Wealth, Search, and the Job Ladder *

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Abstract

This paper studies the impact of workers' wealth and precautionary motives on labor market equilibrium. I develop an equilibrium job-ladder model with incomplete markets and endogenous search intensity. Wealth affects search intensity and thereby vacancy yields and turnover, which in turn govern between-firm competition along the job ladder. I use the calibrated model to study the liquidity effect of unemployment insurance. Unemployment insurance reduces search effort particularly among poorer workers in low-productivity firms by mitigating their precautionary motives. Low-productivity firms retain workers more easily, lowering wages and expanding vacancies, whereas high-productivity firms raise wages and cut vacancies. The average wage is largely unaffected, but wage inequality increases.

JEL Classification: J30, E21, E24, D83

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1 Introduction

Many policies and institutional changes affect households' wealth and their precautionary behavior. For example, social insurance policies such as unemployment insurance reduce the extent to which workers must rely on their own assets in the event of an adverse shock (Chetty and Finkelstein, 2013), while access to credit for low-income households has expanded considerably over recent decades due to technological advances (Herkenhoff et al., 2024). A growing body of evidence shows that wealth plays a key role in shaping workers' job search behavior: liquidity constraints lead poor unemployed workers to exit unemployment more quickly and poor employed workers more likely to switch jobs to earn more (e.g., Chetty 2008, Griffy 2021). Yet relatively little is known about how wealth-driven job search behavior feeds back into firms' wage-setting and hiring decisions, and thereby into labor market equilibrium. Understanding these equilibrium effects is important for assessing the aggregate impact of policies and institutional changes that influence households' wealth and precautionary behavior.

This paper studies how the wealth accumulation and job search behavior of workers affect the wage setting and job creation of firms and how such interaction determines the aggregate labor market outcomes. To that end, I build an equilibrium labor search model with on-the-job search where wealth affects how intensely workers search for a better job and their search behavior in turn affects how firms set wages and create vacancies. The contribution of this paper is to demonstrate that wealth reshapes labor-market competition by altering the poaching and turnover gradient along the job ladder, thereby changing the competitive pressure faced by firms and ultimately the equilibrium wage schedule.

Specifically, I extend the canonical equilibrium job-ladder model of Burdett and Mortensen (1998) with firm-side productivity heterogeneity by incorporating wealth accumulation and endogenous search intensity among risk-averse workers. Employed workers accumulate savings as they move up the ladder and use their wealth to smooth consumption after job loss. Poorer workers, positioned near the lower end of the ladder, search more intensively to obtain better jobs and build savings. On the firm side, heterogeneous producers decide how many jobs to create and what wages to offer, jointly shaping the job ladder that workers climb.

Relative to standard models where workers receive job offers at a market-wide arrival rate, workers in my framework adjust their search intensity in response to wages. Firms set wages taking into account not only their position in the productivity distribution—as in the standard model—but also how wages affect vacancy yields and turnover rates through workers' endogenous search responses. A worker's wealth influences both the level and the elasticity of search effort, thereby altering vacancy yields and turnover rates across the productivity distribution. As a result, the allocation of workers with different wealth levels across firms of varying productivity becomes a key determinant of the equilibrium wage-offer distribution. This mechanism establishes a novel link between workers' wealth holdings and firms' incentives for wage posting and job creation. I examine the implications of this link for equilibrium labor-market outcomes.

I calibrate the model to the U.S. labor market using information on labor-market flows, the employment share by firm size, and the wage distribution. I validate the model by showing that the wealth gradient in job-to-job transition rates generated by the model closely matches the one computed from data.

I then demonstrate the importance of wealth and precautionary behavior in shaping aggregate labor-market outcomes. Specifically, I use the framework to evaluate the equilibrium impact of unemployment insurance (UI). As discussed by Chetty (2008), UI has both a liquidity effect, which affects workers by changing their cash-on-hand, and a moral hazard effect, which affects workers by distorting the relative value of employment and unemployment. I deliberately isolate the liquidity effect of UI and investigate its impact on labor market equilibrium. Specifically, in the counterfactual experiment, workers receive a lump-sum payment upon exogenous job destruction where the lump-sum nature of the policy keeps the relative value of employment and unemployment unchanged.

This policy allows workers—particularly those at the lower end of both the productivity and wealth distributions—to smooth consumption after job loss without needing to rapidly accumulate precautionary savings. In addition, unemployed workers who flow into low-productivity firms arrive with more wealth, further shifting the wealth distribution at the bottom of the job ladder.

As a result, workers in low-productivity firms on average reduce their search effort, lowering the turnover rate of low-productivity firms. Crucially, this decline in search intensity makes the labor market less congested through the aggregate matching function, which raises the job-finding prospects of all workers and induces those employed by high-productivity firms to increase their search effort. This non-monotonic response of search intensity across the productivity distribution leads to a similarly non-monotonic change in turnover rates, which in turn reshapes the competitive forces facing firms at different productivity levels.

On the firm side, the reduction in turnover at low-productivity firms allows them to expand, creating room for wage cuts. Moreover, workers employed at these firms become wealthier, making them less sensitive to wage reductions and further weakening competitive pressure in that segment of the market. As a result, low-productivity firms respond to the introduction of public insurance by offering lower wages and posting more vacancies as profitability improves.

In contrast, high-productivity (but not the highest) firms face greater difficulty retaining workers. They respond by raising their wage offers but reducing vacancy postings. These interacting forces reshape the equilibrium job ladder: wage offers fall across most of the distribution, while those toward the top rise as high-productivity firms increase wages to retain and attract workers.

At the aggregate level, the average wage remains largely unchanged despite the reshaped wage offer distribution because workers eventually climb to the upper rungs of the ladder, but wage inequality increases in terms of the standard deviation of log wages due to the change in the wage offer distribution. Overall, the analysis highlights that a simple form of public insurance, by altering workers' wealth and search behavior, can substantially reshape the job ladder and thereby increase the wage inequality.

Related literature. This paper contributes to several strands of literature. First, this paper contributes to the literature of equilibrium search models with incomplete markets. Krusell et al. (2010) incorporate incomplete markets into a standard Diamond (1982)-Mortensen and Pissarides (1994) (DMP) model to study optimal unemployment insurance and aggregate shocks. Huang and Qiu (2022) study a DMP model with incomplete markets and two-sided heterogeneity to study how incomplete markets affect the mismatch of workers and firms. There are also some papers incorporating saving into the competitive search framework of Moen (1997), including Herkenhoff (2019), Braxton et al. (2024), Eeckhout and Sepahsalari (2024), Herkenhoff et al. (2024). These papers focus on the search behavior of unemployed workers, whereas I consider on-the-job search, which makes it possible to study how workers' wealth affects between-firm competition over employed workers.

Griffy (2021) incorporate on-the-job search into a competitive search model with incomplete markets to study how initial wealth shapes earnings growth, and Chaumont and Shi (2022) analyze unemployment insurance. However, their focus is on how wealth affects the direction of worker search, and they do not incorporate firm-side productivity heterogeneity. In contrast, firms in my model differ in productivity, and the differential search responses across the productivity distribution play a central role in determining the entire wage schedule.

Second, the worker side of this paper is built on the literature of partial-equilibrium job search models with incomplete markets where job offers are exogenous. Lentz and Tranaes (2005) study job search and saving behavior of risk-averse workers in a partial equilibrium environment where only unemployed workers search for a job, while Lise (2013) introduces on-the-job search. In these papers, workers randomly get a job offer, as in many equilibrium search models, but they can choose job search intensity to control how frequently they get offers. Building on the worker-side framework of these papers, I endogenize wage settings and job creation on the firm side in the spirit of Burdett and Mortensen (1998) to study how worker-side job search intensity choices in incomplete markets affects firm-side decisions.

Third, this paper is also related to the literature on monopsony in the labor market, especially with search friction (e.g. Burdett and Mortensen 1998, Bontemps et al. 2000, Fukui 2020, Engbom and Moser 2022, Gouin-Bonenfant 2022, Berger et al. 2024, Jarosch et al. 2024, Bilal and Lhuillier 2025, Lindenlaub et al. 2024, Lhuillier 2025). In contrast to these papers that have no wealth accumulation, I demonstrate the role of wealth in shaping monopsonic power and wage setting.

Fourth, this paper is related to the literature on unemployment insurance, particularly studies that analyze its macroeconomic effects (e.g. Acemoglu and Shimer 1999, Mitman and Rabinovich 2015, Landais et al. 2018, Chodorow-Reich et al. 2019, Birinci and See 2023, Karahan et al. 2025). This literature typically emphasizes the disincentive (moral hazard) effects of unemployment insurance, or does not explicitly distinguish between liquidity effects and moral hazard effects. In contrast, I isolate the liquidity effect of unemployment insurance and study how it affects labor market equilibrium in a job-ladder framework. This perspective highlights an underexplored aspect of the macroeconomic effects of unemployment insurance operating through workers' wealth and firms' equilibrium responses.

On a technical side, the consumption saving decision in the worker block of my model is built on a continuous-time approach by Achdou et al. (2022), which characterize the equilibrium of an incomplete market model with a set of differential equations. Huang and Qiu (2022) apply their methodology to a random search and matching model with wage bargaining. My paper is another application of the useful approach to an equilibrium search model.

2 Model

In this section, I develop an equilibrium search model by extending the framework of Burdett and Mortensen (1998). Specifically, I enrich the worker-side problem by introducing borrowing and saving and search intensity choice by risk-averse workers as in the partial-equilibrium search models such as Lise (2013). This allows me to study the interaction between wealth distribution on the worker side and wage settings on the firm side.

The model is continuous time and infinite horizon. Throughout the paper, I focus on the steady state.

2.1 Workers

There is a unit mass of homogeneous workers who are infinitely lived, risk-averse, and discount the future at a rate ρ. Workers are either employed or unemployed. Employed workers earn wages w that are different across firms while unemployed workers earn unemployment income b. Utility from consumption $c \geq 0$ is given by $u(c)$ where u is strictly increasing and concave. Workers can save and borrow at an interest rate r. Wealth a evolves according to

$$\dot{a} = \begin{cases} ra + w - c & \text{if employed,} \\ ra + b - c & \text{if unemployed.} \end{cases} \tag{1}$$

Both employed and unemployed workers engage in a job search. A worker chooses job search intensity $s \geq 0$ that comes with disutility $\psi(s)$ that is strictly increasing and convex. With job search intensity s, a worker gets a job offer at rate $s\lambda$ where λ is derived from an aggregate matching function in equilibrium. Search is random, and a job offer w is drawn from an endogenous wage offer distribution $F(w)$ with support $[b, \overline{w}]$ that is determined in equilibrium. A job is endogenously terminated when a worker accepts a better offer and exogenously destroyed at a rate δ.

Value functions. I denote the value of unemployment by $U(a)$ and the value of employment at wage w by $W(a,w)$. They satisfy the following Hamilton-Jacobi-Bellman (HJB) equations:

$$\begin{aligned}\rho U(a) = \max_{c,s} u(c) + U'(a)(ra + b - c) \\ - \psi(s) + s\lambda \int_b^{\overline{w}} \max\big\{W(a,w) - U(a), 0\big\} dF(w),\end{aligned} \tag{2}$$

and

$$\begin{aligned}\rho W(a,w) = \max_{c,s} u(c) + \big(\partial_a W(a,w)\big)(ra + w - c) - \psi(s) \\ + s\lambda \int_b^{\overline{w}} \max\big\{W(a,w') - W(a,w), 0\big\} dF(w') + \delta\big(U(a) - W(a,w)\big),\end{aligned} \tag{3}$$

with a borrowing constraint $a \geq \underline{a}$. ∂_a is shorthand notation for $\frac{\partial}{\partial a}$. $\underline{w}(a)$ is the reservation wage for a worker with wealth a at which the worker is indifferent between unemployment and employment. For both equations, the first two terms capture consumption and saving decisions while the next two terms capture job search decisions. The last term of the HJB equation for the employed (3) captures the exogenous job destruction. By construction, a worker who is unemployed and a worker employed at the lowest wage $w = b$ have the same current income and the same continuation opportunities. Therefore, their value functions coincide: $U(a) = W(a,b)$.

Policy functions. Since the employment value $W(a,w)$ is strictly increasing in w, there is a reservation wage $\underline{w}(a)$ such that an unemployed worker accepts a job offer with wage w if $w \geq \underline{w}(a)$. Reservation wages satisfy $W(a, \underline{w}(a)) = U(a)$. Since $U(a) = W(a,b)$, the reservation wage is given by $\underline{w}(a) = b$ for all a.

This feature of the reservation wage follows Lise (2013) and arises from the assumption that unemployed and employed workers share the same search technology, which greatly simplifies the analysis. Intuitively, the reservation wage is determined by the trade-off between the flow value of accepting an offer and the option value of waiting for better offers by rejecting the offer at hand. In the current model, since workers face exactly the same job search cost $\psi(s)$ and the arrival rate $s\lambda$ regardless of the employment status, there is no option value of waiting for better offers. As a result, regardless of wealth a, workers accept an offer if the flow value $w - b$ is positive, which implies the reservation wage $\underline{w}(a) = b$.

I denote the consumption and search policy functions by $c_u(a), s_u(a)$ for unemployed workers and by $c_e(a,w), s_e(a,w)$ for employed workers. The consumption policy functions satisfy the following first-order conditions:

$$u'(c_u(a)) = U'(a), \tag{4}$$

$$u'(c_e(a,w)) = \partial_a W(a,w). \tag{5}$$

As discussed in Achdou et al. (2022), the borrowing constraint does not show up in the HJB equations, and the first-order conditions hold with equality at the boundary $a = \underline{a}$. However, saving at the boundary must be nonnegative, which gives rise to state constraint boundary conditions:

$$U'(\underline{a}) \geq u'(r\underline{a} + b), \tag{6}$$

$$\partial_a W(\underline{a}, w) \geq u'(r\underline{a} + w). \tag{7}$$

The search policy functions solve the following first-order conditions:

$$\psi'(s_u(a)) = \lambda \int_b^{\overline{w}} \Big(W(a,w) - U(a) \Big) dF(w), \tag{8}$$

$$\psi'(s_e(a,w)) = \lambda \int_w^{\overline{w}} \Big(W(a,w') - W(a,w) \Big) dF(w'). \tag{9}$$

Workers choose search intensity so that they balance the marginal cost and the expected return from job search. Later, I describe how the search policy functions relate to wealth a and a current wage w.

Worker distributions. The stationary distributions of workers are given by the Kolmogorov Forward (KF) equations that describe the evolution of the worker distributions over time. Let $g_u(a), g_e(a,w)$ be the stationary distributions of unemployed workers and employed workers, respectively. They satisfy

$$0 = \partial_t g_u(a) = -\partial_a\big((ra + b - c_u(a))g_u(a)\big) \\ - s_u(a)\lambda\big(1 - F\big(b\big)\big)g_u(a) + \delta \int_b^{\overline{w}} g_e(a, w)dw, \tag{10}$$

and

$$0 = \partial_t g_e(a, w) = -\partial_a\big((ra + w - c_e(a, w))g_e(a, w)\big) \\ - s_e(a, w)\lambda(1 - F(w))g_e(a, w) - \delta g_e(a, w) \\ + s_u(a)\lambda f(w)\mathbb{1}\{w \geq b\}g_u(a) + \lambda f(w) \int_b^{w} s_e(a, x)g_e(a, x)dx. \tag{11}$$

The first term on the right-hand side of equation (10) represents the outflow from (a, w) due to asset accumulation, while the second term captures the outflow through job finding. The last term represents the inflow due to exogenous job destruction. In equation (11), the first three terms capture the outflow due to asset accumulation, job-to-job transition, and exogenous job destruction, while the last two terms capture the inflow from unemployment and employment at lower wages. The densities are integrated to 1:

$$\int g_u(a)da + \int \int g_e(a, w)dadw = 1. \tag{12}$$

For notational brevity, I denote the aggregate search intensity conditional on each employment status by

$$\bar{s}_u = \int s_u(a)g_u(a)da, \tag{13}$$

$$\bar{s}_e(w) = \int s_e(a, w)g_e(a \mid w)da. \tag{14}$$

In particular, $\bar{s}_e(w)$ denotes the average job search intensity of employees in a firm that posts a wage w and therefore plays a key role in determining the optimal wage in the firm problem.

2.2 Firms

There is an exogenous measure N of firms that are heterogeneous in terms of productivity y that is distributed according to $\Gamma(y)$ with support $[b, \overline{y}]$ and the corresponding density function $\gamma(y)$. They have constant returns to scale technology and produce output y per worker. They discount the future at the same rate ρ as workers.

Wages and vacancies. Firms post vacancies v with wage w. Importantly, firms commit to a single wage that is fixed over employment spell and cannot be renegotiated (Burdett and Mortensen, 1998).[1] Creating v vacancies costs, which is captured by a strictly increasing and convex cost function $c(v)$.

Following the convention, I let $\rho \to 0$ so that the firm's problem reduces down to the maximization of the steady-state flow profit.[2] Firms choose wages w and vacancies v to maximize the steady-state profit:

$$\max_{w,v \geq 0} (y - w)l(w, v) - c(v), \tag{15}$$

where $l(w, v)$ is the size of workers employed by a firm posting w and vacancies v. To characterize the firm size, I first define the vacancy yield $Q(w)$ and the turnover rate $T(w)$ as

$$Q(w) = \underbrace{q}_{\text{Contact rate}} \times \underbrace{\left(\frac{\bar{s}_u}{S} + \frac{\int_{-\infty}^{w} \int_{\underline{a}}^{\infty} \bar{s}_e(a, \tilde{w}) g_e(a, \tilde{w}) da d\tilde{w}}{S} \right)}_{\text{Acceptance probability}}, \tag{16}$$

$$T(w) = \underbrace{\delta}_{\substack{\text{Exogenous}\\ \text{destruction}}} + \underbrace{\bar{s}_e(w)\lambda(1 - F(w))}_{\text{Job-to-job transition}}, \tag{17}$$

where S is the aggregate search intensity. In the steady state, the flow into and out of the firm must be the same:

$$\underbrace{T(w)l(w, v)}_{\text{Outflow}} = \underbrace{vQ(w)}_{\text{Inflow}}, \tag{18}$$

which implies that the size of a firm posting v vacancies with a wage w is given by

$$l(w, v) = v\tilde{n}(w), \quad \text{where} \quad \tilde{n}(w) = \frac{Q(w)}{T(w)}. \tag{19}$$

[1] Although this is commonly assumed in the application of Burdett and Mortensen (1998), it restricts firms' ability to retain workers. For example, Burdett and Coles (2003) allow for wage-tenure contracts and firms backload wages to reduce the turnover of workers.

[2] Bilal and Lhuillier (2025) confirm that starting from the dynamic problem with $\rho > 0$ and letting $\rho \to 0$ after taking the first-order condition gives the same condition as letting $\rho \to 0$ from the beginning and derive the first-order condition.

$\tilde{n}(w)$ is the ratio of the vacancy yield to the turnover rate, which is increasing in w. It can also be thought of as the number of employed workers per vacancy. The steady state firm size is the product of the steady state number of vacancy posting times the ratio $\tilde{n}(w)$. Since $\tilde{n}(w)$ is increasing in w, the firm size $l(w, v)$ is increasing in w. Therefore, the objective function in (15) is supermodular in (y, w), and as a result, more productive firms offer higher wages, which is known as the rank-preserving property of the model (Moscarini and Postel-Vinay, 2013).

One thing worth noting is that employees' wealth a or its distribution does not directly show up in the firm problem. Although how much intensely employees search for an outside offer depends on their wealth, firms posting the same wage w face the same wealth distribution of their employees in the steady state, and the turnover depends just on $\bar{s}_e(w)$. The fact that I do not need to keep track of the firm-level wealth distribution of its employees keeps the model tractable.

Given the policy functions $w(y)$ and $v(y)$, the equilibrium wage offer distribution is given by

$$F(w) = \frac{1}{V} \int_b^{\overline{y}} \mathbb{1}[w(y) \leq w] v(y) d\Gamma(y), \tag{20}$$

where V is the aggregate vacancies.

2.3 Aggregate Matching

The aggregate search intensity and total mass of vacancies are given by

$$S = \int_{\underline{a}}^{\infty} s_u(a) g_u(a) da \; + \; \int_b^{\overline{w}} \int_{\underline{a}}^{\infty} s_e(a, w) g_e(a, w) da dw, \tag{21}$$

$$V = N \int_b^{\overline{y}} v(y) d\Gamma(y). \tag{22}$$

The aggregate matching function is given by a constant returns to scale function $\mathcal{M}(S, V)$. I define the market tightness as $\theta = \frac{V}{S}$. The contact rate on the worker side is given by $s\lambda = s\mathcal{M}(1, \theta)$ for a worker choosing search intensity s. The contact rate on the firm side is $q = \mathcal{M}(\theta^{-1}, 1)$ and the constant returns to scale implies $\lambda = \theta q$.

2.4 Equilibrium

Steady-state equilibrium. A steady state equilibrium consists of worker value functions $\{W, U\}$, policy functions $\{\underline{w}, s_u, c_u, s_e, c_e\}$, worker distributions $\{g_u, g_e\}$, firm policy functions $\{w, v\}$, a wage offer distribution F, aggregate search intensity S, aggregate vacancies V, labor market tightness θ, job offer arrival rate λ, vacancy filling rate q, and firm sizes l such that; the worker value functions and policy functions solve the HJB equations (34), (3); the worker distributions solve the KF equations (10), (11) and (12); the firm policy functions solve (15); the wage offer distribution is given by (20); the aggregate search intensity and vacancies are given by (21) and (22); the job offer arrival rate and vacancy filling rate satisfies $\lambda = \mathcal{M}(1, \theta)$ and $q = \mathcal{M}(\theta^{-1}, 1)$ where $\theta = V/S$.

3 Search and Wage Setting Behavior

In this section, I investigate theoretical properties of worker job search intensity and its implications for wage-setting behavior by firms.

3.1 Worker Search Behavior

I assume that the job search cost function takes the iso-elastic form:

$$\psi(s) \ = \ \psi_0 \frac{s^{1+\eta_s}}{1+\eta_s}, \tag{23}$$

where ψ_0 is the scale parameter and η_s captures the curvature. Then, the first-order conditions for search intensity imply that

$$s_u(a) = \left(\frac{\Delta_u(a)}{\psi_0}\right)^{\frac{1}{\eta_s}}, \quad \text{where} \quad \Delta_u(a) = \lambda \int_b^{\overline{w}} \Big(W(a,w) - U(a)\Big) dF(w), \tag{24}$$

$$s_e(a,w) = \left(\frac{\Delta_e(a,w)}{\psi_0}\right)^{\frac{1}{\eta_s}}, \quad \text{where} \quad \Delta_e(a,w) = \lambda \int_w^{\overline{w}} \Big(W(a,w') - W(a,w)\Big) dF(w'). \tag{25}$$

The expected gain from search $\Delta_u(a)$ and $\Delta_e(a,w)$ is decreasing in the current wealth. Intuitively, the concavity of the utility function implies that wage gains associated with job finding are more valuable for poor workers than wealthy workers. In addition, $\Delta_e(a,w)$ is decreasing in a current wage w because a higher current wage implies that the probability of drawing a wage offer that is better than the current wage is smaller. As a result, the optimal search intensity is decreasing in a and w, which I formally state in the following proposition.

Proposition 3.1 (Monotonicity)**.** Optimal search intensity $s_u(a)$ and $s_e(a, w)$ are weakly decreasing in wealth a. In addition, $s_e(a, w)$ is weakly decreasing in wage w.

Proof. See Appendix A.1. □

First, the proposition suggests that wealthier unemployed workers take more time to find a job, which is consistent with empirical evidence in many papers (e.g. Chetty 2008, Lise 2013, Huang and Qiu 2022). Second, it implies that wealthier employed workers are less likely to make a job-to-job transition, which is consistent with an empirical finding in Griffy (2021). Lastly, it suggests that workers who currently earn more are less likely to move to another job, which is confirmed in Faberman et al. (2022). Importantly, these features of search intensity, together with the distribution of workers over wealth and wages, determine the shape of the vacancy yield $Q(w)$ and the turnover rate $T(w)$.

3.2 Firm Wage Setting Behavior

I assume that the vacancy cost function $c(v)$ takes an iso-elastic form

$$c(v) = c_0 \frac{v^{1+\eta_v}}{1+\eta_v}, \tag{26}$$

where c_0 is the scale parameter and η_v captures the curvature.

The first-order conditions for firms imply that the wage function $w(y)$ and the vacancy function $v(y)$ satisfy

$$\tilde{n}(w(y)) = \big(y - w(y)\big)\tilde{n}'(w(y)), \tag{27}$$

$$c_0 v(y)^{\eta_v} = \big(y - w(y)\big)\tilde{n}(w(y)). \tag{28}$$

The left-hand side of the first equation is the cost of raising a wage, which is proportional to the firm size. The right-hand side captures the return from raising a wage, which depends on how much firms can grow $\tilde{n}'(w(y))$ times the profit per person $y - w(y)$. The second equation states that firms create vacancies to the point where the marginal cost on the left-hand side equals the marginal return from vacancy creation on the right-hand side.

I define the firm size per vacancy as a function of productivity $n(y) = \tilde{n}(w(y))$, which then implies $n'(y) = \tilde{n}'(w(y))w'(y)$. Plugging this into the first equation implies a first-order ordinary differential equation (ODE) given h:

$$w'(y) \;=\; \big(y \;-\; w(y)\big)\frac{n'(y)}{n(y)} \tag{29}$$

with the boundary condition $w(\underline{y}) = b$. This equation represents how much higher productivity translates to higher wages. It depends on the two forces. First, $(y - w(y))$ captures the per-worker profitability, and to the extent that the profit per worker is larger, firms raise a wage to expand. Second, $n'(y)/n(y)$ denotes how much slightly more productive firms are larger, capturing local competition (Gouin-Bonenfant, 2022). A larger $n'(y)/n(y)$ reflects an elastic labor supply response to a wage locally at y, which pushes up wages. Note that $n'(y)/n(y) = \frac{d \log n(y)}{dy}$, and recall $\log n(y) = \log Q(w(y)) - \log T(w(y))$, which is the log vacancy yield minus the log turnover. $n(y)$ grows more to the extent that slightly higher productivity greatly increases the poaching or greatly decreases the turnover.

Solving the first-order ODE gives the following wage function:

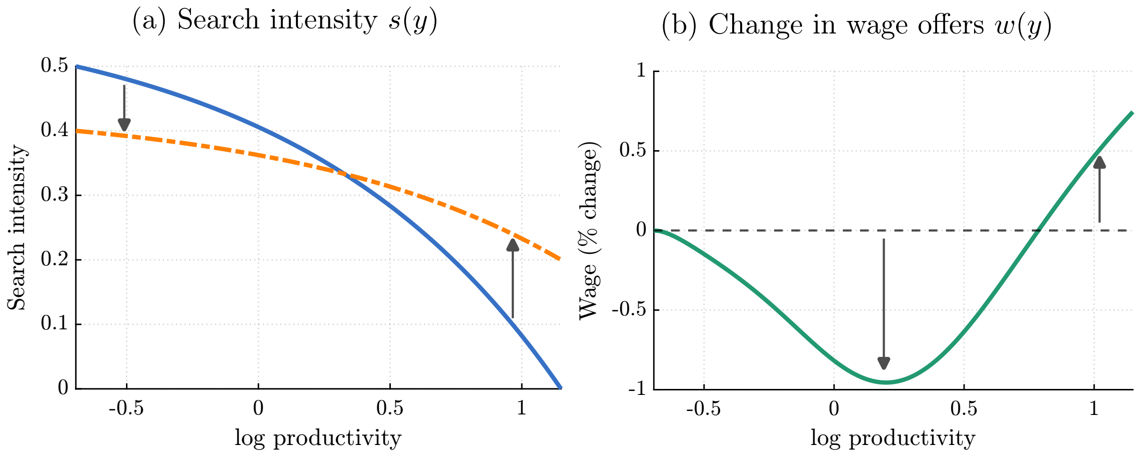
$$w(y) \;=\; y \;-\; \int_b^y \frac{n(x)}{n(y)} dx. \tag{30}$$

This expression is commonly observed in the Burdett and Mortensen (1998)'s framework, but unlike the standard model, $n(y)$ is endogenous to workers' wealth distribution and search intensity choices.[3] This does not explicitly characterize $w(y)$ since $n(y)$ implicitly depends on $w(y)$ through job search intensity, but it is still informative about how between-firm competition shapes the wage function. Due to the search friction, firms set wages below the marginal product of labor y. How much firms can push down wages below the marginal product depends on the competition force captured by the second term, which builds up from the bottom $y = b$. For example, if the firm size per vacancy $n(y)$ of a firm with productivity y is much larger than those below, that implies that labor supply is elastic around there, which puts upward pressure on wages.

Role of search behavior. To illustrate how workers' search behavior shapes wage offers, I exogenously specify the search intensity of workers and solve for the corresponding wage

[3] See Appendix A.2 for the derivation.

Figure 1: Illustration of Wage Functions



Note: This figure illustrates the relationship between the search intensity of workers and the resulting wage offers $w(y)$. Panel (a) shows the two exogenously set search intensity functions, and panel (b) shows how much wage offers change when moving from the search intensity represented by the solid line in panel (a) to the other search intensity represented by the dashed line in panel (a). The parameter values: $b = 0.5$, $\Gamma(y) = 1 - (b/y)^{5.0}$, $\delta = 0.03$, $M(S, V) = S^{0.5}V^{0.5}$. $v(y)$ is perfectly inelastic at 1.

functions. Panel (a) of Figure 1 displays two exogenously imposed search intensity profiles as functions of firm productivity. The solid blue line represents the baseline search intensity, while the dashed orange line corresponds to an alternative search intensity profile in which workers employed at low-productivity firms search less intensively and those employed at high-productivity firms search more intensively.

For each search intensity profile, I solve the firm-side problem together with the steady-state conditions and compute the resulting wage offers. Panel (b) of Figure 1 shows the percentage change in wage offers induced by the change in workers' search behavior.

Two patterns are worth noting. First, the reduction in search intensity among workers at low-productivity firms weakens between-firm competition in that segment of the market, leading to lower wage offers among low- and medium-productivity firms. Second, the increase in search intensity among workers at high-productivity firms intensifies competition there, resulting in higher wage offers among the most productive firms.

Wage offers decline most sharply at intermediate productivity levels, and moderately high-productivity firms also experience wage reductions. This non-monotonic response reflects a key feature of Burdett–Mortensen models: competitive conditions at low-productivity firms spill over to higher segments of the productivity distribution. In the present framework, this spillover is captured by the integral term in the wage function (30), which aggregates competitive pressure from below.

In the remainder of the paper, workers endogenously adjust their search behavior in response to changes in their wealth or their exposure to earnings losses upon job loss. These endogenous adjustments in search behavior, in turn, differentially shape the competitive environment across the productivity ladder.

4 Calibration

I solve the model at an annual frequency and use the implied transition rates to target labor market transition rates at an arbitrary frequency.

4.1 Functional Forms

The utility function takes the form of constant relative risk aversion (CRRA) with the risk aversion parameter σ: $u(c) = \frac{c^{1-\sigma}}{1-\sigma}$. I slightly modify the search cost function and assume it takes the form of

$$\psi(s) = \psi_0 \frac{(s - \underline{s})^{1+\eta_s}}{1 + \eta_s}, \tag{31}$$

where $\underline{s}$ is a model parameter representing the minimum search intensity a worker can choose without any cost, motivated by empirical evidence in Faberman et al. (2022) that workers sometimes receive unsolicited job offers without sending applications.[4] The vacancy cost function takes the form of $c(s) = c_0 \frac{v^{1+\eta_v}}{1+\eta_v}$. The matching function is given by a Cobb-Douglas function $\mathcal{M}(S, V) = AS^{\eta_m} V^{1-\eta_m}$. The exogenous productivity distribution follows a four-parameter Beta distribution Beta(α, β) with support $[\underline{y}, \overline{y}]$.

4.2 Externally Set Parameters

I first externally set or normalize some parameters. I set the interest rate r to 0.03 and the discount rate ρ to 0.05 following Lise (2013). I set the borrowing constraint to $\underline{a} = 0$. I set the risk aversion parameter to 2.0, which is standard in the literature. I set the income of unemployed workers to $b = 0.4$, and given this normalization, I later estimate the productivity distribution. I set the maximum productivity to $\bar{y} = 2.0$. I set the elasticity parameter of the matching function to $\eta_m = 0.5$ following Petrongolo and Pissarides (2001).

[4] Bagger and Lentz (2019) also assume the same functional form.

I normalize the scale of the search cost function and the vacancy cost function at $\psi_0 = c_0 = 1$ since they cannot be separately identified from the matching efficiency. In equilibrium, firms with productivity less than the reservation wage do not post vacancies. Since the reservation wage is b, I set the lower end of the support to $\underline{y} = b$.

Directly inferred parameters. The job destruction rate δ is directly identified from the employment to unemployment transitions. I set $\delta = 0.18$ at annual frequency so that the monthly job destruction rate is 1.5%. The average firm size in the model is $\frac{1-\mathtt{u}}{N}$, which identifies the measure of firms N given the unemployment rate $\mathtt{u}$. Later I target $\mathtt{u} = 0.06$, which implies $N = \frac{1-0.06}{\text{avg. firm size}}$. The average firm size of 23.3 reported in Bilal et al. (2022) leads to $N = 0.04$.

4.3 Parameters Estimated Internally

The remaining seven parameters $(A, \eta_s, \eta_v, \underline{s}, \alpha, \beta)$ are chosen to fit model moments to data counterparts. Although all the data moments jointly pin down all the estimated parameters, I briefly discuss which information in data is particularly informative about which parameter.

The matching efficiency A directly affects the job finding rate, and given the calibrated job destruction rate δ, it monotonically affects the steady state unemployment rate $\mathtt{u} = \frac{\delta}{\delta + \lambda \bar{s}_u}$. I pin it down by targeting the steady state unemployment rate of 6%.

The curvature of the search cost function η_s drives cross-sectional dispersion in search behavior. Given the wealth level a, unemployed workers search most intensely and workers reduce search intensity as they climb up the job ladder. To the extent that the cost function has a smaller curvature, workers sharply reduce job search intensity along the job ladder. I pin down this parameter by targeting the job-to-job transition rate relative to the UE rate. For the numerator, I use the monthly job-to-job transition rate of 0.02. For the denominator, I combine the calibrated monthly EU rate 0.015 and the targeted unemployment rate $\mathtt{u} = 0.06$ to back out the monthly UE rate of 0.235.

The curvature of the vacancy cost function η_v is informed by the employment share of large firms. To see that, given the normalization $c_0 = 1$, the first-order condition for vacancy creation is given by

$$v(y) = \Big(\big(y - w(y) \big) \tilde{n}(w(y)) \Big)^{\frac{1}{\eta_v}}. \tag{32}$$

Letting $N(y) = l(w(y), v(y))$ be the firm size, I can rewrite this condition as

$$\log\left(\frac{v(y)}{N(y)}\right) = -\left(1 - \frac{1/\eta_v}{1 + (1/\eta_v)}\right) \log N(y). \tag{33}$$

The vacancy rate is negatively related to firm sizes, with the slope getting flatter as $\eta_v \to 1$. To the extent that η_v is larger, larger firms post fewer vacancies relative to smaller firms, reducing the employment share of large firms. I target the employment share of firms with 500+ workers, which is 0.52 in the Census Business Dynamics Statistics according to Bilal et al. (2022).

The non-costly search $\underline{s}$ is set so that the monthly rate of an unsolicited offer equals 0.026 based on Faberman et al. (2022).

The shape parameters (α, β) jointly determine the shape of the productivity distribution, and each of them differently affects the mean and the variance of productivity y.[5] Given the normalized b, I target the average replacement rate $b/\mathbb{E}[w]$ of 0.5 so that unemployed workers receive 50% of their previous wages as unemployment benefits, which is informative about the mean productivity. I also target the firm effect in the log wage dispersion in the data, which is informative about the dispersion of productivity. Kline (2024) reports that bias-corrected standard deviations of firm fixed effects take values around 0.2, which I use as a target.[6]

In Appendix C, I support these heuristic arguments by computing how each targeted moment responds to a small perturbation in each parameter. I find that the moment associated with each parameter is indeed strongly informative about that parameter relative to other moments.

4.4 Estimation Results

Parameter values. Table 1 summarizes the model parameters. The curvature of the job search cost function η_s is estimated to be 0.77, and therefore it is more elastic than implied by the quadratic cost function sometimes assumed in the literature, which is consistent with Lise (2013) and Bagger and Lentz (2019).

The curvature of the vacancy cost function η_v is estimated to be 1.48, larger than the

[5]The mean and the variance of the Beta distribution over $[0, 1]$ are given by $\frac{\alpha}{\alpha+\beta}$ and $\frac{\alpha\beta}{(\alpha+\beta)^2(\alpha+\beta+1)}$.

[6]See Figure 3 of Kline (2024).

Table 1: Model Parameters

Parameters	Description	Source/Target	Value	Model moment	Data moment
Panel A: Directly calibrated parameters					
ρ	Discount rate	Lise (2013)	0.05		
r	Interest rate	Lise (2013)	0.03		
$\underline{a}$	Borrowing limit		0.00		
σ	Relative risk aversion		2.0		
b	Unemployment income	Normalization	0.4		
$\overline{y}$	Maximum productivity		2.00		
η_m	Matching function elasticity	Petrongolo and Pissarides (2001)	0.5		
ψ_0	Job search cost: scale	Normalization	1.0		
c_0	Vacancy cost: scale	Normalization	1.0		
Panel B: Directly inferred parameters					
δ	Job destruction rate	EU rate of 1.5% (monthly)	0.18		
N	Measure of firms	Avg. firm size of 23.3	0.04		
Panel C: Estimated parameters					
η_s	Job search cost: curvature	JJ rate / UE rate	0.77	0.09	0.09
η_v	Vacancy cost: curvature	Empl. share of firms sized 500+	1.48	0.52	0.52
A	Matching efficiency	Unemployment rate	7.54	0.06	0.06
$\underline{s}$	Free search	Unsolicited offer (monthly)	0.13	0.026	0.026
α	Productivity distribution	UI replacement rate	0.89	0.40	0.40
β	Productivity distribution	Log wage std. dev.	5.53	0.20	0.20

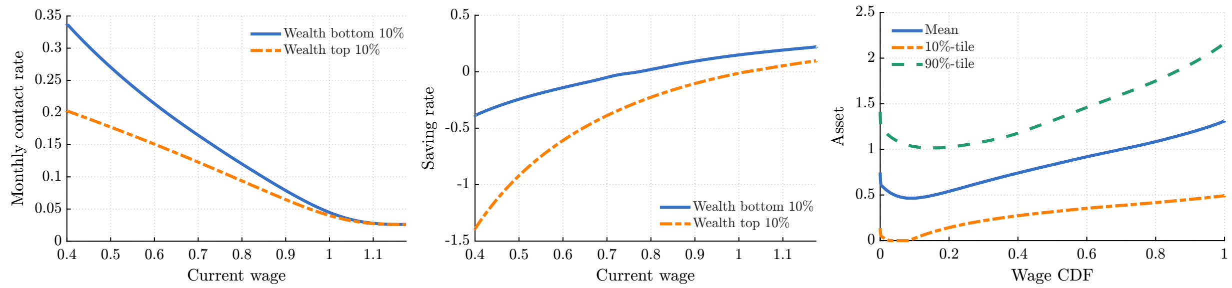
quadratic cost function, and close to the estimate of Bilal and Lhuillier (2025) about the French labor market.

Saving and search. Panel (a) of Figure 2 displays the search policy function $s_e(a, w)$ evaluated at $a = a_{p10}$ and $a = a_{p90}$, where a_{p10} and a_{p90} denote the 10th and 90th percentiles of the wealth distribution, respectively. The search intensity $s_e(a, w)$ is multiplied by $\lambda/12$ so that it represents the monthly contact rate. At the bottom of the job ladder, poor workers search much more intensively than wealthy workers in order to climb the ladder quickly and accumulate wealth, while this difference gradually diminishes as wages rise. The contact rate remains positive even at the top of the ladder because workers continue to receive unsolicited offers.

Panel (b) of Figure 2 plots the saving rate $\dot{a}/w$ as a function of current wages for workers at the 10th and 90th wealth percentiles. Workers at the lower end of the ladder dissave to smooth consumption, whereas wealthier workers save a larger fraction of their earnings at higher wage levels.

Figure 2: Model Solution: Saving and Search Intensity

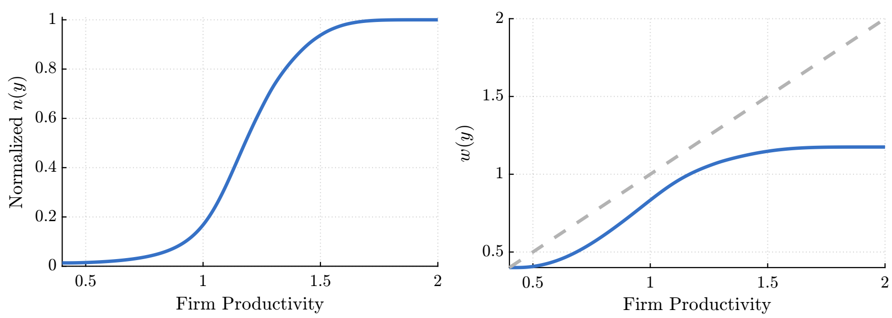
(a) Search intensity $s(a, w)$ (b) Saving rate $\dot{a}/w$ (c) Wealth distribution



Note: Panel (a) displays the search policy $s_e(a, w)$ evaluated at the 10th and 90th percentiles of the wealth distribution. Values of $s_e(a, w)$ are multiplied by $\lambda/12$ to represent monthly contact rates. Panel (b) shows the saving rate $\dot{a}/w$ as a function of current wages for workers at the 10th and 90th wealth percentiles. Panel (c) plots the wealth distribution conditional on wages across different rungs of the job ladder.

Figure 3: Model Solution: Wage Policy and Job Search

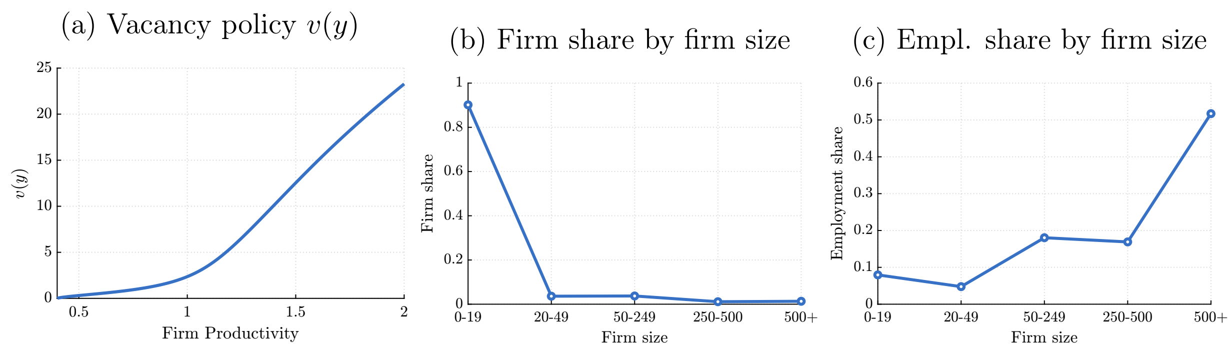
(a) Normalized $n(y)$ (b) Wage function $w(y)$



Note: Panel (a) displays the firm size per vacancy $n(y)$ normalized by $n(\overline{y})$ over productivity. Panel (b) displays the wage function $w(y)$.

Panel (c) shows how these search and saving behaviors translate into the distribution of wealth across different rungs of the job ladder. Wages and wealth are mostly positively correlated, reflecting that high-wage jobs facilitate asset accumulation. At the bottom, however, a slight negative correlation emerges because poor workers search much more intensively to escape the lower tail of the wage distribution. Consistent with this pattern, Chetty (2008) use data from the Survey of Income and Program Participation and report that workers in the lowest quartile of the wealth distribution earn more than those in the second quartile, while earnings and wealth are positively correlated from the second through the fourth quartile.

Figure 4: Model Solution: Vacancy



Note: Panel (a) displays the vacancy policy $v(y)$. Panel (b) displays the firm share by firm size categories. Panel (c) displays the employment share by firm size categories.

Wage function. The calibrated model generates the firm size per vacancy $n(y)$ and the wage function $w(y)$ as displayed in Figure 3. The shape of $n(y)$ is similar to one of the examples illustrated in panel (a) and (b) of Figure 1 in Section 3.2. As discussed in Section 3.2, the convex part of panel (a) captures strong between-firm competition, reflecting elastic labor supply in that segment. Indeed, panel (b) shows that the wage keeps strongly increasing in the corresponding segment. In contrast, the concave part of $n(y)$ displayed in panel (a) suggests weak between-firm competition among high-productivity firms, which translates to the flatter wage function in that segment.

Vacancy function. Figure 4 displays the vacancy policy function $v(y)$ and the resulting firm share and employment share by firm size. The estimated vacancy cost function implies that highly profitable firms post much more vacancies to expand, which is reflected by the vacancy policy $v(y)$ shown in panel (a) of the figure. About 90% of firms are small and employ less than 20 workers (panel b), which is consistent with data (Bilal et al., 2022). Yet, elastic vacancy posting allows productive firms to greatly expand, and a majority of workers are employed by a small number of large firms.

4.5 Model Validation

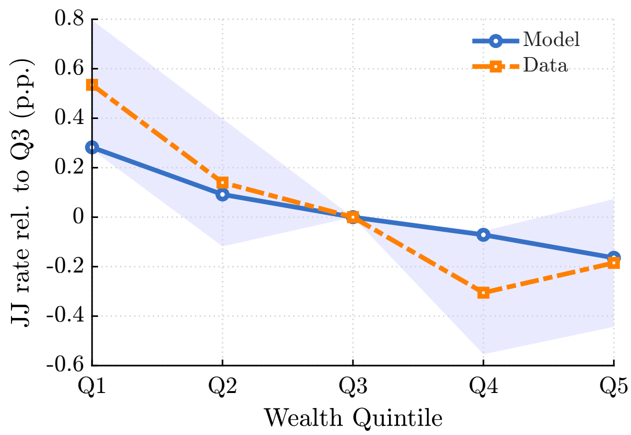
Productivity dispersion and markdown. As a validity check on the firm side, I compare non-targeted model moments with their data counterparts, as reported in Table 2. The estimated productivity distribution implies a standard deviation of log firm productivity of 0.29. In the model, productivity dispersion is disciplined only through firm-driven wage

Table 2: Productivity dispersion and markdown

Moment	Model	Data	Source
Std. dev. log productivity	0.29	0.31-0.36	Blackwood et al. (2021)
Avg. markdown	0.82	0.74-0.91	Seegmiller (2025)

Note: This table reports firm-side non-targeted moments in the model and data. The standard deviation of log firm productivity in data comes from Blackwood et al. (2021) Table 1. The markdown in the model is defined as $\frac{w(y)}{y}$ for each y and the average is taken across firms. The average markdown in data comes from Seegmiller (2025) Table 6.

Figure 5: Job-to-Job Transitions and Wealth



Note: Monthly job-to-job transition rates are computed for male employed workers aged 25–55 in the private sector in the data from the Survey of Income and Program Participation (SIPP) panels 1996-2008 and for employed workers in the model. Wealth in the data corresponds to net liquid wealth. Job-to-job transition rates are relative to the middle quintile within each series to highlight differences in the slope. Shaded regions report 95% confidence intervals for the coefficients from the linear regression of an indicator for a job-to-job transition on wealth quintiles, year fixed effects, state fixed effects, and dummies for education.

dispersion in the data, and there is no guarantee that the estimated productivity dispersion matches the empirical one. Nevertheless, it is close to the plant-level log-productivity standard deviation of 0.31–0.36 estimated by Blackwood et al. (2021) using U.S. data.

Firms in the model face heterogeneous competitive pressure, resulting in different wage markdowns across the productivity distribution. The estimated model implies an average markdown of 0.82, meaning that firms retain 18 cents per dollar of output. Seegmiller (2025), using U.S. employer–employee matched data, report an average markdown of 0.74–0.91. The implied markdown of 0.82 in my model lies squarely in the middle of these estimates.

Job-to-job transitions and wealth. The response of worker search behavior to wealth is at the core of the model. As a validity check, I compare the relationship between job-to-job transitions and wealth in the model with its empirical counterpart, which is not targeted in the estimation. Figure 5 plots job-to-job transition rates by wealth quintile in the data from Survey of Income and Program Participation and in the model, with each series normalized relative to the middle quintile (Q3).[7] In the data, job-to-job mobility declines sharply with wealth, consistent with liquidity-constrained workers searching more aggressively.

The model reproduces this downward-sloping pattern. Poor workers search more because the marginal value of moving up the job ladder is higher at low asset levels, whereas wealthy workers adjust search effort only modestly. Quantitatively, the model's gradient is somewhat flatter than in the data, implying that it may understate—but does not overstate—the sensitivity of job-to-job mobility to wealth.

5 Equilibrium Impact of Public Insurance

The framework developed in this paper provides a natural setting to study the equilibrium effects of changes in workers' wealth or their precautionary behavior. Building on this framework, I study the equilibrium effects of unemployment insurance.

The unemployment insurance literature largely emphasizes changes in the relative value of employment and unemployment, which induce moral hazard effects on the worker side (Chetty, 2008) and discourage job creation by improving workers' outside options (Mitman and Rabinovich, 2015). However, as emphasized by (Chetty, 2008), unemployment insurance also increases the wealth of unemployed workers, and this liquidity effect can independently affect workers' behavior. In this section, I study the equilibrium implications of the liquidity effect of unemployment insurance, which has been underexplored relative to the moral hazard effect of unemployment insurance.

To this end, I consider a stylized policy that provides a lump-sum payment z upon exogenous job destruction occurring at rate δ. I set z equal to the average six-month wage in the baseline equilibrium. This policy can be interpreted as a lump-sum version of unemployment insurance or as government-provided severance pay. Rather than replicating the institutional details of actual unemployment insurance systems, the purpose of this specifica-

[7] For the construction of the sample, see Appendix.

tion is to construct a benchmark that isolates the liquidity effect of unemployment insurance from its incentive (moral hazard) effects on job search.

To ensure that the policy operates solely through workers' wealth and precautionary behavior, I impose two additional assumptions. First, unemployed workers also receive the lump-sum payment z at rate δ. Second, the policy is financed by a uniform tax τ levied on all workers, including the unemployed. Together, these assumptions guarantee that the policy does not alter the relative value of employment and unemployment, and that the reservation wage is exactly the same as in the baseline economy. In this way, I isolate the liquidity effect of unemployment insurance: workers adjust their behavior in response to changes in their wealth or precautionary motives, rather than to changes in the relative value of employment and unemployment. Since this policy is deliberately stylized and does not replicate the institutional features of actual unemployment insurance systems, I refer to it as public insurance against job loss.

Specifically, this intervention directly modifies the HJB equations and the corresponding KF equations, while leaving the firm-side problem unchanged. The HJB equation for unemployed workers is now

$$\begin{aligned}\rho U(a) = \max_{c,s} u(c) + U'(a)(ra + b - \tau - c) \\ - \psi(s) + s\lambda \int_b^{\overline{w}} \max\big\{W(a,w) - U(a), 0\big\} dF(w) + \delta\big(U(a+z) - U(a)\big),\end{aligned} \tag{34}$$

while the HJB equation for employed workers becomes

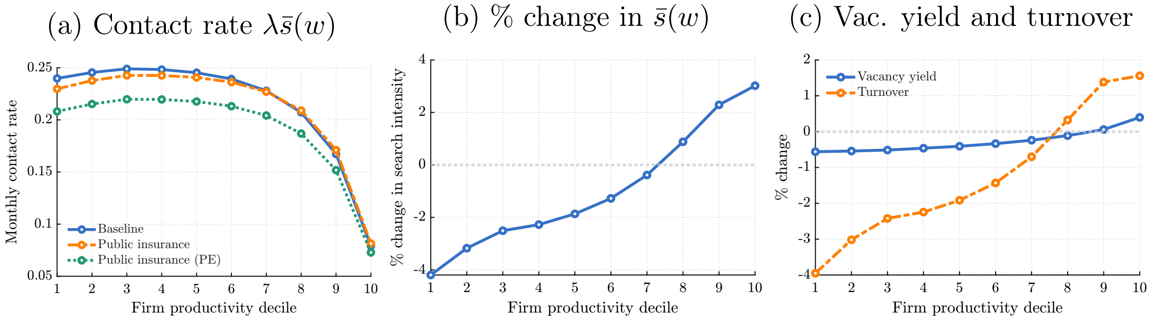
$$\begin{aligned}\rho W(a,w) = \max_{c,s} u(c) + \big(\partial_a W(a,w)\big)(ra + w - \tau - c) - \psi(s) \\ + s\lambda \int_w^{\overline{w}} \big(W(a,w') - W(a,w)\big) dF(w') + \delta\big(U(a+z) - W(a,w)\big),\end{aligned} \tag{35}$$

where the second term on the right-hand side now reflects the tax τ, and the last term captures the lump-sum payment z upon job destruction. Importantly, the reservation wage remains $\underline{w}(a) = b$. To balance the government budget, the tax τ satisfies

$$\tau = z\delta. \tag{36}$$

In the model, workers accumulate wealth to smooth consumption after falling off the job

Figure 6: Impact of Public Insurance on Search Intensity



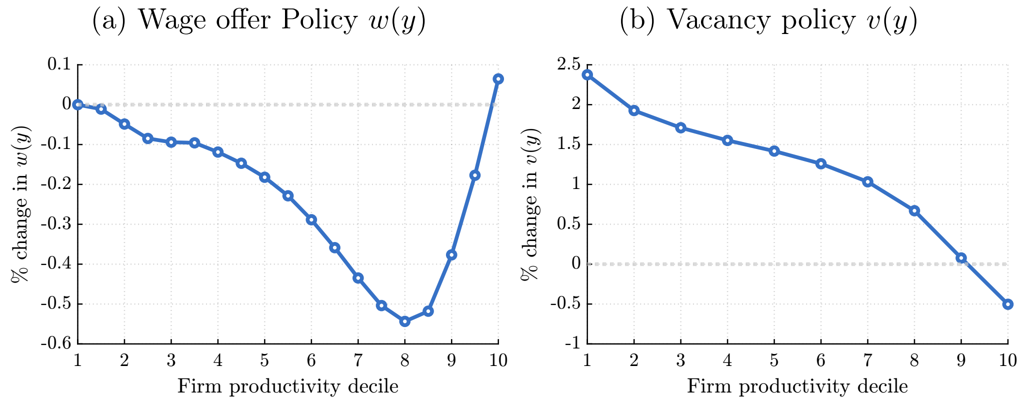
Note: Panel (a) compares the baseline economy (solid line) and the counterfactual (dashed line) in terms of the average monthly contact rate of employees $\lambda\bar{s}_e(w(y))$ over firm productivity deciles. Each point is the unweighted average within each decile. The dotted line shows the counterfactual economy with the firm-side solutions and the aggregate contact rates fixed at baseline. Panel (b) displays the percentage change in search intensity. Panel (c) displays the percentage change in vacancy yields and turnover.

ladder through job destruction. With public insurance, workers can use the payment z to smooth consumption upon job loss, and therefore poorer workers have less incentive to exert effort to quickly build up wealth. Also, workers who just got out of unemployment are more wealthy than before, which also directly reduces their search intensity.

Panel (a) of Figure 6 plots the average monthly contact rate of employees working for firms averaged within each productivity decile in the baseline and counterfactual economies, while panel (b) shows the percentage change in the average on-the-job search intensity $\bar{s}_e(w(y))$. Poor workers tend to be employed by low-productivity firms, and public insurance raises their wealth, substantially reducing their search effort. In contrast, workers at high-productivity firms increase their search effort to further climb the job ladder. This is because the policy-induced reduction in search intensity among workers at low-productivity firms alleviates labor-market congestion through the aggregate matching function, making job-finding easier overall and prompting workers in high-productivity firms to respond by searching more. Indeed, the dotted line in panel (a) displays the partial-equilibrium response with the firm-side solutions and the aggregate contact rates fixed at the baseline, and it shows that in partial equilibrium, the search intensity decreases across the board.

Panel (c) of Figure 6 shows the percentage changes in the vacancy yield $Q(w(y))$ and the turnover rate $T(w(y))$ across the productivity distribution. The decline in search intensity among workers at low-productivity firms lowers the vacancy yield throughout most of the distribution, with the exception of the top. Changes in the turnover rate largely mirror the

Figure 7: Impact of Public Insurance on Firm-Side Decisions



Note: This figure displays the percentage change from the baseline economy to the counterfactual one with public insurance in terms of the wage offer and the vacancy over the firm productivity vigintiles for wages and deciles for vacancy.

changes in search intensity, and since its changes are larger than the changes in vacancy yields, the turnover response drives the response of the firm size per vacancy $n(y)$, which determines the competition force across productivity distribution. Low-productivity firms now face lower turnover, which allow them to become larger per vacancy. In contrast, high-productivity firms face higher turnover, which prevents them from becoming larger.

I next explore how such differential changes in the competitive forces across productivity distribution manifest itself in the wage offer and the vacancy creation by firms. Figure 7 shows the percentage changes in the wage-offer policy $w(y)$ and the vacancy policy $v(y)$ from the baseline economy to the one with public insurance against job loss. Reflecting the weakened competition, low-productivity firms offer lower wages, as they are now less concerned about the turnover. In contrast, firms very close to the top of the productivity distribution offers higher wages, facing intensified competition among them.

Changes in wage offers are accompanied by changes in firms' recruiting behavior. Panel (b) of Figure 7 shows that low-productivity firms post more vacancies as their reduced wage offers make them more profitable and lower turnover makes their jobs last longer. In contrast, high-productivity firms post fewer vacancies due to higher wage costs and higher turnover.

From the perspective of workers, what matters for their job search and their values is the wage-offer distribution, given by

$$F(w) = \frac{1}{V} \int_{b}^{\overline{y}} \mathbb{1}[w(y) \leq w]\, v(y)\, d\Gamma(y), \tag{20}$$

Figure 8: Impact of Public Insurance on the Wage Offer Distribution

Note: This figure displays the change in the wage-offer distribution between the baseline and counterfactual economies. Each point represents the average within each decile of the distribution.

Table 3: Impact of Public Insurance on Labor Market Outcomes

	$z = 0.25\bar{w}$	$z = 0.5\bar{w}$	$z = 0.75\bar{w}$	$z = 1\bar{w}$
Average wage (% change)	0.1	0.1	0.0	-0.2
Std. dev. log wage (% change)	0.1	1.2	3.0	5.2
JJ rate (% change)	0.4	1.0	1.6	2.2

Note: This table reports the aggregate labor market outcomes in the baseline economy and in the counterfactual economy with public insurance against job loss. z is the amount of public insurance payments and $\bar{w}$ is the average wage in the baseline economy.

which depends jointly on $w(y)$ and $v(y)$. I next look at how the policy-induced changes in these functions $w(y)$ and $v(y)$ translate into the shape of the wage-offer distribution, or the job ladder.

Figure 8 shows that wage offers decline across most of the productivity distribution, except around the top of the job ladder. This pattern reflects two interacting forces. The first is the wage channel: low- and medium-productivity firms reduce their wage offers, whereas high-productivity firms raise theirs. The second is the vacancy channel: low-productivity firms substantially expand vacancy postings, while medium- to high-productivity firms post fewer vacancies, shifting the overall composition of job offers toward lower wages. Together, these adjustments compress the wage distribution and flatten the job ladder, with the upper tail sustained only by highly productive firms.

Table 3 summarizes the aggregate labor market effects of public insurance z, which ranges from the equivalent of a three-month wage ($z = 0.25\bar{w}$) to a twelve-month wage ($z = \bar{w}$), where $\bar{w}$ denotes the average wage in the baseline economy. Although the job ladder becomes flatter except at the top, the impact on the average wage is quantitatively small and non-monotonic. This pattern reflects two opposing forces: while high-quality job offers improve, low-quality offers deteriorate. The net effect on the average wage therefore depends on the relative strength of these two forces. In contrast, wage inequality increases monotonically with the generosity of public insurance. When insurance is very generous ($z = \bar{w}$), the standard deviation of log wages rises by 5.2 percent relative to the baseline. Finally, the table shows that although workers at the lower end of the productivity distribution reduce their search effort, workers in the middle of the distribution search more intensively. This reallocation of search effort partially offsets the decline in job-to-job transitions among low-productivity workers.

The policy analyzed here is deliberately designed as a benchmark that isolates the liquidity effect of unemployment insurance. Unlike standard unemployment insurance, which conditions benefits on remaining unemployed and directly distorts job-search incentives, the policy considered here provides a lump-sum transfer upon job destruction and is financed by a uniform tax. As a result, it leaves the relative value of employment and unemployment unchanged and abstracts from standard moral-hazard effects. This design allows the analysis to cleanly isolate how insurance-induced changes in workers' wealth affect search behavior and, through firms' endogenous responses, reshape the equilibrium job ladder and wage distribution. While stylized, the mechanism highlighted here is likely to extend to actual unemployment insurance and other social insurance programs insofar as they affect the search behavior of low-wealth workers.

6 Conclusion

This paper develops an equilibrium job-ladder model with endogenous search intensity and wealth accumulation. Workers accumulate assets as they move up the job ladder and draw on their wealth to smooth consumption following job loss. Because workers' search effort responds endogenously to their wealth position, changes in the wealth distribution feed back into vacancy yields and turnover rates across firms. These feedback effects reshape firms' wage-setting and vacancy-creation decisions and thereby determine the equilibrium structure of the job ladder.

A key contribution of the paper is to isolate and clarify the wealth channel through which public insurance affects labor market outcomes. To this end, I study public insurance against job loss that is deliberately designed as a benchmark that abstracts from standard moral-hazard effects of unemployment insurance. By providing a lump-sum transfer upon job destruction and financing it with a uniform tax, the policy leaves the relative value of employment and unemployment unchanged and operates solely through changes in workers' wealth and precautionary saving motives. This design allows the analysis to cleanly trace how insurance-induced changes in wealth alter search behavior and, through firms' endogenous responses, reshape between-firm competition and the equilibrium wage structure.

The analysis shows that insuring workers against income risk can have substantial general-equilibrium effects even in the absence of direct search disincentives. By raising wealth at the lower end of the job ladder, insurance reduces search effort among workers in low-productivity firms, lowering turnover and weakening competitive pressure in that segment of the market. In contrast, equilibrium effects induce workers in higher-productivity firms to search more intensively. These heterogeneous responses lead low-productivity firms to expand at lower wages, while high-productivity firms raise wages but contract vacancy postings. As a result, the job ladder flattens except at the top, with little change in average wages but a noticeable increase in wage inequality.

While stylized, the mechanism highlighted in this paper is likely to extend beyond the specific policy experiment considered here. More broadly, any social insurance program that affects workers' wealth—such as unemployment insurance, severance pay, or income-support policies—can reshape labor market outcomes by altering search behavior and firms' incentives in general equilibrium. The framework developed in this paper provides a tractable way to study these interactions and can be extended to analyze alternative policy designs that jointly affect workers' wealth, search incentives, and firm behavior.

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Online Appendix (Not for Publication)

A Proofs

This appendix provides the proofs to the propositions in the main text and also collects several basic properties of the value functions and consumption policy functions that are used in the proofs.

Lemma 1 (Monotonicity in wealth and wage)**.** The value functions $U(a)$ and $W(a, w)$ are strictly increasing in wealth a for each wage w. In addition, for each a, $W(a, w)$ is strictly increasing in the current wage w.

Proof. Fix any labor-market state (unemployed or employed with wage w) and two initial asset levels $a_1 < a_2$. Any feasible consumption–search plan starting from a_1 is also feasible from a_2. Hence the budget set from a_2 strictly contains that from a_1, and the associated value satisfies $V(a_2) \geq V(a_1)$ where $V(\cdot) = U(\cdot), W(\cdot, w)$. Since u is strictly increasing, there exists a feasible plan from a_2 that yields strictly higher expected utility than any given feasible plan from a_1. Therefore, both $U(a)$ and $W(a, w)$ are strictly increasing in a. The same argument applies to w. □

Lemma 2 (Weak concavity in wealth)**.** The value functions $U(a)$ and $W(a, w)$ are weakly concave in wealth a.

Proof. The discrete-time analogue of the problem features strictly concave value functions in wealth a (see Lise 2013, Lemma A.4). Weak concavity is preserved under pointwise convergence in the limit where time intervals go to zero. □

Lemma 3 (Consumption monotonicity in wealth)**.** The optimal consumption policies $c_u(a)$ and $c_e(a, w)$ are weakly increasing in assets a for each w.

Proof. From the Euler equations,

$$u'(c_u(a)) = U'(a), \qquad u'(c_e(a, w)) = \partial_a W(a, w). \tag{37}$$

By Lemma 2, the marginal value of assets $U'(a)$ and $\partial_a W(a, w)$ are weakly decreasing in a. Since u' is strictly decreasing, $c_u(a)$ and $c_e(a, w)$ are weakly increasing in a. □

Finally, I make an assumption about the dependence of consumption on wage

Assumption 1 (Consumption monotonicity in wage)**.** For each a, the optimal consumption policy $c_e(a, w)$ is weakly increasing in wage w.

Assumption 1 is natural but technically demanding to prove in the continuous-time setting. For this reason, I state Assumption 1 explicitly but I confirm that it holds in numerical solutions.

A.1 Proof of Proposition 3.1

Proof. The first-order conditions for search intensity are given by

$$s_u(a) = \left(\frac{\Delta_u(a)}{\psi_0}\right)^{\frac{1}{\eta_s}}, \quad \text{where} \quad \Delta_u(a) = \lambda \int_b^{\overline{w}} \Big(W(a, w) - U(a)\Big) dF(w), \tag{24}$$

$$s_e(a, w) = \left(\frac{\Delta_e(a, w)}{\psi_0}\right)^{\frac{1}{\eta_s}}, \quad \text{where} \quad \Delta_e(a, w) = \lambda \int_w^{\overline{w}} \Big(W(a, w') - W(a, w)\Big) dF(w'). \tag{25}$$

Differentiating $\Delta_u(a)$ and $\Delta_e(a, w)$ with respect to a, combined with the first-order conditions for consumption (4) and (5), gives

$$\Delta_u'(a) = \lambda \int_b^{\overline{w}} \Big(u'(c_e(a, w)) - u'(c_u(a))\Big) dF(w) \leq 0, \tag{38}$$

$$\partial_a \Delta_e(a, w) = \lambda \int_w^{\overline{w}} \Big(u'(c_e(a, w')) - u'(c_e(a, w))\Big) dF(w') \leq 0, \tag{39}$$

where $c_u(a) = c_e(a, b)$ and the expressions inside the integrals are nonpositive based on the assumption 1. These equations imply that $s_u(a)$ and $s_e(a, w)$ are weakly decreasing in a. Differentiating $\Delta_e(a, w)$ with respect to w gives

$$\partial_w \Delta_e(a, w) = -\lambda(1 - F(w))\partial_w W(a, w) \leq 0, \tag{40}$$

where $\partial_w W(a, w) > 0$ from Lemma 1. This inequality implies that $s_e(a, w)$ is weakly decreasing in w. $\square$

A.2 Derivation of the Wage Function $w(y)$

The first-order condition for the wage function is

$$w'(y) = \big(y - w(y)\big) \cdot \frac{n'(y)}{n(y)}. \tag{41}$$

Rewriting this equation yields

$$n(y)w'(y) + n'(y)w(y) = yn'(y). \tag{42}$$

Rewriting the left-hand side gives

$$\big[n(y)w(y)\big]' = yn'(y). \tag{43}$$

Integrating both sides from b to y and using the boundary condition $w(b) = b$ yield

$$n(y)w(y) - n(b)b = \int_b^y xn'(x)dx, \tag{44}$$

which gives

$$w(y) = b\frac{n(b)}{n(y)} + \int_b^y x\frac{n'(x)}{n(y)}dx. \tag{45}$$

Another useful expression is as follows. The integration by parts gives

$$\int_b^y xn'(x) = yn(y) - bn(b) - \int_b^y n(x)dx. \tag{46}$$

Substituting this equation into the one before yields

$$w(y) = y - \int_b^y \frac{n(x)}{n(y)}dx. \tag{47}$$

B Data

This section describes how the data from the Survey of Income and Program Participation (SIPP) are processed to construct the job-to-job (JJ) transition rates and liquid-wealth measures used in the empirical analysis.

B.1 Data Sources and Sample

I use the 1996, 2001, 2004, and 2008 SIPP panels, drawing the monthly core files and the topical module on wealth (Module 3 or 4, depending on the panel). The core files provide monthly labor-force information, employer identifiers, and demographic characteristics. The topical module provides detailed information on assets and liabilities at a single point during each panel.

The sample is restricted to individuals aged 25–55, male workers, private-sector wage and salary workers, and workers with strictly positive monthly earnings. I also further restricts the sample to the wave where wealth information is collected. All results are weighted using the SIPP person weights.

B.2 Variable Construction

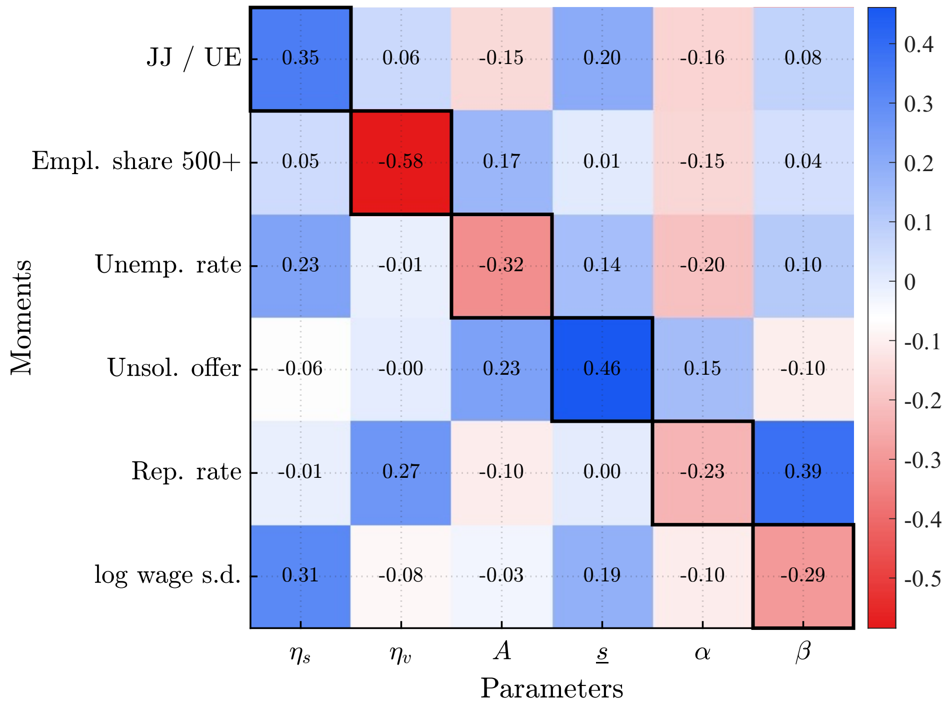
Job-to-job transitions are defined as a move in which an individual is employed in two consecutive months and the employer identifier changes, excluding cases in which the employer identifier is missing in either month.

Following Chetty (2008), liquid wealth is defined as total wealth minus home equity, business equity, and vehicle equity. Net liquid wealth is liquid wealth minus unsecured debt. All monetary variables are converted into 2015 dollars using the CPI-U. Wealth quintiles are computed from the distribution of net liquid wealth after sample selection and using person weights.

C Identification of Model Parameters

Jacobian matrix. To clarify how individual parameters influence the objects matched in the calibration, Figure 9 reports a normalized sensitivity matrix obtained from the model's Jacobian. Starting from the estimated parameter vector, I perturb each of the seven parameters by one percent and recompute all targeted moments. The resulting Jacobian—whose (i, j) element measures the percentage response of moment i to a marginal change in parameter j—is then converted into a nonnegative matrix by taking absolute values. To remove differences in scale across both rows and columns, I apply a Sinkhorn-Knopp algorithm so that each row and each column sums to one, following (Engbom et al., 2025). This nor-

Figure 9: Absolute-Value Sensitivity Matrix



malization removes level differences across moments and parameters and makes the figure informative about their *relative*, rather than absolute, influence.

The normalized matrix highlights the relative importance of each parameter for each moment. In a case where a moment is driven almost exclusively by one parameter, the diagonal entry would be close to one. In contrast, in a situation where all moments are equally informative about all parameters, entries would be more evenly spread across the columns. The diagonal elements of the matrix in Figure 9 confirm that each targeted moment is strongly influenced by the parameter it is intended to identify. Specifically, the diagonal elements are the largest for the first four moments within each row, suggesting that these moments are helpful in identifying the corresponding parameters. The last moments strongly influence multiple parameters, but no two parameters display highly similar sensitivity profiles across the targeted moments. This lack of similarity indicates that each parameter affects the moments in a distinct way, helping the identification of parameters.