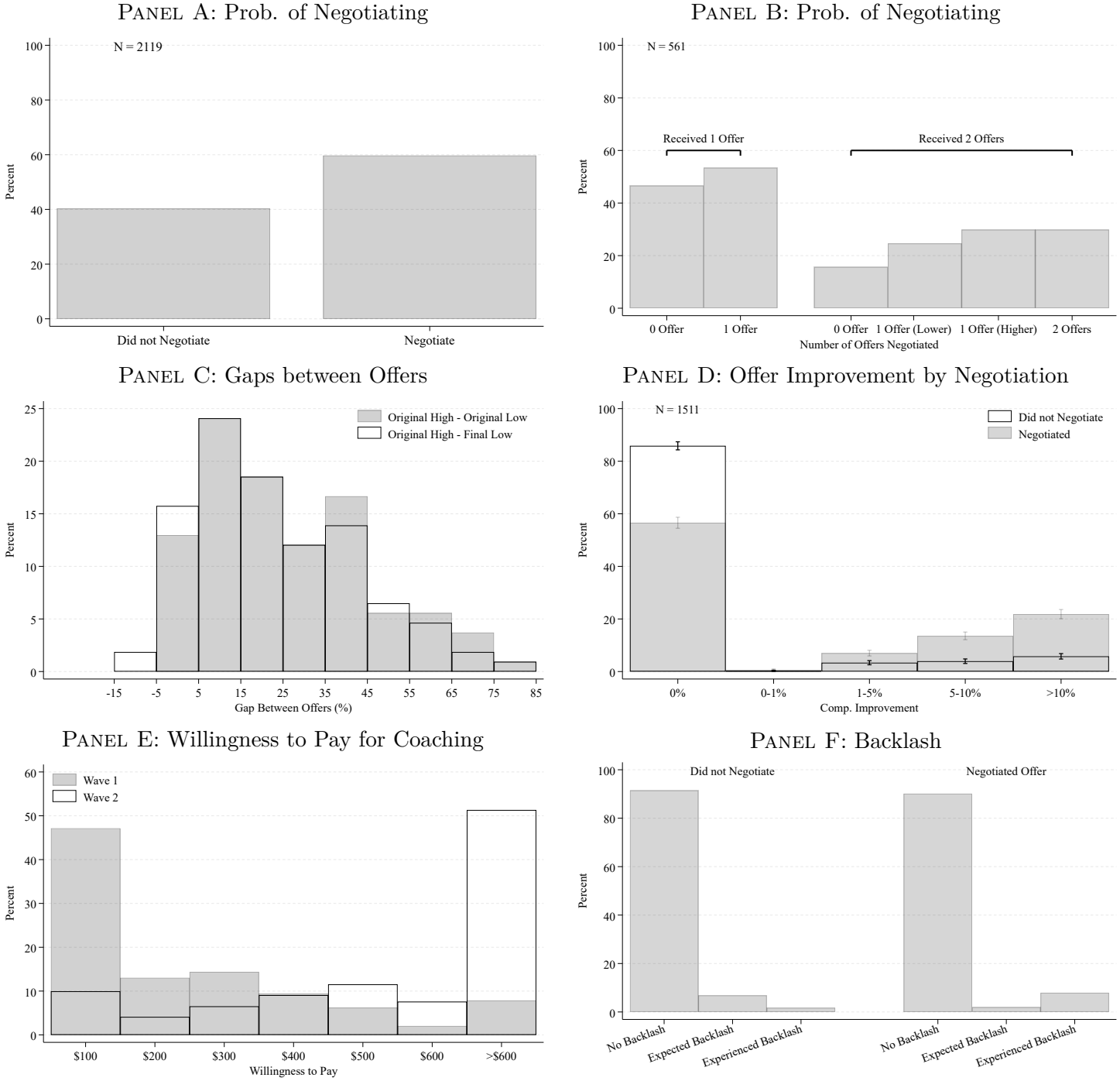
Notes: Panel (A) is a screenshot of the negotiation lessons treatment message. Panel (B) is a screenshot of the coaching service treatment messag

Figure 2 Screenshot of the Website with Survey Links



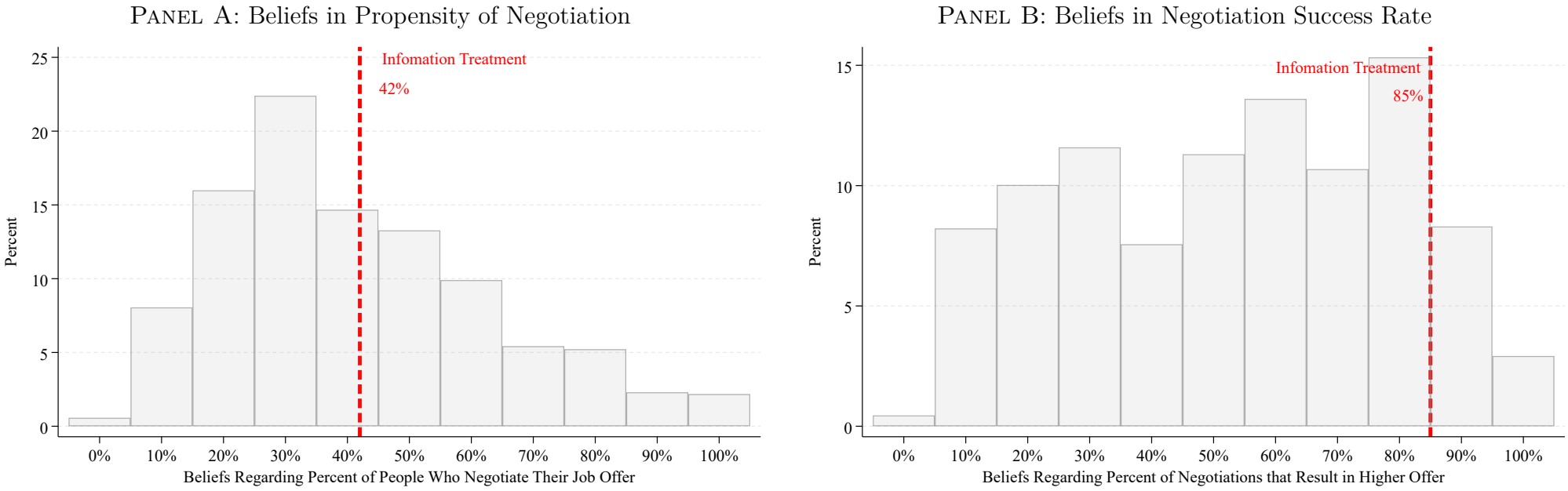
Notes: This is a screenshot of the website with the links to the baseline survey.

Figure 3 Descriptive Analysis



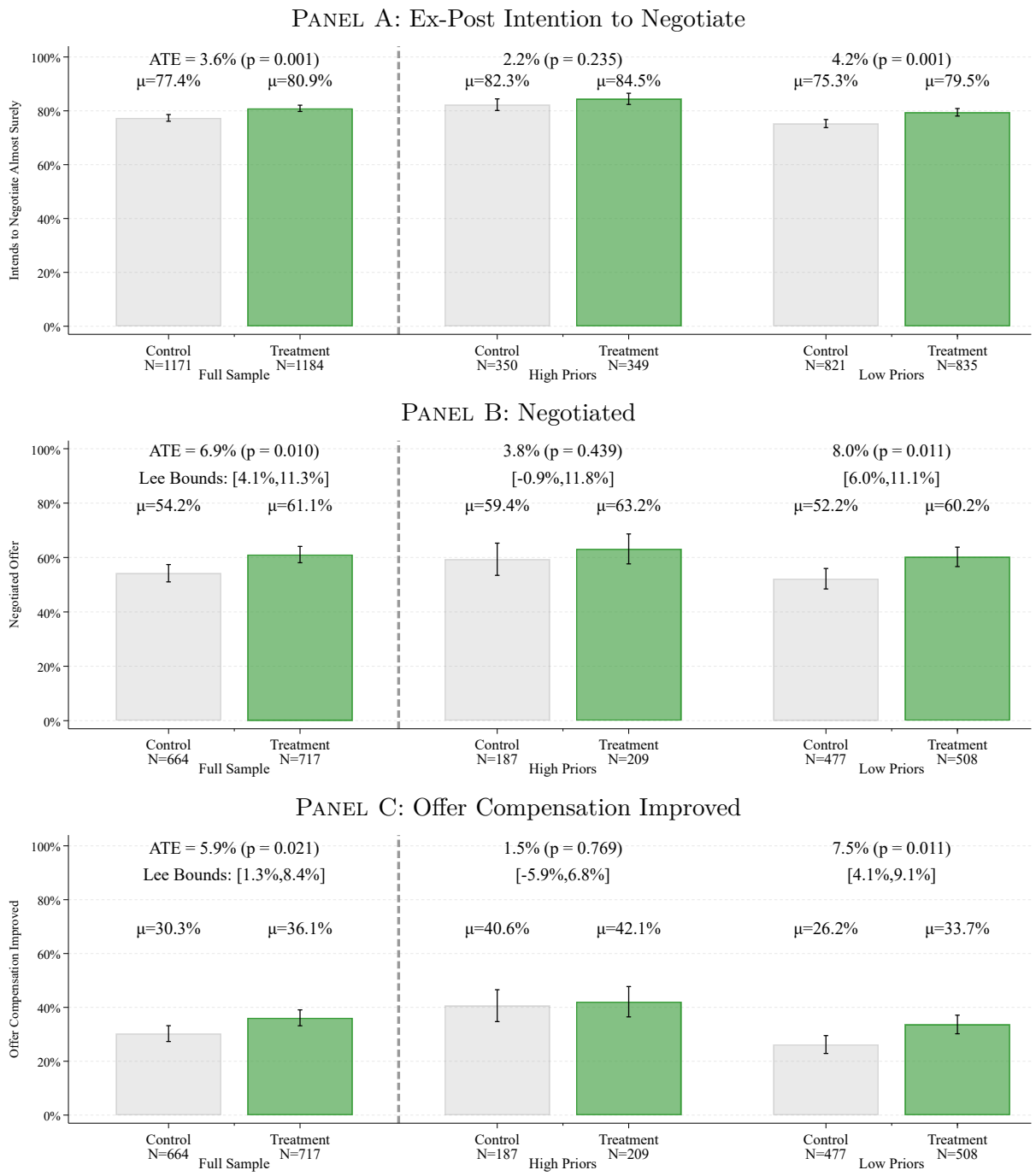
Notes: Panel (a) and (d) is conditional on having at least one offer. Panel (b)–(c)are restricted to survey participants with no current employment and two external offers. Panel (e) includes the full sample. Panel (f) is based on an optional open-ended question: "Did you experience, or do you expect to experience, any negative consequences from your negotiation?" The sample of valid answers are from 23.9% of the offers that were not negotiated and 30.2% of the negotiated offers.

Figure 4 Histograms of Prior Beliefs



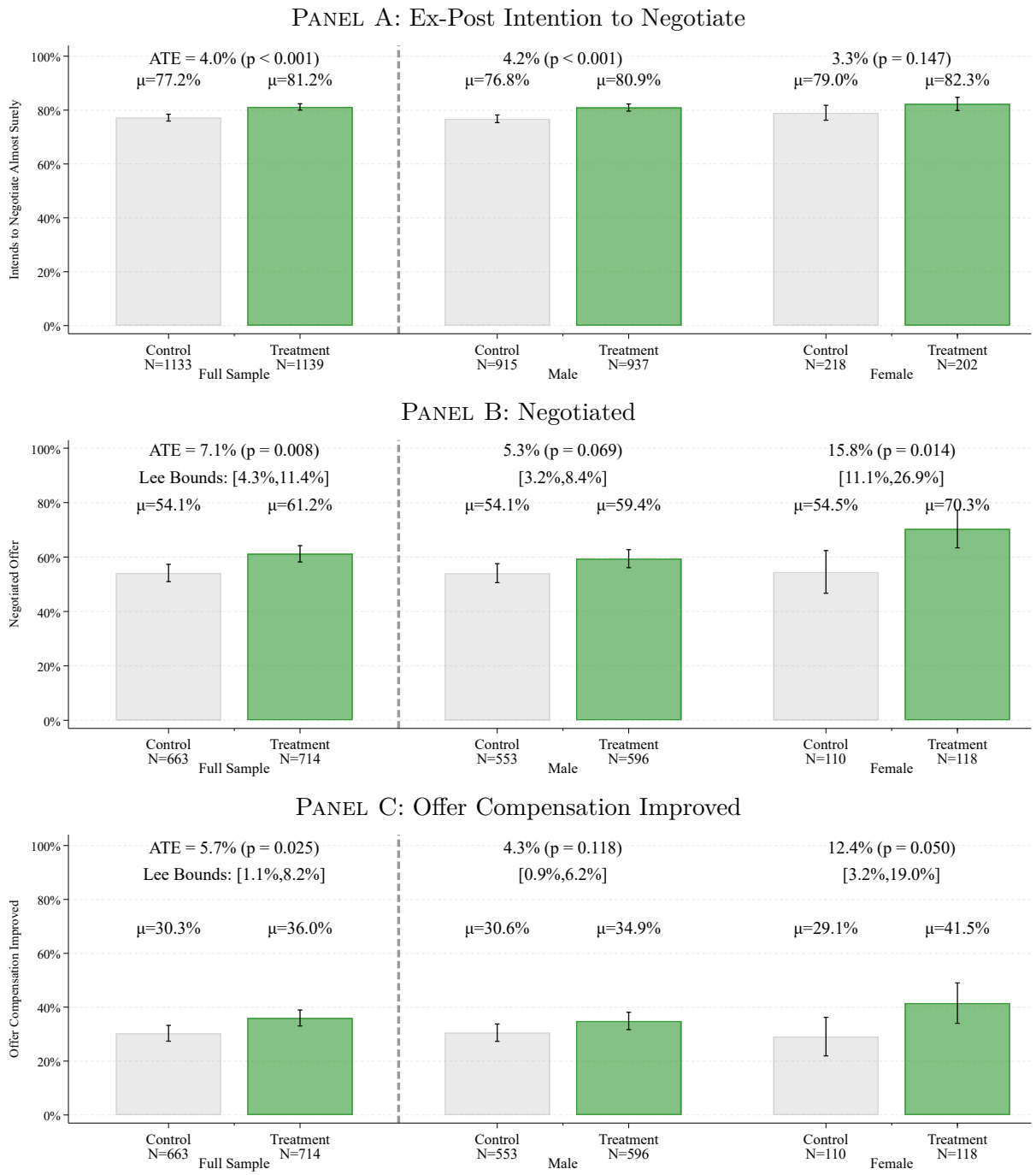
Notes: Panel (A) is based on the question "What percent of people do you think try to negotiate the compensation terms after receiving a job offer?" Panel (B) is based on the question "Among individuals who attempt to negotiate, what percentage of them do you think were successful? In other words, what percentage got at least some of what they asked for?" The dashed lines show the numbers we presented on the encouragement lesson screen.

Figure 5 The Effects of Information Treatment and Heterogeneity by Priors (Wave 1)



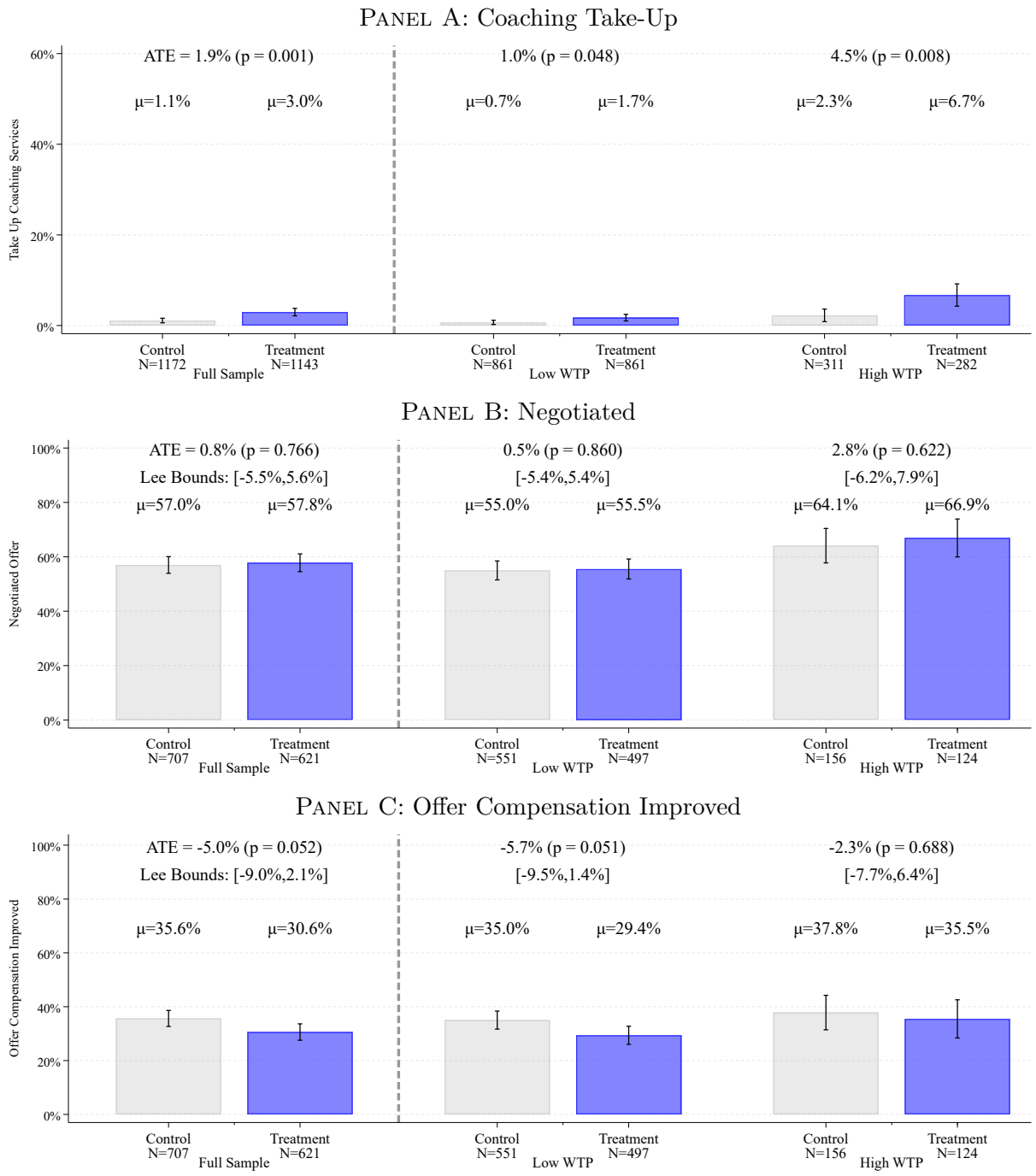
Notes: Main outcomes by information treatment status (with the treated group in green bars and 90% standard errors in brackets). Each panel corresponds to a different dependent variable: Panel (A) for ex-post intention to negotiate, Panel (B) for negotiating an offer, and Panel (C) for having offer compensation increased. In each panel, the first two bars represent the full wave 1 sample, and the right four bars split the sample based on prior beliefs. Participants are categorized as "Low Priors" if their prior estimates about negotiation rates and success rates were lower than the provided information.

Figure 6 The Effects of Information Treatment and Heterogeneity by Gender (Wave 1)



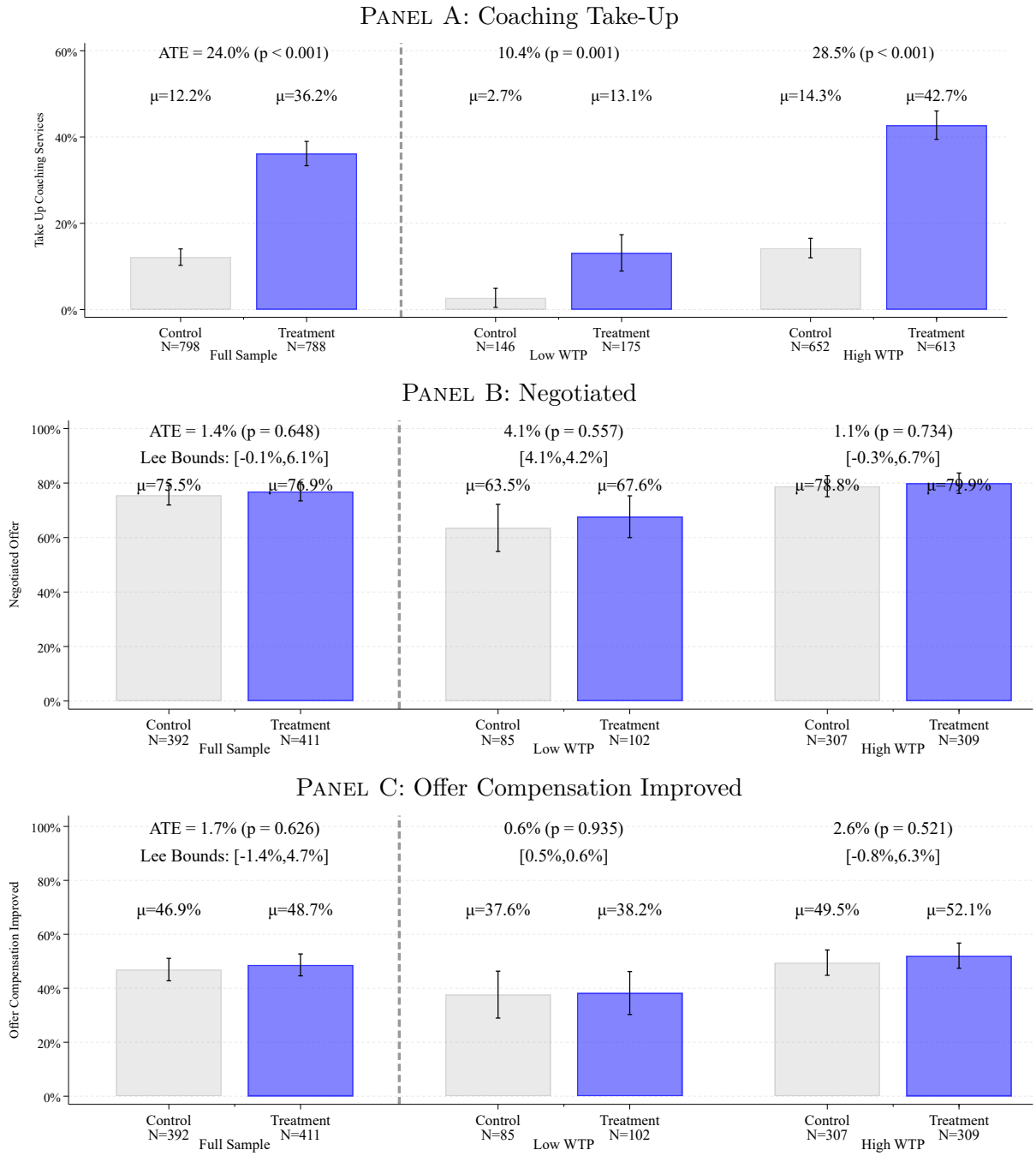
Notes: Main outcomes by information treatment status (with the treated group in green bars and 90% standard errors in brackets). Each panel corresponds to a different dependent variable: Panel (A) for ex-post intention to negotiate, Panel (B) for negotiating an offer, and Panel (C) for having offer compensation increased. In each panel, the first two bars represent the full wave 1 sample, and the right four bars split the sample based on gender.

Figure 7 The Effects of Coaching Treatment and Heterogeneity by Ex-Ante Willingness to Pay (Wave 1)



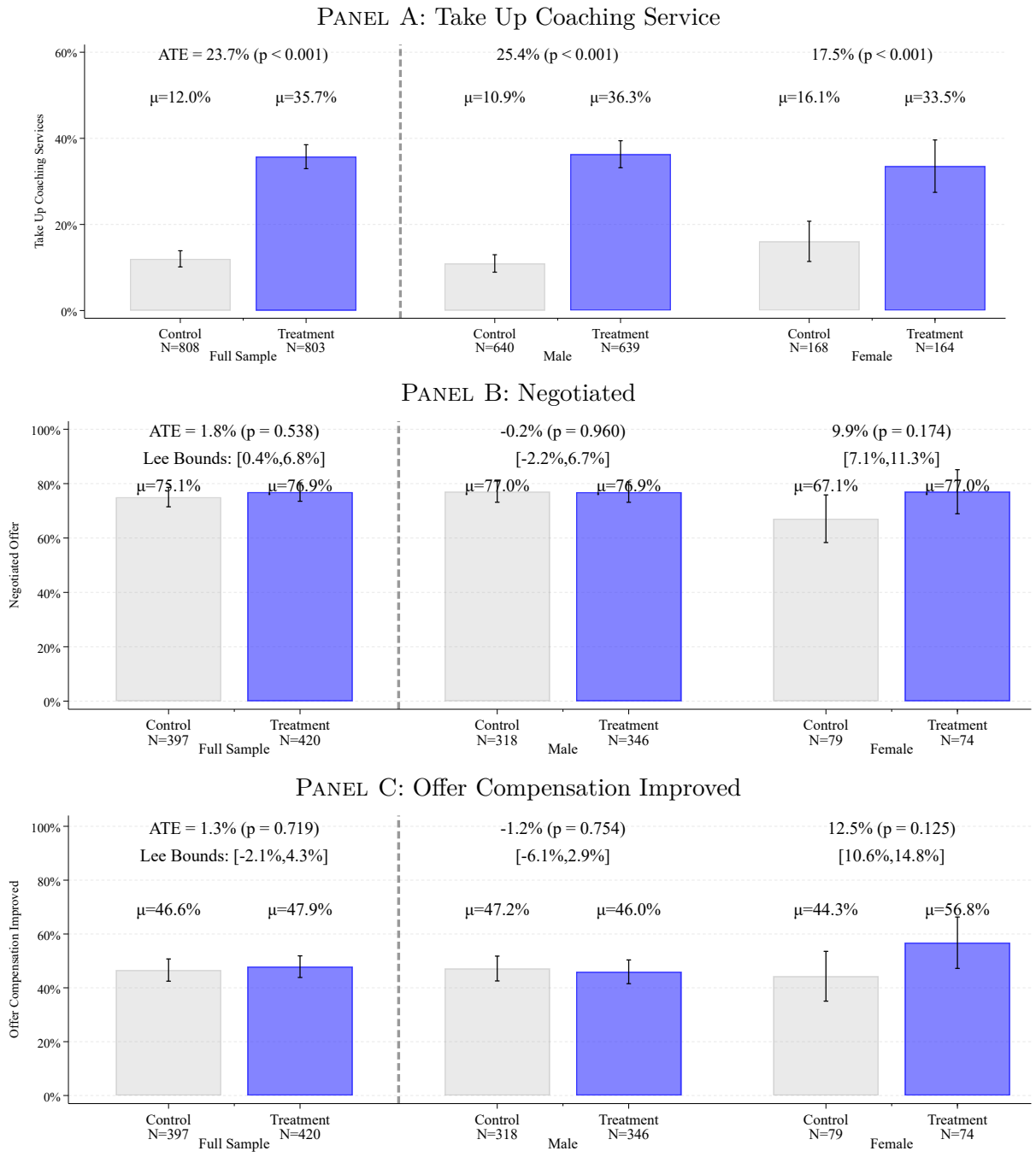
Notes: Main outcomes by coaching treatment status (with the treated group in blue bars and 90% standard errors in brackets). Each panel corresponds to a different dependent variable: Panel (A) for taking up coaching services, Panel (B) for negotiating an offer, and Panel (C) for having offer compensation increased. In each panel, the first two bars represent the full wave 1 sample, and the right four bars split the sample based on ex-ante willingness to pay for coaching services. Participants are categorized as "Low WTP" if their their willingness to pay is lower than $250 (i.e., the discounted price in the treatment).

Figure 8 The Effects of Coaching Treatment and Heterogeneity by Ex-Ante Willingness to Pay (Wave 2)



Notes: Main outcomes by coaching treatment status (with the treated group in blue bars and 90% standard errors in brackets). Each panel corresponds to a different dependent variable: Panel (A) for taking up coaching services, Panel (B) for negotiating an offer, and Panel (C) for having offer compensation increased. In each panel, the first two bars represent the full wave 2 sample, and the right four bars split the sample based on ex-ante willingness to pay for coaching services. Participants are categorized as "Low WTP" if their their willingness to pay is lower than $250 (i.e., the discounted price in the treatment).

Figure 9 The Effects of Coaching Treatment and Heterogeneity by Gender (Wave 2)



Notes: Main outcomes by coaching treatment status (with the treated group in blue bars and 90% standard errors in brackets). Each panel corresponds to a different dependent variable: Panel (A) for taking up coaching services, Panel (B) for negotiating an offer, and Panel (C) for having offer compensation increased. In each panel, the first two bars represent the full wave 2 sample, and the right four bars split the sample based on gender.

A Proofs, and Additional Theoretical Results

Proof of Proposition 9:

Proof. Without loss of generality, let $v_1 > v_2 > ... > v_N$. Because the worker's match value is lowest at firm N than at all other firms, the worker accepts a job at firm N only if, for each firm $i < N$, she was either rejected from i, or chose not to negotiate with i.

Consider the following algorithm.

Stage [1] Let n be the smallest-index firm such that either $\hat{\rho}_n = 1$ or $w_n = v_n$. If no such n exists, then define $n = N+1$. If $n < N+1$, then $o_n^* = v_n - w_n$, and $o_i^* = 0$ for all $i > n$. If $n = 1$, then terminate the algorithm. Otherwise, go to Stage [2].

The remainder of this algorithm considers $i < n$. We inductively construct the optimal counteroffers via a double induction argument.

Stage [2] Let $\theta_{n-1} := v_n \mathbb{1}_{n<N+1}$.

Stage [2.1] If $\hat{\rho}_{n-1}v_{n-1} + (1-\hat{\rho}_{n-1})\theta_{n-1} \geqslant w_{n-1}$, then set $o_{n-1}^{[2.1]} = v_{n-1} - w_{n-1}$ and set $\theta_{n-2}^{[2.1]} = \hat{\rho}_{n-2}v_{n-2} + (1-\hat{\rho}_{n-2})\theta_{n-1}$. Otherwise, set $o_{n-1}^{[2.1]} = 0$ and set $\theta_{n-2}^{[2.1]} = w_{n-1}$. If $n-1 = 1$ then terminate the algorithm and let $o_i^{[2.1]} = o_i^*$ for all $i \leqslant n$. Otherwise, go to Stage [2.2].

Stage [2.k] Let $o_i^{[2.k]} = o_i^{[2.k-1]}$ for all $i \in \{n, ..., n-(k-1)\}$. If $\hat{\rho}_{n-k}v_{n-k} + (1-\hat{\rho}_{n-k})\theta_{n-k}^{[2.k-1]} \geqslant w_{n-k}$, then set $o_{n-k}^{[2.k]} = v_{n-k} - w_{n-k}$ and set $\theta_{n-k-1}^{[2.k]} = \hat{\rho}_{n-k-1}v_{n-k-1} + (1-\hat{\rho}_{n-k-1})\theta_{n-k}^{[2.k-1]}$, moreover, if $n-k = 1$ then terminate the algorithm and let $o_i^{[2.k]} = o_i^*$ for all $i \leqslant n$ and if $n-k > 1$ then go to Stage $[2.k+1]$. If $\hat{\rho}_{n-k}v_{n-k} + (1-\hat{\rho}_{n-k})\theta_{n-k}^{[2.k-1]} < w_{n-k}$, go to Stage [3].

Stage [m] Let $K^{[m]}$ be the final firm considered in Stage $[m-1]$. Let $o_{K^{[m]}}^{[m.1]} = 0$, $o_i^{[m.1]} = 0$ for all $i > K^{[m]}$ such that $v_i \leqslant w_K^{[m]}$ or $\hat{\rho}_i = 0$, and let $o_j^{[m.1]} = v_j - w_j$ for all other firms $j > K^{[m]}$. Let $L^{[m]}$ be the set of firms such that for each $\ell \in L^{[m]}$, $w_K^{[m]} < v_\ell < v_K^{[m]}$ and $\hat{\rho}_\ell > 0$. Set $\theta_{K^{[m]}-1}^{[m.1]} = \sum_{j=1}^{|L^{[m]}|} \left(\prod_{\ell=1}^{j-1}(1-\hat{\rho}_{k+\ell})\right)\hat{\rho}_{k+j}v_{k+j} + \left(\prod_{\ell=1}^{|L^{[m]}|}(1-\hat{\rho}_{k+\ell})\right)w_{K^{[m]}}$.

Stage $[m.1]$ If $K^{[m]}-1=0$ then terminate the algorithm and let $o_i^{[m.1]}=o_i^*$ for all $i\leqslant n$. Otherwise, if $\hat{\rho}_{K^{[m]}-1}v_{K^{[m]}-1}+(1-\hat{\rho}_{K^{[m]}-1})\theta^{[m.1]}_{K^{[m]}-1}\geqslant w_{K^{[m]}-1}$, then set $o^{m.1}_{K^{[m]}-1}=v_{K^{[m]}-1}-w_{K^{[m]}-1}$ and set $\theta^{m.1}_{K^{[m]}-2}=\hat{\rho}_{K^{[m]}-2}v_{K^{[m]}-2}+(1-\hat{\rho}_{K^{[m]}-2})\theta^{m.1}_{K^{[m]}-1}$, then go to Stage $[m.2]$. If $\hat{\rho}_{K^{[m]}-1}v_{K^{[m]}-1}+(1-\hat{\rho}_{K^{[m]}-1})\theta^{[m.1-1]}_{K^{[m]}-1}<w_{K^{[m]}-1}$, go to Stage $[m+1]$.

Stage $[m.k]$ Let $o_i^{[m.k]}=o_i^{[m.k-1]}$ for all $i\in\{n,...,K^{[m]}-(k-1)\}$. If $\hat{\rho}_{K^{[m]}-k}v_{K^{[m]}-k}+(1-\hat{\rho}_{K^{[m]}-k})\theta^{[m.k-1]}_{K^{[m]}-k}\geqslant w_{n-k}$, then set $o^{[m.k]}_{K^{[m]}-k}=v_{K^{[m]}-k}-w_{K^{[m]}-k}$ and set $\theta^{[m.k]}_{K^{[m]}-k-1}=\hat{\rho}_{K^{[m]}-k-1}v_{K^{[m]}-k-1}+(1-\hat{\rho}_{K^{[m]}-k-1})\theta^{[m.k-1]}_{K^{[m]}-k}$, moreover, if $K^{[m]}-k=0$ then terminate the algorithm and let $o_i^{[m.k]}=o_i^*$ for all $i\leqslant n$ and if $K^{[m]}-k>0$ then go to Stage $[m.k+1]$. If $\hat{\rho}_{K^{[m]}-k}v_{K^{[m]}-k}+(1-\hat{\rho}_{K^{[m]}-k})\theta^{[m.k-1]}_{K^{[m]}-k}<w_{n-k}$, go to Stage $[m+1]$.

We claim that the algorithm always terminates, does so at an optimal portfolio of counteroffers, and that this optimal portfolio is generically unique.

To see that the algorithm terminates, suppose for contradiction that it does not. This means that at no stage $[m]$, $m>2$ does the algorithm reach a substage $[m.k]$ such that $K^{[m]}-k=1$ and $\hat{\rho}_{K^{[m]}-k}v_{K^{[m]}-k}+(1-\hat{\rho}_{K^{[m]}-k})\theta^{[m.k-1]}_{K^{[m]}-k}\geqslant w_{n-k}$. However, by construction, $(K^{[m]})_{m>2}$ is a strictly decreasing sequence of integers, i.e. a lower index firm is the first firm referenced at the beginning of each Stage. Therefore, there is some stage $[m^*]$, $m\leqslant n+1$ such that $K^{[m^*]}=1$. Then the algorithm immediately terminates, i.e. before reaching Stage $[m^*.1]$. This contradicts that the algorithm never terminates, which completes the desired argument.

We now claim that the outcome of the algorithm o^* is optimal, and uniquely so generically.

To see this, first note that, defining n as in Stage [1], it must be the case that $o'_n=v_n-w_n$ and $o'_i=0$ for all $i>n$ in any optimal counteroffer portfolio. Therefore, if there exists some o' such that o' yields the worker a weakly higher payoff than does o^*, $o'_j=o^*_j$ for all $j\geqslant n$.

Consider any Stage $[m-1]$, $m-1\geqslant 2$. We claim that if the algorithm terminates at the conclusion of Stage $[m-1]$ then o^* is generically uniquely optimal, and if it does not terminate, then $(o^{[m.1]}_{K^{[m]}},o^{[m.1]}_{K^{[m]+1}},...,o^{[m.1]}_N)$ is generically the uniquely optimal portfolio of counteroffers supposing the worker's initial portfolio comprised of only offers from firms

$(K^{[m]}, K^{[m]+1}, ..., N)$. Our argument is by induction on the index of Stages.

Base case, $m-1=2$: If the algorithm terminates in Stage [2] then, by construction, the worker optimally negotiates with all firms $j < n-1$, and the worker has strict incentives to negotiate with all such firms if $\hat{\rho}_{n-k}\nu_{n-k} + (1-\hat{\rho}_{n-k})\theta_{n-k}^{[2.k-1]} > w_{n-k}$ in all Stages [2.k], $k > 1$ which is generically satisfied given that $\hat{\rho}_{n-k}\nu_{n-k} + (1-\hat{\rho}_{n-k})\theta_{n-k}^{[2.k-1]} \geqslant w_{n-k}$ is satisfied (note that by a similar argument, the firm's generically optimal choice is defined for firm $n-1$). If the algorithm does not terminate in Stage [2] then there is some final substage $[2.\hat{k}]$, in which the worker considers negotiation with firm $K^{[3]}$. At the conclusion of stage $[2.\hat{k}]$, the (generically unique) optimal negotiation decision has been determined, by the most recent argument, for all firms $i > K^{[3]}$ under the inductive hypothesis that the worker negotiates with all firms $i \geqslant K^{[3]}$, however, this assumption has been violated by the fact that the transition to Stage [3] implies that the firm does not optimally negotiate with firm $K^{[3]}$ given an expected value $\theta_{K^{[3]}}^{[2.\hat{k}]}$ conditional on being rejected from firm $j \leqslant K^{[3]}$ because

$$\hat{\rho}_{K^{[3]}}\nu_{K^{[3]}} + (1-\hat{\rho}_{K^{[3]}})\theta_{K^{[3]}}^{[2.\hat{k}]} < w_{K^{[3]}}. \tag{A.1}$$

Assume, subject to later verification, that in any optimal vector of counteroffers given a portfolio comprised only of offers from firms $(K^{[3]}, K^{[3]+1}, ..., N)$, that the firm elects not to negotiate with firm $K^{[3]}$. Then, given this portfolio, the worker achieves a payoff of at least $w_{K^{[3]}}$ and must negotiate with firm $i > K^{[3]}$ if and only if $\nu_i \geqslant w_{K^{[3]}}$, $\hat{\rho}_i > 0$, and $w_i < \nu_i$, where by genericity we assume that there are no firms i such that $\nu_i = w_{K^{[3]}}$. Doing so implies that, the worker matches with firm $K^{[3]}$ if and only if she is rejected from all such firms i. This mechanically lowers the worker's continuation value, conditional on being rejected from all such firms i and $K^{[3]}$ to a value lower than $\theta_{K^{[3]}}^{[2.\hat{k}]}$. Therefore, our assumption subject to verification, and the proof of the Base Case, is shown to be correct if and only if the worker optimally elects not to negotiate with firm $K^{[3]}$ given this lower continuation value. But this is satisfied, because if Equation (A.1) is satisfied, it is also satisfied if instead the worker's continuation value $\theta_{K^{[3]}}^{[2.\hat{k}]}$ is reduced.

Induction case, $m-1>2$: Our argument thus far implies that $(o_{K^{[m]}}^{[m.1]}, o_{K^{[m]+1}}^{[m.1]}, ..., o_N^{[m.1]})$ is

generically the uniquely optimal portfolio of counteroffers supposing the worker's initial portfolio comprised of only offers from firms $(K^{[m]}, K^{[m]+1}, ..., N)$. This is clearly true if $K^{[m]} - 1 = 0$, i.e $K^{[m]} = 1$. Otherwise, the construction of $\theta^{[m.1]}_{K^{[m]}-1}$ gives the worker's optimal continuation value given that she is rejected from all firms j such that $j < K^{[m]}$, or $v_j \geqslant w_{K^{[3]}}$, $\hat{\rho}_j > 0$, and $w_j < v_i$. The remainder of the argument follows similar logic as that of the Base Case.

We have already shown that the algorithm terminates at some Stage $[m]$, $m \leqslant n+1$. When it does so, by construction, it specifies a value o_i^* for each firm i. By the inductive argument presented above, it must be the case that o_i^* is generically the unique negotiation vector.

□

Proof of Proposition 11

Proof of Part 1: Consider a firm ℓ such that $v_\ell > v_j$. We argue that the worker optimally negotiates with firm ℓ. To this end, it is either the case that $w_\ell > w_j$ or $w_\ell \leqslant w_j$:

- Suppose $w_\ell > w_j$. Then it must be the case that the worker negotiates with firm ℓ, as desired, or else j would not be the highest-initial-offer firm that the worker does not negotiate with.

- Suppose $w_\ell \leqslant w_j$, and further suppose for contradiction that the worker does not negotiate with firm ℓ. First, note that there is a strictly positive probability that the worker is matched with firm j; if not, then because we assume $\hat{\rho}_i > 0$ for all i, there exists some firm i' with $v_{i'} = w_{i'}$ such that $v_{i'} > v_j$. But combining the inequality and equality in the previous sentence implies that $w_{i'} > w_j$, which contradicts the ongoing assumption that j is the highest-initial-offer firm with which the worker does not negotiate. Given the strictly positive probability of matching with firm j, we claim that $w_\ell \leqslant w_j$ implies that the worker would be better off negotiating with firm ℓ. This claim is clear if $w_\ell < w_j$, and if $w_\ell = w_j$, then the maintained assumption that $v_\ell > v_j$ implies that $v_\ell - w_\ell > 0$ meaning that there are strictly positive gains from negotiating

with firm ℓ. Therefore, the worker not negotiating with firm ℓ contradicts the assumed optimality of the counteroffers.

In both of the exhaustive cases above, we arrive at a contradiction if the worker does not negotiate with firm ℓ, thus completing the argument. □

Proof of Part 2: This follows from inspection of the algorithm provided in the proof of Proposition 9—at each stage, the worker negotiates with the indicated firm i if and only if the stated condition is satisfied. □

Proof of Proposition 14

Proof. We provide an argument in the text for Parts 1 and 2 of the proposition. Here, we provide a formal proof for Part 3.

"if" direction The following argument demonstrates that $\hat{\rho}$ is robustly self-enforcing for any $(\mathcal{N}, \Theta)$ if $\hat{\rho}_i \in \{0, 1\}$ for all $i \in \mathcal{N}$. Throughout, we break indifferences by supposing the worker does not make a counteroffer.

To see this the desired result, first consider a firm $j \in \mathcal{N}$ such that $\hat{\rho}_j = 0$, which implies that no worker type makes a counteroffer to j in equilibrium. Because $w_j^g < v_j$ means by definition that j negotiates with no group-g workers, the claim is demonstrated if we can show that for any $g \in \{A, B\}$, $w_j^g < v_j$ is supported in equilibrium in any labor market $(\mathcal{N}, \Theta, F, \{v_i\}_{i \in \mathcal{N}})$ with a single belief vector $\hat{\rho}$ in the support of F. Holding fixed the strategies of other firms, consider two exhaustive cases. First, suppose that no worker type makes a counteroffer to j for any $w_j^g < v_g$. By the full support assumption on F, and by Part 2 of Proposition 11, this implies that $v_i \leqslant \underline{\theta}$, so that any $w_j^g < v_j$ can be supported in equilibrium. Second, suppose that at least one worker type makes a counteroffer to j for some $w_j^g < v_j$. Consider $\tilde{w}_j^g = \underline{\theta} + \epsilon$, where $\epsilon > 0$. For ϵ sufficiently small, the full support assumption on F and Part 2 of Proposition 11 imply that with positive probability, a worker type r will be selected such that: 1) $\theta^r < \tilde{w}_j^g$, 2) $g^r = g$, 3) $N^r = \{j\}$, and 4) r optimally does not make a counteroffer to j. Such a worker type r will be employed at firm j at wage $\tilde{w}_j^g < v_j$, and because such a type is selected with strictly positive probability, j earns positive expected profit by selecting initial wage offer $\tilde{w}_j^g$.

Thus, j cannot set $w_j^g = v_j$ in equilibrium, as this yields zero profit (from workers of group g). This completes the argument in the case that $\hat{\rho}_j = 0$.

Next, consider a firm $\ell \in \mathcal{N}$ such that $\hat{\rho}_j = 1$. Note that by construction, firm ℓ makes zero profit in any labor market $(\mathcal{N}, \Theta, F, \{v_i\}_{i\in\mathcal{N}})$ with a single belief vector $\hat{\rho}$ in the support of F: either the selected worker negotiates with ℓ, in which case ℓ earns zero profit, or the selected worker does not negotiate with ℓ, which implies that the worker does not match to firm ℓ with positive probability (for otherwise, $\hat{\rho}_\ell = 1$ would imply the worker negotiates with ℓ), in which case ℓ also earns zero profit. Therefore, for any labor market $(\mathcal{N}, \Theta, F, \{v_i\}_{i\in\mathcal{N}})$ with a single belief vector $\hat{\rho}$ in the support of F, there is an equilibrium in which firm ℓ sets $w_j^g = v_j$ for $g \in \{A, B\}$. In such an equilibrium, the negotiation probability at firm j is 1 by fiat, as desired.

"only if" direction The following argument demonstrates that $\hat{\rho}$ is not robustly self-enforcing if $\hat{\rho}_j \in (0, 1)$ for some $j \in \mathcal{N}$.[59] Suppose for contradiction that given $(\mathcal{N}, \Theta)$, there exists a robustly self-enforcing belief vector $\{\hat{\rho}\}_{i\in\mathcal{N}}$ such that $\hat{\rho}_j \in (0, 1)$ for some $j \in \mathcal{N}$. Then if $v_j < \underline{\theta}$, every worker type optimally sets $o_i^* = 0$. Therefore, in order for the firm to negotiate with the proper probability $\hat{\rho}_i$, it must be that either $w_i^A = 0$ or $w_i^B = 0$, but not both: if $w_i^A = 0 = w_i^B$, then $o_i^* = 0$ for all worker types implies that the negotiation probability at firm i is equal to $0 < \hat{\rho}_i$, and if $w_i^A = 1 = w_i^B = 0$, then the negotiation probability at firm i is, by definition, equal to $1 > \hat{\rho}_i$. Similarly, the negotiation probability at firm i will equal $\hat{\rho}_i$ only if the probability of a worker being a member of some group $g \in \{A, B\}$ is equal to $\hat{\rho}_i$, and $w_i^g = v_i$ and $w_i^{-g} < v_i$ where $-g \neq g$. As the probability of a worker being a member of some group $g \in \{A, B\}$ being equal to $\hat{\rho}_i$ does not hold across all possible distributions F such that $\hat{\rho}$ is the unique belief vector in its support, $\hat{\rho}$ is not robustly self enforcing, leading to a contradiction. □

Proof of Proposition 16

Proof. Recall that for any worker type r that receives offers from subset of firms N^r, $V^{N^r} := \max\left\{\{v_i | i \in N^r\} \cup \{\theta\}\right\}$. We show that for any $\epsilon > 0$ there exists $\delta > 0$ such that if $\hat{\rho}_i^r > 1 - \delta$

[59] We note the existence of, but do not present, more complicated arguments that yield the same conclusion.

for all $i \in \mathcal{N}$ for a worker type r with $V^{N^r} > \theta$ (i.e. $V^{N^r} = v_{i^*}$ for some $i^* \in N^r$) either $w_{i^*}^{g^r} > V^{N^r} - \epsilon$ or the worker optimally negotiates with firm i^* in any equilibrium. In words the previous sentence states that a worker with beliefs that are only δ away from $\vec{1}$ and has a match value with at least one firm that exceeds her outside option will either negotiate with the firm with the highest match value, or must receive an initial offer that yields almost all of the match value from this firm. Recalling that equilibrium imposes $\hat{\rho}_i^r = \rho_i$ for all $i \in \mathcal{N}$ and all worker types r, showing this statement suffices to prove the desired result, because for small enough ϵ either the worker negotiates with the maximum-match-value firm—in which case she is matched there with probability $\hat{\rho}_i > 1 - \delta$—or she does not negotiate with this firm but accepts its offer anyway because its offer is higher than the match value at any other firm: $w_{i^*}^{g^r} > v_{i^*} - \epsilon > v_j$ for all $j \neq i^*$, where the second inequality holds for small enough ϵ because $v_i \neq v_j$ for all $i \in \mathcal{N}$.

In the event that $\hat{\rho}_{i^*}^r = 1$, the desired claim follows straightforwardly. In the case that $\hat{\rho}_{i^*}^r \neq 1$, the desired claim follows from Part 2 of Proposition 11, which finds that a worker r optimally negotiates with firm i^* if and only if $\frac{\hat{\rho}_{i^*}^r v_{i^*} - w_{i^*}^{g^r}}{\hat{\rho}_{i^*}^r - 1} \geqslant \theta_{i^*}$. By construction $\theta_{i^*} \geqslant \underline{\theta} > -\infty$, implying the worker will negotiate with firm i^* if $\hat{\rho}_{i^*}^r v_{i^*} - w_{i^*}^{g^r} + \underline{\theta}[1 - \hat{\rho}_{i^*}^r] \geqslant 0$. The left-hand side of this inequality is continuous in $\hat{\rho}_{i^*}^r$ and converges to $v_{i^*} - w_{i^*}^{g^r} \geqslant 0$ as $\hat{\rho}_{i^*}^r \to 1$. Therefore, for sufficiently high beliefs, the worker either negotiates with i^* or is initially offered approximately the entire match value at i^*. □

Proof of Proposition 15

The argument behind this result follows from a similar one to that presented in the Proof of Proposition 16, and is therefore omitted.

The Proposed Bargaining Model Rationalizes Experimental Finding on Initial Misperceptions

Evidence from our extensive-margin experimental treatment arm shows that workers who are initially pessimistic about the viability of bargaining experience the largest gains from receiving accurate information (see Figure 5). This short section rationalizes this finding in

the context of our model.

Consider a labor market $(\mathcal{N}, \Theta, F, \{\nu_i\}_{i \in \mathcal{N}})$ in partial equilibrium,[60] and consider two worker types r and r'. We assume that the two worker types are identical in every way, except that they have different beliefs, r has accurate beliefs while r' is pessimistic about the efficacy of bargaining at all firms: $N^r = N^{r'}$, $\theta^r = \theta^{r'}$, $g^r = g^{r'}$, but $\hat{\rho}^r = \rho$ while $\hat{\rho}^{r'} < \rho$.

It follows straightforwardly that worker r's expected payoff (weakly) exceeds that of worker r', as r optimizes her portfolio using accurate information, and r' optimizes using inaccurate information. This observation leads to the following conclusion about how eliminating misperceptions about extensive-margin uncertainty reduces inequality.

Remark 17. *Suppose an information treatment (for example, one similar to that in our experiment) induces correct beliefs about the viability of negotiation in all workers. Then a worker with misperception in her prior belief will benefit relative to an otherwise-identical worker with accurate prior beliefs.*

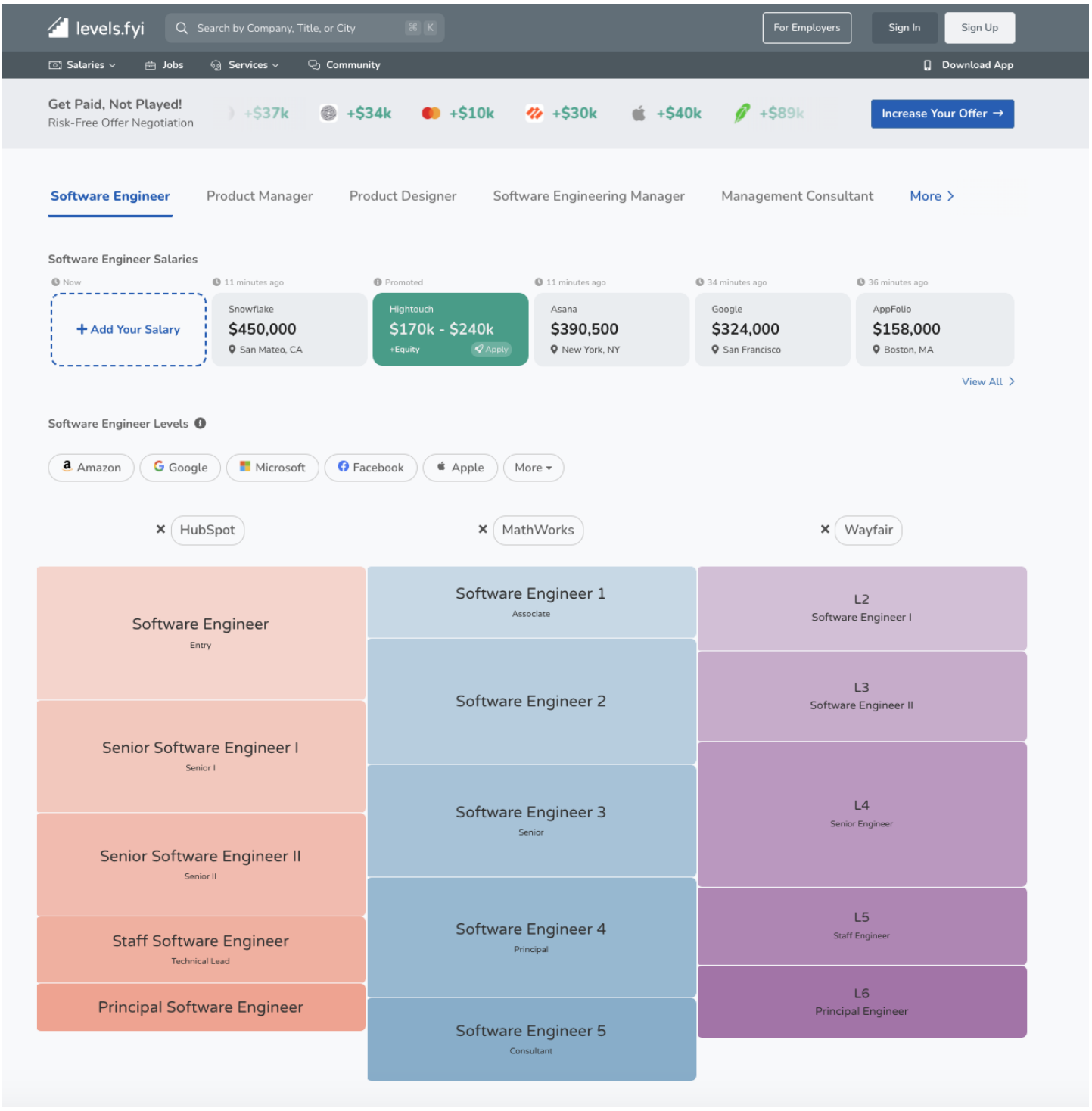
B Additional Details about the Experiment

[60] Recalling Proposition 14, the labor market cannot be in equilibrium if different worker types have different belief vectors, as this would violate rational expectations.

C Survey Samples

D Robustness Checks

Figure B.1 Levels.fyi Landing Page



Notes: This is a screenshot of landing page of Levels.fyi.

Figure B.2 Levels.fyi Salary Submission Page

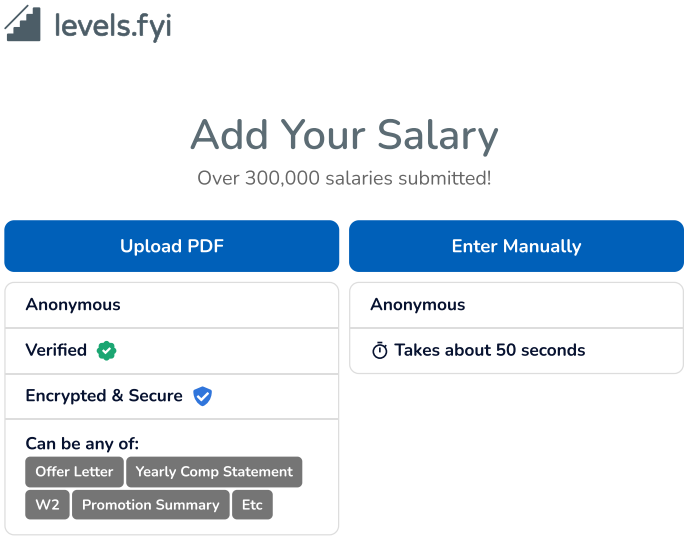
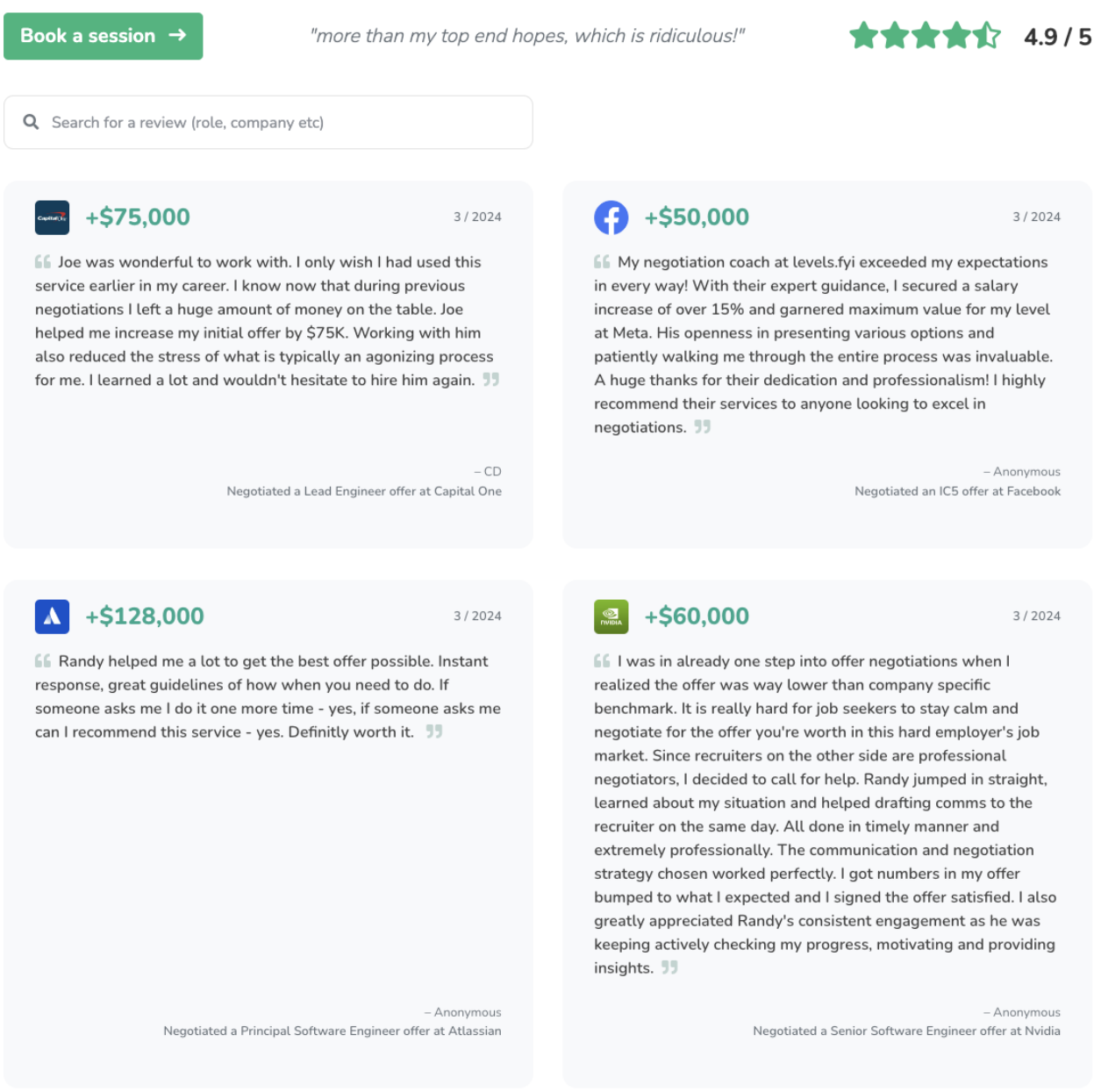
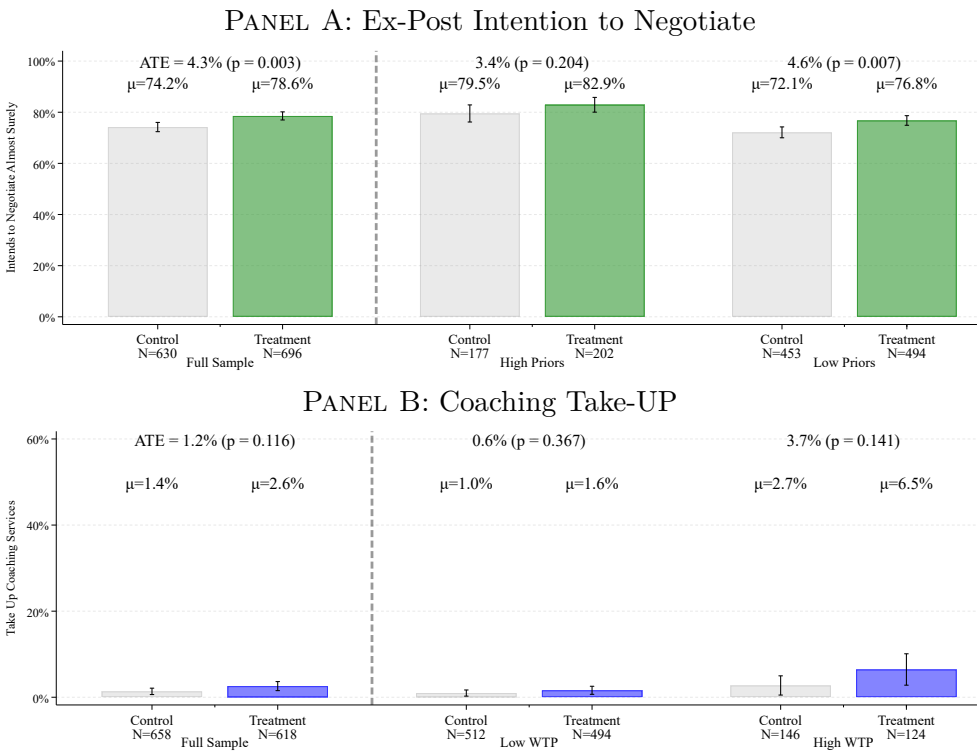


Figure B.3 Levels.fyi Negotiation Reviews



Notes: This is a screenshot of the Levels.fyi salary negotiation service reviews. These are the top four reviews among the 300+ reviews.

Figure D.1 Adjust Sample



Notes: Panel (A) replicates Panel (A) from Figure 5, except that the sample is adjusted to match the one used in Panels (B) and (C) of Figure 5. Panel (B) replicates Panel (A) from Figure 8, except that the sample is adjusted to match the one used in Panels (B) and (C) of Figure 8.

E Levels.fyi Calendar

Levels.fyi Negotiation Team

Levels.fyi Consultation (Survey Participant)

10 min

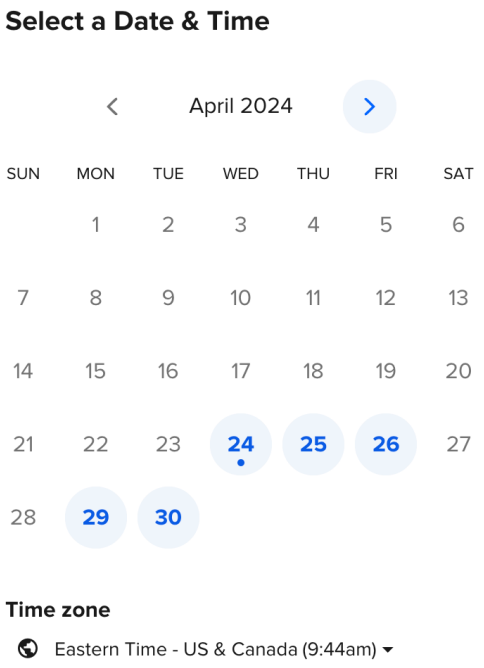
This will be a Google Meeting

Hey there,

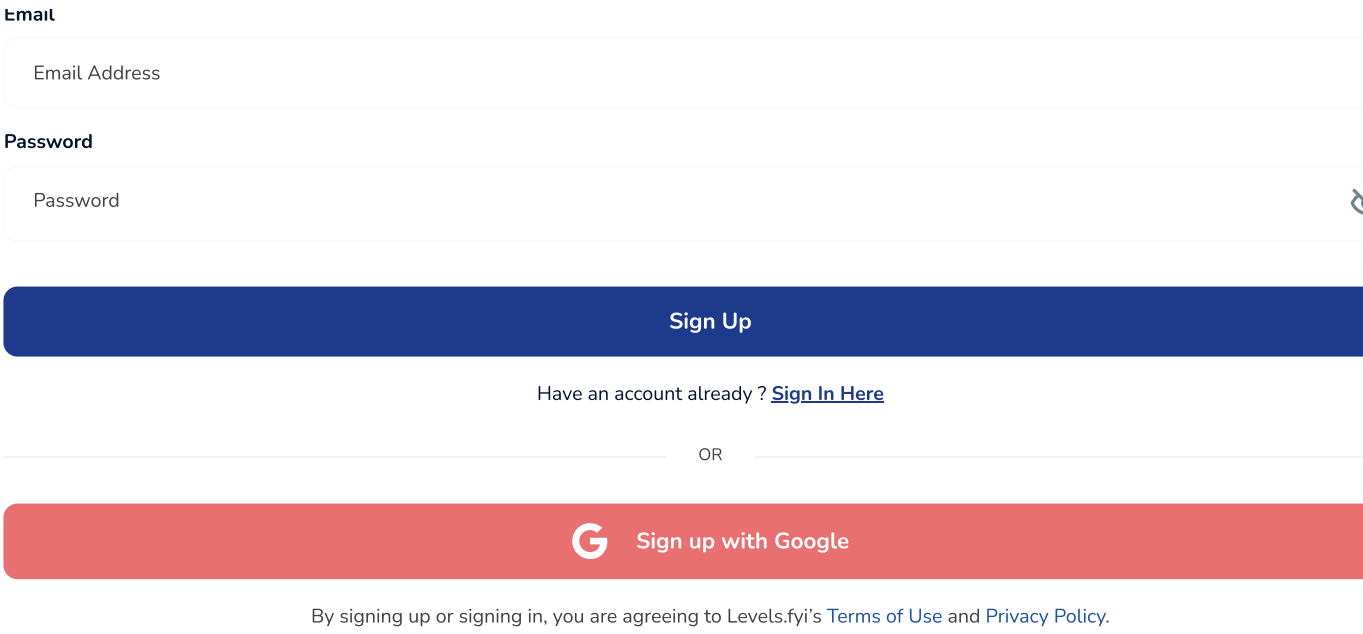
We're excited to meet with you! You'll be meeting with Zuhayeer, Zaheer, or Brian from the Levels.fyi team. This will be a quick, 10-minute consultation call to go over how our negotiation service works, and get you scheduled with your first session with your coach.

We'll be happy to hear what your situation is and explain how you'll work with your coach.

If none of the available times work, please feel free to email us at negotiation@levels.fyi and we'll try our best to accommodate you.



F Levels.fyi Registration form





Welcome to Levels.fyi!

We're excited to help you build a better career.

Let's build your profile and explore your work preferences.

Get Started

By clicking Get Started, I agree to the Terms of Service and Privacy Policy

Let's Get Started

Tell us a little about yourself

Full Name

Sundar Pichai

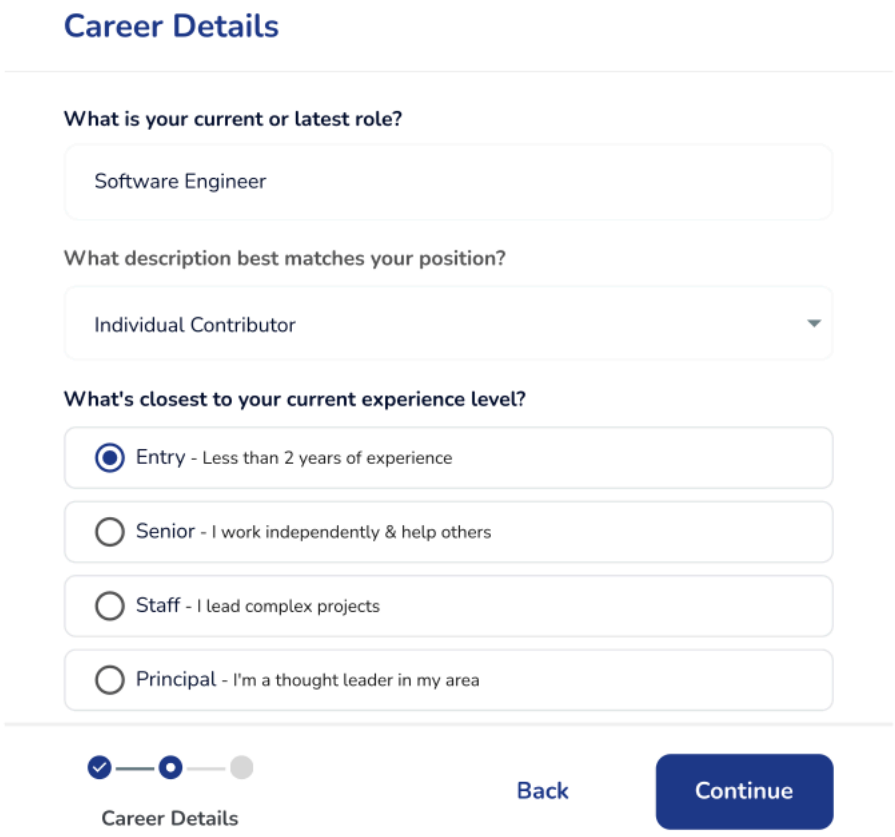
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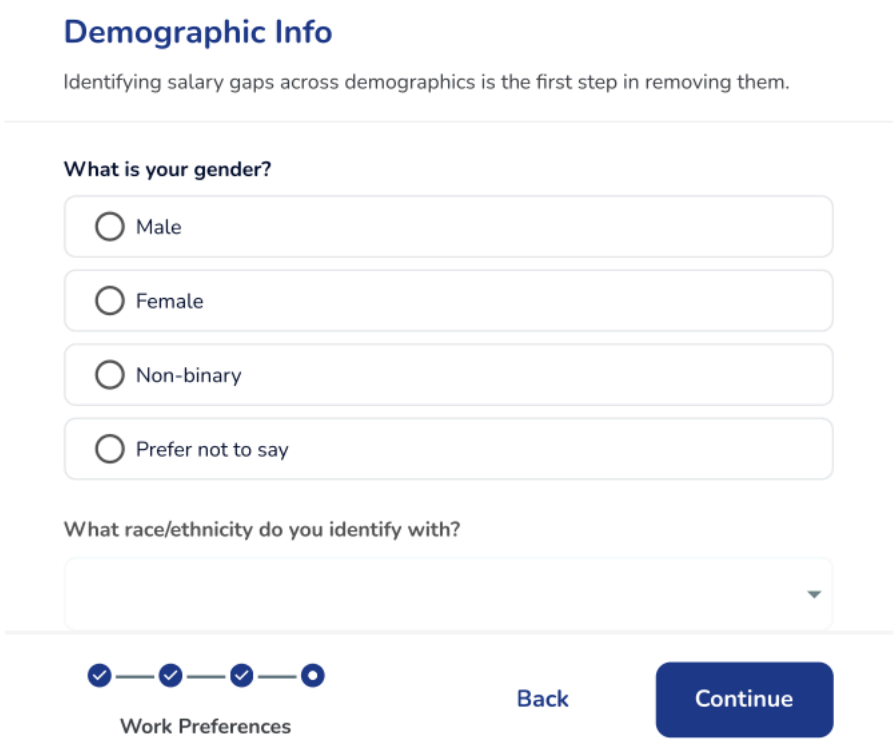
worldsbestgoogler

Where are you located?

Mountain View, CA

Back Continue


Career Details
What is your current or latest role?
Software Engineer
What description best matches your position?
Individual Contributor
What's closest to your current experience level?
Entry - Less than 2 years of experience
Senior - I work independently & help others
Staff - I lead complex projects
Principal - I'm a thought leader in my area
Career Details
Back
Continue


Demographic Info
Identifying salary gaps across demographics is the first step in removing them.
What is your gender?
Male
Female
Non-binary
Prefer not to say
What race/ethnicity do you identify with?
Work Preferences
Back
Continue



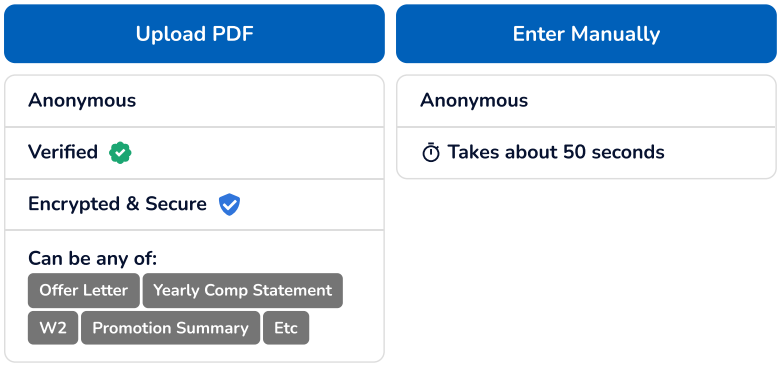
Your account has been created!

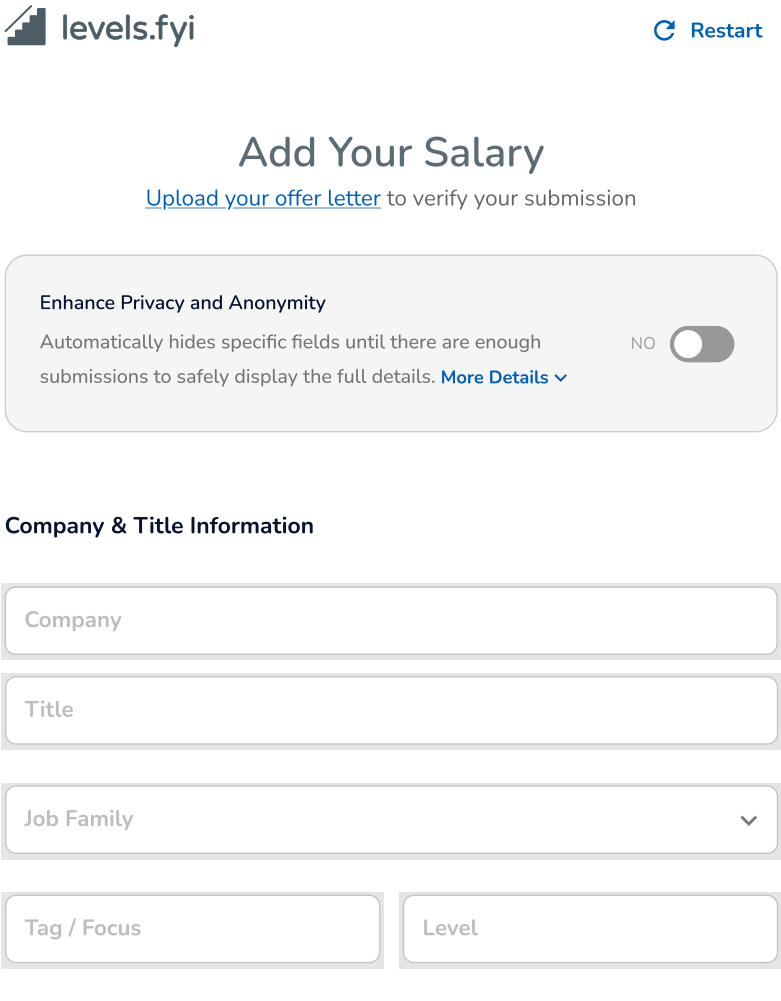
Start exploring leveling, salaries, our community, and more!

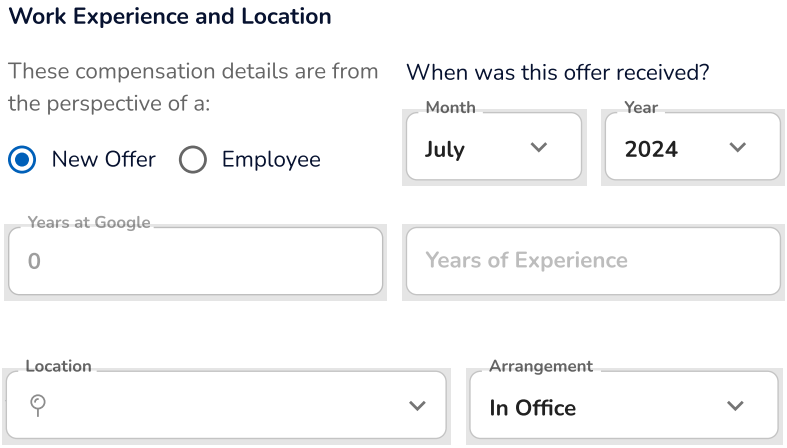
☐ Email me relevant salaries and jobs for Software Engineers in my preferred locations

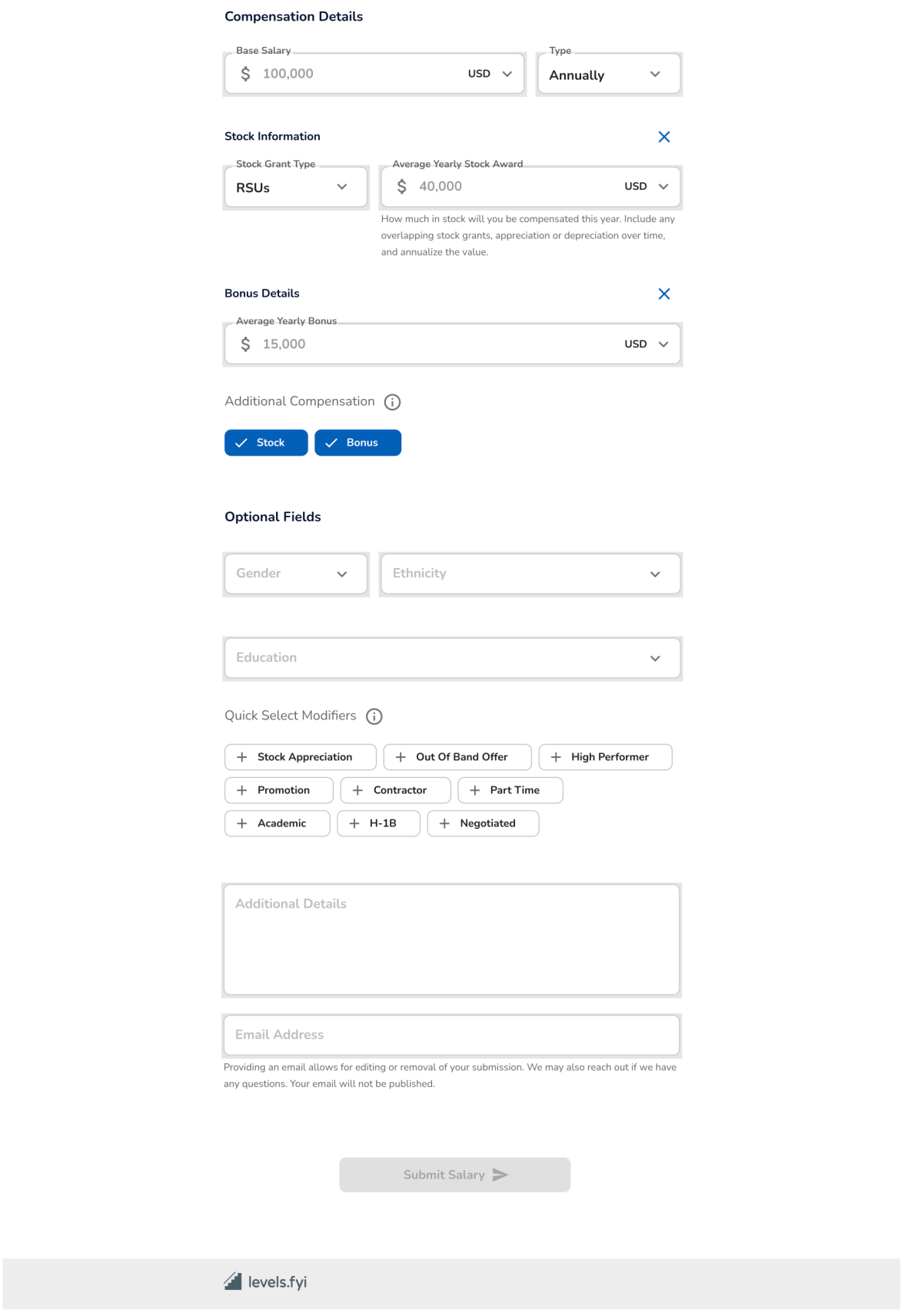
Get Started!

G Levels.fyi Salary Submission form




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Restart
Add Your Salary
Upload your offer letter to verify your submission
Enhance Privacy and Anonymity
Automatically hides specific fields until there are enough submissions to safely display the full details. More Details
NO
Company & Title Information
Company
Title
Job Family
Tag / Focus
Level

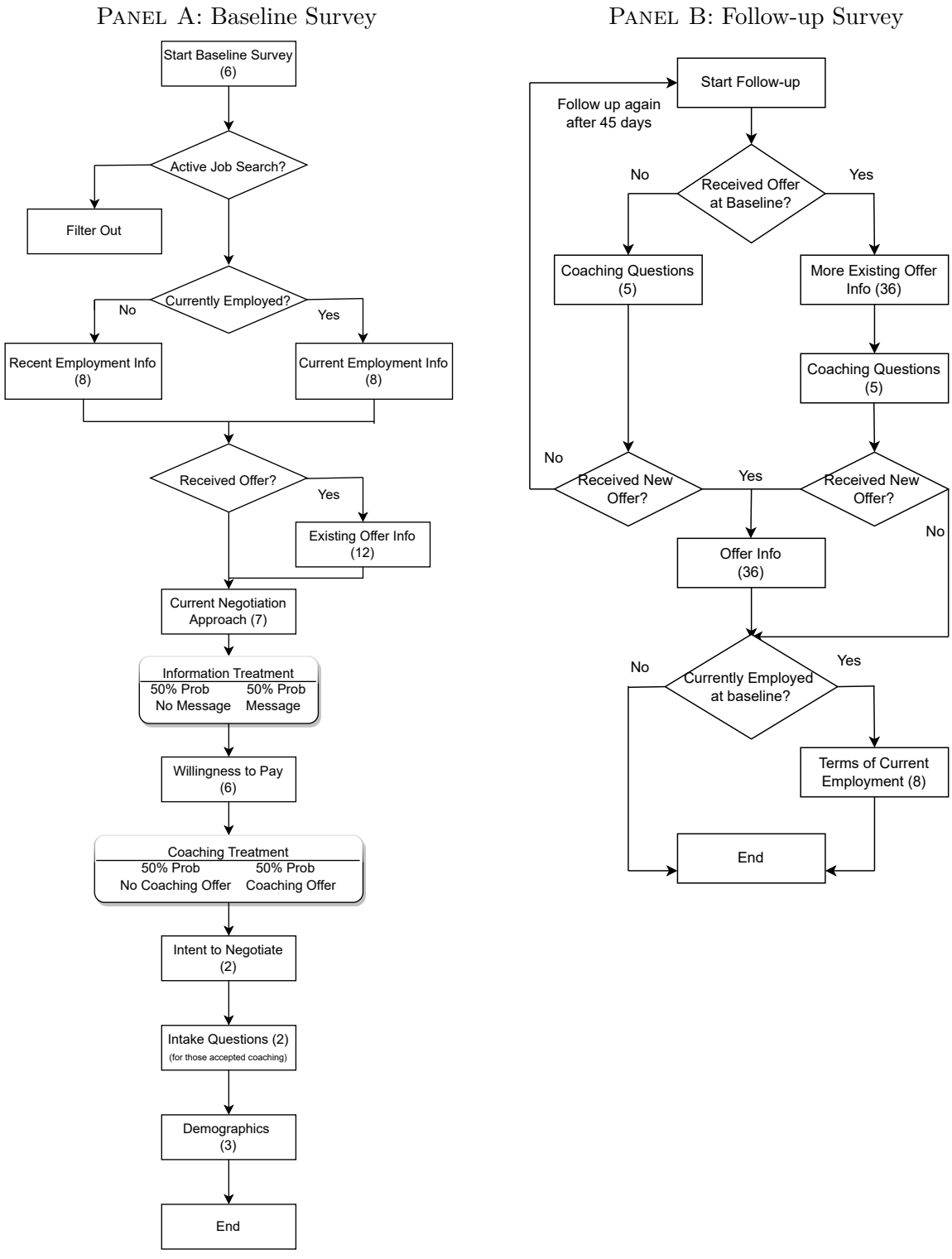

Work Experience and Location
These compensation details are from the perspective of a:
New Offer
Employee
When was this offer received?
Month
July
Year
2024
Years at Google
0
Years of Experience
Location
Arrangement
In Office


Compensation Details
Base Salary
$ 100,000 USD
Type
Annually
Stock Information
Stock Grant Type
RSUs
Average Yearly Stock Award
$ 40,000 USD
How much in stock will you be compensated this year. Include any overlapping stock grants, appreciation or depreciation over time, and annualize the value.
Bonus Details
Average Yearly Bonus
$ 15,000 USD
Additional Compensation
Stock
Bonus
Optional Fields
Gender
Ethnicity
Education
Quick Select Modifiers
Stock Appreciation
Out Of Band Offer
High Performer
Promotion
Contractor
Part Time
Academic
H-1B
Negotiated
Additional Details
Email Address
Providing an email allows for editing or removal of your submission. We may also reach out if we have any questions. Your email will not be published.
Submit Salary
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H Survey Recruitment

In response to feedback from subjects, we made a couple of changes to the timing of the incentives. For survey participants recruited from May 24 to July 17, 2023, we pay them $25 for completing the baseline survey and another $25 for completing the follow-up survey. For those recruited from July 18,2023 to July 25, 2023, we pay them $25 for completing the baseline survey and another $50 for completing the follow-up survey. For survey participants recruited after July 17, 2023, we pay them $50 after they completed the follow-up survey.

Figure H.1 Survey Flowcharts



Notes: These are the flowcharts of the surveys.

I Baseline Survey

Levels.fyi is partnering with academic researchers from Harvard University, UC-Berkeley, and Brown University to understand how to serve you in the job market. This study consists of two surveys – one 10-minute survey today, and a 5-minute follow-up survey that you will receive via email in one month.

Participants who meet three eligibility criteria will receive a $25 Amazon gift card within 10 business days after completing this survey, and another $25 gift card after completing the follow-up survey. Participants may also receive subsidies for coaching services and reports with insights from the study. If you would like to participate, please continue with this confidential 10-minute survey.

Key Information

The following is a short summary of this study to help you decide whether or not to be a part of this research.

Why am I being invited to take part in a research study? We invite you to take part in a research study because you registered on Levels.fyi website and provided your contact information. Your responses will be shared with Levels.fyi, Harvard University, UC-Berkeley University and Brown University.

What should I know about a research study?

- Someone will explain this research study to you.
- Whether or not you take part is up to you.
- Your participation is completely voluntary.





Are you currently employed?

- ○ Yes
- ○ No



Where are you located?

Location





What is your age?

- ○ 20 years old or younger
- ○ 21-25 years old
- ○ 26-30 years old
- ○ 31-35 years old
- ○ 36-40 years old
- ○ 41-45 years old
- ○ 46-50 years old
- ○ 51-55 years old
- ○ 56-60 years old
- ○ More than 60 years old





What is the highest level of education you have completed?

- ○ Some high school or less
- ○ High school diploma or GED
- ○ College degree
- ○ Graduate or professional degree





Do you already have an offer from another employer?

- ○ Yes
- ○ No



Are you actively searching for a new job? (e.g. applying to jobs and doing interviews)

- ◯ Yes
- ◯ No





What do you think is the probability that you receive a job offer in the next 30 days?

- ○ 0%-10%
- ○ 10%-20%
- ○ 20%-30%
- ○ 30%-40%
- ○ 40%-50%
- ○ 50%-60%
- ○ 60%-70%
- ○ 70%-80%
- ○ 80%-90%
- ○ 90%-100%

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Harvard Business School

What are the details of your most recent employment?

Company

Job title

Which state was the job in?

State

Was the work in person or remote?

- ○ Fully in-person
- ○ Partly remote (hybrid or other)
- ○ Fully remote

How many years of work experience do you have?

Years of experience

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Harvard Business School

What was your **annual** base salary?

$

What was the value of your average annual stock-based compensation in the offer?

(i.e., your expected annual earnings in Restricted Stock Units or Stock Options. If the stock-based compensation change from year to year, please report the per-year average.)

$

What was your average annual bonus compensation?

$





At the time you were first hired by [Recent Employment Company], did you negotiate, or attempt to negotiate, compensation terms?

- ○ Yes
- ○ No



Have you ever received any training or information on how to negotiate? Please select all that apply.

- [ ] I hired a negotiations coach
- [ ] I took a course on negotiations
- [ ] I read a book on negotiations
- [ ] I received mentorship on negotiations from a colleague
- [ ] I read an article on negotiations

Do you have past experience negotiating your compensation?

- ◯ Yes
- ◯ No



What percent of people do you think try to negotiate the compensation terms after receiving a job offer?

- ○ 0%
- ○ 1%-10%
- ○ 11%-20%
- ○ 21%-30%
- ○ 31%-40%
- ○ 41%-50%
- ○ 51%-60%
- ○ 61%-70%
- ○ 71%-80%
- ○ 81%-90%
- ○ 90%-100%

Among individuals who attempt to negotiate, what percentage of them do you think were successful? In other words, what percentage got at least some of what they asked for?

- ○ 0%
- ○ 1%-10%
- ○ 11%-20%
- ○ 21%-30%
- ○ 31%-40%
- ○ 41%-50%
- ○ 51%-60%
- ○ 61%-70%
- ○ 71%-80%
- ○ 81%-90%
- ○ 90%-100%

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Harvard Business School

How comfortable would you feel negotiating compensation terms of an offer?

- ○ Very uncomfortable
- ○ Uncomfortable
- ○ A little uncomfortable
- ○ Not at all uncomfortable

On a scale of 1 to 10, how confident do you normally feel when you have to negotiate?

1 - Not at all confident	2	3	4	5	6	7	8	9	10 - Extremely confident
○	○	○	○	○	○	○	○	○	○

On a scale of 1 to 10, where 1 represents being extremely socially introverted and 10 represents being extremely socially extroverted, how would you rate yourself?

1 - Extremely introverted 2 3 4 5 6 7 8 9 10 - Extremely extroverted





Next, some participants of this survey will be chosen to receive information related to the previous questions. Please continue to the next screen to find out if you will be randomly selected to receive this information.





According to a survey conducted by Fidelity Investments, around 42% of Americans attempted to negotiate the initial offer that they received. There is evidence suggesting that people should attempt to negotiate even more often.

Don't feel guilty about negotiating. While it's natural to feel guilty or afraid about it, companies expect you to negotiate. In some cases, the person you are negotiating with has been hired precisely for that job. They'd be happy if you attempt to negotiate – that's what they were hired for! And negotiating the compensation can make the employment relationship stronger.

The success rate is quite high. According to the Fidelity survey, 85% of Americans who attempted to negotiate the compensation terms of their offer were successful – that is, they got at least some of what they asked for.

The gains from negotiating add up quickly. According

to the Harvard Business School Negotiations Course, by age 65, the salary gap between those who did and did not negotiate when they were 30 rises to more than $30,000, totaling $1.6 million gains over the working years.

Levels.fyi offers a negotiation coaching service that includes an initial 30 minute 1-on-1 call with your coach, up to 2 follow up calls, and unlimited email support for a duration of up to 90 days. Your coach will be a tech recruiter from the industry who has experience approaching these conversations from the other side. The team of recruiters has negotiated thousands of offers and regularly increase offers by $30k+. They will help you strategize the best negotiation process for your situation and provide guidance through your interactions. The service costs $650.

For more information about the service, visit our FAQ page

Were you aware of this coaching service?

- ◯ Yes
- ◯ No





Below you are presented with 6 hypothetical scenarios. In each scenario, you will be presented a choice between receiving free coaching services OR extra money as part of your reward for responding to the survey.

We will randomly choose 10 survey respondents. If you are one of these 10 lucky respondents, one of the 6 scenarios will be randomly chosen to be implemented. As a result, it is in your best interest to respond honestly to these scenarios.

Please make your choices below, and in the next screen you will find out if your responses will be implemented or will remain hypothetical.

Between the following two options, which one would you prefer?

- ◯ Coaching service
- ◯ $100 Amazon gift card

Between the following two options, which one would you prefer?

- ◯ Coaching service
- ◯ $200 Amazon gift card

Between the following two options, which one would you prefer?

- ◯ Coaching service
- ◯ $300 Amazon gift card

Between the following two options, which one would you prefer?

- ◯ Coaching service
- ◯ $400 Amazon gift card

Between the following two options, which one would you prefer?

- ◯ Coaching service
- ◯ $500 Amazon gift card

Between the following two options, which one would you prefer?

- ◯ Coaching service
- ◯ $600 Amazon gift card





You have NOT been randomly selected among the 10 participants who will have one of their 6 scenarios implemented. As a result, your choices in the 6 scenarios remain hypothetical. Please continue with the survey.



You have been randomly selected to receive a special offer for negotiation coaching services.

Typically coaching services require you to pay $650 up front, but we are giving you the opportunity to sign up at no cost. You will be paired with a coach that helps you through your negotiation process. If the total compensation increase for the first year is greater than $1,200 after negotiations, you will pay a flat fee of $550 to Levels.fyi. If there is no successful outcome after you have received an offer, no payment will be required. You can see the full terms here.

Do you want to claim your special offer?

- ◯ Yes
- ◯ No

If you select Yes, we will provide instructions to sign up later in the survey. If you select No, you'll continue to the end of the survey. If you select No here, you will *not* be able to claim the offer later.





You have claimed your special offer for negotiations coaching. At the end of the survey, you'll be directed to a scheduling tool to schedule your initial 1-on-1 call with a coach.



Do you plan to negotiate the terms of any current offers or offers that you may receive soon?

- ○ Yes, almost surely
- ○ Yes, probably
- ○ Yes, but unlikely
- ○ No

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Harvard Business School

What's your expectation about what you'd get out of the negotiation?

- ◯ My compensation will decrease
- ◯ My compensation will not change
- ◯ My compensation will increase by 1%-5%
- ◯ My compensation will increase by 6%-10%
- ◯ My compensation will increase by 11%-15%
- ◯ My compensation will increase by 16%-20%
- ◯ My compensation will increase by more than 20%

Please answer the following questions to help inform your negotiations coach.

List any companies you are in interviews with where you do not yet have an offer. For each, include Company Name, Status, Role & Location.

	Interview Details			
	Company	Role	Location	Offer Status
Company 1				
Company 2				
Company 3				
Company 4				
Company 5				
Company 6				
Company 7				

What are your career goals? Include any other information that may be relevant to negotiations.

LinkedIn Profile or Resume URL?





What is your gender?

- ○ Male
- ○ Female
- ○ Other

What is your ethnicity?

- ○ American Indian or Alaska Native
- ○ Asian
- ○ Black or African American
- ○ Native Hawaiian or Other Pacific Islander
- ○ White
- ○ Hispanic/Latino
- ○ Other

How would you rate your current level of financial stress or need?

- ◯ Very low
- ◯ Low
- ◯ Moderate
- ◯ High
- ◯ Very high





Recent research on decision making shows that choices are affected by the context in which they are made. Differences in how people feel, in their previous knowledge, experience, and in their environment can influence the choices they make. To help us understand how people make decisions, we are interested in information about you. Specifically, whether you actually take the time to read instructions. If you don't, some results may fail to tell us very much about decision making in the real world. To help us confirm that you have read these instructions, please do not select an answer corresponding to how you are currently feeling, and instead only check the "none of the above" option. Thank you very much.

- [ ] Interested
- [ ] Hostile
- [ ] Nervous
- [ ] Distressed
- [ ] Enthusiastic
- [ ] Determined
- [ ] Excited
- [ ] Proud
- [ ] Attentive

☐ Upset	☐ Irritable	☐ Jittery
☐ Strong	☐ Alert	☐ Active
☐ Scared	☐ Inspired	☐ None of the above



In your opinion, were the questions in this survey easy or difficult to understand?

- ○ Easy to understand
- ○ Neither easy nor difficult
- ○ Difficult to understand

Did you have any issues with this survey?

Yes	No
○	○





To complete the survey, you must schedule your first session with your coach below, and click the right arrow at the bottom of the page to advance to the final screen. If you have any questions, reach out to us at services@levels.fyi.

You'll receive a $25 amazon gift card within 10 business days. In one month, we will email you a 5-minute follow up survey. Once you complete the follow-up survey, you'll receive a second $25 gift card.



Levels.fyi Negotiation Team

Negotiation Session (HBS)

30 min

We start with a 1-on-1 call with an experienced Recruiter. Your Coach will guide you through the entire negotiation process with up to 2 follow-up calls (if you prefer) and email support.

Select a Date & Time

August 2023

SUN	MON	TUE	WED	THU	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26



We thank you for your time spent taking this survey. Your response has been recorded.

You'll receive a $25 amazon gift card within 10 business days. In one month, we will email you a 5-minute follow up survey. Once you complete the follow-up survey, you'll receive a second $25 gift card.

J Follow-Up Survey



Levels.FYI is partnering with academic researchers from Harvard University, UC-Berkeley, and Brown University to understand how to serve you in the job market.

We greatly appreciate your involvement and the completion of our initial survey. We hope that you can complete this short (5-minute) follow-up survey. As a token of our gratitude, participants who complete this survey will receive a $25 Amazon gift card. Additionally, participants may also receive reports containing valuable insights derived from the study.

Rest assured that all your responses will be treated with th utmost confidentiality and used solely for research purposes.



Did you use the negotiation coaching service from Levels.fyi?

- ◯ Yes
- ◯ No

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Harvard Business School

On a scale of 1 to 10, where 1 is not helpful at all and 10 is extremely helpful, how would you rate your experience with levels.FYI's negotiation coaching?

1 - Not helpful at all 2 3 4 5 6 7 8 9 10 - Extremely helpful

How many times did you meet with your coach?

- Never
- 1 time
- 2 times
- 3 times
- 4 times or more

How many emails or messages did you exchange with your coach?

- Never

- ○ 1-5 times
- ○ 6-10 times
- ○ 11-15 times
- ○ 16 times or more

On a scale of 1-10, where 1 is very poor and 10 is excellent, how would you rate the overall compatibility and rapport you had with your coach?

1 - Very poor	2	3	4	5	6	7	8	9	10 - Excellent
○	○	○	○	○	○	○	○	○	○



How many positions/companies have you interviewed for?

- ◯ None
- ◯ 1
- ◯ 2
- ◯ 3
- ◯ 4
- ◯ 5 or more

Have you received any offers since then?

- ◯ Yes
- ◯ No





How many offers have you received since the initial survey?

If you have received 3 or more offers, select 3.

- ○ 1
- ○ 2
- ○ 3





What are the details of your offer?

Company

Job title

Company location

Is the work in person or remote?

- ○ Fully in-person
- ○ Partly remote (hybrid)
- ○ Fully remote





When did you first receive this offer?

Date:





We now want to ask you about the **latest terms** of your [Offer Job Title] offer from [Offer Company Name].

What is the **annual** base salary in the offer?

What is the value of your average annual stock-based compensation in the offer?

(i.e., your expected annual earnings in Restricted Stock Units or Stock Options. If the stock-based compensation change from year to year, please report the per-year average.)

$

What is the average annual bonus compensation in the offer? (excluding sign-on or relocation bonuses)

Enter "0" if there is no annual bonus

$

What is the relocation bonus in the offer?

Enter "0" if there is no relocation bonus

$

What is the year 1 sign-on bonus in the offer?

Enter "0" if there is no year 1 sign-on bonus

$

What is the year 2 sign-on bonus in the offer?

Enter "0" if there is no year 2 sign-on bonus

$

What is the average annual bonus compensation in the offer? (excluding sign-on or relocation bonuses)

Enter "0" if there is no annual bonus

$

What is the relocation bonus in the offer?

Enter "0" if there is no relocation bonus

$

What is the year 1 sign-on bonus in the offer?

Enter "0" if there is no year 1 sign-on bonus

$

What is the year 2 sign-on bonus in the offer?

Enter "0" if there is no year 2 sign-on bonus

$





Did you accept this offer?

- ◯ Yes, I accepted the offer
- ◯ No, I declined the offer
- ◯ I have not yet responded to the offer





Do you expect to accept this offer in the future?

- ◯ Yes, almost surely
- ◯ Yes, probably
- ◯ Possibly, but unlikely
- ◯ No



You just told us about the latest terms of the offer. Now, we want to ask you about the original offer – that is, the terms when you first received the offer.

Have the compensation terms changed since you received the original offer?

- ◯ Yes
- ◯ No





Would you say the compensation terms improved since you received the original offer?

- ◯ Yes
- ◯ No





For latest offer, you reported an annual base salary of $70000. What was is the annual base salary in the **original** offer?

$

For latest offer, you reported an average annual stock-based compensation of $5000. What was the value of your average annual stock-based compensation in the **original** offer?

$

For latest offer, you reported an annual bonus of $20000. What is the annual annual bonus compensation in the **original** offer?

$

For latest offer, you reported a relocation bonus of $0. What is the relocation bonus in the **original** offer?

$

For latest offer, you reported a year 1 sign-on bonus of 0. What is the year 1 sign-on bonus in the **original** offer?

$

For latest offer, you reported a year 2 sign-on bonus of $0. What is the year 2 sign-on bonus in the **original** offer?

$



Did [Offer Company Name] inquire about your previous salary or salary expectations before presenting the original terms of the offer?

- ◯ Yes
- ◯ No

When [Offer Company Name] asked you for your prior salary or salary expectations, did you provide any information?

- ◯ Yes
- ◯ No

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Who did you speak to at [Offer Company Name] regarding the terms of your offer? Select all that apply.

- ☐ Human Resources (HR) Representative
- ☐ Recruiter
- ☐ Hiring Manager
- ☐ Direct Supervisor
- ☐ Other

Have you already negotiated, or attempted to negotiate, these compensation terms with [Offer Company Name]?

- ○ Yes
- ○ No





How satisfied are you with your decision to negotiate this offer?

1 - Not at all Satisfied	2	3	4	5 - Extremely Satisfied
○	○	○	○	○

(Optional) Please explain why:

(Optional) Did you experience, or do you expect to experience, any negative consequences from your negotiation?

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Harvard Business School

We asked you about the compensation terms. Now we want to ask you about the **non-compensation** terms (e.g. benefits, remote work options). Have the **non-compensation** terms changed since you received the original offer?

- ○ Yes
- ○ No



Would you say the non-compensation terms improved since you received the original offer?

- ◯ Yes
- ◯ No





Which non-compensation terms have improved? Select all that apply.

- [ ] Remote work options
- [ ] Number of days of PTO
- [ ] Role/job/title
- [ ] Other

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Harvard Business School

What is the number of additional days of PTO per year that are now part of your offer?

If you had to put a price on these additional days of PTO, what annual price would you set?

$

What is the number of additional days of remote work per week that are now part of your offer?

If you had to put a price on these additional days of remote work, what annual price would you set?

$

If you had to put a price on the improvements to your role/job/title, what annual price would you set?

$

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Harvard Business School

On a scale of 1 to 5, with 1 being the lowest and 5 being the highest, how well do you think the job [Offer Job Title] at [Offer Company Name] aligns with your skills, interests, and career goals?

1 - Lowest	2	3	4	5 - Highest
○	○	○	○	○





We thank you for your time spent taking this survey.
Your response has been recorded.

K Expert Forecast Survey Survey

L Expert Forecast Survey Survey Instrument

The survey will take approximately 5 minutes to complete. Your responses will remain completely anonymous. Participation is voluntary, and you may withdraw from the survey at any time.

Please click “I Agree” when you are ready to begin the survey.

Yes, I would like to take the survey

Background

To study salary negotiations, we conducted a panel survey of individuals in the U.S. technology sector who are active in the job market. To recruit subjects, we partnered with a company that offers a range of services to tech workers through its website and app, most prominently data on market salaries.

There are two treatment arms:

- Information Treatment: a light-touch intervention that encourages subjects to consider negotiating the offer terms.
- Coaching Service Treatment: a deep discount for a negotiation coaching service.

The subjects were recruited in two waves during 2023 and 2024, with each wave using a different recruitment strategy tailored to one of the treatment arms.

We will ask you to forecast the results for each of the two treatment arms. The order in which the arms appear in your survey has been chosen at random.

→

Main Outcomes of Interest

The follow-up survey asks a comprehensive set of questions about the offers individuals received and the outcomes of each. Participants must also provide their LinkedIn profile to join the study, which we use to measure job mobility, even for those who do not respond to the follow-up survey.

We ask you to please forecast the effects on a selected set of outcomes:

- Negotiation Attempt: conditional on receiving an offer, the probability that the individual attempts to negotiate the compensation terms.
- Compensation Improvement: conditional on receiving an offer, the %-change in total cash compensation from the initial offer terms to the final terms.
- Change of Employer: the probability of changing employers, measured via LinkedIn.

For individuals with multiple offers, the negotiation attempt is the probability of negotiating with at least one employer, and the compensation improvement corresponds to the maximum improvement across all offers.

→

Information Treatment

The information treatment is a light-touch intervention that encourages subjects to consider negotiating the offer terms.

In the 2023 wave, we recruited subjects who had recently registered an account with the partner company. The average subject in our sample earns around $160,000 per year in total compensation and has 7 years of work experience. Most subjects already have a job but are open to switching employers. The offers are for a variety of positions such as Software Engineer, Product Manager, and Data Scientist, and come from a range of companies including Amazon, Google, and Tesla.

→

The only difference between the control and treatment groups is that the treatment group sees an additional screen, shown below:

According to a survey conducted by Fidelity Investments, around 42% of Americans attempted to negotiate the initial offer that they received. There is evidence suggesting that people should attempt to negotiate even more often.

Don't feel guilty about negotiating. While it's natural to feel guilty or afraid about it, companies expect you to negotiate. In some cases, the person you are negotiating with has been hired precisely for that job. They'd be happy if you attempt to negotiate – that's what they were hired for! And negotiating the compensation can make the employment relationship stronger.

The success rate is quite high. According to the Fidelity survey, 85% of Americans who attempted to negotiate the compensation terms of their offer were successful – that is, they got at least some of what they asked for.

The gains from negotiating add up quickly. According to the Harvard Business School Negotiations Course, by age 65, the salary gap between those who did and did not negotiate when they were 30 rises to more than $30,000, totaling $1.6 million gains over the working years.

→

Next, we ask you to forecast the effects of this treatment arm for each of the three main outcomes described earlier.

Consider individuals who, by the follow-up survey, have received at least one offer. In the control group (who did not see the information treatment), 50% of subjects attempted to negotiate at least one of their offers. In the treatment group (who saw the information treatment), what percent of subjects do you think attempted to negotiate at least one of their offers?

[ ] %

Consider again individuals who, by the follow-up survey, have received at least one offer. In the control group (who did not see the information treatment), the average total compensation changed by +3.5%. In the treatment group (who saw the information treatment), what do you guess was the average change in total compensation?

[ ] %

In the control group (who did not see the information treatment), 40% of subjects changed employers. In the treatment group (who saw the information treatment), what percent of subjects do you think changed employers?

[ ] %

→

On a scale from 1 (Not confident at all) to 5 (Extremely confident), how confident are you in the above predictions?

Not confident at all

Slightly confident

Somewhat confident

Very confident

Extremely confident

(Optional) We'd love to hear your reasoning behind the predicted effects you shared with us. Could you please explain your thought process for the predictions you made?

→

How do you believe the treatment's effectiveness will vary between men and women?

Stronger effect for men than women

Stronger effect for women than men

About the same

Compared to the control group, do you expect the treatment group to experience more, less, or the same level of backlash from employers when attempting to negotiate?

More backlash

Less backlash

About the same backlash

→

Coaching Treatment

The coaching service treatment consists of a deep discount for the following service. The partner company offers a negotiation coaching service priced at $1,250 for the mid-level package. This service is designed to equip candidates with the knowledge and confidence to secure the best possible compensation package during the hiring process. Clients are paired with an experienced negotiation coach who provides personalized advice and strategies for negotiating salary and other benefits. Coaching is typically delivered via video calls and email, with support available for up to three months. The service includes a customer guarantee: clients can request a full refund if their total compensation does not increase by at least $2,500.

In the 2024 wave, we recruited subjects directly from the negotiation coaching website. Specifically, the partner company added a button below the “Book Now” option, offering the opportunity to receive a deep discount on the service if they participate in a research study. The average subject in this sample earns around $160,000 per year in total compensation and has eight years of work experience. Most subjects are currently employed but are open to switching jobs. The offers span various positions, such as Software Engineer, Product Manager, and Data Scientist, and come from companies including Amazon, Google, and Tesla.

→

At the end of the survey, the coaching service is described to both the treatment and control groups. However, only the treatment group is shown an additional screen with a special discount: they can book the service for the special price of $250 (an $1,000 discount, or 80% off).*

Due to this significant discount, the treatment has a notable effect on the take-up of the service. In the control group, 10% of the subjects signed up for the coaching service, while in the treatment group, around 30% signed up for the service.

* Among the subjects who signed up for the service in our sample, around 60% qualify for the mid-level package, while the remaining qualify for the senior-level package. The senior-level package costs $2,200. For these individuals, the treatment consisted of a $1,950 discount (or 89% off).

→

Next, we ask you to forecast the effects of the negotiation coaching treatment arm.

Consider individuals who, by the follow-up survey, have received at least one offer. In the control group (who did not receive the discount), 70% of subjects attempted to negotiate at least one of their offers. In the treatment group (who received the discount), what percent of subjects do you think attempted to negotiate at least one of their offers?

[ ] %

Consider again individuals who, by the follow-up survey, have received at least one offer. In the control group (who did not receive the discount), the average total compensation changed by +4%. In the treatment group (who received the discount), what do you guess was the average change in total compensation?

[ ] %

In the control group (who did not receive the discount), 40% of subjects changed employers. In the treatment group (who received the discount), what percent of subjects do you think changed employers?

[ ] %

→

On a scale from 1 (Not confident at all) to 5 (Extremely confident), how confident are you in the above predictions?

Not confident at all

Slightly confident

Somewhat confident

Very confident

Extremely confident

(Optional) We'd love to hear your reasoning behind the predicted effects you shared with us. Could you please explain your thought process for the predictions you made?

→

How do you believe the treatment's effectiveness will vary between men and women?

Stronger effect for men than women

Stronger effect for women than men

About the same

Compared to the control group, do you expect the treatment group to experience more, less, or the same level of backlash from employers when attempting to negotiate?

More backlash

Less backlash

About the same backlash

→

Before taking this survey, have you seen preliminary results for this project?

No

Yes

→

Lastly, we would like to ask you to forecast some non-experimental results.

Consider an unemployed worker with exactly two job offers from different employers, each offering a different total compensation. This worker will attempt to negotiate the compensation with only one of the two offers. What is the probability that this worker will negotiate with the employer who offered the highest initial compensation?

[ ] %

Consider an unemployed worker who receives two job offers from different employers. The two initial offers differ in terms of total compensation. After the worker negotiates, the difference in compensation between the two offers changed. Which of the following is more likely?

- The difference in compensation (in absolute value) between the two offers decreased
- The difference in compensation (in absolute value) between the two offers increased

→

Imagine there is a policy (e.g., banning exploding offers) that eliminates the risk of a job offer being rescinded if a worker attempts to negotiate. In equilibrium under this policy, employees always attempt to negotiate offers. In this new equilibrium, would employees be better off, the same, or worse off?

- Better off
- The same
- Worse off

In this new equilibrium, would employers be better off, the same, or worse off?

- Better off
- The same
- Worse off

→

This is the last section of the survey. We would appreciate if you could share some information about yourself.

Which of the following describes your current position?

- Professor
- Associate Professor
- Assistant Professor
- Post-Doc
- Researcher
- PhD Student
- Master's Student

Please select your discipline

- Economics
- Management
- Psychology

Sociology

Other

Do you have research experience in the following fields? Please select all that apply:

Labor Economics

Personnel Economics

Public Economics

Behavioral Economics

Organizational Economics

None of the above

→

This is the end of the survey. We thank you for taking the time to provide your forecasts!

If you have any comments for us, please leave them below:

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