Job Search Behavior among the Employed and Non-Employed

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R. Jason Faberman, Federal Reserve Bank of Chicago
Andreas I. Mueller, Columbia University, NBER and IZA
Ayşegül Şahin, Federal Reserve Bank of New York
Giorgio Topa, Federal Reserve Bank of New York

Abstract

Using a unique new survey, we study the relationship between search effort and search outcomes for employed and non-employed job seekers. Our data have extensive information on individuals' current and previous employment situations, search behavior, job offers, accepted offers, and reservation wages. We find that the employed fare much better than the unemployed in their job search prospects along several dimensions, despite lower job search effort. The employed receive more offers per job application, and conditional on an offer, they are offered higher pay, more benefits, and more hours. Despite this, the unemployed are much more likely to accept their job offers. We apply our results to a model of on-the-job search with endogenous search effort, allowing for differences in search efficiency and wage offer distributions between the employed and unemployed. The calibrated model does better in fitting the relevant facts than the standard job-ladder model and implies a reasonable flow value of unemployment.

Keywords: job search, unemployment, on-the-job search, search effort, reservation wage
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1. Introduction

Economists have studied how workers find jobs for some time. Most studies, however, have focused on the job search of the unemployed.[1] Empirical research on the search behavior outside of the unemployed has been sparse, primarily because of a lack of data on it. In this paper, we fill this void by documenting new facts about the search behavior and outcomes of employed job seekers, and assess the importance of these facts for search-theoretic models of the aggregate labor market.

To this end, we design and implement a survey that focuses on the employment status, job search behavior, and search outcomes for all individuals, regardless of their labor force status. The survey is a supplement of the Survey of Consumer Expectations (SCE), which is administered monthly by the Federal Reserve Bank of New York. The SCE surveys roughly 1,300 individuals per month. Our supplement follows up with survey respondents in October of 2013, 2014, and 2015. We ask about an individual's search efforts and search outcomes, including whether any unsolicited contacts or other informal recruiting behavior was involved. We also elicit detailed information on their current employment situation and recent employment history, as well as the characteristics of any job offers received. These characteristics include information on how the offer came about, the bargaining process, and the decision to accept or reject the offer. We also we ask those currently employed similar, retrospective questions about the search process that led to their current job.

The overarching theme from our findings is that the employed face relatively better job search prospects along multiple dimensions. With regard to theories of labor market search, two margins in particular stand out.

[1] Early theories of frictional job search focus on search among the unemployed. (e.g., McCall, 1970; Mortensen, 1977; Pissarides, 1985; Mortensen and Pissarides, 1994). Search theories have also focused on on-the-job search and the relationship between labor force participation and search (e.g., Alvarez and Shimer, 2010). See for example, Burdett, 1978; Pissarides, 1994; Cahuc, Postel-Vinay, Robin, 2006; Mortensen and Nagypal, 2007; Menzio and Shi, 2009; and Moscarini and Postel-Vinay, 2013).

First, the search effort of the employed appears to be more efficient than that of the unemployed. The employed receive a disproportionate amount of unsolicited job offers, contributing to the observed differences in search efficiency. We find that the unemployed exert nearly twice as much search effort as those the searching while on the job, and roughly an order of magnitude more effort than all employed individuals, in both time spent searching and applications sent. Nevertheless, the employed receive more employer contacts and job offers per application sent. Many of these contacts and offers go to employed workers who report no active search activity. These individuals receive over one-quarter of all offers in our sample, underscoring the importance of informal recruiting mechanisms for generating our observed differences in search efficiency.

Second, the employed seem to draw from a higher-quality job offer distribution than the unemployed. This holds even after controlling for observable characteristics of the worker and job, as well as the prior earnings and work history of the worker (which we use as proxies for unobservable worker characteristics). When the non-employed receive a job offer, we find that it tends to pay a lower wage, offer fewer hours, and is considerably less likely to offer any benefits. Unconditionally, the wages offered to the non-employed are 40 log points lower than the wages offered to the employed. After accounting for our controls, the average wage offered to the non-employed remains 29 log points lower. Despite the poor quality of these job offers, the non-employed are about one-and-a-half times more likely to accept them. The evidence suggests that many non-employed workers accept a poor-quality offer because it is their only option. The non-employed are also less likely to have bargained over the offer during the hiring process. In contrast, employed job seekers tend to do relatively well in their searches: they are much more likely to find full-time work with benefits, and are much more selective in their job acceptance decisions. A non-trivial amount of the employed also receive some form of counter-offer from their current employer.

Survey responses on the search process that led the hiring of those employed at the time of the survey reinforce these results. Specifically, we that find those that were hired directly from employment are in jobs that pay better, have longer hours, and are more likely to offer benefits. In contrast, those hired from non-employment are not only employed in lower-quality jobs, but are also more likely to be searching for new work at the time of the survey. Interestingly, we also find those hired from directly employment and those hired from non-employment had similar wages in their previous jobs. We interpret this as suggestive evidence that the difference in current employment outcomes is not driven by workers sorting into previous labor force status based on unobservable characteristics. Consequently, when we condition the wage at the time of hire on observable characteristics that include the wages and hours of the previous job, a significant 16 log point difference remains between the starting wages of those hired from employment and those hired from non-employment.

We apply our results to a model of on-the-job search and endogenous search effort. Our data allow us to directly estimate several moments that previous research has often had to either infer through calibration or estimation, or abstract from completely. Specifically, we extend the model of Christensen et al. (2005) to allow for differences in the search effort, search efficiency, and the wage offer distributions of the employed and unemployed. Search efficiency in the model captures differences in the job-offer arrival rate (per unit of search effort) between the employed and unemployed that in practice occur along multiple margins, including differences in employer preferences as well as differences in the incidence of unsolicited employer contacts and referrals. We compare a model of endogenous search effort to a more standard model of on-the-job search where search effort is exogenous. Our extended model with endogenous search effort does better in matching the key facts from our empirical analysis, primarily because it allows for the larger discrepancy in search efficiency between the unemployed and the employed at the bottom of the job-ladder. When fed into the model, our findings on search effort and search outcomes suggest that the employed are over 2.9

times more efficient in their search than the unemployed. The model also performs better than the standard model because it accounts for the differences in offer wages that we observe in the data. The model also implies a reasonable flow value of unemployment and generates a mean-min wage ratio, first examined by Hornstein, Krusell, and Violante (2011), that is comparable to the empirically-observed ratio despite the relatively high implied values of unemployment.

Our findings provide several contributions to the literature on job search. First, we provide the most comprehensive evidence to date on the nature of on-the-job search, building on recent work by Fujita (2013). On-the-job search is pervasive, with over 23 percent of the employed looking for work during our survey month. Second, and perhaps even more striking, is the propensity of employed individuals not seeking work to generate job offers. This finding has strong implications for labor market models that incorporate on-the-job search. The finding is analogous to recent work on vacancies by Davis, Faberman, and Haltiwanger (2013), who find that a sizable fraction of hiring by firms occurs without the use of a formal vacancy. Part of our result stems the fact that informal job search methods, such as the use of referrals and unsolicited contacts by employers, play an important role in the job search process.[2] Through the lens of a standard labor search model, we show that this implies the employed are much more efficient in their job searches. Finally, we find that the job offer distributions potentially differ by labor force status. This is at odds with standard models of random search and suggests unobserved factors that are unique to employment status (such as a stigma in the hiring of the unemployed) are an important part of the hiring process.

The next section describes our survey. Section 3 presents our evidence on job search behavior and job search outcomes by labor force status. Section 4 presents a model of on-the-job search with endogenous search effort, and its calibration to our findings. Section 5 concludes.

[2] Models of hiring through referrals such as Galenianos (2013) are consistent with our findings.

2. Data

Our data are an annual supplement to the Survey of Consumer Expectations (SCE), administered monthly by the Federal Reserve Bank of New York. The SCE is a nationally-representative survey of roughly 1,300 individuals that asks respondents about their expectations about various aspects of the economy. We designed the supplement ourselves and first administered it in October 2013. We have administered it annually in 2014 and 2015 since then, and present results for a sample that pools all three years of data together. Our supplement asks a broad range of questions on employment status, job search behavior, and job search outcomes. Demographic data is also available for respondents through the monthly portion of the SCE survey.

The data ask a variety of questions that are tailored to individuals' employment status and job search behavior. For the employed, including the self-employed, the survey asks questions about their wages, hours, benefits, and the type of work that they do, including questions on the characteristics of their workplace. For the non-employed, the survey asks a range of questions about their work history, including detailed questions on their most recent employment spell. The survey also asks questions related to the type of non-employment, including those related to retirement, school enrollment status, and any temporary layoff.

Regardless of employment status, the survey asks all individuals if they have searched for work within the last four weeks, and if they had not searched, whether or not they would accept a job if one was offered to them. Among the employed, the survey distinguishes between those searching for new work and those searching for a job in addition to their current one. For individuals who have searched or would at least be willing to accept a new job if offered, the survey asks a series of questions relating to their job search (if any), including the reasons for their decision to (not) search. It then asks an exhaustive set of questions on the types of effort exerted when seeking new work (e.g., updating

resumes, searching online, contacting employers directly). It also asks about the number of job applications completed within the last four weeks and the number of employer contacts and job offers received. It also probes further to see how those contacts and offers came about, i.e., whether they were the result of traditional search methods or whether they came about through a referral or an unsolicited employer contact. For those who received an offer, including any offers within the last six months, the survey asks about a range of characteristics of the job offer, including the wage offered, the expected hours, its benefits, as well as the type of work to be done and the characteristics of the employer. It also asks what led, or may lead, the respondent to accept or reject the offer, and asks a range of questions about whether there was any bargaining over the wage with either the current or future employer. The survey asks job seekers about their reservation job values, including their reservation wage and their preferred hours, and it asks how much the wage would have to change for them to endure a variety of work disamenities (e.g., a lack of benefits, longer work hours, a longer commute, or a relocation). Since only fraction of respondents in our sample report a job offer in the months leading up to the survey, we ask those who are currently employed a range of additional, retrospective questions about the search process that led to their current job, as well as questions about the characteristics of their previous job.

Many of the survey questions follow a format similar to the Current Population Survey (CPS), though there are notable differences. The survey identifies the labor force status of respondents at several different points in their employment history: at the time of the survey, at the time of their hiring (if currently employed), and at the time of their job offer (if they received one within the last six months). We also impute a labor force status for individuals four weeks prior to the survey. Our ability to identify labor force status at these different points allow us to deal with time aggregation and related issues when comparing the search and job-finding behavior of the employed and non-employed.

We define respondents' labor force status at the time of the survey in a manner similar to the CPS, but because we ask about search effort more broadly than the CPS, we can generate two measures of unemployment that are consistent with the BLS definition. The BLS definition classifies someone as unemployed if they "do not have a job, have actively looked for work in the prior 4 weeks, and are currently available for work." Those on temporary layoff are also included regardless of search effort or availability. We employ the same definition, but due to the skip logic of the CPS survey design, there are some non-employed who are never asked about whether they searched for work. These are primarily retired individuals who state that they do not want a job (and are therefore assumed to be unavailable for work). Our survey, however, captures search effort regardless of whether a non-employed individual states that they want work. Throughout our analysis, we employ the broader "job search" definition of unemployment, but in the online appendix, we replicate our estimates on search effort and outcomes using the definition consistent with the CPS survey design. The difference is that the "job search" definition includes non-employed individuals who did not state that they want to work but actively searched and are available, while the stricter "BLS definition" includes only those who additionally state that they want work. The results in the online appendix show that those included in the broader "job search" definition represent about 12 percent of those considered out of the labor force under the BLS definition.

We identify individuals as either employed or non-employed at the time of their hiring or receipt of a job offer. The survey allows for some greater disaggregation of these labor force statuses, though we obtain results similar to those in our main analyses when using the more detailed definitions.[3] We also

[3] Specifically, the labor force status at the time of hiring distinguishes between those who quit from a previous job and those who lost their job immediately prior to starting the current job. The majority of the employed quit from their current job, so the results for this group are very similar to those reported in our analysis. The labor force status at the time of job offer distinguishes between those who were employed either full-time or part-time at the time of the offer. Most individuals were employed full-time, and consequently their results are similar to what we report in our analysis. The vast majority of the non-employed under both definitions report actively searching.

impute a labor force status four weeks prior to the survey for individuals using a range of their responses on employment status, job tenure, non-employment duration, job offer incidence and timing, etc. We detail our imputation methodology in the appendix. Having a labor force status for individuals approximately one month prior to the survey is useful for when we take our empirical findings to the model because the model characterizes a job seeker's search behavior based on their labor force status prior to exerting search effort or receiving any job offers.

Our analysis uses a sample from the SCE of individuals aged 18 to 64 pooled across the 2013, 2014, and 2015 surveys, which provides just under 2,900 respondents. By design, the SCE only includes heads of household. The survey does not ask the self-employed about job search, so the self-employed are generally excluded by construction throughout our job search analysis. In addition to our main sample, we also focus on two subsamples of the data. The first is the subsample of the currently employed (excluding the currently self-employed). After removing respondents with missing data, this sample includes 1,763 respondents. We use this subsample to examine the job search behavior that led to their hiring to their current jobs. The second is a subsample of all individuals who received a job offer within the last six months. By construction, some of these offers will reflect the respondent's current job. After removing offers with only partial data, the sample has 654 observations. We use this sample to examine the job offer characteristics, including the offer wage distribution, as well as the characteristics of accepted job offers.

Table 1 presents basic summary statistics for our analysis sample and a comparable sample using the same months of data from the Current Population Survey (CPS). The demographic statistics across the two surveys are roughly similar though the shares of married and white workers are both higher in the SCE sample. The employment-to-population ratio, which is unaffected by the differing unemployment definitions, is somewhat higher in the SCE as well. Under the BLS definition, the

unemployment rate in the SCE is slightly higher than the CPS rate, but not statistically different. Including the additional job seekers in the "job search" definition increases the unemployment rate considerably, however, from 5.3 percent to 8.0 percent.

3. Evidence

3.A. Job Search Effort and Outcomes

We begin with evidence on the basic characteristics of individual job search effort and its results. Table 2 reports the incidence of job search by labor force status. By definition, all unemployed, save for those on temporary layoff, search. Among the employed, just over 23 percent looked for new work in the last four weeks, with 20 percent applying to at least one job and a similar amount searching at least once in the last seven days.[4] Among the employed, just over 6 percent did not search but would take a new job if offered. A minimal amount of those out of the labor force engaged in search, but by our "job search" definition of unemployment, none are available for work.

Table 3 reports the effort related to the job search process. We categorize the employed by whether or not they are actively looking for work. The estimates are for all individuals excluding the self-employed. The unemployed send substantially more job applications and dedicate more hours to search than the other groups. They put in roughly twice as much effort as the employed that actively look for work, and roughly seven times as much effort as all employed, regardless of search incidence.

Table 4a reports search outcomes by labor force status. It shows that those employed and looking for work receive the greatest number of employer contacts despite their lower search effort.

[4] Of those searching on the job, 20.5 percent were searching for an additional job and not looking to leave their current job and 27.4 percent were only looking for work similar to their current job. Note that only 14 percent report that they are available for new work, which is mostly a consequence of notice of separation required for the current job. In contrast, only 5.3 percent of the unemployed were only looking for work similar to their last job.

They also receive the most unsolicited employer contacts and job interviews. Employed individuals not looking for work receive about one-quarter as many contacts as the unemployed despite their lack of effort. The employed actively seeking work generate about five times as many offers as those who are not actively searching. They generate about 14 percent more offers than the unemployed, again, despite exerting about half as much search effort.

One potential concern with the estimates in the top panel of Table 4a is that the outcomes are based on retrospective questions about contacts and job offers over the last 4 weeks by current labor force status. It is therefore possible that an individual who was unemployed at the time of the offer accepted the job offer and started working on it within the 4-week reference period and thus was employed by the time of the survey. To address this potential selection issue, in the bottom panel of Table 4a we report offer outcomes by labor force status in the *prior* month.[5] The results show that the fraction with at least one offer over the last 4 weeks, decreases slightly from 11.8 percent to 10.5 percent for the employed but increases substantially for the unemployed from 22 percent to 33.9 percent. This is in line with the expectation that some of those who are unemployed at the time of the offer started working by the time of the survey. Another concern may be that a substantial fraction of employed workers look for additional jobs and thus in the bottom panel of Table 4a we also report offer outcomes ignoring offers of those who do not look for new work but only additional work. The fraction of those receiving at least one offer ignoring job search for additional jobs is 9.1 percent, which is our preferred estimate of the offer rate, which we use in the model calibration further below.

It is possible that some individuals many simply not pursue offers that they are likely to reject. To address this issue, our survey asked a question whether an employer indicated that they may be

[5] Labor force status in the prior month is computed from information of labor force status at the time of the job offer and questions on job tenure and unemployment duration. We also estimated a separate set of results where we linked the SCE quarterly survey to the SCE monthly survey. The results are very similar to the ones reported in Table 4a and are available upon request.

willing to make an offer but the respondent indicated that he or she is not interested in the offer. We label these offers as unrealized rejected offers as respondents rejected these offer before a formal offer was made. Among those who did *not* report a formal offer over the last 4 weeks, about 4 percent of employed workers indicated that they rejected such an unrealized offer, compared to only 1 percent for the unemployed. The bottom panel of Table 4a reports the fraction of individuals who received at least one offer, including these unrealized offers, which sums to 13.2 percent for the employed and 34.9 percent for the unemployed.

Table 4b reports the acceptance decision for offers received in the last four weeks by labor force status in the prior month. The results show that the unemployed are much more likely to accept a given offer with over 50 percent of their best offers accepted compared to about 30 percent of employed who accept their best job offer (the question about whether respondents accepted a job offer was only asked for the best offer). The estimates of the acceptance rate that correspond to our preferred measure of the offer rate, i.e., excluding offers for additional jobs, is 53.2 percent for the unemployed and 30.0 percent for the employed. Once we factor in the receipt of multiple offers in a given month, the acceptance rate slightly declines but the difference between the unemployed and employed remains nearly the same.

Table 5 reports the distribution of respondents, job applications, and job search outcomes, including job offers, by labor force status. The unemployed make up just over 7 percent of our sample, but account for nearly 40 percent of all job applications sent. At the same time, they only receive 16 percent of all offers made. In stark contrast, the employed who report not looking for work send no applications by construction but account for around 28 percent of all employer contacts and receive over 27 percent of all job offers. This is due, in part, to the fact that they also account for 44 percent of all unsolicited employer contacts and 26 percent of all referrals. Those actively searching on the job

account for another 48 percent of all job offers. Thus, the job search behavior of the unemployed can be characterized by high effort, but relatively low returns in terms of employer contacts and job offers. The employed, on the other hand, fare fairly well regardless of whether they are actually looking for work.

3.B. Characteristics of Job Offers and Accepted Jobs

We now examine how the job offers themselves, including all offers and the subset of those that are accepted, differ by an individual's labor force status at the time of the offer. Our survey asks individuals about any offers they received in the last four weeks. For those who received no offer in the last four weeks, it probes further to elicit information on any offers received within the last six months. It asks a variety of job characteristics and about characteristics of the search and bargaining process. It also asks if the offer was accepted (and if it represents their current job), and it asks whether the individual was employed, either full-time or part-time at the time of the offer. We also compare how reported reservation wages differ by labor force status and ask about their desired hours and their preferences on other aspects of the job (relocation, commuting, health benefits, and hours).

We use an hourly estimate of wages. Respondents report this either directly as an hourly wage, or as a measure of weekly or annual earnings. In the latter cases, we measure the wage as earnings per hour, based on the reported usual hours worked. In all cases, we convert all wages used into real terms using the Consumer Price Index (CPI).

Table 6 presents the characteristics of best job offers received within the last six months by labor force status (employed vs. non-employed) at the time of the job offer. First, note that over 70 percent of job offers in our sample go to those who were employed at the time of the offer. The results consistently show that the employed receive much better job offers than the non-employed. Unconditionally, the employed receive wage offers that are about 40 log points higher than the wage

offers of the non-employed. Even after conditioning on the observable characteristics of the worker and the job offer, the prior wage, hours, and work history of the worker, and the incidence of any bargaining or counter-offers in the offer process, the employed enjoy wage offers that are nearly 29 log points higher than the wage offers of the non-employed.[6] The top panel of Figure 1 shows that, even after accounting for these controls, the distribution of wage offers for the employed stochastically dominates the distribution of wage offers for the non-employed. The remainder of Table 6 shows that job offers received by the employed are superior on other margins as well. Their hours are only 8 log points higher (which is not statistically significant), but they are 20 percentage points more likely to receive at least some benefits such as retirement pay or health insurance. The employed are nearly twice as likely to have received their offer through an unsolicited contact, though only slightly more likely to have received the offer through a referral. The employed and non-employed are roughly equally likely to have had a "good idea" of what the job paid prior to receiving the offer. Potentially contributing to the differences in offer wages between the two groups, the employed significantly more likely to bargain over their offers, with 39 percent of their offers involving some bargaining, compared to 24 percent for the non-employed. Counter-offers by the current employer, defined as anything from matching the outside offer to offering a promotion, pay raise, or some added job benefit, occurred for about 14 percent of the employed who received an offer from an outside firm. Despite these relatively poor job offers, the non-employed are about one-and-a-half times more likely to accept them, with 55 percent of offers accepted by the non-employed versus 35 percent by the employed. Table 6 also suggests that a primary reason that the non-employed are more likely to accept their relatively poorer job offers is a perceived lack of alternative options. About 27 percent of the non-employed cite a lack of other

[6] Our conditional estimates of the offered wage and the subsequent accepted wage include the same set of variables used to generate the conditional estimates of the starting wage reported in Table 5 except for job tenure, tenure squared, an indicator for self-employment, and the industry of the job offer. We report estimates of the differences in hours and other characteristics of the offer conditional on these controls in the online appendix.

alternatives as the main reason for accepting an offer, while only 7 percent of the employed cite that as their primary reason. The bottom panel of Figure 1 shows that the accepted wage distribution of the employed stochastically dominates the accepted wage distribution of the non-employed.

We can also examine job search retrospectively for those employed at the time of the survey interview by asking them how they came about their current jobs. The advantage of this approach is that we are able to compare the starting wages across labor force statuses controlling for differences in prior employment history (i.e., the wage and hours of the previous job), which provides a rough proxy for any unobserved differences in individual characteristics that cause individuals to sort into different labor force statuses. Our retrospective questioning allows us to differentiate individuals into those who were previously employed and those who were hired from non-employment.[7]

Table 7 presents the characteristics of the current and previous job by labor force status at the time of hire. We focus on the comparison of the non-employed to those who move directly from employment to their current job. At the time of the survey interview, those hired from non-employment are paid lower wages, have fewer work hours, and are much less likely to have any benefits than those who were hired directly following a quit. They are also somewhat more likely to be looking for new work at the time of the survey. Estimates reported in the middle of Table 7 show that most of the wage differences between those hired from employment and those hired from non-employment stem wage differences at their time of hiring. The real starting wage of those hired from non-employment is 28 log points lower than the real starting wage of those hired following a quit, on average. Conditioning on the observable characteristics of the worker and the job reduces the wage difference by nearly half, to about 14 log points. Additionally controlling for the (log) real wage and (log) hours of the worker's

[7] In unreported results, we experiment with further differentiating the non-employed by those who were and were not searching for work when they were hired, but it turns out that nearly all of the non-employed were looking for work when hired.

previous job, as well as their five-year prior employment history, does not reduce the gap further.[8] The last two rows of Table 7 show why controlling for the prior work history makes little difference. Despite the large differences in the wage and hours of the current job across the two labor force categories, the differences in their previous jobs' wage is small and statistically insignificant. This is true for both the unconditional real wage and the wage that controls for observable worker and job characteristics and the five-year work history.[9]

Figure 2 illustrates the wage differences between those hired from employment and those hired from non-employment for their full wage distributions. It plots the (log) differences in the real starting wage, relative to the real previous wage, for each group, after controlling for observable worker and job characteristics and the prior five-year work history. The wage distribution of those hired from employment stochastically dominates the distribution of those hired from non-employment. The figure also shows, however, that there is a sizable fraction of hires that quit to a lower wage and a sizable fraction of hires that receive a higher wage after non-employment. Nevertheless, after conditioning out our controls, those who quit receive a 8 log point increase in their wage, on average, while those who were non-employed receive an 12 log point *decrease* in their wage, on average.[10]

[8] Throughout our analysis, our reported conditional wage estimates are the residual from regressions on our controls and dummy variables for labor force status, with the appropriate coefficients and adjusted wage mean added back. In the online appendix, we also report the characteristics of the current job after controlling for observable worker, job, and firm characteristics and prior work history. Our worker controls include sex, age, age squared, marital status, marital status × sex, education, race, homeowner status, and number of household children. Our firm and job controls are their two-digit occupation, two-digit industry, job tenure, tenure squared, firm size, and an indicator for self-employment. Controls for five-year work history are the shares of the previous five years spent either employed, unemployed, in school, or otherwise out of the labor force. In unreported results, we also experimented with additionally controlling for the state unemployment rate (a proxy for labor market tightness) at the time of hire, and it did little to change results. The addition of the state unemployment rate also had little effect on subsequent wage measures throughout our analysis.

[9] Our residual measure of the previous wage includes all of the controls of the residual measure of the starting wage except for job tenure, tenure squared, industry, and firm size.

[10] In the online appendix, we show that the unconditional changes in the wage between jobs is an 11 log point gain and a 15 log point loss for those hired from employment and from non-employment, respectively.

3.C. Taking Stock

We have seen that the unemployed fare worse than those searching while on the job in their job-finding prospects. They exert more effort yet receive fewer offers. Furthermore, those who do find work appear to be in lower-quality jobs that those who quit directly to their current job despite the fact that there are little differences in the earnings of their previous jobs. This holds even after controlling for observable characteristics of the job and worker. The evidence does not seem to support the hypothesis that the poor employment prospects of those seeking work from non-employment are the result of negative selection. In contrast, the employment histories by labor force status at the time of hire are quite similar. Instead, the evidence appears consistent with the view that the employed are in a better bargaining position than the unemployed due to their better outside option, as in the model of Cahuc, Postel-Vinay and Robin (2006). The evidence is also consistent with an implicit penalty for job seeking while unemployed, similar to Kroft, Lange, and Notowidigdo (2013). Even those who found work immediately following a layoff fare better than those who had a non-employment spell prior to their hiring. If job-finding has a stochastic and idiosyncratic component to it, these individuals could be thought of as those who were stochastically "lucky" in their job findings prospects, while the remainder are those who were forced into a spell of non-employment before finding a job, further dampening their prospects. There may still be some unobserved differences across individuals that previous job history does not capture, but the job histories alone suggest that individuals at the time of hire are fairly similar, on average, across the labor force categories. Furthermore, the fact that those hired from non-employment are more likely to be looking for work at the time of the survey interview is consistent with a story where these individuals have received a negative employment shock and are looking to move back up the job ladder.

Putting the evidence on job offers and accepted offers together suggests that the unemployed draw their wage offers from a lower-quality distribution even after controlling for a variety of factors

and accept relatively poor job offers in part because of the perceived lack of alternative options. We now turn to incorporating our evidence into a model of labor market search.

4. A Model of On-the-Job Search with Endogenous Search Effort

In this Section, we relate our empirical findings to search theory. To this purpose, we calibrate a partial equilibrium model of on-the-job search where both unemployed and employed workers face a random arrival of job offers, and evaluate to what extent the search and acceptance decisions in the model match those observed in our data. The calibrated model also allows us to relate to the discussion in Hornstein, Krusell and Violante (2011) who argued that plausibly calibrated search models typically imply implausibly low flow values of unemployment.

4.A. Model Setup

Our model is an extension of the model of Christensen et al. (2005). Here, we allow for differing levels of search efficiency between the employed and unemployed, which is reflected in differing job-offer arrival rates. The model economy is comprised of homogenous, risk neutral workers who can search either on-the-job or while unemployed. Wage offers, w, are drawn from an i.i.d. distribution with c.d.f. $F(w)$, i.e., $F(w)$ equals the probability a wage $w' \leq w$ is drawn. We allow for the possibility that the wage offer distribution varies for the employed and unemployed, so that the employed draw from a distribution $F_e(w)$ and the unemployed draw from a distribution $F_u(w)$.

In our model, time is discrete and an individual receives a job offer with probability $\lambda(s) = \alpha + \beta s$, where $s \in [0, \frac{1-\alpha}{\beta}]$ is the endogenously chosen level of search effort. The constant α reflects the possibility that individuals may receive unsolicited offers even in the absence of any search effort. The

job-offer arrival rate differs by employment status, so that $\lambda_i(s) = \alpha_i + \beta_i s$ for $i \in \{e, u\}$.[11] Search effort has an increasing, convex cost, $c_i(s)$, with $c_i', c_i'' > 0$ and $c_i(0) = c_i'(0) = 0$. Existing jobs end exogenously at a rate δ, and the discount rate is r.

Given this setup, the Bellman equation for the employed is

$$W(w) = \max_{\frac{1-\alpha_e}{\beta_e} \geq s \geq 0} \left\{ w - c_e(s) + \frac{1}{1+r}\left(W(w) + \lambda_e(s)(1-\delta) \int_{\underline{w}}^{\overline{w}} [W(x) - W(w)] dF_e(x) - \delta[W(w) - U] \right) \right\}. \quad (1)$$

As Christensen et al. (2005) show, the value of employment is increasing in the wage. Consequently, optimal search effort will vary with the wage. The first order condition of (1) is

$$c_e'(s_e(w)) \leq \beta_e \frac{1-\delta}{1+r} \int_{\underline{w}}^{\overline{w}} [W(x) - W(w)] dF_e(x), \quad (2)$$

which holds with equality if the optimal search effort is below $\frac{1-\alpha_e}{\beta_e}$ and where $\overline{w}$ is the upper support of $F_e(w)$. Since the cost of search effort is increasing and convex, search effort will decline with the wage. Note that, since $s'(w) < 0$, it will be the case that $s(\overline{w}) = 0$.

[11] Our model is closely related to the extension of Christensen et al. (2005) derived by Hornstein, Krusell, and Violante (2011), but it maintains the distinction between search effort, s_i, and search efficiency, β_i, since our data can separately identify the two, and allows for differences in the wage offer distribution between the employed and unemployed.

The Bellman equation for the unemployed worker is of a similar structure. While unemployed, individuals receive a flow utility of unemployment, b. We assume that the search cost function Consequently, an unemployed job seeker solves

$$U = \max_{\frac{1-\alpha_u}{\beta_u} \geq s \geq 0, R} \left\{ b - c_u(s) + \frac{1}{1+r} \left(U + \lambda_u(s) \int_R^{\bar{w}} [W(x) - U] dF_u(x) \right) \right\}. \quad (3)$$

The unemployed will have a reservation wage, R, that solves $W(R) = U$. In other words, the reservation wage is the wage where the unemployed are just indifferent between a job that pays R and unemployment. Since the unemployed all have the same flow value of unemployment and face the same expected wage, they will all choose the same search effort. Despite the fairly straightforward solution to the optimal search effort of the unemployed, it is useful in this case to derive the first order condition for (3) because it will be useful in deriving R in this model,

$$c_u{}'(s_u) \leq \beta_u \int_R^{\bar{w}} [W(x) - U] dF_u(x). \quad (4)$$

The solution differs from (2) in the different search cost function, the slope of the job offer production function, and the expected gain from accepting a job, which is determined by the optimal reservation wage *R* and the shape of the wage offer distribution for the unemployed. For the same search cost function, the job offer production function and the wage offer distribution function do not differ between employed and unemployed, then the model predicts a higher search effort for the unemployed relative to the employed because the value of employment at any wage w>R is higher than the value of unemployment.

As documented in the empirical section, employed workers appear to reject a non-negligible fraction of offers before they are made. We model these unrealized offers, by assuming that job seekers

observe the terms of the offer prior to receiving the formal offer with probability χ_i for $i \in \{e, u\}$, and do not pursue the offer further (i.e., reject) it the wage is below the reservation wage.[12] For a worker with reservation wage *r*, one can thus write:

$$\tilde{\lambda}(r) = \lambda_i(s(r))(\chi_i(1 - F_i(r)) + 1 - \chi_i) \quad (5)$$

$$\tilde{A}(r) = \frac{1-F_i(r)}{\chi_i(1-F_i(r))+1-\chi_i}. \quad (6)$$

where $\lambda_i(s(r))$ is the probability of receiving an offer, including unrealized one, $\tilde{\lambda}(r)$ is the probability of receiving a formal offer, $\tilde{A}(r)$ is the observed acceptance rate and $(1 - F_i(r))$ is the likelihood a potential offer is above the reservation wage threshold. Note that one can show that the optimal search effort in this model is a function of the reservation wage.

4.B. Calibration

To highlight some key features of our data, we calibrate three versions of the model. The first version of the model is the standard job-ladder model without endogenous search effort, where we set the exogenous search effort to unity, ignore the role of unsolicited job offers, and assume that both the employed and unemployed draw from the same wage offer distribution. The second version of the model extends to the standard model to include endogenous search effort and unsolicited job offers but maintains the assumption of a homogenous wage offer distribution. The third version of the model allows for differing wage offer distributions between the employed and unemployed.

There are a number of parameters that match evidence extrinsic to our survey and that are summarized in Table 8. We calibrate a discrete time version of the model above at monthly frequency and set the monthly discount factor to be 0.9966 to match an annual interest rate of 4 percent. We set the monthly job separation rate to be 0.015, which matches the average E-to-U flow rate in the Current

[12] See the Appendix of Hall and Mueller (2017) for a similar assumption.

Population Survey in recent years. For the model versions with endogenous search effort, we follow Christensen et al. (2005) and let the search effort cost function be $c_i(s) = k_i s^{1+\frac{1}{\gamma}}$ with $\gamma = 1.19$. Not that, unlike Christensen et al. (2005), we assume that the cost function differs for the employed and unemployed by the scaling parameter k_i. We assume the wage offer distribution to be log normal and normalize the mean of the log offered wages to zero and calibrate the standard deviation of the wage offer distribution to be 0.24 as in Hall and Mueller (2017). This is estimate is close to other estimates of frictional wage dispersion, see Tjaden and Wellschmied (2014). In the full model, we set the mean log offered wage of the employed to 0.23, consistent with the difference in mean wage offers observed in the SCE data.

Our model features nine parameters, which we calibrate from moments in our survey data: First, we calibrate the β_is to the observed job offer arrival rates for the employed and unemployed in the data.[13] Recall that we assume an offer production function of the form $\lambda_i(s) = \alpha_i + \beta_i s$ and thus β_i is a key determinant of the returns to search. In the models with endogenous effort, we normalize the search effort of the unemployed to unity and set the κ_is to match normalized search efforts of the unemployed and employed and set the α_is to match the unsolicited offer rate for both the employed and unemployed. As discussed in the empirical section, unrealized offers represent a non-negligeable fraction of overall offers among employed workers, and we set the parameters χ_l to match the unrealized offer rates for both the employed and unemployed.

The remaining parameter left to calibrate is the flow value of unemployment, b. One option would be to assume that b is equal to a specific value as in Shimer (2005) or Hall and Milgrom (2008). The issue is that there is little consensus of what the appropriate level of b is, except that it should not

[13] We set the offer arrival rates equal to the probability of receiving at least one offer over the course of the last four weeks. We measure search effort as the average number of applications sent over the last four weeks.

be too low. We instead calibrate b to match the average acceptance rate of the unemployed. This allows our model calibrations, by assumption, to match their job-finding rate, as both the acceptance rate and the offer rate of the unemployed are a target in the calibration. The key test then is whether the different models can match the average acceptance rate of the *employed*.

4.C. Results

Table 9 shows the simulation results for the calibration of all three versions of the model. The baseline model, which ignores endogenous search effort, implies that the unemployed are 2.7 times more efficient at search than the employed. This is because the unemployed receive more than twice as many offers than the employed, so ignoring all other aspects of job search will imply that they more than twice as efficient at search. The models with endogenous search effort, however, show the opposite finding. The in both cases, the models predict that the employed have a search efficiency parameter of 0.93-0.94, while the unemployed have a search efficiency parameter of 0.32, implying that the *employed* are 2.9 times more efficient per unit of search effort. Given the high efficiency of search effort for the employed, our calibration implies a very high cost of search for the employed to match the relatively low average search effort of the employed. Censoring of rejected offers appears to be negligible for the unemployed but substantial for the employed, as indicated by the parameters χ_l, with about 35-40 percent of rejected offers that are a not realized/not reported for the employed.

Despite the censoring of rejected offers, in the model with exogenous job offer arrival rate the acceptance rate of the employed is only 17.7 percent and thus well below the empirical estimate of 30.0 percent in out survey. The reason is that workers who move up the wage ladder will reject most offers once they get closer to the top. The model with endogenous search effort clearly improves on this, with an acceptance rate of 21.7 percent. The reason is that workers at the bottom of the wage ladder accept more offers and, due to endogenous search, are also more likely to receive an offer than those at the

top of the ladder. Finally, the model with different job offer distributions generates a substantially higher acceptance rate of the employed and with 33.6 percent even slightly over predicts the acceptance rate in the data. The reasons for the better performance of this model version is that the wage offer distribution of the employed stochastically dominates the wage offer distribution of the unemployed and thus the acceptance rate for a worker at the reservation wage *R* exceeds the acceptance rate of unemployed worker.[14]

Table 9 also shows the flow value of unemployment relative to the prior wage. Hornstein, Krusell and Violante (2011) advocate that any search model that aims at fitting transition rates and wage dispersion needs to back out the implied flow value of unemployment, as search models often imply very low or even negative flow values of unemployment. Our benchmark job-ladder model without search effort implies a flow value of unemployment of 0.31, which is at the lower end of parameters used in the literature. Note that the dispersion of wages used for this exercise is relatively modest, as in Hall and Mueller (2017). If we used a higher dispersion in wage offers instead, the benchmark model would fare worse, with a lower flow value of unemployment. The models with endogenous search effort do substantially better at producing a reasonable flow value of unemployment of between 0.49 and 0.69, depending on whether one nets out search costs.

Finally, our model with different offer distributions performs demonstrably better than the other two models in matching the amount of wage dispersion observed in the data. Hornstein, Krusell, and Violante (2011) argue that a standard model of frictional search and matching in the labor market can only account for a tiny fraction of the wage dispersion observed in the data. They find that extending the model to include on-the-job search can increase mean-min wage ratio, the ratio of the

[14] Note that censoring of wage offers also significantly affects the observed acceptance rate of the employed, as without censoring the acceptance rate in the model is 14.5, 17.7 and 29.2 percent respectively in the three model versions.

mean wage to the minimum wage observed in the data, as high as 1.4, but not nearly as high as the 1.7 ratio observed in the data. In fact, our baseline model that includes on-the-job search yields a mean-min wage ratio of 1.43. Endogenizing search effort increases the implied ratio to 1.49. The model, which also allows for heterogeneity in wage offer distributions, increases the ratio to 1.79. The ability of our model to generate wage dispersion that is consistent with the data is particularly notable because it does so while yielding reasonable values for the flow utility of unemployment as well as nearly matching the acceptance rate of the employed in our data.

Overall, we conclude from this exercise that the models with endogenous search effort do better at fitting the relevant facts (the acceptance rate) and produce reasonable flow values of unemployment. Moreover, the full model, which allows for the employed to draw job offers from a better wage distribution—something that is supported by the data—is able to match the empirical mean-min wage ratio while still generating a reasonable flow value of unemployment.

5. Conclusions

In this paper, we document new facts on the search effort and search outcomes of the employed and non-employed. We find that search among the employed is pervasive. Over 23 percent of the employed report actively looking for work within the past month. We also find that search is more efficient for the employed. They exert only a fraction of the effort of the unemployed yet receive more employer contacts and the same amount of offers per job application sent. Furthermore, a sizable fraction of job offers go to employed workers not even looking for work, underscoring the importance of unsolicited employer contacts in the job search process.

We also find that the employed are not only more efficient in their search, but they also tend to receive and accept better job offers. The differences in search outcomes persist even after controlling

for observable characteristics of the worker and job, and the prior earnings and work history worker (our control for unobservable worker characteristics). Those receiving offers while employed tend to be offered higher wages, more hours, and better benefits. This is true of individuals who were hired to their current job directly from another job, and of individuals who were employed at the time of receiving a job offer reported in the survey. Individuals receiving a job offer while employed are also more likely to engage in bargaining over the offer, and 14 percent of the employed receive some counter-offer from their current employer. Nevertheless, those receiving an offer while non-employed are almost twice as likely to accept their relatively lower-quality offers. Our evidence suggests that this is because these offers are much more likely to be their only option. It is also partly because they have lower reservation wages, on average.

We calibrate our findings to a model with endogenous search effort and on-the-job search, as in Christensen et al. (2005). We extend the model to allow for differences in search efficiency between the employed and unemployed, as in Hornstein, Krusell, and Violante (2011), but extend the model to allow for unsolicited offers (i.e., offer arrivals independent of search effort) and for differences in the wage offer distribution. A basic calibration of our full model suggests that the employed are about 2.9 times more efficient at search than the unemployed, after accounting for the arrival rates of unsolicited offers. A model with exogenous search effort suggests that the unemployed are actually more efficient at search because it fails to capture the differences in effort and relative importance of unsolicited offers. Furthermore, the full model is able to match additional, untargeted moments of the data. In particular, it is able to generate the empirically observed level of the mean-min wage ratio while still generating a plausible value for the flow utility of unemployment. Therefore, accounting for the differences in search effort, search efficiency, and differing offer distributions between the employed and unemployed that we observe in the SCE data are important for models of labor market search and matching that aim to reconcile the theory with the facts on job search, hiring outcomes, and wage dynamics.

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Table 1. Summary Statistics, SCE Labor Supplement vs. Current Population Survey

	SCE Labor Supplement		***Current Population Survey***
Labor Force Status	*Job Search Definition*	*BLS Definition*	
Employment-population ratio	0.761	0.761	0.743
	(0.008)	(0.008)	(0.001)
Unemployment rate	8.0	5.3	5.0
	(0.5)	(0.5)	(0.1)
Labor force participation rate	82.8	80.5	78.2
	(0.7)	(0.7)	(0.1)
Demographics			
Percent male	48.7		51.4
	(0.9)		(0.1)
Percent white, non-Hispanic	72.6		63.6
	(0.8)		(0.1)
Percent married	65.5		51.6
	(0.9)		(0.1)
Percent with college degree	33.0		34.1
	(0.9)		(0.1)
Percent aged 18-39	35.2		38.9
	(0.9)		(0.1)
Percent aged 40-59	49.6		49.5
	(0.9)		(0.1)
Percent aged 60+	15.2		11.7
	(0.7)		(0.1)

Notes: Estimates come from authors' tabulations from the SCE Labor Supplement and the Current Population Survey (CPS) for data pooled across October 2013, 2014, and 2015. Both samples are for heads of household ages 18 to 64. "Job Search" definition of unemployment includes all non-employed who actively searched and are available for work, regardless of reporting whether they "want work." Standard errors are in parentheses.

Table 2. Basic Job Search Statistics by Labor Force Status

	Employed	Unemployed	Out of Labor Force
Percent that actively searched for work	23.1 (0.9)	99.4 (0.6)	2.1 (0.7)
Percent that actively searched and available for work	14.1 (0.7)	99.4 (0.6)	0.0 (0.0)
Percent reporting no active search or availability, but would take job if offered	6.1 (0.5)	0.3 (0.4)	6.0 (1.1)
Percent applying to at least one vacancy in last four weeks	19.8 (0.8)	93.0 (2.0)	1.8 (0.6)
Percent with positive time spent searching in last seven days	20.5 (0.8)	85.9 (2.7)	2.6 (0.8)
Percent only seeking part-time work, conditional on active search	20.5 (1.8)	22.6 (3.3)	
Percent only seeking similar work (to most recent job), conditional on active search	27.4 (2.1)	5.3 (1.8)	
N	2,302	163	432

Notes: Estimates come from authors' tabulations from the October 2013-15 waves of the SCE Labor Supplement, for all individuals aged 18-64, by labor force status. Standard errors are in parentheses.

Table 3. Search Effort by Labor Force Status

	Employed				
	Looking for Work	**Not Looking**	**All**	***Unemployed***	***Out of Labor Force***
Labor Force Status at Time of Survey					
Hours spent searching, last 7 days	4.35	0.05	1.18	8.46	0.07
	(0.30)	(0.01)	(0.09)	(0.75)	(0.04)
Mean applications sent, last 4 weeks	4.63	0.00	1.22	8.14	0.08
	(0.49)	(---)	(0.13)	(1.24)	(0.06)
N	508	1,520	2,028	163	432
Labor Force Status in Prior Month					
Mean applications sent			1.19	10.49	0.47
			(0.13)	(1.75)	(0.10)
Mean applications sent, ignoring applications to additional jobs			0.95	10.48	0.47
			(0.13)	(1.75)	(0.10)
N			2,053	117	453

Notes: Estimates come from authors' tabulations from the October 2013-15 waves of the SCE Labor Supplement, for all individuals aged 18-64, excluding the self-employed, by detailed labor force status. The top panel reports results by labor force status at the time of the survey, while the bottom panel reports the results by labor force status in the prior month. See the appendix for how prior month's labor force status is determined. Standard errors are in parentheses.

Table 4a. Search Outcomes by Labor Force Status

	Employed				
	Looking for Work	**Not Looking**	**All**	***Unemployed***	***Out of Labor Force***
Labor Force Status at Time of Survey					
Mean contacts received	1.874	0.337	0.742	1.261	0.118
	(0.281)	(0.038)	(0.079)	(0.232)	(0.033)
Mean unsolicited contacts	0.783	0.298	0.426	0.459	0.099
	(0.124)	(0.032)	(0.040)	(0.154)	(0.030)
Mean job interviews (2014-15)	0.460	0.005	0.115	0.354	0.022
	(0.045)	(0.002)	(0.012)	(0.107)	(0.018)
Mean offers	0.425	0.086	0.175	0.373	0.079
	(0.039)	(0.011)	(0.014)	(0.078)	(0.026)
Mean unsolicited offers	0.047	0.046	0.046	0.043	0.053
	(0.010)	(0.009)	(0.007)	(0.016)	(0.023)
Fraction with at least one offer	0.299	0.057	0.118	0.220	0.041
	(0.020)	(0.007)	(0.007)	(0.033)	(0.010)
Fraction with at least one unsolicited Offer	0.041	0.028	0.031	0.043	0.026
	(0.009)	(0.005)	(0.004)	(0.016)	(0.008)
Fraction with at least one offer, including unrealized offers	0.345	0.086	0.155	0.237	0.059
	(0.021)	(0.007)	(0.008)	(0.033)	(0.011)
N	508	1,520	2,028	163	432
Labor Force Status in Prior Month					
Fraction with at least one offer			0.105	0.339	0.074
			(0.007)	(0.044)	(0.012)
Fraction with at least one unsolicited offer			0.030	0.031	0.036
			(0.004)	(0.016)	(0.009)
Fraction with at least one offer, including unrealized offers			0.144	0.349	0.085
			(0.008)	(0.044)	(0.013)
Labor Force Status in Prior Month, Ignoring Effort and Outcomes for Additional Jobs					
Fraction with at least one offer			0.091	0.339	0.074
			(0.006)	(0.044)	(0.012)
Fraction with at least one unsolicited offer			0.029	0.031	0.036
			(0.004)	(0.016)	(0.009)
Fraction with at least one offer, including unrealized offers			0.132	0.349	0.085
			(0.007)	(0.044)	(0.013)
N			2,053	117	453

Note: Estimates come from authors' tabulations from the October 2013-15 waves of the SCE Labor Supplement, for all individuals aged 18-64, excluding the self-employed, by labor force status. The top panel reports results by labor force status at the time of the survey, while the middle and bottom panels report the results by labor force status in the prior month. See the appendix for how prior month's labor force status is determined. Standard errors are in parentheses.

Table 4b. Acceptance Decisions by Labor Force Status in Previous Month

	Employed	Unemployed	Not in Labor Force
Fraction of best offers accepted	31.6	53.2	19.7
	(3.3)	(8.3)	(6.9)
Fraction of all offers accepted	27.0	48.3	17.5
	(3.0)	(7.9)	(6.4)
Percent of best offers accepted, ignoring offers for an additional job	30.0	53.2	19.7
	(3.5)	(8.3)	(6.9)
Percent of all offers accepted, ignoring offers for an additional job	26.4	48.3	17.5
	(3.3)	(7.9)	(6.4)
N	196	37	34

Note: Estimates come from authors' tabulations from the October 2013-15 waves of the SCE Labor Supplement, for all individuals aged 18-64, excluding the self-employed, by labor force status in the prior month. See the appendix for how prior month's labor force status is determined. Standard errors are in parentheses.

Table 5. Distribution of Search Effort and Outcomes by Labor Force Status

	Employed				
	Looking for Work	**Not Looking**	**All**	***Unemployed***	***Out of LF***
Pct. of population	19.4	54.2	73.6	7.3	19.1
Job Search over Last Four Weeks					
Pct. of total applications	59.5	0.0	59.5	39.5	1.0
Pct. of contacts received	55.0	27.6	82.6	14.0	3.4
Pct. of unsolicited contacts	41.5	44.2	85.7	9.2	5.1
Pct. of interviews (2014-15 only)	72.7	2.4	75.1	21.0	3.9
Pct. of offers received	48.1	27.1	75.2	16.0	8.8
Pct. of unsolicited offers received	19.1	52.8	71.9	6.7	21.5

Note: Estimates come from authors' tabulations from the October 2013-15 waves of the SCE Labor Supplement, for all individuals aged 18-64, excluding the self-employed, by labor force status at the time of the survey.

Table 6. Characteristics of Best Job Offer by Labor Force Status at Time of Offer

	Employed at Offer	Non-Employed at Offer	Difference, *E – NE*
Percent of job offers	70.5	29.5	
Offer Wage Estimates			
log real offer wage, unconditional	2.893 (0.041)	2.496 (0.057)	0.397 (0.075)
Controlling for observable characteristics	2.853 (0.034)	2.603 (0.036)	0.250 (0.075)
Additionally controlling for previous job's earnings and 5-year work history	2.842 (0.030)	2.557 (0.035)	0.286 (0.081)
Additional Job Offer Characteristics			
log offer usual hours	3.409 (0.032)	3.333 (0.040)	0.076 (0.056)
Pct. of offers with no benefits	40.5 (2.2)	60.6 (3.8)	-20.1 (4.2)
Pct. of offers through an unsolicited contact	26.2 (2.0)	14.4 (2.7)	11.8 (3.6)
Pct. of respondents with at least a 'good idea' of pay	54.6 (2.3)	58.8 (3.8)	-4.2 (4.2)
Pct. of offers with some counter-offer given	14.2 (1.6)		
Pct. of offers that involved bargaining	38.8 (2.2)	24.4 (3.4)	14.4 (3.8)
Pct. of (best) job offers accepted	34.6 (2.2)	54.7 (3.9)	-20.1 (4.1)
Pct. of offers accepted as only option, conditional on acceptance	6.9 (1.9)	27.3 (4.8)	-20.4 (5.2)
N	489	165	

Note: Estimates come from authors' tabulations from the October 2013-15 waves of the SCE Labor Supplement, for individuals aged 18-64, excluding the self-employed, with at least one job offer in the last six months. Observable characteristics controlled for in the conditional wage estimates include fixed effects for survey year and state as well as a vector of demographic controls: sex, age, age squared, four education categories, four race categories, a dummy for homeownership, the number of children under age 6 in the household, marital status, and marital status × sex. They also include the two-digit SOC occupation of the job and six categories of the firm size of the potential employer. Estimates that control for the earnings of the previous job use 342 and 165 observations for the employed and non-employed, respectively. Standard errors are in parentheses.

Table 7. Characteristics of Current and Previous Job, by Labor Force Status at Time of Hire

	Hired from Employment	Hired from Non-Employment	Difference, *E – NE*
Share of Employment	69.1	30.9	
Characteristics of Current Job			
log real current wage	3.126	2.841	0.285
	(0.018)	(0.029)	(0.033)
log usual hours	3.679	3.546	0.132
	(0.010)	(0.019)	(0.020)
Median tenure (mos.)	58.0	41.0	17.0
	(2.8)	(3.6)	(4.6)
Pct. with no benefits	16.0	30.9	-16.8
	(1.0)	(2.0)	(2.1)
Percent actively searched	25.4	32.1	-6.6
for work, last four weeks	(1.2)	(2.0)	(2.3)
Starting Wage Estimates			
log real starting wage,	2.938	2.663	0.275
unconditional	(0.018)	(0.028)	(0.033)
Controlling for observable	2.898	2.754	0.144
characteristics	(0.014)	(0.018)	(0.027)
Additionally controlling for previous job's	2.921	2.766	0.155
earnings and 5-year work history	(0.013)	(0.022)	(0.031)
Previous Wage Estimates			
log real previous wage,	2.859	2.821	0.038
unconditional	(0.024)	(0.037)	(0.045)
Controlling for observable characteristics	2.826	2.910	-0.084
and 5-year work history	(0.019)	(0.031)	(0.044)
N	1,238	525	

Note: Estimates come from authors' tabulations from October 2013-15 waves of the SCE Labor Supplement, restricted to currently employed individuals aged 18-64, excluding the self-employed, with a reported labor force status at the time of hire and reported current, starting, and previous-job wages and hours. Observable characteristics controlled for in the conditional wage estimates include fixed effects for survey year and state as well as a vector of demographic controls: sex, age, age squared, four education categories, four race categories, a dummy for homeownership, the number of children under age 6 in the household, marital status, and marital status × sex. They also include job tenure, tenure squared, an indicator for whether the individual is self-employed, the two-digit SOC occupation of the current job, as well as the two-digit NAICS industry and six categories of firm size for the current employer. Standard errors are in parentheses.

Table 8. Chosen Parameter Values

Parameter	Value	Calibration – Chosen Target
r	0.9966	Implied annual discount rate of 4 percent
δ	0.015	CPS employment-to-unemployment transition rate
γ	1.19	Christensen et al. (2005)
Mean of log offered wage for unemployed, $\mu_{y,u}$	0.00	Normalization
Std. deviation of log offered wages, σ_y	0.240	Hall-Mueller (2016)

Note: Table reports parameter values chosen for all versions of our model. See text for details.

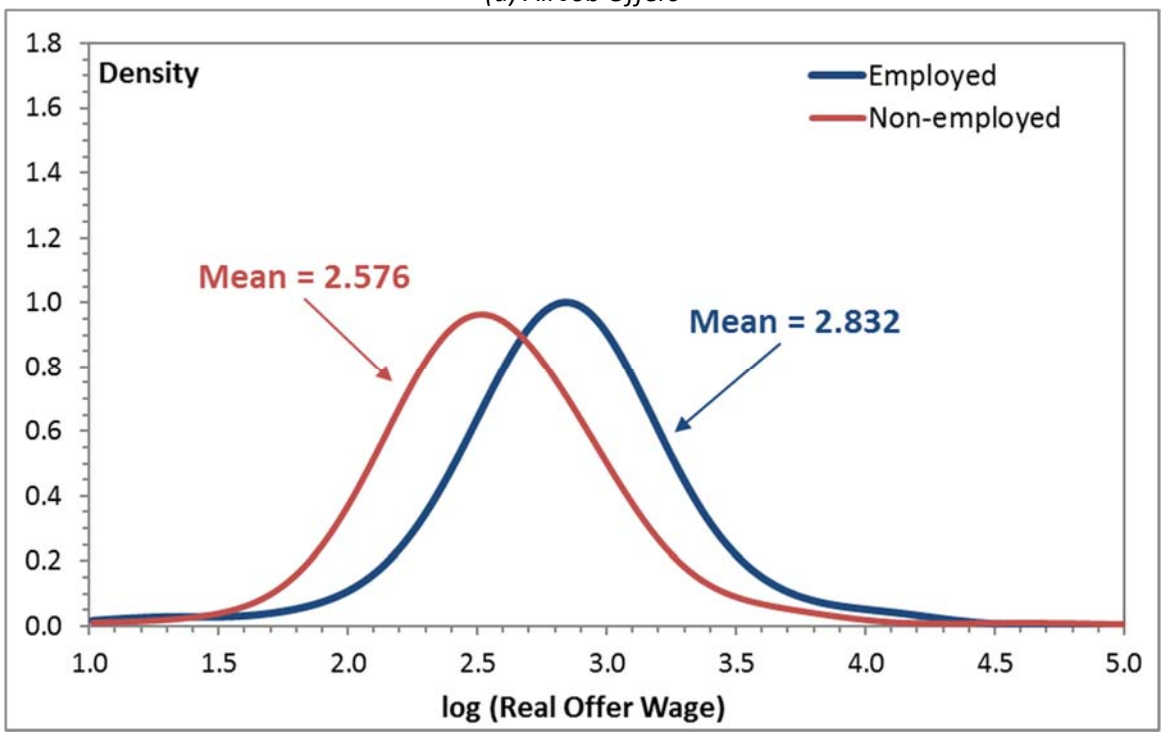
Table 9. Calibrated Parameter Values and Model Simulation Results

			Model versions:	
	Data Moments	**Exogenous offer rates**	**Endogenous search effort**	**Endogenous search effort + different offer distributions**
Calibrated parameter values		(1)	(2)	(3)
κ_u		---	0.31	0.13
κ_e		---	2.27	3.69
α_u		---	0.03	0.03
α_e		---	0.05	0.05
β_u		0.35	0.32	0.32
β_e		0.13	0.94	0.93
χ_u		0.06	0.06	0.06
χ_e		0.35	0.37	0.40
b		0.45	1.01	1.49
$\mu_{y,e}$		0.00	0.00	0.23
Targeted moments (means)				
Search effort of unemployed	1	---	1	1
Search effort of employed	0.091	---	0.091	0.091
Unsolicited offer rate of unemployed	0.029	---	0.029	0.029
Unsolicited offer rate of employed	0.031	---	0.031	0.031
Offer rate of unemployed	0.339	0.339	0.339	0.339
Offer rate of employed	0.091	0.091	0.091	0.091
Unrealized offer rate of unemployed	0.010	0.010	0.010	0.010
Unrealized offer rate of employed	0.041	0.041	0.041	0.041
Acceptance rate of unemployed	0.532	0.533	0.533	0.533
Additional moments		0	0	0
Mean acceptance rate of employed	0.300	0.181	0.218	0.336
Wage offer differential (E - U)	0.25	0.02	0.02	0.25
Mean search cost of unemployed		0.00	0.31	0.13
Mean search cost of employed		0.00	0.04	0.07
b/E(w)		0.32	0.69	0.85
b/E(w) (net of search costs)		0.32	0.49	0.81
Mean-Min Ratio		1.43	1.48	1.78

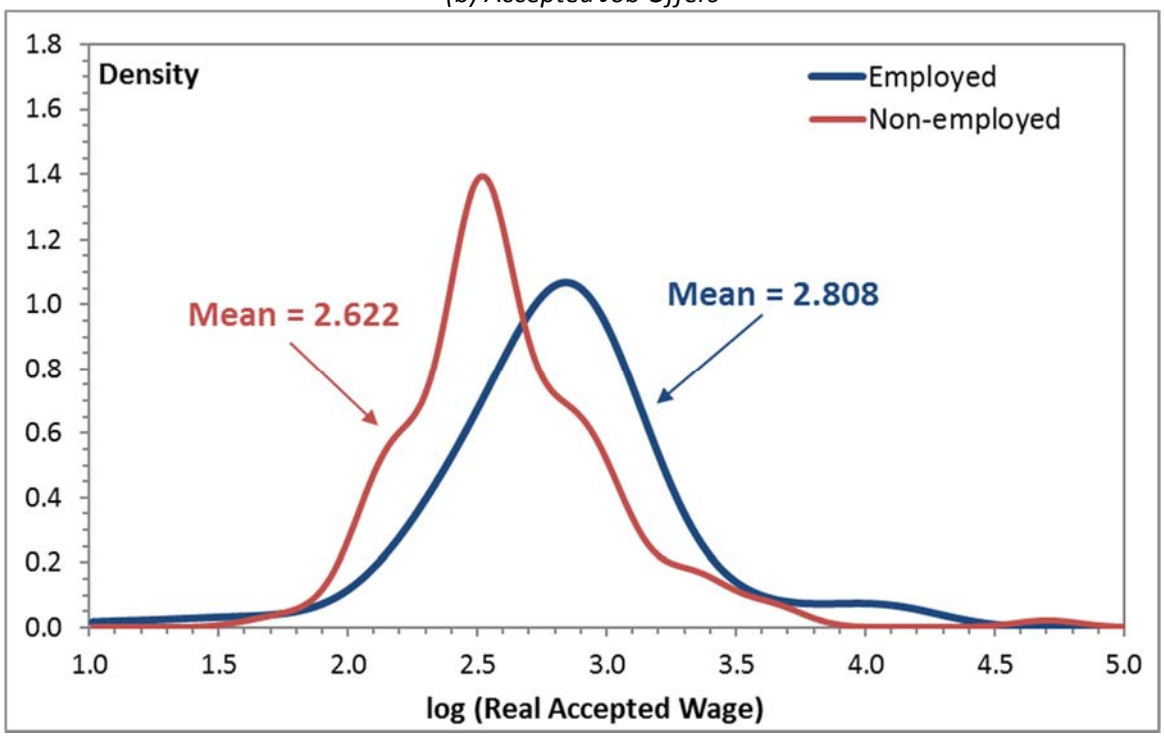
Note: Table reports calibrated parameter values, targeted moments, and additional (untargeted) moments for three versions of our model. The first model assumes exogenous (costless) search effort and homogeneous wage offer distributions, while ignoring the role unsolicited job offers. The second version of the model endogenizes search effort and allows for unsolicited offers. The third version of the model additionally allows for heterogeneous wage offer distributions. See the text for details.

Figure 1. Distribution of Job Offer Wages and Accepted Offer Wages

(a) All Job Offers

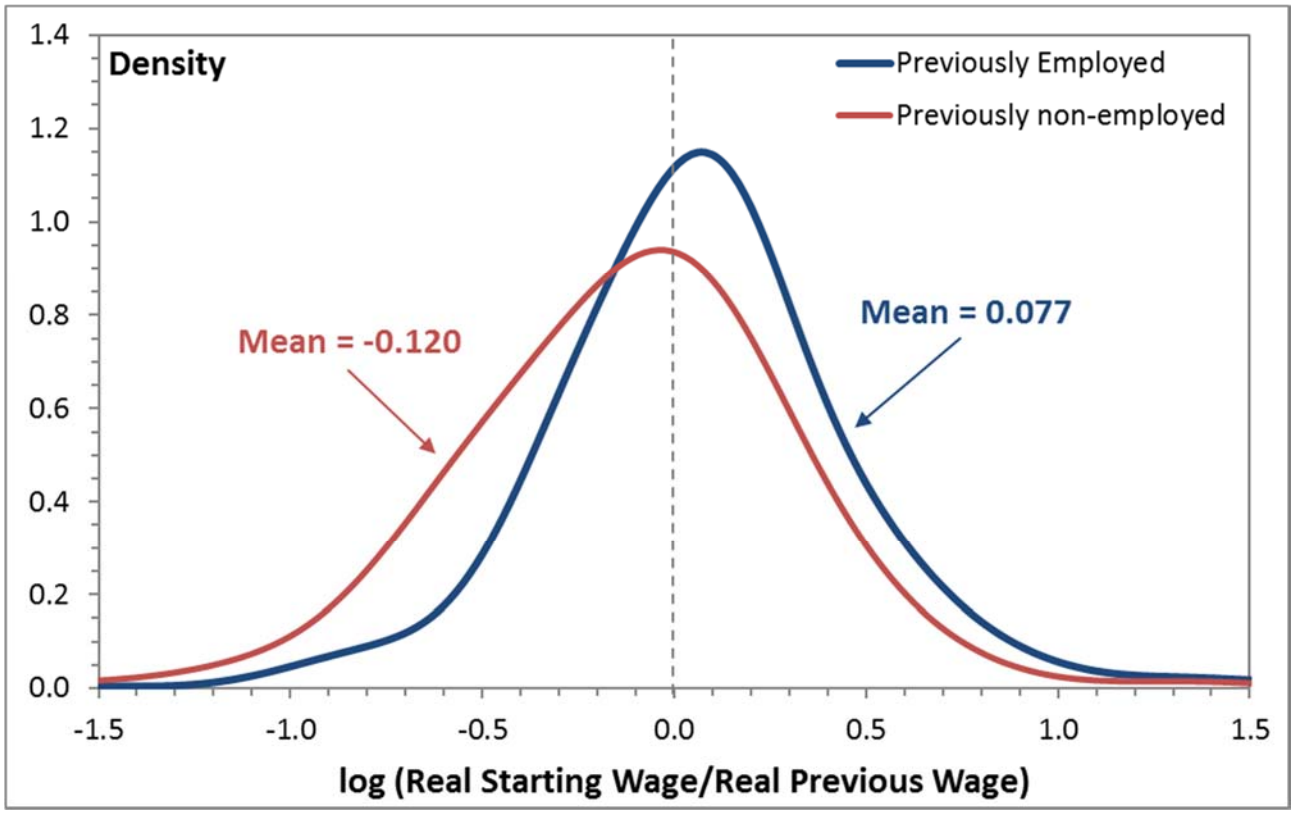


(b) Accepted Job Offers



Note: Figures report kernel density estimates of the log(real job offer wage) by labor force status after controlling for observable worker and job characteristics, the previous wage and hours of the worker, and their five-year work history.

Figure 2. Distribution of Starting Wages Relative to Previous Wage among the Currently Employed



Notes: Figure reports kernel density estimates of the log(real starting wage/real previous wage), where the starting wage is for the current job and the previous wage refers to final wage of the prior job, and where the wage estimates control for observable characteristics of the worker and job, and the prior five-year work history. Estimates are for the sample of the currently employed (excluding self-employed).