

Viewing Job-Seekers' Reservation Wages and Acceptance Decisions through the Lens of Search Theory *

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Abstract

Using a new body of data, I construct an account of a labor market with on-the-job search where

- The log-standard deviation of the distribution of wages offered to an individual job-seeker is 0.075, far below the dispersion of wages in the cross section but far above the tiny dispersion that the traditional search model implies.
- The reservation wage for unemployed job-seekers implied by their acceptance decisions is 91 percent of their average earnings and unemployment compensation, somewhat above estimates from preferences and UI rates and far above the low (sometimes negative) levels implied by earlier work on on-the-job search.
- Reported reservation wages are biased a moderate amount above actual reservation wages.

I conclude that the data support a version of the on-the-job search or job-ladder model that fits all of criteria that search economists have proposed for judging the success of the model. My overall conclusion is that the on-the-job search model explains old and new findings about the response of job-seekers to dispersion in wage opportunities in a comfortable way.

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Search theory is firmly established as a useful way to think about unemployment and labor mobility. But it is well known that fitting search models to data on wages and labor flows is a challenge. Wages have huge dispersion among workers with similar observed characteristics. Traditional search theory hypothesized that job-seekers would keep considering wage offers until they found one high in the upper tail of the distribution of available opportunities. But the size of the flow of searchers out of unemployment into jobs suggests that searchers are leaving money on the table by taking jobs long before it is likely that they have adequately sampled the upper tail. The addition of on-the-job search to the model relieves some of this tension, because job-seekers departing unemployment may do so by taking an interim job and continue to search for the dream job in the upper tail while employed in the interim job. Even then, models that calibrate the offer distribution to the distribution of wages across workers find that the exit rate from unemployment to jobs makes sense only if workers find unemployment virtually intolerable, else they would be more picky in their acceptance decisions. These points reflect the suspicions that search economists have harbored for some time. They recently came into sharp focus in an influential article, Hornstein, Krusell and Violante (2011) (HKV).

In this paper, I investigate a new data source with the aim of resolving the conflict between the interpersonal dispersion of wages and the unemployment-to-work flow. That source is a novel survey of unemployed workers in 2009 and 2010 that Alan Krueger and Andreas Müller (KM) carried out—see Krueger and Müller (2011a) and Krueger and Müller (2011b). The KM data permit a more refined measure of dispersion than do the data sources in earlier work—they liberate search theory from inferring the distribution of opportunities from the residuals of wage regressions. The data include prior wages collected from administrative sources and survey responses about reservation wages each week during a spell of unemployment, and the wages of job offers and of newly accepted jobs. Although earlier surveys have collected cross-section data on reservation wages, the KM survey is the first, as far as I know, that collects panel data on reservation wages. It is also the first U.S. source to match survey data and administrative data, I believe.

I consider the job-ladder model—search while employed is at least as productive as search while jobless. In addition, workers and employers incur no costs from job-changes themselves. Consequently, unemployed job-seekers take any job that has a wage that beats the flow value of unemployment. The flow value incorporates unemployment benefits and the value of the

extra leisure enjoyed when not working. In the simple job-ladder model, unemployment has no value as a real option, because taking a job forecloses no opportunity that might arise while jobless.

I construct a model to match some key moments in the KM data. The model hypothesizes that each job-seeker (unemployed or searching on the job) faces a personal distribution of wage offers with moderate dispersion. HKV use the term *frictional* for the personal component. The model also hypothesizes a distribution of productivity across workers with wide dispersion—both workers and potential employers observe the productivity. Finally, the model hypothesizes a distribution of reported reservation wages around the individual’s actual reservation wage.

The first set of moments describes the acceptance choices of respondents to wage offers that are either better than or worse than their previously reported reservation wages. The moments are the three distinct elements of the 2×2 contingency table for the two binary outcomes, acceptance v. rejection and offered wage above or below reservation wage. The model needs to deal with the fact that the acceptance rate for wage offers below the reservation wage is substantial. Absent the model’s property that the reported reservation wage is a noisy version of the actual reservation wage, the model could not account for these acceptances. The model also accounts for the much smaller incidence of job rejections when the offered wage exceeds the reservation wage.

The second set of moments describes the distribution of the ratio of the reservation wage to the wage the job-seeker earned in the prior job. Because both are arguably proportional to the individual’s personal productivity, the distribution of the ratio reflects purely the variability induced by the individual’s earlier position on the job ladder and the variability arising from the random element of the reservation wage, but does not depend on the distribution of productivity across individuals. The first set of moments helps identify the dispersion of the reported reservation wage and thus identify the dispersion of the worker’s prior actual wage relative to the worker’s productivity. Finally, the job-ladder model identifies the dispersion of the offered wage from the distribution of actual wages.

I find the values of four parameters that cause the calculated moments to match the moments in the KM data reasonably closely. These parameters are (1) the reservation wage of the unemployed, (2) the log-standard deviation of the wage offer distribution, (3) a parameter controlling the bias of the reported reservation wage, and (4) log-standard

deviation of the reported reservation wage.

HKV note that most empirical search models that appear to rationalize observed unemployment-to-employment flows invoke much too low a flow value of unemployment. The flow value is frequently negative. These models generally infer the value of job search from estimates of the dispersion of wage offers derived from cross-sectional data, where dispersion is high. Sampling from that distribution is highly valuable activity, which implies that people must truly hate unemployment to be in equilibrium while unemployed. In the results in this paper, where job-seekers sample from a distribution with modest dispersion (a log-standard deviation of 0.075), the reservation wage for unemployed job-seekers is roughly in line with values of the flow value of unemployment derived from evidence on preferences and on the replacement rate for unemployment benefits.

HKV write, pp. 2894-5 [I have taken the liberty of changing their symbol for the relative value of non-market time, ρ , to z , as generally used in the DMP literature]:

A number of papers in the literature claim that the (on-the-job search) model is successful in simultaneously matching both the wage distribution and labor-market transition data (see, e.g., Christian Bontemps, Robin, and van den Berg 2000; Jolivet, Postel-Vinay, and Robin 2006)...the exercise is incomplete because it neglects the implications of the joint estimates of $F(w)$ and of the transition parameters for the relative value of nonmarket time z . The key additional “test” that we are advocating would thus entail using the estimated $F(w)$ in the reservation-wage equation and, given an estimate of w^* , backing out the implied value for z . In light of our results, we maintain that z would be often negative or close to zero.

This paper carries out the test that HKV recommend.

This version of the paper leaves many topics unexplored. In the concluding section, I describe some directions for additional work.

1 Related Research

See Hornstein et al. (2011) for an extensive discussion and many cites, notably Mortensen (2003), Rogerson, Shimer and Wright (2005), Bontemps, Robin and Berg (2000), Jolivet, Postel-Vinay and Robin (2006), Jolivet (2009), and Postel-Vinay and Robin (2002)

2 The KM Survey

For details on the KM survey, see Krueger and Müller (2011a) and Krueger and Müller (2011b). The survey enrolled roughly 6,000 job-seekers in New Jersey who were unemployed in September 2009 and collected weekly data from them for several months. The authors also make use of data from administrative records for the respondents, notably their wages on the jobs they held just prior to becoming unemployed.

My work with the KM data makes extensive use of the survey results for reservation wages. Each week, the respondents in the KM survey answered a question about their reservation wages: “Suppose someone offered you a job today. What is the lowest wage or salary you would accept (before deductions) for the type of work you are looking for?”

The KM survey asked respondents each week: “In the last 7 days, did you receive any job offers? If yes, how many?” The respondents received a total of 2,626 offers in 39,201 reported weeks of job search (Krueger and Müller (2011a), p. 19). The ratio of the two, 0.067, is a reasonable estimate of the overall weekly rate of receipt of job offers.

Table 6.1a in Krueger and Müller (2011a) provides data sufficient to calculate the overall acceptance rate. 62.5 percent of respondents who had received offers had accepted them, 16.8 percent had rejected, and 20.7 percent had not yet decided. On the assumption that the undecideds will split in the same proportion as those who had decided, the survey finds an acceptance rate of $62.5/(62.5 + 16.9) = 78.8$ percent.

Krueger and Müller (2011a), Table 6.1a, report the acceptance rates for job-seekers when offered no less than their most recent reservation wage and when offered less. My calculation of these rates makes the assumption that the undecided job-seekers will accept at the same rate as those who have decided. Table 1 shows the distribution of offers and acceptances. Here P stands for probability, A for acceptance, R for rejection, H for offered wage not lower than reservation wage, and L for offered wage lower than reservation wage. Overall, 79 percent of offers are accepted. Offered wages are above the reservation wage about half the time. These facts demonstrate a bias in the reservation wage—job-seekers actually accept jobs fairly frequently at wages below their reservation wages. It is far more common for a job-seeker to accept a wage below the reservation wage (PAL = 31 percent of offers) than to reject an offer above the reservation wage (PRH = 7 percent of offers).

Table 2 pulls together information from Krueger and Müller (2011a) about the distribution of the ratio of the reservation wage reported in the survey to the respondent’s earlier

	<i>Accepted offer</i>	<i>Rejected offer</i>	<i>All offers</i>
Offered wage no less than reservation wage	PAH=0.48	PRH=0.07	0.54
Offered wage below reservation wage	PAL=0.31	PRL=0.15	0.46
All offers	0.79	0.21	

Table 1: Frequencies of Acceptance and Offered Wage Relative to Reported Reservation Wage

<i>Moment</i>	<i>Source in Krueger and Müller (2011a)</i>	<i>Value</i>
Exp of mean log wage ratio	Table 4.2, col. 2	0.90
Mean wage ratio	Table 4.1	0.99
25th percentile of wage ratio	Text, p. 17	0.70
Median wage ratio	Text, p. 17	0.91
75th percentile of wage ratio	Text, p. 17	1.07

Table 2: Five Moments of the Distribution of the Ratio of the Reservation Wage to the Prior Wage

wage, as found in administrative records. I denote the ratio w^R/w . The authors report 5 moments of the distribution, calculated over all respondents and all of the reported reservation wages for each respondent. The moments are the log-mean, the mean, and three quantiles.

3 Model Part I: Acceptance, the Reservation Wage, and the Offered Wage

Let x be the productivity of a worker and assume it is known to employers and to the worker. All of the wage-related objects in what follows are proportional to x , so I can set $x = 1$ to enforce an assumption that everything scales with personal productivity. I denote the reported reservation wage as w^R .

I use the term “offer” to describe a job-seeker’s encounter with a definite opportunity to take a job. Nothing in this paper requires that employers make firm job offers and that job-seekers then make up-or-down decisions. The job-seeker’s decision problem, upon finding a

job opportunity with a joint surplus for the job-seeker and employer, is the same whether the employer is making a single firm offer, or the parties make a Nash bargain, or they engage in alternating-offer bargaining. In the bargaining cases, the job-seeker knows in advance what the bargain will be, so the job-seeker decides whether to engage in bargaining just as he would if he faced a firm offer. That said, the survey included a question about the nature of the job offer and in the majority of cases, the employer did make a firm offer.

The simplest model to explain the facts in Table 1 would take the reservation wage at face value, so $PRH = 0$ and $PAL = 0$. That model is unable to explain the fairly low but positive frequency of rejection of offers with wages no less than the reservation level ($PRH = 0.07$) and unable to explain the high frequency of acceptance of offers with wages below the reservation level ($PAL = 0.31$). The asymmetry suggests that job-seekers regard a Type I error—rejecting a good offer—as more costly than a Type II error—accepting a poor offer. There’s nothing irrational about the asymmetry.

A more realistic model considers randomness in the reported reservation wage relative to actual acceptance decisions. I take the reported reservation wage to be a log-normal random variable with log-standard deviation σ_R and mean γ times the actual reservation wage, w^* . I also assume, here and in the rest of the paper, that wage offers come from a log-normal distribution with log-standard deviation of σ and zero log-mean. The latter is a normalization. The events corresponding to Table 1 are:

$$A: w \geq w^* \tag{1}$$

$$R: \text{not } A \tag{2}$$

$$H: w \geq w^R \sim \text{LN}(\log w^* + \log \gamma, \sigma_R^2) \tag{3}$$

$$L: \text{not } H \tag{4}$$

Figure 1 shows the event space for acceptance-rejection and the offered wage relative to the reservation wage. The random variable on the horizontal axis is the log of the offered wage w minus the log of the true reservation wage, w^* . The latter is a constant. The random variable on the vertical axis is the log of the reported reservation wage w^R less $\log w^*$. The events are labeled; for example, the event AH (accept offer and offered wage at least as high

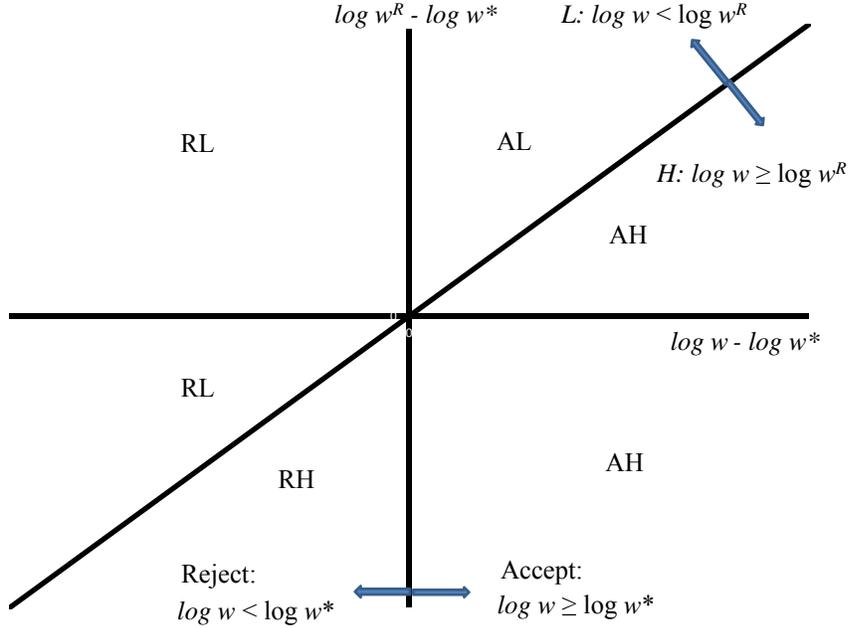


Figure 1: Event Space for Acceptance-Rejection and Offered Wage above-below Reservation Wage

as reported reservation wage) is the lower triangle to the right of the vertical axis above the horizontal axis plus the rectangle below the horizontal axis.

The probabilities such as PAH are the integrals of the joint probability of the two random variables over the various rectangles and triangles. The triangles such as AH involve integrals of the generic form

$$\int_{y=0}^{\infty} \int_{x=0}^y d\Phi\left(\frac{x - \mu_x}{\sigma_x}\right) d\Phi\left(\frac{y - \mu_y}{\sigma_y}\right),$$

which don't seem to have a closed form. Here Φ is the standard normal cdf. I evaluate them with a standard quadrature method. The output of Part I of the model is the vector of fitted values of the probabilities PAH, PAL, PRL. The fourth value, PRH, is redundant because the four probabilities sum to one.

4 Model Part II: Ratio of Reservation Wage to Prior Wage

By design, the KM survey gathered information on the search decisions of only the unemployed. A re-employed worker can continue to search—job-to-job transitions account for about half of all hires in the U.S. economy. A reasonable strategy for the unemployed is

to take an interim job and keep on searching for a more permanent job. Hall (1995) describes a labor market operating in this mode. The job-ladder model, as in Burdett (1978), Burdett and Mortensen (1998), and Hagedorn and Manovskii (2013), formalizes the process. In that model, provided that the offer rate for employed workers does not fall short of the rate for unemployed job-seekers, the reservation wage for a job-seeker is just the flow value of unemployment. The reservation wage for a worker currently receiving a wage of w is w itself—a costless move to any job that beats the current wage is an improvement. If holding a job results in a lower offer rate or if the job-seeker incurs a cost upon changing jobs, the job-seeker will set a reservation wage above the flow value of unemployment to preserve the option value of unemployment. In this section, I consider the simple job-ladder model with equal offer probabilities for unemployed and employed workers and no mobility cost, so the reservation wage is the flow value of unemployment. I discuss the extension to the case of modest real-option value of the current job—merited by the findings for the simple model—in the concluding section of the paper.

To infer the distribution of the prior wage, relative to personal productivity, from the data on the ratio of the reservation wage to the prior wage, I entertain the hypothesis that the reservation wage w^* is a common multiple of personal productivity across job-seekers. In the job-ladder model, that condition holds if the flow value of unemployment is zx for a job-seeker with productivity x and if all job-seekers have the same z . Relaxation of this hypothesis is a topic for further research.

The hypothesis that reservation wages are proportional to personal productivity permits a solution to a problem that has significantly impeded research on labor search behavior. HKV, Section VII, discuss the challenges in detail with many references. The problem is the lack of information on individual wages relative to personal productivity. Conditional on measures of personal characteristics available to the econometrician, wages have huge dispersion. As HKV observe, research that uses econometric residuals to measure wages relative to personal productivity has failed, so far, to find a model that fits all the restrictions that seem reasonable. In particular, the implied flow value of unemployment, z , is far too low in models that use that approach. The dispersion of wages thought to be available to job-seekers is so high that only a spectacular aversion to unemployment can explain the observed rate at which job-seekers take jobs.

Under the proportionality hypothesis for the reservation wage, both the reservation wage

and the wage in the prior job are proportional to personal productivity, so the ratio removes its influence. The dispersion of the ratio is purely frictional, in the vocabulary of HKV. Thus the HM survey permits a new attack on the question that HKV pose but do not answer: Is it possible to build an empirical model conforming to the measured amount of frictional wage dispersion and a reasonable flow value of unemployment?

The goal of this section is to derive the stationary distribution of the wage across employed workers, stated, as throughout the paper, as a ratio to personal productivity. I make the same assumption about the distribution of the reported reservation wage w^R as I did for Part I of the model. Then I compute distribution of the ratio $\omega = w^R/w$ and thus the fitted values of the five moments in Table 2.

4.1 Distribution of the wage in the job-ladder model

Let $G(w)$ be the cdf of wages among workers and job-seekers, with the latter forming a mass at $w = w^*$, the reservation wage of unemployed job-seekers. Here I describe the calculation of G from a given distribution of wage offers.

I start by calculating the transition probabilities for the wage in the job-ladder model, and from those probabilities, the stationary (invariant) distribution of the wage. The wage, w , is a personal state variable, with $w = w^*$ for the unemployed. Let

$$a(w) = 1 - F(w), \tag{5}$$

the probability that a worker holding a job at wage w will accept a job offer, a draw from the offer distribution $F(w)$.

First, for unemployed job-seekers (treated as having wage w^*) the transition distribution to wage w' is

$$\begin{aligned} T(w'|w^*) &= \text{with probability mass } 1 - \lambda a(w^*) \text{ at } w' = w^* \text{ (remain unemployed)} \\ &= \lambda(F(w') - F(w^*)) \text{ for } w' > w^* \text{ (take a job)}. \end{aligned} \tag{6}$$

Jobs end because of the arrival of a better offer or through exogenous separation and a drop to the bottom of the ladder. With an offer rate of λ , the probability of a better offer is $\lambda a(w)$. Separation without a job offer occurs with exogenous probability s and sends the worker into unemployment at the bottom of the ladder. The combined probability of a job ending is

$$\delta(w) = 1 - (1 - s)(1 - \lambda a(w)). \tag{7}$$

The transition distribution from wage w to wage w' is

$$\begin{aligned}
T(w'|w) &= \text{probability mass } s \text{ at } w' = w^* \text{ (fall off ladder)} \\
&= \text{probability mass } 1 - \delta(w) \text{ at } w' = w > w^* \\
&\quad \text{(stay at same wage)} \\
&= (1 - s)\lambda(F(w') - F(w)) \text{ for } w' > w \text{ (move up)}.
\end{aligned}$$

The stationary distribution of the wage satisfies the invariance condition,

$$Q(w') = \int_{w=0}^{\infty} T(w'|w)dQ(w). \quad (8)$$

To approximate the stationary distribution to any desired accuracy, choose a lattice of values $\{w_i\}$ and associated midpoints $\{\bar{w}_i\}$ and solve the linear system,

$$q_j = Q(w_j) - Q(w_{j-1}) = \sum_i (T(w_j|\bar{w}_i) - T(w_{j-1}|\bar{w}_i))q_i. \quad (9)$$

The solution is

$$q' = \text{bottom row of } [(\text{all but last column of } T - I), \iota]^{-1}, \quad (10)$$

where I is the identity matrix and ι is a vector of ones.

The resulting distribution will include the unemployed as a mass at $w = w^*$. The cdf of wages among the employed is

$$Q_E(w) = \frac{Q(w)}{1 - Q(w^*)} \text{ for } w > w^* \text{ 0 otherwise.} \quad (11)$$

The cdf of ω is the convolution,

$$\begin{aligned}
\Pr \left[\frac{w^R}{w} \leq \omega \right] &= \Pr [w^R - \omega w \leq 0] \\
&= \int_0^{\infty} \left(1 - S_E \left(\frac{w^R}{\omega} \right) \right) dF^R(w^R),
\end{aligned}$$

where F^R is the cdf of the reported reservation wage, assumed to be independent of the prior wage w (again, the independence is within a group of job-seekers with the same observed productivity).

Recall that I assume that the reported reservation wage is log-normal with log-mean $\log(\gamma w^*)$ and log-standard deviation σ_R . The corresponding approximation of the cdf of $\tilde{\omega}$ is

$$\sum_i (1 - Q_E(\bar{w}_i)) \left(\Phi \left(\frac{\log \tilde{\omega} + \log w_{i+1}}{\sigma_R} \right) - \Phi \left(\frac{\log \tilde{\omega} + \log w_i}{\sigma_R} \right) \right). \quad (12)$$

<i>Measure</i>	<i>Interpretation</i>	<i>Value</i>	<i>Source</i>
λ	Weekly offer rate	0.067	Krueger and Müller (2011a), p. 19
a	Acceptance rate	0.79	Krueger and Müller (2011a), Table 6.1a
s	Weekly separation hazard	0.0052	Corresponds to 9 percent unemployment

Table 3: Values of Three Key Parameters

<i>Parameter</i>	<i>Description</i>	<i>Estimate</i>
w^*	Reservation wage	0.945
σ	Log-standard deviation of offered wage	0.075
γ	Bias parameter for reported reservation wage	1.024
σ_R	Log-standard deviation of reported reservation wage	0.293

Table 4: Estimated Parameters

4.2 Calibration

Table 3 summarizes the calibration of three key parameters. Recall that the distribution of wage offers is log-normal with log-mean zero (a normalization) and log-standard deviation of σ , a parameter to be estimated. $PAH + PAL = a = 0.788$ is the acceptance rate reported in the KM survey. I take the offer arrival rate to be $\lambda = 0.067$ from the survey as well. I calculate the entry rate to unemployment, s , as

$$s = \frac{u\lambda a}{1-u} = 0.0052 \text{ per week}, \quad (13)$$

the weekly rate consistent in stationary stochastic equilibrium with an unemployment rate of $u = 0.09$ and the observed job-finding rate.

5 Estimates

Figure 2 shows the distribution of the wage that the estimation results imply.

Table 6 shows the actual and fitted moments of ω , based on the distribution calculated above and shown in Figure 2.

<i>Wage offer</i>	<i>Name</i>	<i>Action</i>	<i>Actual fraction</i>	<i>Fitted fraction</i>
No less than reservation wage	PAH	Accept	0.48	0.45
	PRH	Reject	0.07	0.09
Below reservation wage	PAL	Accept	0.31	0.32
	PRL	Reject	0.15	0.13

Table 5: Actual and Fitted Probabilities

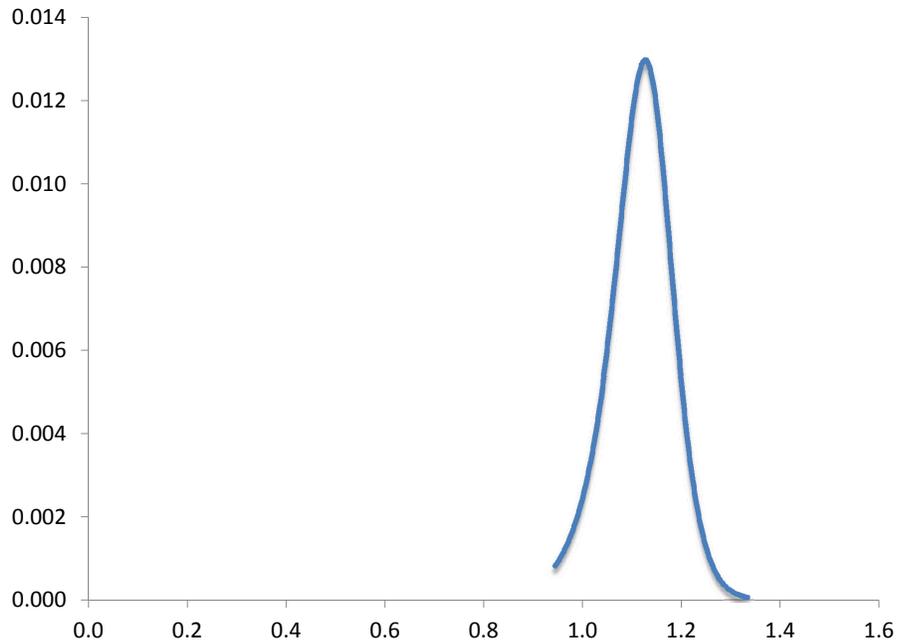


Figure 2: Distribution of the Wage in the Job-Ladder Model

<i>Moment</i>	<i>Actual value</i>	<i>Fitted value</i>
Exponential of mean log wage ratio	0.90	0.89
Mean wage ratio	0.99	0.93
25th percentile of wage ratio	0.70	0.73
Median wage ratio	0.91	0.89
75th percentile of wage ratio	1.07	1.09

Table 6: Actual and Fitted Values of the Moments of the Ratio of the Reservation Wage to the Prior Wage, Based on Job-Ladder Model

5.1 Interpretation

To investigate the issues surrounding the reported and actual reservation wage, I let y be the expected value of the cash earnings of a worker, considering periods of unemployment with unemployment benefits b , and wages averaging \bar{w} :

$$y = ub\bar{w} + (1 - u)\bar{w}. \quad (14)$$

I let z be the ratio of the flow value of unemployment to y . According to the job-ladder model, the reservation wage for the unemployed is the flow value of unemployment, $w^* = zy$. Hall and Milgrom (2008) discuss the value of this parameter in some detail, based on evidence about the elasticity of labor supply, rates of unemployment compensation, and the complementarity of hours of work and consumption of goods and services. We find that the value of z is 0.71 times the expected flow of income, y , from wages and unemployment benefits:

By contrast, Hagedorn and Manovskii (2008) describe a labor market where the flow value of unemployment is only slightly below the average wage. But see Hall and Milgrom (2008) for a discussion that points away from that possibility. The implied wage elasticity of labor supply is far above direct estimates of that elasticity. In addition, if z is close to average wages, unemployment should be way more sensitive to changes in unemployment

benefits than most studies find.

The expected value of the wage among the employed is 1.12. Hall and Milgrom (2008) estimate that the ratio of UI benefits to earnings, b , is 0.25. The corresponding value of y is

$$y = ub\bar{w} + (1 - u)\bar{w} = 0.09 \times 0.25 \times 1.12 + 0.91 \times 1.12 = 1.043 \quad (15)$$

The estimated actual reservation wage is $w^* = 0.945$. The estimate of the parameter z is:

$$z = \frac{w^*}{y} = \frac{0.945}{1.043} = 0.91, \quad (16)$$

somewhat above Hall and Milgrom's estimate of 0.71.

The finding that the reservation wage of the unemployed is higher than the flow value of time spent unemployed has a ready interpretation: The assumption of no real-option value to job search is too extreme. A transition cost to employment raises the reservation wage above the flow value. Another source of real-option value arises from the exclusion in the traditional search model and the simplest DMP model of on-the-job search.

The estimated expected reported reservation wage as a ratio to the actual reservation wage is

$$\frac{\mathbb{E} w^R}{w^*} = \gamma \exp\left(\frac{\sigma_R^2}{2}\right) = 1.07. \quad (17)$$

The reason that w^R is so high, in terms of the inputs, is that (1) the calculated average wage under the job-ladder model is 1.12, yet (2) the various measures of the ratio w^R/w in Table 2, notably the mean of the ratio, suggest that the ratio is at or a bit below one. If the ratio is near one, the reported reservation wage w^R must be near the mean, 1.12, as it is.

6 The Reservation Wage over the Period of Unemployment

Earlier research on reservation wages had found that across job-seekers of varying amounts of elapsed unemployment, those with longer durations had lower ratios of reservation wages to past wages. This finding suggested that individual job-seekers lowered their reservation wages as time passed without taking a new job. The KM survey found that this suggestion does not hold among job-seekers in general. In regressions with the log of the ratio of the reservation wage to the prior wage as the left-hand variable, and with fixed effects for respondents, there is almost no downward trend in the ratio. The measured downward trend

is 0.42 percent for each 10 weeks of additional time since job loss, with a standard error of 0.70 percentage points. Among job-seekers aged 51 to 65, the downward trend is 2.6 percent for each 10 weeks, with a standard error of 0.7 percentage points.

The stability of the reservation wage during a spell of unemployment supports the view that job-seekers regard the flow value of unemployment as the reservation wage. The perceived option value of unemployment, if substantially positive, would surely decline with disappointing search results, so job-seekers would lower their reservation wages as unemployment continued.

7 Conclusions about the Job-Ladder Model

The KM data support a view of the labor market based on the job-ladder model that appears to meet all the criteria that labor economists and macroeconomists have developed in earlier work on job search. Job-seekers adopt reservation wages that govern their job-taking decisions. After adjustment for an upward bias, the reservation wages seem to be rational, in that they reflect both the value job-seekers enjoy when not working and the fact that there is a low real option value to search, in the sense that search can continue after starting a job. That job will have an interim character if the wage is low, because the likelihood of a better offer is fairly high. The problem that has arisen in much past work does not arise in this view. Earlier, as HKV stress, there seemed to be a yawning discrepancy between the high dispersion of wages across workers, even after adjustment for observed characteristics, and the high flow of job-seekers into jobs, which suggests that job-seekers see offered wages as close to uniform, so that declining an offer has little chance of resulting in a better subsequent offer.

Obviously, the main ingredient in the resolution of the discrepancy is the invocation of the simple job-ladder model, which robs job search of a real-option character and makes it rational to take the first job that comes along that beats the flow value of being unemployed. That point is well known. The demonstration that the simple job-ladder model generates a stationary distribution of earnings with reasonable dispersion is a step forward in establishing the plausibility of the job-ladder model. And the finding that reported reservation wages have an upward bias relative to the actual acceptance decisions of job-seekers is important in making all the pieces fit together.

The simple job-ladder model makes the potentially extreme assumptions that holding a

job is not a major impediment to searching for a better one and that job mobility has a low joint cost to worker and employer. The first assumption may be reasonable. Time-use data, including the detailed data in the HM survey, suggest that search rarely consumes much time relative to normal amounts of work, even for jobless searchers. Most search seems to take the form of applying for jobs and waiting to see what happens. Many observers have suggested that applicants already holding jobs receive favorable treatment from potential new employers—unemployment is an adverse signal of an applicant’s quality.

This discussion follows HKV, except that they believe that the amount of implied dispersion in the offer distribution in the job-ladder model is small, whereas I find that it is enough, possibly, to resolve the puzzle that arises in the traditional search model. They write, “Therefore, through the lenses of models with on-the-job search, deviations from the law of one price are more significant, albeit still fairly minor in absolute size” (page 2875). My review of the KM data finds deviations from the law of one price—that is, dispersion of the purely personal or frictional component of the wage—to have a log-standard deviation of 0.075, a fairly large amount, though much smaller than the cross-sectional standard deviation.

8 Topics for Further Research

- Introduce a job-transition cost, so that acceptance would have the real-option character emphasized in the traditional search model.
- Introduce a non-wage job amenity. Make use of the information in the survey about commuting cost.
- The earlier wage was from a time when the market was tighter, so it would probably make more sense to derive the stationary distribution of the prior wage for a tighter market. It could even be done in a non-stationary way tracking the actual history of tightness.
- Learn more about the way the survey measured reservation wages and actual prior wages. And why so many offers were still pending. What fractions of the pending offers were accepted.
- Measure the offer distribution from the offers received.

- Maximum likelihood version of the acceptance-reservation wage sub-model using the actual offered wage rather than just its binary comparison with the reservation wage
- Make on-the-job search effort depend on the current wage.
- Consider taking the distribution of ω as given and deriving the offer distribution from it, keeping the assumption that w^R is log-normal.
- Include a self-contained description of the derivation of z from preferences and the UI replacement rate.
- Add tenure effects to the wage dynamics.

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