Online Appendix

"Job Ladder and Wealth Dynamics in General Equilibrium"

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A Data Appendix

A.1 PASS

The Panel Study Labour Market and Social Security (PASS) is an annual representative household survey starting in the year 2007. The survey covers about 10,000 households including about 15,000 persons aged 15 or older. We use information elicited from the person and household questionnaires. The former includes a large set of demographic characteristics and information about the individual's employment and non-employment histories for which PASS also provides a biography spell module. All working-age household members (employed or non-employed) report whether they have been looking for jobs during the last four weeks, and if so, they report further information about job search behavior. See Trappmann et al. (2019) for a detailed description of these data.

Here we present descriptive statistics about households and workers surveyed in the PASS (waves 2007–2019). As described in the main text, we only consider persons aged 25–66 who are neither in education, parental leave, childcare leave or sick leave. Moreover, we exclude all individuals who spent less than 70% of their worklife (after age 25) in paid employment. Therefore, the non-employed workers in our sample are closely attached to the labor force. Cross-sectional sampling weights are applied throughout.

Tables A.1 and A.2 show cross-sectional means of various household and individual characteristics. Table A.2 compares all working-age individuals in PASS data with our sample. Given that PASS oversamples benefit recipients and program participants, many of whom are out of work for many years, the sample is much smaller when we apply our restrictions. Workers in our sample are also less often female, more often German nationality, more likely to be employed, and higher skilled.

Table A.3 reports in the first row the share of active searchers among employed and non-employed workers in our sample. Conditional on active searching, the other rows report the means of further statistics about job search behavior. Relative to employed job seekers, non-employed searchers make use of more search channels, they send more applications, they apply more broadly and spend more time on job search. Finally, Figure A.1 shows the age profiles of quarterly EE and NE transition rates in PASS data, separately for workers

Table A.1: Household characteristics (means)

Wealth	
Zero	0.110
Low	0.230
Middle	0.377
High	0.283
Income	2945.3
Household size	2.357
Number of children	0.639
Debt	
Zero	0.579
Low	0.205
High	0.215
Observations	9332

NOTE: For financial wealth, "Low" is above zero and up to €2,500, "Middle" is €2,500 – 20,000, "High" is over €20,000. For (non-mortgage) debt, "Low" is above zero and up to €5,000, "High" is over €5,000.

Table A.2: Individual characteristics (means)

	All	Our sample
Age	43.48	43.49
Female	0.487	0.410
German	0.845	0.883
Married	0.684	0.699
Education		
Years	12.34	12.76
Unskilled	0.159	0.104
Vocational training	0.659	0.690
University	0.181	0.206
Employment Status		
Employed	0.695	0.917
Non-employed	0.305	0.083
Number of employer changes	0.683	0.753
Net labor earnings	1729.0	1854.1
Weekly working hours	35.91	38.36
Observations	28,005	11,444

reporting active search and those who do not report active search. Among non-employed workers, active search raises the job-finding rate by about 7 percentage points on average (16.0% vs 9.0%). For employed workers, the job-to-job transition rate is on average 5.1 percentage points higher for active searchers (6.7% vs 1.6%). Taking the average proportions of active searchers in these two groups into account, the average NE rate in PASS is 11.32% and the average EE rate is 1.95%. In SOEP data, we obtain an average NE rate (EE rate) equal to 12.41% (4.73%). Therefore, SOEP transition rates are above PASS transition rates by the factor 2.43 (NE) and 1.10 (EE). To obtain the calibration targets for NE and EE rates in Table 2, we multiply the PASS transition rates for active and passive searchers by these factors.

Table A.3: Job search (means)

	Employed	Non-employed
Job Search	0.061	0.307
Job Search Channels		
Number	2.303	3.649
Newspaper	0.583	0.740
Public agency job posting	0.371	0.682
Other internet sources	0.663	0.723
Private networks	0.511	0.705
Public agency	0.0966	0.576
Private agent	0.0795	0.224
Number of applications	3.594	11.34
More than one occupation	0.551	0.648
Any possible occupation	0.192	0.278
Hours of job search per week	2.515	9.062
Observations	47,634	4,463

A.2 SOEP

To obtain further statistics for calibration and evaluation of model fit, we use data from the German Socio-Economic Panel (SOEP). SOEP is a well-known and widely used longitudinal panel dataset of the population in Germany. Every year, surveyed individuals provide information on their income, employment history, and education, among other topics. The survey also includes modules that are administered at a lower frequency, such as the quinquennial survey of wealth introduced in 2002. When measuring transition rates by wealth groups in the main text, we use a respondent's most recent reported information from the quinquennial survey of wealth to define his/her own wealth.

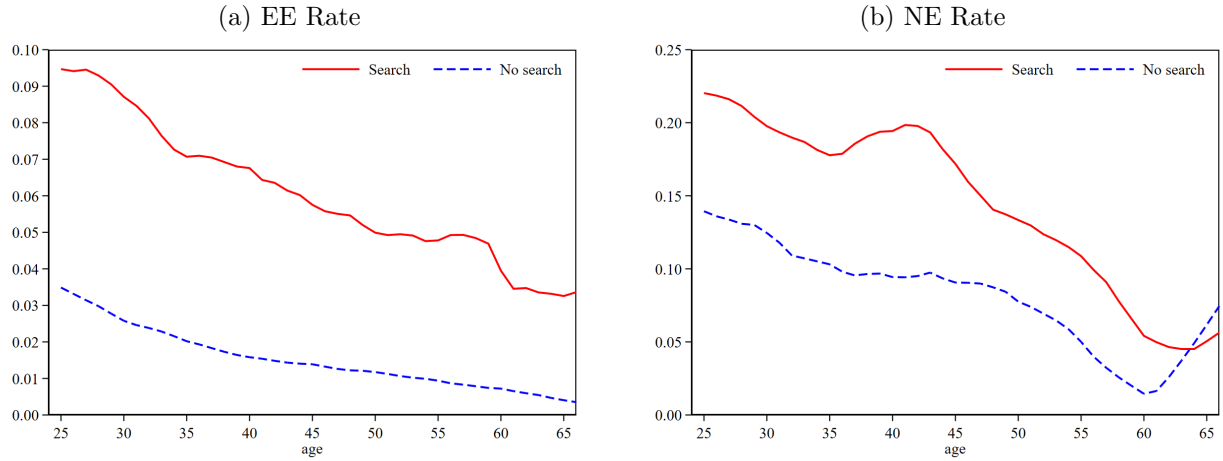


Figure A.1: Quarterly EE and NE rates by age and search status (PASS)

NOTES: EE and NE dummies in PASS data are regressed on age and time dummies, separately for searching and non-searching workers in PASS data. The graphs show centered 7-year moving averages of the age coefficients.

Tables A.4 and A.5 show cross-sectional means of various household and individual characteristics from the 2005-2015 waves of SOEP which we use for our analysis. We impose sample restrictions similar to those with the PASS data, namely we exclude unattached workers by requiring that individuals spent at least 70% of their worklife in employment, and we further exclude workers whose part-time experience accounts for more than 50% of their total work experience. As shown in A.5, this restriction leads to a lower share of female workers in our sample, but the other personal characteristics are otherwise similar to the larger sample of all working-age individuals in the survey.

A.3 Regressions

Here we present OLS regressions of the binary active search outcome (PASS data) and of EE and NE transition dummies (SOEP data). Using alternative probit specifications lead to no meaningful differences in results.

Table A.6 shows how active search of employed and non-employed worker varies with financial wealth in four categories where "zero" is the reference category and with worker age, applying different sets of controls. "Controls I" are those variables that play no role in our model and that are also applied in Figure 1 (education, gender, household size, marital status, and calendar time). "Controls II" are variables which are endogenous in our model (household income, labor earnings, spell duration and number of previous employers) but

Table A.4: Household characteristics (means)

Income	3,183
Household size	2.5
Number of children	0.5
Financial wealth	
Zero	25.8
Low	23.2
Middle	23.7
High	27.3
Debt	
Zero	52.7
Low	17.8
High	29.6
Observations	6,696

NOTES: For financial wealth, "Low" is above zero and up to €10,000, "Middle" is €10,000 – €30,000, "High" is over €30,000. For debt, "Low" is above zero and up to €25,000, "High" is over €25,000

which may have an independent impact on the workers' search behavior. In both specifications, seen in columns (1) and (3) for employed workers and in columns (2) and (4) for non-employed workers, we confirm the main insights from Figure 1 that active search is declining in wealth and in age. When more controls are applied, most of the coefficient estimates go down but they remain economically and statistically significant. Columns (5) and (6) additionally include household debt (without mortgages) in three categories (zero debt as the reference), applying the first set of controls.[51] Active search again is declining in wealth and in age, with rather similar coefficient estimates as in columns (1) and (2). Additionally, indebted workers have a somewhat higher propensity to search, with the exception of high-debt non-employed workers where the difference to zero-debt individuals is statistically insignificant.

In Table A.7, we analyze the relation between job-finding rates and age and financial wealth, controlling for a host of person and household characteristics. The table is organized similar to Table A.6: We consider four financial wealth categories, we further add household debt on the right-hand side of the regressions, and apply different sets of controls. The table shows an economically and statistically significant negative relation between job-finding rates and the variables of interest. Having financial wealth above €30,000 leads to a 2.8–3.0 pp lower probability of making an EE transition, depending on which set of controls is

[51] Applying also Controls II again reduces the coefficient estimates and raises R-squared without meaningful difference in the conclusions.

Table A.5: Individual characteristics (means)

	All	Our sample
Age	45.8	46.1
Female	50.0	34.8
German	90.3	92.8
Married	59.3	60.8
Education		
Number of years	12.3	12.6
Less than high school	10.8	5.9
High school	64.2	66.4
More than high school	24.9	27.7
Employment status		
Salaried employed	65.5	82.4
Self-employed	7.6	10.3
Registered unemployed	7.3	4.7
Out of the labor force	19.6	2.6
Net labor earnings	1,793	2,110
Weekly working hours	38.5	42.1
Observations	16,518	8,273

considered. The corresponding estimates for the NE rate is between -1.9 and -2.2 pp. As shown in the table, "Controls II" increases the R-squared of the regression, without altering the magnitude of the effects. Similarly, controlling for household debt does not change the magnitude of the effects of wealth on EE and NE rates. In results not reported here, we find that the conclusions remain unchanged when we replace financial wealth on the right-hand side of the regressions by net wealth and when we consider either net wealth dummies or a polynomial function of net wealth.

A.4 Job Search and Wealth in U.S. Data

We conduct an empirical analysis similar to the one presented in Section 2 for the United States, using the Survey of Consumer Expectations (SCE). As explained below, the sample is much smaller than that of the German PASS data. As a result, the U.S. estimates are less precisely estimated. Nonetheless, our results confirm, at least qualitatively, the empirical patterns of the relationships between active search on the one hand, and age and wealth on the other hand, found in German data.

The SCE is a nationally representative, online survey of a rotating panel of approximately 1,300 household heads, administered by the Federal Reserve Bank of New York. The survey is carried out monthly, with respondents participating in the panel for up to twelve months.

Table A.6: Active search of employed and non-employed workers

	(1) Employed	(2) Non-employed	(3) Employed	(4) Non-employed	(5) Employed	(6) Non-employed
Low wealth	-0.0253***	-0.0068	-0.0204***	-0.0117	-0.0246***	-0.0099
	(0.0054)	(0.0188)	(0.0055)	(0.0193)	(0.0054)	(0.0189)
Middle wealth	-0.0612***	-0.0821***	-0.0453***	-0.0892***	-0.0574***	-0.0830***
	(0.0053)	(0.0234)	(0.0054)	(0.0238)	(0.0053)	(0.0236)
High wealth	-0.0765***	-0.1514***	-0.0509***	-0.1455***	-0.0695***	-0.1496***
	(0.0057)	(0.0271)	(0.0059)	(0.0289)	(0.0057)	(0.0275)
Age	-0.0020***	-0.0064***	-0.0009***	-0.0058***	-0.0020***	-0.0063***
	(0.0002)	(0.0008)	(0.0002)	(0.0008)	(0.0002)	(0.0008)
Low debt					0.0207***	0.0491**
					(0.0038)	(0.0186)
High debt					0.0254***	0.0038
					(0.0039)	(0.0197)
Controls I	Y	Y	Y	Y	Y	Y
Controls II	N	N	Y	Y	N	N
Observations	44,213	4,313	43,252	4,114	43,871	4,270
R^2	0.025	0.191	0.035	0.213	0.027	0.194

NOTES: OLS regressions of the active search dummy in PASS data. "Controls I" are years of education, household size, hours worked, gender, marital status and year fixed effects. "Controls II" are household income, duration of the current spell, number of previous employers. Zero financial wealth is the reference category, "Low wealth" is up to €2,500, "Middle wealth" is €2,500-20,000, "High wealth" is over €20,000. In columns (5) and (6), zero debt is the reference category, "Low debt" is up to €5,000, "High debt" is over €5,000. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The SCE focuses primarily on expectations about economic outcomes. In addition, all participants fill out a labor market survey (which includes information on wages, occupation, etc. and job search behavior) and a household finance survey. Since our analysis requires linking respondents who participate in both modules to the core survey, we lose a fraction of the SCE panel. We then restrict the analysis to individuals between the ages of 25 and 66 who participate in the labor market and who are not permanently disabled (as a labor force status), retired or studying. The resulting sample contains about 2,000 individuals.

Beginning with the labor market questions, we classify as "employed" those individuals who are either working full time or part time or are currently on leave. We classify as "non-employed" those individuals who are not working but would like to work and those who are on temporary lay-off. For employed workers, we consider that the individual is actively searching if s/he has been looking for a new job or for an additional job in the last four weeks. For non-employed workers, we classify them as actively searching if they report searching for work in the last four weeks. Next, from the household finance module, we extract information about household wealth and debt. The financial wealth variable corresponds to the total

Table A.7: NE and EE Rate Regressions

	(1)	(2)	(3)	(4)	(5)	(6)
	EE Rate (%)	NE Rate (%)	EE Rate (%)	NE Rate (%)	EE Rate (%)	NE Rate (%)
Low wealth	-1.302**	1.671	-1.259**	0.915	-1.333**	1.502
	(0.531)	(1.174)	(0.535)	(1.141)	(0.526)	(1.153)
Middle wealth	-3.231***	1.370	-3.130***	1.157	-3.156***	1.361
	(0.482)	(1.142)	(0.480)	(1.140)	(0.481)	(1.147)
High wealth	-2.993***	-2.161**	-2.879***	-1.861*	-2.822***	-2.099**
	(0.482)	(1.033)	(0.485)	(1.058)	(0.485)	(1.046)
Age	-0.181***	-0.337***	-0.182***	-0.355***	-0.178***	-0.332***
	(0.021)	(0.046)	(0.020)	(0.046)	(0.020)	(0.046)
Low debt					0.760	1.799
					(0.476)	(1.298)
High debt					-1.079***	0.190
					(0.319)	(0.961)
Controls I	Y	Y	Y	Y	Y	Y
Controls II	N	N	Y	Y	N	N
Observations	63,570	27,832	63,570	27,832	63,570	27,832
R-squared	0.014	0.045	0.016	0.056	0.015	0.045

NOTES: OLS regressions of EE and NE rates (%) in SOEP data. "Controls I" are years of education, household size, gender, marital status and time fixed effects. "Controls II" are a dummy for German nationality, spousal income, and regional (Lander) fixed effects. Zero financial wealth is the reference category, "Low wealth" is above zero and up to €10,000, "Middle wealth" is €10,000 − €30,000, "High wealth" is over 30,000. In columns (5) and (6), zero debt is the reference category, "Low debt" is up to 25,000, "High debt" is over €25,000. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

value of checking and savings accounts, certificates of deposit, money market funds, savings bonds, mutual funds or investment trusts, and treasury bonds. Note that it does not include the value of retirement accounts. For debt, the variable includes balances on credit cards (including retail cards), student loans, vehicle loans, and other personal loans, as well as medical or legal bills; it excludes housing-related debt.

A.4.1 Main Findings

We first verify that the univariate correlations between search and financial wealth that we document in the German PASS data are also present in the U.S. SCE data. When we group individuals by wealth in three bins of roughly the same size, we find that the fraction of active searchers is at 28% for those with less than $8,000 of financial wealth vs. about 20% among those with between $8,000 and $50,000, and slightly under 20% above $50,000 of financial wealth. This negative relation continues to hold when we restrict the analysis to individuals who are currently employed. At the same time, we find a positive relation between active search and debt. Among workers with debt under $2,500, the fraction searching is at roughly 20%, while it increases to 22-23% for those with debt between $2,500 and $21,000, and to about 28% above the latter debt threshold.

Table A.8: Active search

	(1) All workers	(2) Employed	(3) All workers	(4) Employed
Middle wealth	-0.0462*	-0.0498*	—-0.0348	—-0.0376
	(0.0221)	(0.0217)	(0.0222)	(0.0218)
High wealth	-0.0355	-0.0392	-0.0148	-0.0164
	(0.0264)	(0.0261)	(0.0270)	(0.0266)
Age	—-0.0033***	—-0.0045***	—-0.0031***	—-0.0043***
	(0.0008)	(0.0008)	(0.0008)	(0.0008)
Middle debt			0.0249	0.0355
			(0.0240)	(0.0237)
High debt			0.0838***	0.0936***
			(0.0230)	(0.0226)
Observations	2,130	2,031	2,130	2,031
R^2	0.045	0.053	0.052	0.061

NOTES: OLS regressions on the active search dummy. Further controls include gender, marital status and presence of children, annual income, education and race dummies. "Low wealth", defined as wealth up to \$8,000, is the reference category; "Middle wealth" is \$8,000-\$50,000, "High wealth" is over \$50,000. In columns (3) and (4), "Low debt", defined as debt up to \$2,500, is the reference category, "Middle debt" is \$2,500-\$21,000, "High debt" is over \$21,000. * $p < 0.05$, ** $p < 0.01$, * $p < 0.001$. Source: Survey of Consumer Expectations, © 2013-2025 Federal Reserve Bank of New York (FRBNY). The SCE data are available without charge at `http://www.newyorkfed.org/microeconomics/sce` and may be used subject to license terms posted there. FRBNY disclaims any responsibility or legal liability for this analysis and interpretation of Survey of Consumer Expectations data.

Next, as with the German PASS data, we observe a negative relation between active search and age. When looking across all individuals, employed and non-employed, we find that the fraction actively searching decreases from slightly more than 30% at the beginning of the working life to about 15% when workers are in their 60s. One difference with the German data, though, is that a substantial share of the decline in active search in the U.S. data occurs between the ages of 25 and 40; the fraction plateaus between the ages of 40 and 60, and then falls again as individuals get closer to retirement.

The next step of our analysis is a multivariate regression analysis similar to Table A.6. We run OLS regressions of the active search indicator on age, wealth and debt, and a number of individual and household controls. Table A.8 reports the results.

First, the regressions confirm the negative relationships between age and search and between financial wealth and search. The wealth coefficients are barely statistically significant at conventional levels, but note that the regression includes many individual controls that correlate with wealth. Second, there is a positive relationship between debt and active search, shown in columns (3) and (4). In sum, the U.S. SCE data confirm, albeit with less precision in the estimates, the empirical patterns that we document in the German data.

B Model Appendix

B.1 Further Model Details

B.1.1 Households' Bellman Equations

Similar to a household with an employed worker, a household with a non-employed worker decides between active and passive search at the beginning of the period. The expected value prior to the realization of utility shocks is

$$V(w,0,a_0,j) = \frac{1}{\gamma_n} \ln \left\{ e^{\gamma_n [V^1(w,0,a_0,j) - \xi_n]} + e^{\gamma_n V^0(w,0,a_0,j)} \right\} \ ,$$

where the continuation values under active and passive search ($i = 1, 0$) are

$$\begin{aligned} V^i(w,0,a_0,j) = \max_{c,a} \Big\{ & u(c) + [1 - s_n^i \lambda(\theta) \bar{H}(q^n(w,a,j))] \bar{V}(w,0,a,j) \\ & + s_n^i \lambda(\theta) \int_{q^n(w,a,j)} (1-\eta) \bar{V}(w,0,a,j) + \eta \bar{V}(\omega x, x, a, j) \ dH(x) \Big\} \end{aligned}$$

subject to

$$c + a = b + (1+r)a_0 \quad , \quad a \geq 0 \ .$$

With probability $s_n^i \lambda(\theta) \bar{H}(q^n(w,a,j))$, the worker receives an offer from a firm with match productivity $x \geq q^n(w,a,j)$ that the worker accepts. Otherwise the worker remains non-employed with continuation utility $\bar{V}(w,0,a,j)$.

Similar to employed workers, the fraction of non-employed workers in state $(w,0,a_0,j)$ choosing active search is

$$\pi^1(w,0,a_0,j) = \frac{e^{\gamma_n [V^1(w,0,a_0,j) - \xi_n]}}{e^{\gamma_n [V^1(w,0,a_0,j) - \xi_n]} + e^{\gamma_n V^0(w,0,a_0,j)}} \ ,$$

while the fraction of passive searchers is $\pi^0(w,0,a_0,j) = 1 - \pi^1(w,0,a_0,j)$.

At the end of the period, households age with probability μ_j. For $j < J-1$, this implies

$$\bar{V}(w,p,a,j) = \beta \left[\mu_j V(w,p,a,j+1) + (1-\mu_j) V(w,p,a,j) \right] \ .$$

For $j = J-1$, an aging event is a transition into retirement:

$$\bar{V}(w,p,a,J-1) = \beta \left[\mu_{J-1} V(w^r(w),0,a,J) + (1-\mu_{J-1}) V(w,p,a,J-1) \right] \ ,$$

where the value function in retirement solves a standard consumption-saving problem with a warm-glow bequest motive:

$$V(w^r, 0, a_0, J) = \max_{c,a} u(c) + \beta(1-\mu_J)V(w^r, 0, a, J) + \beta\mu_J v(a)$$

$$\text{s.t.} \quad c + a = w^r + (1+r)a_0 \ , \ a \geq 0.$$

B.1.2 Firms' Bellman Equations

To describe the Bellman equation of a firm with a job filled with a worker in state (w, p, a_0, j) at the beginning of the period, note first that wage renegotiations may occur in two situations. First, the worker (with savings a at the match/separation stage) receives an outside offer from a firm with productivity $x \in [q(w, p, a, j), p]$ in which case the wage is renegotiated to $w' = \mathcal{W}(x, p, a, j)$. Second, the worker has a credible threat to quit to non-employment, in which case either the quit occurs or the wage is raised. Write $w' = \mathcal{W}^c(w, p, a, j)$ for the continuation wage which satisfies

$$\mathcal{W}^c(w, p, a, j) = \begin{cases} w & \text{if } \bar{V}(w, p, a, j) \geq \bar{V}(w, 0, a, j) \ , \\ \min[w', \omega p] & \text{else, where } w' \text{ satisfies } \bar{V}(w', p, a, j) = \bar{V}(w, 0, a, j) \ . \end{cases}$$

In the first line, the worker has no credible threat to quit so that the wage remains at w. In the second case, the firm either retains the worker if $w' \leq \omega p$. But if $w' > \omega p$, the worker quits and the continuation profit is zero which is (for the firm) equivalent to employing the worker at continuation wage ωp.

The Bellman equation for the profit value of a job is

$$\Pi(w, p, a_0, j) = \omega p - w + \sum_{i=0,1} \pi^i(w, p, a_0, j) \Bigg\{ s_e^i \lambda(\theta) \int_{q(w,p,a^i,j)}^{p} \bar{\Pi}(\mathcal{W}(x, p, a^i, j), p, a^i, j) \ dH(x) \\ + \left[1 - \rho - \kappa\lambda(\theta) - s_e^i \lambda(\theta) \bar{H}(q(w, p, a^i, j))\right] \bar{\Pi}(\mathcal{W}^c(w, p, a^i, j), p, a^i, j) \Bigg\} \ ,$$

with assets $a^i = \mathcal{A}(w, p, a_0, j, i)$. The continuation profits on the right-hand side entail the following possibilities: Either the worker (searching actively or passively in proportions π^1 and π^0) obtains an outside offer. If match productivity at the poaching firm is above $q(.)$ and below p (which happens with probability $s_e^i \lambda(\theta)[H(p) - H(q(.))]$, a renegotiation takes place (first line). If the job at the poaching firm is more productive (probability $s_e^i \lambda(\theta) \bar{H}(p)$), and also if an exogenous separation shock occurs (probability $\rho + \kappa\lambda(\theta)$), the worker quits

and continuation profit is zero (not shown in the Bellman equation). In all other events (shown in the second line), the job either survives with continuation wage $\mathcal{W}^c(.) < \omega p$. Or, alternatively, if the worker cannot be profitably retained ($\mathcal{W}^c = \omega p$), the worker quits and the continuation profit $\bar{\Pi}(\omega p, p, a^i, j)$ is zero.

After the matching and renegotiation stage and before aging, profit values satisfy the recursions

$$\begin{aligned}\bar{\Pi}(w,p,a,j) &= \frac{1}{1+r}\left[\mu_j \Pi(w,p,a,j+1) + (1-\mu_j)\Pi(w,p,a,j)\right] \ , \ j < J-1 \ , \\ \bar{\Pi}(w,p,a,J-1) &= \frac{1}{1+r}(1-\mu_{J-1})\Pi(w,p,a,J-1) \ .\end{aligned}$$

In the last equation, the worker retires with probability μ_{J-1} in which case continuation profit is zero. Next-period profit values Π are discounted with financial discount factor $(1+r)^{-1}$.

Finally, the free-entry condition (8) reflects that the probability to meet a worker in a given state (w,p,a_0,j) is given by the search efficiency of workers in that state, which is $\sum_{i=0,1} s_\ell^i \pi^i(w,p,a_0,j) d\nu(w,p,a_0,j)$ for $\ell = e,n$, relative to aggregate search efficiency which is the sum of search efficiency of all employed and non-employed workers, including those employed workers receiving reallocation shocks:

$$\bar{s} \equiv \int_{j<J,p>0} \sum_{i=0,1} \pi^i(w,p,a_0,j)(s_e^i+\kappa)\, d\nu(w,p,a_0,j) + \int_{j<J} \sum_{i=0,1} \pi^i(w,0,a_0,j) s_n^i \, d\nu(w,0,a_0,j) \ . \tag{B.1}$$

B.1.3 Walras's Law

To derive the goods-market equilibrium condition, write

$$M = (1+r)K + \int_{j<J,p>0} \Pi(w,p,a_0,j)\ d\nu(w,p,a_0,j)$$

for the (cum-dividend) value of the mutual fund at the beginning of a period. This value satisfies the recursion

$$M = rK + \int_{j<J,p>0} [\omega p - w]\ d\nu(w,p,a_0,j) - kV + \frac{M}{1+r} \ . \tag{B.2}$$

Stationarity of the household distribution implies that the assets bought in any period, net of those bequests which are not paid to newborn households (hence collected by the

government), are identical to households' asset holdings at the beginning of a period, i.e.

$$\int \sum_{i=0,1} \pi^i(w,p,a_0,j)\mathcal{A}(w,p,a_0,j,i)\ d\nu(w,p,a_0,j)$$
$$-\mu_J \int \mathcal{A}(w^r,0,a_0,J,0)\ d\nu(w^r,0,a_0,J) + \mu_0 \int a_0\ d\Phi(a_0) = \int a_0\ d\nu(w,p,a_0,j)\ . \tag{B.3}$$

From capital market equilibrium (10) and equation (B.2) follows that

$$\begin{aligned}(1+r)\int a_0\ d\nu(w,p,a_0,j) &= M \\ &= rK + \int_{j<J,p>0} [\omega p - w]\ d\nu(w,p,a_0,j) - kV + \frac{M}{1+r} \\ &= -\delta K + F_K(K,E)K + F_E(K,E)E - W - kV + \frac{M}{1+r}\ ,\end{aligned} \tag{B.4}$$

with aggregate wage income $W = \int_{j<J,p>0} w\ d\nu(w,p,a_0,j)$. The third line follows from $F_K = r+\delta$ and $\int \omega p\ d\nu(w,p,a_0,j) = \omega E = F_E E$. Adding up budget constraints of all (employed, non-employed, retired) households gives

$$(1+r)\int a_0\ d\nu(w,p,a_0,j) = \tag{B.5}$$
$$\begin{aligned}&\int_{j<J,p>0} \sum_{i=0,1} \pi^i(w,p,a_0,j)[\mathcal{C}(w,p,a_0,j,i) + \mathcal{A}(w,p,a_0,j,i) - w + T(w)]\ d\nu(w,p,a_0,j) \\ &\quad + \int_{j<J} \sum_{i=0,1} \pi^i(w,0,a_0,j)\ [\mathcal{C}(w,0,a_0,j,i) + \mathcal{A}(w,0,a_0,j,i) - b]\ d\nu(w,0,a_0,j) \\ &\quad\quad + \int [\mathcal{C}(w^r,0,a_0,J,0) + \mathcal{A}(w^r,0,a_0,J,0) - w^r]\ d\nu(w^r,0,a_0,J) \\ &\quad = \int \sum_{i=0,1} \pi^i(w,p,a_0,j)\ [C(w,p,a_0,j,i) + \mathcal{A}(w,p,a_0,j,i)]\ d\nu(w,p,a_0,j) \\ &- \int_{j<J,p>0} w\ d\nu(w,p,a_0,j) - \mu_J \int \mathcal{A}(w^r,0,a_0,J,0)\ d\nu(w^r,0,a_0,J) + \mu_0 \int a_0\ d\Phi(a_0) \\ &\quad = C - W + \int a_0\ d\nu(w,p,a_0,j)\ .\end{aligned}$$

Here the second equation uses the government budget constraint (9), and the third equation uses (B.3).

Equating (B.4) and (B.5), using $F_K(K,E)K + F_E(K,E)E = F(K,E)$ and capital market equilibrium (10) yields the goods market equilibrium identity (11). The partition of $F(K,E)$ into wage, profit and rental income follows since $F_E(K,E)E = W + \int_{j<J,p>0}[\omega p -$

$w]\ d\nu(w, p, a_0, j)$.

B.1.4 Normalization

Here we explain why the normalization of the marginal product of labor efficiency $\omega = 1$ together with the normalization of average earnings to one is innocuous. For arbitrary ω, write $\tilde{p} = \omega p$ for the marginal product of a job with labor efficiency p. We calibrate the gamma distribution of $\tilde{p}$ to normalize average earnings to one and to target the average NE rate, as explained in Section 4. For the calibrated value of the real interest rate r and the normalized tightness (vacancy-to-search-efficiency ratio) $\theta = 1$, together with further externally calibrated parameters (governing pensions, initial assets), we can solve the household problem, equilibrium wages and the stationary distribution ν. Hence we obtain aggregate labor efficiency $E = \int_{p>0} p\ d\nu$, and define $\Omega = \omega E$. Note that Ω is independent of the choice of ω, since the distribution of $\tilde{p}$ (and not the distribution of p) is calibrated to match average earnings $\int_{p>0} w\ d\nu / (\int_{p>0} d\nu) = 1$. Instead, aggregate labor efficiency $E = \Omega/\omega$ scales inversely proportional with ω.

We can also solve aggregate household assets, firm profits (from firms' value functions) and obtain aggregate capital K from capital market equilibrium and hence independent of ω.

From the marginal products of capital and efficient labor:

$$(r + \delta) = F_K = \alpha \mathcal{T} K^{\alpha-1} E^{1-\alpha} \quad , \quad \omega = F_E = (1-\alpha) \mathcal{T} K^{\alpha} E^{-\alpha} \ .$$

Substituting $E = \Omega/\omega$ into the second equation implies

$$\omega^{1-\alpha} = (1-\alpha) \mathcal{T} K^{\alpha} \Omega^{-\alpha} \ .$$

This shows that any arbitrary choice of ω pins down aggregate TFP $\mathcal{T}$ proportionate to $\omega^{1-\alpha}$. The choice of ω (and $\mathcal{T}$) has no consequence for any economic outcomes, however. The capital cost satisfies

$$r + \delta = \frac{\alpha}{1-\alpha} \frac{\Omega}{K} \ ,$$

which shows how the calibrated values of r and δ determine parameter α uniquely.

Aggregate output is

$$Y = \mathcal{T} K^{\alpha} E^{1-\alpha} = \mathcal{T} \omega^{\alpha-1} K^{\alpha} \Omega^{1-\alpha} = \frac{\Omega}{1-\alpha} \ ,$$

which is unaffected by the choice of ω.

B.1.5 Consumption-Equivalent Variation

We describe how we calculate the percentage increase in consumption $\hat{c}$ (the consumption-equivalent variation CEV) that would make a newborn household in the benchmark economy (index B) indifferent to the newborn household in the post-reform environment (index P). Due to the presence of idiosyncratic search utility shocks, we cannot calculate $\hat{c}$ directly from the obtained value functions, so that we need to resort to simulations.

For both economies B and P, we simulate a large number i of newborn households until they either die or until time exceeds an implausibly large number (1000 quarters). We calculate the average discounted utility of consumption for both economies and denote them

$$U^B = \text{Average}^B \left(\sum_{t \geq 0} \beta^t \tilde{u}(c_t^i) \right) ,$$
$$U^P = \text{Average}^P \left(\sum_{t \geq 0} \beta^t \tilde{u}(c_t^i) \right) ,$$

with $\tilde{u}(c) = c^{1-\sigma}/(1-\sigma)$. It is important to use $\tilde{u}(c)$ at this stage and not the original CRRA utility function $u(c) = (c^{1-\sigma} - 1)/(1-\sigma)$.

From the solution of the model, we can calculate the value functions of newborn households:

$$V^B = \mathbb{E}V^B(0, 0, a_0, 1) \quad , \quad V^P = \mathbb{E}V^P(0, 0, a_0, 1) ,$$

where the expectation is over the initial asset endowment a_0. Then we calculate the component of utility which is due to the fixed utility costs of search, the idiosyncratic search utility shocks, the utility from bequests, and the constant term in the utility function, as the residuals

$$X^B = V^B - U^B \quad , \quad X^P = V^P - U^P .$$

The consumption-equivalent variation $\hat{c}$ increases (decreases) U^B to $U^B(1+\hat{c})^{1-\sigma}$ when $\hat{c} > 0$ ($\hat{c} < 0$). From the above terms, we obtain

$$\hat{c} = \left(\frac{V^P - X^B}{U^B} \right)^{\frac{1}{1-\sigma}} - 1 .$$

To calculate the contributions of search disutility, consumption level and volatility, and bequest utility to the overall welfare effect seen in Table 8, we proceed as follows. We

isolate the search disutility component by first computing similar values $\tilde{U}^B$ and $\tilde{U}^P$ as above, this time embedding the discounted utility of bequests as well. We then compute the ensuing residual $\tilde{X}^P = V^P - \tilde{U}^P$. The consumption-equivalent variation from different search disutility $\hat{c}^{\text{s}}$ can then be computed as $\hat{c}^{\text{s}} = -\big((V^B - \tilde{X}^P)/\tilde{U}^B)^{\frac{1}{1-\sigma}} - 1\big)$. Similarly, the bequest utility component is calculated as $\hat{c}^{\text{b}} = -\big((V^B - X^P)/U^B)^{\frac{1}{1-\sigma}} - 1\big) + \hat{c}^{\text{s}}$. The level effect of consumption is simply equal to the change in average consumption, $\hat{c}^{\text{c,lev}} = \bar{C}^P/\bar{C}^B - 1$, where C^P and C^B denote average consumption in the benchmark and post-reform economies, respectively. Finally, we define the volatility effect of consumption as the residual $\hat{c}^{\text{c,vol}} = \hat{c} - \hat{c}^{\text{s}} - \hat{c}^{\text{b}} - \hat{c}^{\text{c,lev}}$.

B.2 Model Fit: Further Results

Table B.1 reports the transition probabilities for each age and wealth group, in both data and the model. As in the main text, the thresholds that define the four quartiles are defined based on individuals' employment statuses, but they are not conditional on age.

We observe in the data panel of Table B.1 that NE transition rates are declining in age for all wealth quartiles. The model matches these conditional declines very well. Conditional on age, the data show declining relationships with wealth for workers until age 44 which is partly captured by the model. The model also predicts mild declines of NE rates in wealth for older workers, while the relationship in the data is hump-shaped.

The middle panel of Table B.1 shows the model fit with respect to the EE transition rates by age and wealth. Similar to NE transitions, the rate of job-to-job transitions decreases with age conditional on the wealth quartile, which is also true in a model with a weaker age gradient. On the other hand, EE transitions in the data are falling in wealth separately for each age group, and the model does a good job at capturing these patterns.

Last, we report transitions from employment to non-employment. As shown in the bottom left panel of Table B.1, these transitions show some variation by age and wealth in the data. In the model, EN rates are rather similar among prime-age workers, and higher for older workers as they are in the data, with little variation in wealth for all age groups.

Table 6 in the main text shows that the model generates a hump-shaped wealth-age profile. While this table reports mean wealth for each age group (in relation to average income), Figure B.1 shows the 25th, 50th, 75th and the 95th percentiles of wealth (again in relation to average income), separately for each of the five age groups. Generally, the model matches the data profile rather well, suggesting that it generates reasonable wealth distributions by age.

Finally, Table B.2 reports statistics about wage growth upon EE transitions in the data

Table B.1: Transition rates by age and wealth: data vs. model

	Data					Model			
NE rate	Q1	Q2	Q3	Q4	NE rate	Q1	Q2	Q3	Q4
25-34	20.6	18.3	16.6	17.2	25-34	17.8	18.4	16.9	16.3
35-44	18.2	15.9	17.5	14.7	35-44	17.7	16.7	15.8	15.3
45-54	11.9	12.1	16.2	13.5	45-54	15.7	13.5	13.2	12.5
55-66	7.4	9.0	8.1	7.9	55-66	8.7	7.1	6.8	6.1
EE rate	Q1	Q2	Q3	Q4	EE rate	Q1	Q2	Q3	Q4
25-34	10.6	7.0	6.3	8.5	25-34	8.2	4.9	4.4	4.2
35-44	7.5	3.8	3.3	3.0	35-44	7.6	4.5	4.4	4.1
45-54	5.7	3.8	3.5	2.6	45-54	7.2	4.3	4.1	3.7
55-66	4.4	2.6	2.5	1.0	55-66	5.8	3.2	2.9	2.4
EN rate	Q1	Q2	Q3	Q4	EN rate	Q1	Q2	Q3	Q4
25-34	2.5	2.0	1.5	2.3	25-34	1.2	1.2	1.2	1.2
35-44	2.0	1.3	1.2	0.7	35-44	1.2	1.2	1.2	1.2
45-54	2.3	0.9	1.1	0.7	45-54	1.3	1.5	1.5	1.5
55-66	3.2	1.8	1.8	1.5	55-66	1.8	2.0	2.0	2.1

NOTES: All numbers in percent.

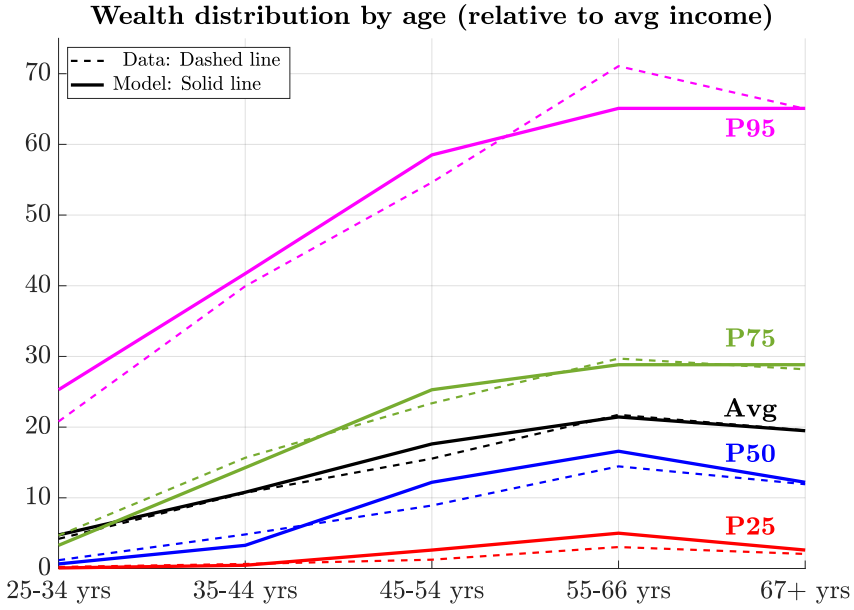


Figure B.1: Percentiles of net wealth by age

and in the model. In the model, the reallocation shock parameter κ is calibrated to match the share of job-to-job transitions where workers experience a decline of the wage, which is 26.9%. Table B.2 shows that this share is increasing in age up until the 45-54 age group and then falls to the 55-66 group, similarly in the data and in the model. Average wage growth upon EE transitions in the data (model) is 12.2% (8.1%), and both the data and the model show U-shaped age profiles, albeit there are sizable discrepancies in the age groups 35-44 and 55-66.

Table B.2: Wage growth upon EE transitions

	All	25-34	35-44	45-54	55-66
% negative					
Data	26.9†	21.6	29.4	33.0	30.8
Model	27.1	23.8	29.6	30.7	23.8
Mean					
Data	12.2	15.3	10.1	4.4	5.6
Model	8.1	12.8	2.6	4.1	14.3

† Calibration target

B.3 Age Profiles of Labor Market Transitions

We demonstrate in Section 4.2 that job-finding rates of employed and non-employed workers are declining in age, an outcome that arises without any age variation in the exogenous parameters that govern search efficiency or utility costs of search. To examine how the characteristics of workers – namely age, wealth and match quality – matter for these life-cycle patterns, we conduct a decomposition analysis similar to the approach of Menzio et al. (2016).

Given the stationary distribution ν over characteristics (w, p, a_0, j), we calculate various conditional distributions. Denote by $\nu^e(w, p, a_0|j)$ the distribution of (w, p, a_0) among employed workers conditional on age j, $\nu^e_{job}(w, p|a_0, j)$ the distribution of job characteristics (w, p) conditional on age j and assets a_0, and $\nu^e_a(a_0|j)$ the distribution of assets conditional on age. All these are probability distributions conditional on employment, hence they integrate to one. Write $\text{EE}(w, p, a_0, j)$ for the EE rate of a worker with characteristics (w, p, a_0, j) and EE_j for the average EE rate of workers of age j. The difference in EE rates between age

groups j and $j-1$ can be split into three terms as follows:

$$\begin{aligned}\text{EE}_j - \text{EE}_{j-1} = &\underbrace{\int \text{EE}(w,p,a_0,j)\; d\nu^e(w,p,a_0|j) - \int \text{EE}(w,p,a_0,j-1)\; d\nu^e(w,p,a_0|j)}_{\text{horizon effect}} \\ &+ \underbrace{\int \left[\int \text{EE}(w,p,a_0,j-1)\; d\nu^e_{job}(w,p|a_0,j)\right] d\nu^e_a(a_0|j) - \int \left[\int \text{EE}(w,p,a_0,j-1)\; d\nu^e_{job}(w,p|a_0,j)\right] d\nu^e_a(a_0|j-1)}_{\text{wealth effect}} \\ &+ \underbrace{\int \left[\int \text{EE}(w,p,a_0,j-1)\; d\nu^e_{job}(w,p|a_0,j)\right] d\nu^e_a(a_0|j-1) - \int \left[\int \text{EE}(w,p,a_0,j-1)\; d\nu^e_{job}(w,p|a_0,j-1)\right] d\nu^e_a(a_0|j-1)}_{\text{selection effect}}\;.\end{aligned}$$

The first line is the direct contribution of age to EE rates, labeled the *horizon effect*, which represents the role of the expected duration of working life on search behavior on-the-job (cf. Chéron et al., 2013; Menzio et al., 2016). The second line is the *wealth effect* which is the difference between the EE rate of age $j-1$ workers who counterfactually have the same wealth and job characteristics of age j workers and the EE rate of age $j-1$ workers who counterfactually have the same job characteristics as age j workers. This effect measures the extent to which wealth accumulation over the life cycle contributes to declining job transitions. The third line is the *selection effect* which is the difference between the EE rate of age $j-1$ workers who counterfactually have the job characteristics of age j workers and the actual EE rate of age $j-1$ workers. It captures the effect of a higher position on the job ladder to fewer job-to-job transitions as a worker ages.

Regarding non-employed workers, denote by $\nu^n(w,a_0|j)$ the distribution of (w,a_0) conditional on age j, $\nu^n_{wage}(w|a_0,j)$ the distribution of previous wages w conditional on age j and assets a_0, and $\nu^n_a(a_0|j)$ the distribution of assets conditional on age. Again, these are all probability distributions conditional on non-employment. As above we can split the difference in job-finding rates between ages j and $j-1$ into a *horizon effect*, a *wealth effect*, and a *selection effect*:

$$\begin{aligned}\text{NE}_j - \text{NE}_{j-1} = &\underbrace{\int \text{NE}(w,a_0,j)\; d\nu^n(w,a_0|j) - \int \text{NE}(w,a_0,j-1)\; d\nu^n(w,a_0|j)}_{\text{horizon effect}} \\ &+ \underbrace{\int \left[\int \text{NE}(w,a_0,j-1)\; d\nu^n_{wage}(w|a_0,j)\right] d\nu^n_a(a_0|j) - \int \left[\int \text{NE}(w,a_0,j-1)\; d\nu^n_{wage}(w|a_0,j)\right] d\nu^n_a(a_0|j-1)}_{\text{wealth effect}} \\ &+ \underbrace{\int \left[\int \text{NE}(w,a_0,j-1)\; d\nu^n_{wage}(w|a_0,j)\right] d\nu^n_a(a_0|j-1) - \int \left[\int \text{NE}(w,a_0,j-1)\; d\nu^n_{wage}(w|a_0,j-1)\right] d\nu^n_a(a_0|j-1)}_{\text{selection effect}}\;.\end{aligned}$$

Here, $\text{NE}(w,a_0,j)$ is the job-finding rate of a non-employed worker in state $(w,0,a_0,j)$, and NE_j is the average NE rate of workers of age j.

Table B.3: Decomposition of age profiles of EE and NE rates

	$EE_2 - EE_1$	$EE_3 - EE_2$	$EE_4 - EE_3$	$NE_2 - NE_1$	$NE_3 - NE_2$	$NE_4 - NE_3$
Total	−1.09	−0.80	−1.47	−1.09	−3.21	−6.71
Horizon	−0.03	−0.14	−0.43	−0.56	−2.48	−5.81
Wealth	−0.69	−0.52	−0.27	−0.30	−0.45	−0.18
Selection	−0.38	−0.13	−0.77	−0.23	−0.28	−0.73

NOTE: EE_j and NE_j denote the average EE and NE rates of workers in age group j. All numbers are in percentage points.

Table B.3 shows how the declines of EE and NE rates with age (first row in percentage points) is decomposed into the three effects. Regarding NE rates, the horizon effect plays the dominant role for the declining age patterns: as workers become older, their incentives to search actively for jobs decrease at an accelerating pace over the life cycle (cf. Table 3). The wealth effect plays a sizable role for falling job-finding rates early in working life, accounting for around 28% of the decline of the NE rate between the ages 25-34 and 35-44. According to our model, as younger workers accumulate wealth, the incentives to search actively go down and the reservation productivity increases.[52] The selection effect is least important early in life, but it accounts for a 0.73 pp lower job-finding rate (around 11% of the total drop) in the pre-retirement age group, where the wealth effect plays only a negligible role. Intuitively, as older non-employed workers have on average higher previous wages (and hence pension claims), their incentives to search for re-employment or to accept low-productivity jobs are lower.

Turning to the decline of job-to-job transition rates with age, we find that the wealth effect is the main driver for prime-age workers, explaining 63% of the decline going from age group 25-34 to age group 35-44, and 65% of the decrease to the subsequent age group 45-54. In contrast, fewer job switches of workers in the pre-retirement phase are mostly explained by the selection effect since older workers in productive and/or well-paid jobs have a lower chance to climb the job ladder further and hence decide to search less. Finally, search intensity on the job and the willingness to remain employed after a reallocation shock decrease with age due to a shorter working life horizon, especially for workers closer to retirement.

[52] Generally, there are two mechanisms for the variation of NE rates across workers: search intensity (active or passive search) and selectivity (job acceptance conditional on a job offer). In Appendix B.5 we provide a variance decomposition which reveals that the selectivity margin is generally the dominant force, while search intensity plays a prominent role for variation of job-finding rates for workers in the first two age groups.

B.4 Robustness: Age-Dependent Search Efficiency

In our benchmark calibration, neither the utility cost of search nor the search efficiencies of active and passive searchers on and off the job depend on worker age. Even with this calibration, our model matches the age relationships of active search and job finding rather well (Tables 3 and 4). Nonetheless, we find that the EE rate in the model decreases less in age than it does in the data, while the decrease of the NE rate is a bit too strong in the model. Clearly, these discrepancies can be avoided when we allow search efficiencies to depend on worker age. Here we present the main findings of such an alternative model calibration.

Specifically, we allow the search efficiency parameters s_n^0, s_n^1, s_e^0 and s_e^1 to vary with age in order to (i) match the job-finding rates (NE and EE) by age exactly, and (ii) impose that the relative search efficiency of active versus passive search is the same as in our benchmark model across all age groups in order to match the gap in NE and EE rates between active and passive searchers as in the data. All other parameters are fully recalibrated to match the same set of moments as in the benchmark calibration.

Table B.4: Search efficiency parameters

Age	s_e^1	s_e^0	s_n^1	s_n^0
25-34	3.94	0.98	1.03	0.68
35-44	2.50	0.62	1.21	0.80
45-54	2.34	0.58	1.32	0.87
55-66	1.81	0.45	1.35	0.89

We report the estimated search efficiency parameters in Table B.4, where the results are as expected: In the benchmark calibration, the age gradient of the EE rate is not steep enough, so that declining age-dependent search efficiencies can resolve this discrepancy. Conversely, search efficiency of the non-employed is required to increase in age to attenuate the age gradient of the NE rate in the model.

Importantly, however, the model fit in the other main untargeted moments (active search by age and wealth and transition rates by wealth) remains very similar (see Tables B.5 and B.6). Moreover, our policy conclusions are very similar to those for the benchmark model with slightly weaker effects on aggregate outcomes (see Table B.7). Welfare losses are also slightly smaller with -1.04 (UI cut) and -0.88 (lower tax progressivity) respectively.

Table B.5: Active search

Non-employed	Data	Model	Employed	Data	Model
By age			By age		
25-34	39.8	44.8	25-34	10.2	9.7
35-44	40.6	39.1	35-44	7.8	6.3
45-54	40.0	33.3	45-54	6.1	5.8
55-66	16.6	24.7	55-66	3.0	5.2
By wealth			By wealth		
Quartile 1	38.0	46.2	Quartile 1	8.9	10.9
Quartile 2	33.8	35.9	Quartile 2	7.7	6.0
Quartile 3	26.4	26.3	Quartile 3	5.6	5.3
Quartile 4	26.2	19.0	Quartile 4	5.2	4.6

Table B.6: Transition rates

	NE rate		EE rate		EN rate	
	Data	Model	Data	Model	Data	Model
By age						
25-34	18.8†	18.8	8.3†	8.3	2.1	0.8
35-44	16.3†	16.3	4.5†	4.5	1.3	1.4
45-54	13.7†	13.7	3.7†	3.7	1.2	1.6
55-66	8.0†	8.0	2.2†	2.3	1.9	2.1
By wealth						
Quartile 1	13.7	17.0	7.2	8.0	2.4	1.3
Quartile 2	13.7	13.5	4.3	4.1	1.4	1.4
Quartile 3	14.1	10.7	3.5	3.4	1.3	1.6
Quartile 4	11.0	9.2	2.3	2.9	1.0	1.7

† Calibration target

B.5 The Role of Search Effort and Selectivity for NE Rates

To uncover the mechanisms behind the variation of job-finding rates in our model, we analyze how endogenous search intensity and differences in reservation productivity (selectivity) account for the differences in NE rates.

The job-finding rate (NE rate) of a worker in state $(w, 0, a_0, j)$ is

$$\text{NE}(w, a_0, j) = \pi^1(w, 0, a_0, j) s_n^1 \lambda(\theta) \bar{H}(q^n(w, A^1, j)) + \pi^0(w, 0, a_0, j) s_n^0 \lambda(\theta) \bar{H}(q^n(w, A^0, j)) \ ,$$

where we use the abbreviation $A^i = A(w, 0, a_0, j, i)$, $i = 0, 1$ for assets of active and passive searchers at the matching stage. To understand to what extent job-finding rates are driven either by the search intensity margin or by the reservation productivity margin, we calculate

Table B.7: Policy analysis – Aggregate results

	Benchmark	UI ↓		Tax Progressivity ↓	
		PE†	GE†	PE†	GE†
Output Y	1.089	+1.2	+2.3	−0.3	−0.3
Capital K	13.36	+1.2	+4.2	−0.3	+0.1
Employment L	86.63	+2.0	+2.4	−0.8	−1.1
Efficiency A	1.268	−0.7	−0.8	+0.6	+0.6
Interest rate r (%)	0.800	–	−4.2bp	–	−0.9bp
MP of labor ω	1.000	–	+0.7	–	+0.2
Tightness θ	1.000	–	+3.1	–	−1.9
Asset supply	15.65	+4.4	+4.0	+5.1	−0.0
EE rate (%)	4.60	+0.25pp	+0.36pp	−0.12pp	−0.18pp
NE rate (%)	13.21	+1.39pp	+1.81pp	−0.33pp	−0.54pp
EN rate (%)	1.48	−0.12pp	−0.13pp	+0.07pp	+0.07pp
Active search					
Employed (%)	6.71	+0.31pp	+0.33pp	+0.06pp	+0.07pp
Non-employed (%)	33.83	+4.70pp	+5.59pp	+0.02pp	−0.05pp
Average wage	1.000	−1.2	−0.7	+1.0	+1.2
Average productivity	1.268	−0.7	−0.1	+0.6	+0.7
Gini: Earnings	0.225	+3.5	+4.4	−2.4	−2.9
Gini: Wealth	0.612	−1.1	−1.1	+1.1	+1.8

counterfactual transition rates that arise when the search intensity margin is turned off. To do so, let $\bar{\pi}_n^1$ denote the share of active searchers among all non-employed workers, so that $\bar{\pi}_n^0 = 1 - \bar{\pi}_n^1$ denotes the share of passive non-employed searchers.

To deactivate the search intensity margin, we assign any worker to active or passive search according to the respective population shares. The resulting counterfactual job-finding rates vary only due to the reservation-productivity margin. These transition rates are given by

$$\mathrm{NE}^{rp}(w, a_0, j) \equiv \bar{\pi}_n^1 s_n^1 \lambda(\theta) \bar{H}(q^n(w, A^1, j)) + \bar{\pi}_n^0 s_n^0 \lambda(\theta) \bar{H}(q^n(w, A^0, j)) \ .$$

The variation of job-finding rates accounted for by the search intensity margin is then obtained by the residuals

$$\mathrm{NE}^{si}(w, a_0, j) \equiv \mathrm{NE}(w, a_0, j) - \mathrm{NE}^{rp}(w, a_0, j) \ .$$

To analyze how much of the variation in job-finding rates is accounted for by the two mar-

gins, we calculate the variance decomposition (using population weights from the stationary distribution ν):

$$\text{var}(\text{NE}) = \text{var}(\text{NE}^{rp}) + \text{var}(\text{NE}^{si}) + 2\text{cov}(\text{NE}^{rp}, \text{NE}^{si}) \ .$$

Results are shown in Table B.8, where the first row shows the overall variance and the other rows are separate decompositions for each age group. While overall the reservation-productivity margin accounts for the majority of the variation in NE rates, the search intensity margin plays a prominent role for the variation among workers in the first two age groups. This is intuitive since younger workers are much less selective about the jobs they accept compared to workers in the other age groups.

Table B.8: Variance decomposition of NE rates

	Decomposition†			Total Variance*
	Reservation Productivity	Search Intensity	Covariance Term	
Overall	81.7	1.7	16.6	276.0
By age				
25-34	103.5	39.4	-43.0	3.7
35-44	35.5	31.6	32.9	15.7
45-54	56.0	11.6	32.4	43.8
55-66	83.5	2.1	14.3	55.0

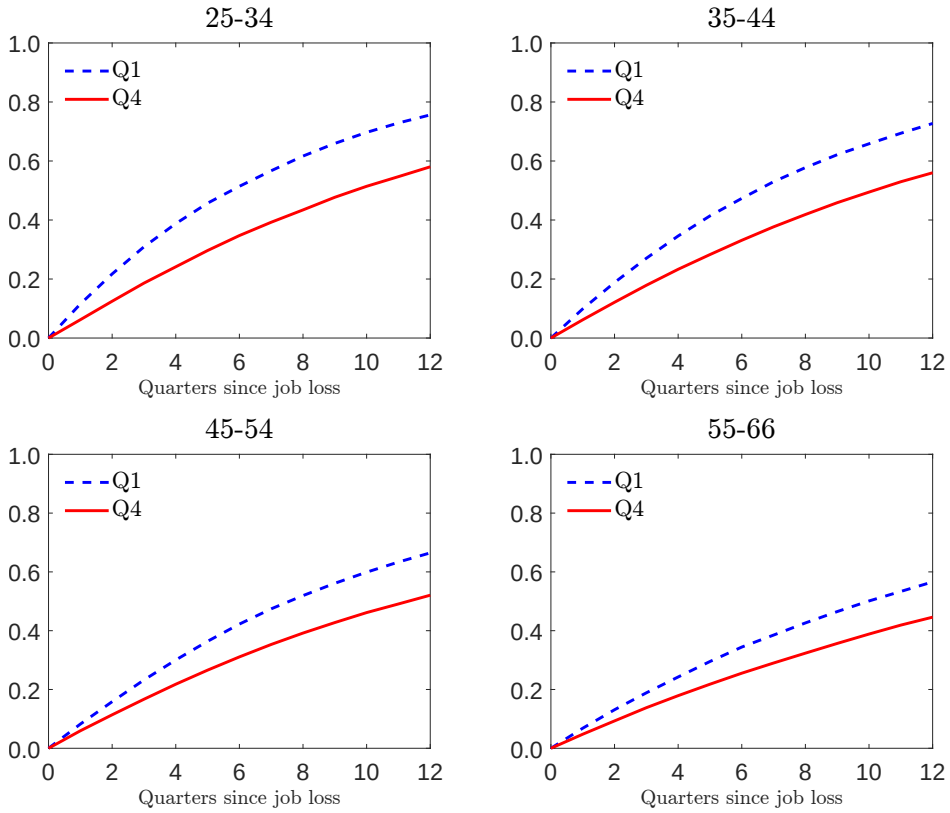
NOTES: † All numbers in percent. * All numbers multiplied by 10^5.

B.6 The Consequences of Job Loss

In this appendix, we analyze the consequences of job loss, with a view to understanding how age and wealth shape household earnings and consumption dynamics in our model. We simulate a panel and consider individuals who get hit by the exogenous layoff shock ρ in some time period denoted as quarter zero. We then track their outcomes over the subsequent twelve quarters (3 years) in relation to individuals with identical characteristics that do not experience a layoff shock in quarter zero.

Figure B.2 reports the trajectories of earnings, separately for workers in the four age groups and with wealth holdings in the lowest and highest quartiles of the respective age groups. For all workers, the model generates substantial and protracted earnings losses after a layoff shock. On average among prime age workers (25 to 54 years old), earnings after three years remain 30% below those of identical workers not losing their job in quarter zero.

This number lines up well with the results of Jarosch (2023) based on German administrative data (see Figure 12 in his paper), although the recovery of earnings in our model follows a more gradual pattern compared to the data.[53]



NOTES: Earnings in each quarter following job loss in relation to earnings of identical workers not losing their job at time zero. Solid curves describe the average of relative earnings among workers with pre-displacement wealth in the fourth quartile (Q4) while dashed curves correspond to workers in the first wealth quartile (Q1). Wealth quartiles are defined separately for each age group.

Figure B.2: Consequences of job loss – Earnings

In the bottom panels of Figure B.2 we observe that the negative consequences of job loss are more severe for older workers. In the age group 55–66, the earnings loss remains at a staggering 49% after three years, while the corresponding figure for workers of ages 25–34 is 37%. The correlation between age and the size of earnings losses is consistent with the evidence reviewed in Davis and von Wachter (2011).[54] In our model, there are two margins

[53] Our model abstracts from several features (specific human capital, job security, accumulation of employment rents) that are likely important to explain the empirical dynamics of earnings following job loss. Thus, we expect the model to generate a dynamics that is simpler than in the data.

[54] Using earnings records from the U.S. social security administration, Davis and von Wachter (2011) document that the present discounted value of earning losses is much larger for workers displaced in their 40s and 50s compared to younger workers (see Table 2 in their paper).

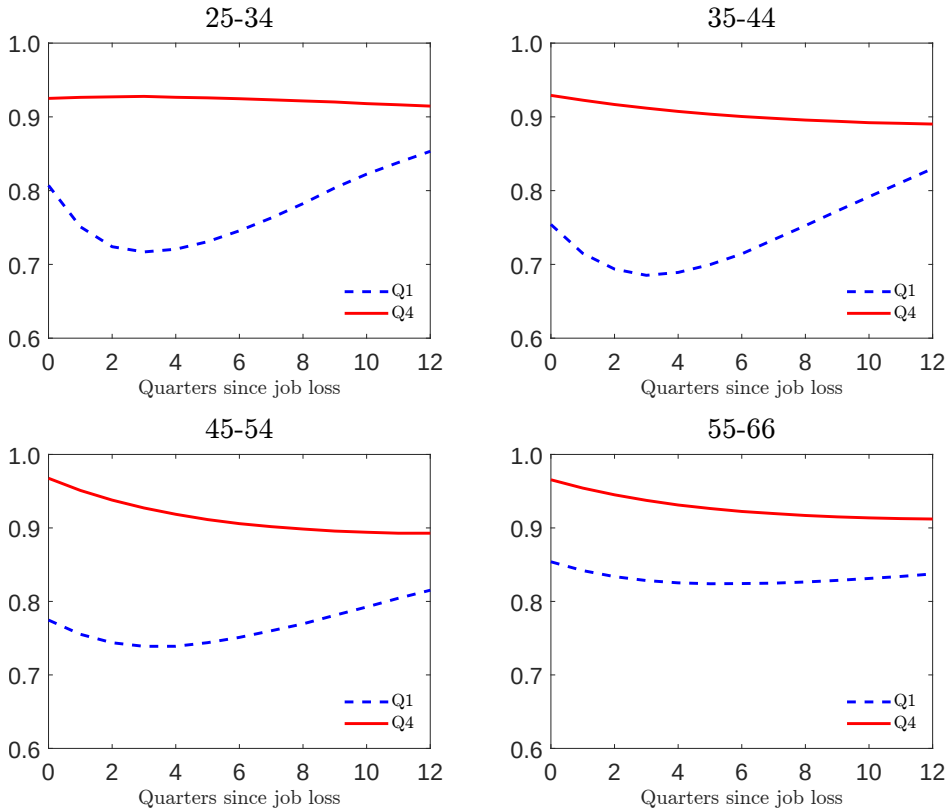
driving the recovery of earnings: active vs. passive search and reservation productivity. As discussed in the previous subsection, older workers have lower returns to engaging into active search and are more selective about match productivity mainly due to the shorter distance to retirement.

Another important observation of Figure B.2 is that poorer individuals recover faster than their wealthier peers. On average among prime-age workers, the Q1-Q4 earnings difference three years after layoff is about 14%. As discussed before, wealthier individuals are less likely to search and more selective in their job acceptance which ultimately contributes to the slower earnings recovery.

Different from standard labor market models without savings, our model offers a distinct set of predictions about the consequences of job loss for consumption. These are depicted in Figure B.3, again separately for wealth-poor and wealth-rich workers of different ages. To begin with, the model generates a consumption reduction by 13% on impact and by 12% after three years, on average across age and wealth groups. The initial drop in consumption is in the upper range of available estimates from studies that span countries with more and less generous unemployment insurance systems; see Ganong and Noel (2019) for the U.S. and Andersen et al. (2023) for Denmark. The high persistence also seems to line up with the data. For instance, Stephens (2001) finds (in U.S. data) that five years after job loss, consumption remains below its initial level by about 10%.

The consequences of job loss for consumption of workers with high and low wealth are rather distinct from the earnings consequences seen in Figure B.2. For those in the top quartile of wealth, the impact drop in consumption is modest (5% on average across the four age groups), and there is no recovery after three years in relation to the "control group" of identical workers who do not experience job loss at time zero – that is, consumption does go up over time, but not by more than among workers from the same age-and-wealth group who do not lose their job during quarter 0. Workers in the bottom wealth quartile suffer a drop by 20% on impact, followed by a gradual recovery, with consumption remaining 16% below pre-displacement levels three years after job separation. The interpretation of these differences is straightforward: Workers in the top quartile have enough assets to dampen the fall in consumption upon job loss, while their less wealthy peers experience a larger pass-through from earnings losses onto consumption. As earnings in the latter group recover more quickly, however, the consumption gap between the two groups shrinks over time.

Figure B.3 further indicates an important relationship between the magnitude of consumption losses and workers' age. In particular, workers in the pre-retirement group experience no consumption recovery, essentially because the earnings recovery for this group is



NOTES: Consumption in each quarter following job loss in relation to consumption of identical workers not losing their job at time zero. Solid curves describe the average of relative consumption among workers with pre-displacement wealth in the fourth quartile (Q4) while dashed curves correspond to workers in the first wealth quartile (Q1). Wealth quartiles are defined separately for each age group.

Figure B.3: Consequences of job loss – Consumption

much weaker. Hence, the consumption gap between wealth-rich and wealth-poor workers remains almost unchanged even three years after job loss.

In sum, our model generates rich patterns of job loss consequences, and most importantly, produces consumption effects that are substantially different from the effects on labor earnings – something that standard job search models have little to say about. It also predicts heterogeneous effects across workers' age and wealth which is relevant for our understanding of tax and transfer policies aimed at mitigating the effects of labor market risks.

B.7 Policy Experiments: Further Results

To complement the policy findings in the main text, we first show how the two policy experiments affect the decisions of different households about active search, savings and consumption. Then we report the output and welfare effects for changes of UI benefits and

tax progressivity for a broad range of parameter values.

Table B.9 reports the percentage-point changes of active search for employed and non-employed workers, differentiated by age and wealth. Regarding the reduction of unemployment benefits, the findings are broadly consistent with those of Figure 5: Active search goes up more strongly for low-wealth non-employed workers which then raises their job-finding rates. Regarding variation by age, the increase in active search is weakest for non-employed workers in the oldest age group which is then reflected in a smaller increase of the NE rate compared to prime-age workers. The increase in active search is also weaker for older employed workers, in line with our findings for EE rates.

Table B.9: Policy analysis – Active Search

	Non-employed			Employed		
	Bench	UI ↓	TaxPr ↓	Bench	UI ↓	TaxPr ↓
By age						
25-34	44.72	+7.56	−0.36	8.45	+0.99	+0.14
35-44	40.82	+6.01	−0.33	6.82	+0.48	+0.13
45-54	33.54	+4.39	−0.25	6.16	+0.37	+0.09
55-66	23.95	+2.33	+0.08	5.56	+0.25	+0.04
By wealth						
Quartile 1	45.84	+7.74	−0.56	11.39	+1.35	+0.10
Quartile 2	36.68	+3.73	−0.43	5.93	+0.28	+0.00
Quartile 3	26.70	+3.49	−0.14	5.23	+0.31	−0.01
Quartile 4	20.09	+1.63	−0.04	4.32	+0.18	−0.00

NOTES: The second and third columns of each panel report the percentage point changes with respect to the benchmark values shown in the first columns.

Changes in tax progressivity have much smaller effects on the active search choices compared with the UI experiment, which is also seen in Table 7. Hence, the policy effects are mainly driven by the selectivity margin. Still, there are noteworthy differences on the search choices of households in different age and wealth groups. Low wealth and young non-employed workers reduce their search activity most since these workers are now less likely to find employment in low-productivity jobs.

Table B.10 reports the percent changes of savings (asset holdings), consumption and wage earnings across age groups after both policies are implemented. Regarding lower UI payments, the increase of savings in response to weaker public insurance is rather homogeneous across age groups, but we observe a hump-shaped age relationship in the consumption response: Although aggregate employment goes up for all workers, young workers' con-

sumption goes up least while consumption of workers in age group 45–54 increases by over 2.6%, although their wage earnings are falling more than those of young workers. This is intuitive since the youngest (oldest) workers have the highest (lowest) need for additional precautionary savings.

Table B.10: Policy analysis – Assets, Consumption and Wages

	Bench	UI ↓	TaxPr ↓
Assets			
25-34	4.74	+7.96	+0.06
35-44	10.79	+7.59	+0.65
45-54	17.62	+6.44	+0.61
55-66	21.44	+7.19	−0.30
67+	19.49	+0.83	−0.01
Consumption			
25-34	0.540	+1.86	−0.20
35-44	0.618	+2.73	+0.74
45-54	0.688	+2.62	+1.55
55-66	0.746	+1.90	+1.73
67+	0.734	+0.26	+0.34
Wage			
25-34	0.881	−0.11	+1.86
35-44	1.004	+0.11	+1.40
45-54	1.073	−0.48	+1.38
55-66	1.031	−0.94	+0.94

NOTES: The second and third columns report the percent changes with respect to the benchmark values shown in the first column.

Regarding the tax progressivity reform, we find that consumption and savings increase for prime-age workers, while savings go down for older workers. The explanation is that despite lower overall employment, wages increases are larger for younger workers who also have a stronger motive for additional precautionary savings due to the higher risk of job loss. In contrast, reduced chances of re-employment and lower average incomes reduce savings of older workers.