Subjective Job Finding Expectations and Optimal Unemployment Insurance*

Jim Been†, Jordy Meekes‡, and Eduard Suari-Andreu§

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Abstract

We develop a theoretical and empirical framework that integrates subjective expectations into the Permanent Income Hypothesis (PIH) to study the consequences of unemployment for consumption. Using rich longitudinal data from the Dutch LISS panel, we show that subjective job finding expectations provide a direct measure of the perceived *persistence* of unemployment shocks, while job loss expectations capture their *unexpectedness*. Our life-cycle model highlights that ignoring perceived persistence conflates these mechanisms and biases estimates of consumption responses to job loss. Empirically, job finding expectations strongly predict realized unemployment duration and substantially attenuate estimated consumption drops at job loss, bringing the results closer to PIH-consistent predictions. A welfare calibration shows that conditioning unemployment insurance benefits on subjective job finding expectations yields consumption-equivalent welfare gains of about 0.6% relative to a uniform policy. The findings underscore the importance of incorporating belief heterogeneity into models of household behavior and the design of optimal social insurance.

JEL codes: D15, D84, E21, E24

Keywords: Subjective expectations; Unemployment; Persistence; Consumption

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†Department of Economics at Leiden University and Netspar. E-mail: j.been@law.leidenuniv.nl

‡Department of Economics at Leiden University and IZA Institute of Labor Economics, Bonn, Germany. E-mail: j.meekes@law.leidenuniv.nl

§Department of Economics at Leiden University and Netspar. E-mail:e.suari.andreu@law.leidenuniv.nl

1 Introduction

Unemployment risk is a central driver of income volatility and household welfare. How individuals *anticipate* and *respond* to that risk shapes consumption dynamics, labor-market behavior, and the normative design of unemployment insurance (UI). This paper develops a life-cycle framework that integrates *subjective expectations* about both the *unexpectedness* of job loss (proxied by job-loss expectations) and the *perceived persistence* of unemployment (proxied by job-finding beliefs). We combine the model with new empirical evidence and a welfare calibration to show that conditioning UI on subjective job-finding expectations yields economically meaningful gains, thereby linking the expectations literature with modern UI design.

Our approach builds on the expectations tradition that treats beliefs as measurable, informative state variables. Foundational work established that survey-based expectations contain systematic information about future income realizations and can be modeled jointly with outcomes (Dominitz and Manski, 1997; Dominitz, 1998, 2001; Manski, 2004). Recent syntheses argue that subjective expectations are both meaningful and decision-relevant (D'Acunto and Weber, 2024), while evidence from earnings risk perspectives documents the macro relevance of income and employment risk for households (Pistaferri, 2001; Guiso et al., 2002). In consumption theory, our mechanism is firmly anchored in the Permanent Income Hypothesis (PIH) (Friedman, 1957) and more modern refinements (e.g. Carroll, 1997; Kaplan et al., 2014), which highlight how expected income paths, uncertainty, and liquidity interact to shape intertemporal choices.

A rapidly growing labor-market literature measures subjective *job finding* beliefs and links them to search behavior, employment transitions, and wage outcomes. Early evidence studies the rationality and consequences of job-loss expectations (Manski and Straub, 2000), while recent work documents that job-finding beliefs are predictive of realized transitions and search intensity among both employed and non-employed workers (Adams-Prassl et al., 2022; Faberman et al., 2022; Mueller et al., 2021). Handbooks and surveys synthesize these advances and emphasize their implications for macro and policy analysis (Mueller and Spinnewijn, 2023). At the same time, new research studies how individuals update job-finding expectations with experience and aggregate signals (He and Kircher, 2025), underscoring the importance of perceived *duration dependence*. Our paper leverages precisely this dimension of beliefs—expected unemployment duration—to explain heterogeneity in consumption responses and the welfare value of UI.

We contribute on three fronts. *First*, we develop a life-cycle model that *separates* the role of job-loss risk (unexpectedness) from subjective job-finding probabilities (persistence) in

determining consumption. The model shows that subjective job-finding beliefs are a sufficient statistic for the perceived persistence of the unemployment shock, thereby altering human wealth and the marginal value of insurance. This complements normative frameworks for optimal UI that emphasize moral-hazard and liquidity channels (Chetty, 2006, 2008; Landais et al., 2018) and macro-stabilization motives (Kekre, 2023; Rendahl, 2016). It also connects to Hendren (2017), who highlights private information about job-loss risk; we extend the focus from *incidence* to *persistence*, showing that belief heterogeneity about duration is first-order for optimal design.

Second, we provide empirical evidence using rich Dutch microdata. We show that subjective job-finding expectations strongly predict realized unemployment durations and mediate the consumption response at job loss, consistent with the model's prediction that higher expected finding rates (shorter expected spells) imply smaller consumption cuts. This result implies that leaving out subjective job-finding information—such as in Stephens (2004) and Hartmann and Leth-Petersen (2024)—attenuates estimates of subjective job-loss expectations. Estimates are biased upwards due to the lack of correcting for the expected persistence of unemployment. Individual Fixed Effects (FE) are insufficient to separate the expectancy and persistence channels in the PIH.

Third, we quantify the welfare and policy implications. Calibrating the model to the Dutch institutional environment—where replacement rates and eligibility rules provide a clean policy baseline—we compare a uniform 70% UI to a simple belief-conditioned schedule that declines with subjective job-finding probabilities. The heterogeneous policy yields consumption-equivalent welfare gains of meaningful magnitude of about 0.6%, in line with the mid-range of modern optimal-UI evaluations (Landais et al., 2018) and reinforcing the case for incorporating expectations into social insurance design.

Two broader implications follow. First, beliefs about *persistence* are fundamental state variables for consumption and savings, not merely behavioral artifacts. Embedding subjective job-finding expectations into dynamic models improves the fit of consumption responses and sharpens welfare prescriptions. Second, policy can leverage expectations: eliciting and incorporating beliefs into UI formulas—without conditioning on ex post outcomes—aligns insurance generosity with perceived duration, potentially raising welfare while preserving incentives. Together, these results bridge expectations measurement (Dominitz and Manski, 1997; Dominitz, 1998, 2001; Manski, 2004; D'Acunto and Weber, 2024) with subjective job-finding dynamics (Adams-Prassl et al., 2022; Faberman et al., 2022; Mueller et al., 2021), and optimal UI insurance (Chetty, 2006, 2008; Hendren, 2017; Landais et al., 2018), offering a unified framework for belief-informed social insurance in labor markets.

2 Permanent Income Hypothesis with Subjective Unemployment Expectations

This section develops a simple life-cycle model of consumption based on the Permanent Income Hypothesis (PIH) that incorporates subjective beliefs about unemployment risk. The model distinguishes between two key expectation mechanisms: (i) *job loss expectations*, which capture the *unexpectedness* of an unemployment shock, and (ii) *job finding expectations*, which capture the *expected duration* (or persistence) of the unemployment spell. We show analytically that both mechanisms affect human wealth and thus consumption, but that the expected duration of unemployment (approximated empirically by subjective job finding probabilities) is particularly important for explaining cross-sectional heterogeneity in consumption responses to job loss.

2.1 Setup

Time is discrete, $t = 0, 1, \ldots, T$. Individuals maximize expected discounted utility over consumption:

$$\max_{\{c_t\}} \mathbb{E}_0 \sum_{t=0}^{T} \beta^t \frac{c_t^{1-\gamma}}{1-\gamma}, \quad \beta \in (0,1),\ \gamma > 0. \tag{1}$$

Assets a_t yield a gross return $R = 1 + r$. The budget constraint is:

$$a_{t+1} = R(a_t + y_t - c_t), \qquad a_{t+1} \geq \underline{a}. \tag{2}$$

Employment status $s_t \in \{E, U\}$ evolves according to a subjective Markov process:[1]

$$\overset{\text{sub}}{\Pr}(s_{t+1} = U \mid s_t = E) = \lambda_t, \quad \text{(subjective job loss probability)} \tag{3}$$

$$\overset{\text{sub}}{\Pr}(s_{t+1} = E \mid s_t = U) = f_t, \quad \text{(subjective job finding probability)} \tag{4}$$

where λ_t measures the *unexpectedness* of unemployment and f_t captures the *persistence* of unemployment (with expected duration $1/f_t$).

Income evolves according to:

$$y_t = \mathbb{E}_{t-1}[y_t] + u_t \tag{5}$$

where u_t is an innovation that follows a permanent component u_t^P and a transitory component

[1] Here, we implicitly assumed that there is no updating of beliefs. This is consistent with the empirical findings of **?** and our empirical analysis below.

u_t^T:

$$u_t = u_t^P + u_t^T \tag{6}$$

We assume that the permanent and transitory components are affected by unemployment only such that income y_t depends on employment status s_t:[2]

$$y_t = \begin{cases} y_E = w_t, & \text{if } s_t = E, \\ y_U = b_t, & \text{if } s_t = U, \end{cases} \qquad y_E > y_U. \tag{7}$$

Therefore, we assume that λ_t determines whether unemployment is a shock ($\lambda_t < 0$) and f_t determines whether the shock is permanent ($f_t \to 0$) or transitory ($f_t \to 1$).

2.2 Value Functions and Euler Equations

Let $V_t^s(a)$ denote the value function conditional on employment status $s_t = s \in \{E, U\}$:

$$V_t^E(a) = \max_{c,a'} \left\{ \frac{c^{1-\gamma}}{1-\gamma} + \beta \Big[(1-\lambda_t)\mathbb{E}_t V_{t+1}^E(a') + \lambda_t \mathbb{E}_t V_{t+1}^U(a') \Big] \right\}, \tag{8}$$

$$V_t^U(a) = \max_{c,a'} \left\{ \frac{c^{1-\gamma}}{1-\gamma} + \beta \Big[f_t \mathbb{E}_t V_{t+1}^E(a') + (1-f_t)\mathbb{E}_t V_{t+1}^U(a') \Big] \right\}, \tag{9}$$

subject to $a' = R(a + y^s - c)$ and $a' \geq \underline{a}$.

The Euler equation while employed is:

$$c_t^{-\gamma} = \beta R \left[(1-\lambda_t)\mathbb{E}_t c_{t+1,E}^{-\gamma} + \lambda_t \mathbb{E}_t c_{t+1,U}^{-\gamma} \right]. \tag{10}$$

Equation (10) shows that λ_t governs the *weight* on future unemployment states (unexpectedness), while f_t enters through $\mathbb{E}_t c_{t+1,U}^{-\gamma}$ via continuation values in unemployment (persistence).

2.3 Human Wealth and the Role of Persistence

Define *human wealth* as the present discounted value of expected future income given beliefs (λ_t, f_t):[3]

$$H_t^{s_t}(\lambda_t, f_t) = \mathbb{E}_t^{\text{sub}} \left[\sum_{j=0}^{T-t} R^{-(j+1)} y_{t+1+j} \right]. \tag{11}$$

[2]For simplicity, we assume full-time work only and the absence of taxes.

[3]Conceptually, this corresponds to the value of human capital wealth adjusted for perceived employment risk. While human capital itself reflects an individual's productive capacity, human wealth measures its financial value under uncertainty.

Under the certainty-equivalence version of the PIH, consumption is proportional to total wealth:

$$c_t = \kappa_t \left(a_t + H_t^{s_t}(\lambda_t, f_t)\right), \quad \kappa_t \equiv \left(\sum_{j=0}^{T-t} (\beta R^{-1})^j\right)^{-1}. \tag{12}$$

κ can be interpreted as the marginal propensity to consume out of total wealth (human wealth + financial wealth). Holding assets constant, the model produces the following comparative statics with λ_t and f_t:

$$\frac{\partial c_t}{\partial H_t^{s_t}} < 0, \qquad \frac{\partial H_t^E}{\partial \lambda_t} < 0, \qquad \frac{\partial H_t^E}{\partial f_t} > 0,$$

implying that higher job loss probabilities λ_t (i.e. unexpectedness) reduce consumption, while higher job finding probabilities f_t (i.e. shorter expected duration) increase consumption.

2.4 Analytical Illustration: Stationary Two-State Case

Consider stationary beliefs (λ, f) and constant incomes (y_E, y_U). Then expected future incomes satisfy:

$$RH_E = y_E + (1-\lambda)H_E + \lambda H_U, \tag{13}$$

$$RH_U = y_U + fH_E + (1-f)H_U. \tag{14}$$

Solving yields:

$$H_E = \frac{y_E(R-1+f) + \lambda y_U}{(R-1+\lambda)(R-1+f) - \lambda f}. \tag{15}$$

Differentiating,

$$\frac{\partial H_E}{\partial f} = \frac{(R-1)(y_E - y_U)}{\left[(R-1+\lambda)(R-1+f) - \lambda f\right]^2} > 0. \tag{16}$$

Proposition 1 (Persistence channel). *In the stationary two-state model, higher job finding probabilities f (shorter expected unemployment duration) increase human wealth H_E and therefore consumption $c_E(a) = \kappa(a + H_E)$.*

Proposition 2 (Consumption drop at unemployment). Let $c_E(a) = \kappa(a + H_E)$ and $c_U(a) = \kappa(a + H_U)$. The consumption drop at job loss is:

$$\Delta c = c_U(a) - c_E(a) = \kappa(H_U - H_E), \tag{17}$$

with $\partial(\Delta c)/\partial f > 0$. Hence, the consumption drop following unemployment is smaller when subjective job finding probabilities f are higher. Hence, f indicates to which job loss has a

transitory or permanent effect.

Interpretation: λ affects how *often* unemployment is expected to occur (unexpectedness), whereas f affects how *long* income remains low (persistence). Ignoring f conflates these channels, potentially biasing estimated consumption responses to unemployment shocks. Without controlling for f, there is no distinction between transitory and permanent effects of job loss.

2.5 Numerical Illustration

We provide a numerical example of the analytic results to illustrate how subjective job finding expectations shape consumption responses to unemployment. We choose the parameters such to reflect the context of the Netherlands where UI benefits typically replace around 70% of previous income and, hence, assume that income from unemployment $y_U = 0.7$.[4]

The remaining parameters reflect standard quarterly calibrations for advanced economies:

$$\beta = 0.96, \quad R = 1.02, \quad y_E = 1.0, \quad y_U = 0.7, \quad \lambda = 0.05.$$

The subjective job finding probability f varies over $\{0.10, 0.25, 0.50\}$, corresponding to expected unemployment durations $(1/f)$ of 10, 4, and 2 periods, respectively.

The simple calibration below compares individuals who face the same perceived job loss risk $\lambda = 0.05$ but differ in how *persistent* they expect unemployment to be, represented by f. When f is low, the individual expects a long unemployment spell, reducing the discounted value of future income (lower human wealth H_E). When f is high, expected unemployment is shorter, raising H_E.

Because consumption follows the PIH rule $c_t = \kappa(a_t + H_t)$, higher H_E translates directly into higher consumption while employed. The unemployment-induced consumption drop, $\Delta c = \kappa(H_U - H_E)$, depends on the income gap $(y_E - y_U)$ and on persistence: it shrinks as f rises, since future recovery is expected sooner.

The calibration results in Table 1 show three patterns of interest:

1. **Human wealth increases with f:** the expected value of future income H_t is larger when an unemployment spell is expected to be short-lived.

2. **Consumption while employed rises with f:** higher H_E leads to higher consumption levels even before job loss occurs. This is shown in Figure 1. Higher f (shorter

[4] In cases where the replacement rate is lower, such as Anglo-Saxon countries, the consumption responses to job finding expectations are stronger: Formal insurance reduces the sensitivity of consumption to subjective duration beliefs, consistent with a policy-belief interaction.

expected duration) raises human wealth H_E, leading to parallel upward shifts in the consumption function.

3. **The unemployment-induced drop Δc becomes smaller (less negative) with f:** individuals with optimistic re-employment beliefs smooth consumption more effectively. This is shown in Figure 2. Those who expect to find a job in the next year with a probability of 0.9 reduce consumption only by a fraction (i.e. job loss is transitory) while those who report to find a job in the next year with a probability of close to zero reduce consumption by about 15 p.p. (i.e. job loss is permanent). Hence, f attenuates the consumption drop.

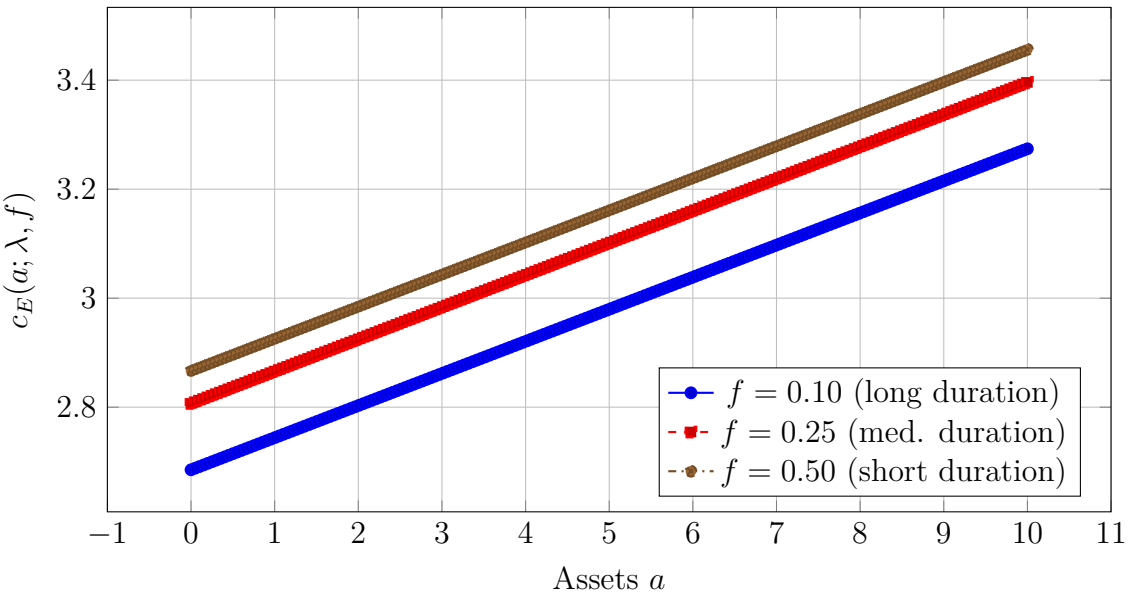


Figure 1: Consumption while employed, $c_E(a;\lambda,f)$, for alternative job finding probabilities f with $y_U = 0.7$.

Table 1: Calibration statistics

f	H_E	H_U	$\Delta c = 0.0589(H_U - H_E)$
0.10	45.588	43.824	−0.104
0.25	47.655	46.718	−0.055
0.50	48.684	48.158	−0.031

These numerical results show that estimating the effect of unemployment on consumption should explicitly account for both the unexpectedness of the job loss and the persistence of the job loss. Holding λ constant shows that belief-driven variation in f alone can generate

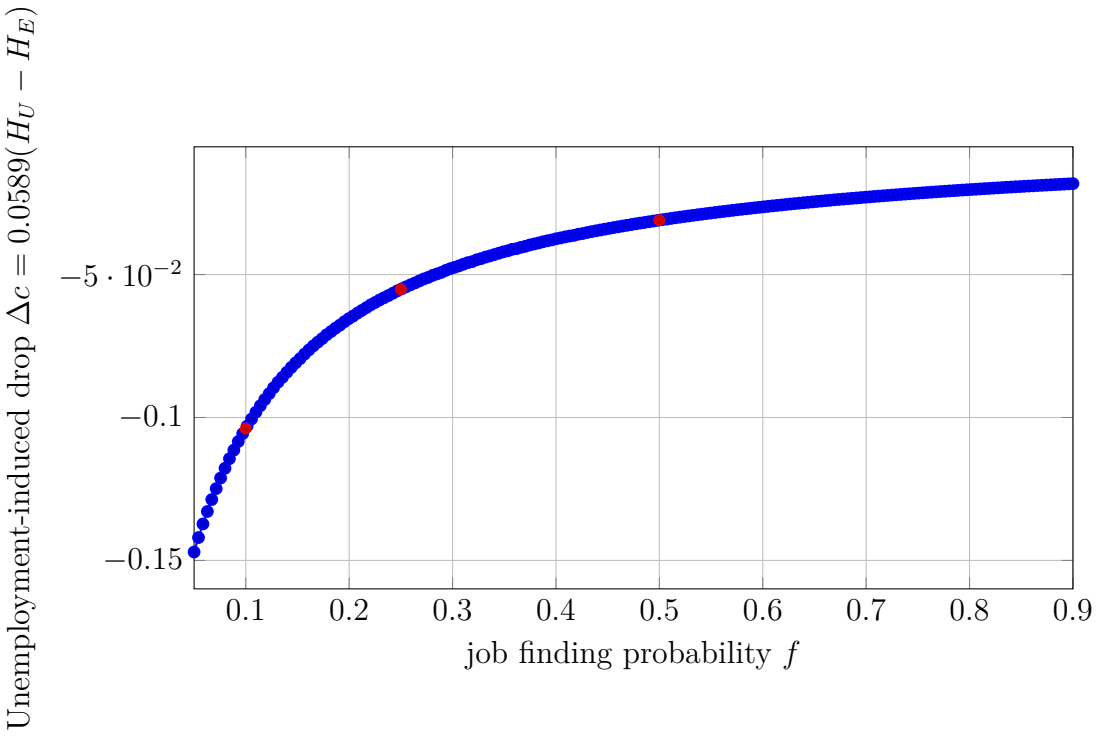


Figure 2: Unemployment-induced consumption drop Δc as a function of the subjective job finding probability f.

sizable consumption heterogeneity—validating that λ (unexpectedness) and f (persistence) are separable drivers.

2.6 Empirical Mapping

Equation (15) implies that consumption depends jointly on the perceived risk of job loss $\widehat{\lambda}$ and the perceived duration of unemployment $\widehat{f}$. This motivates an empirical specification similar to Stephens (2004), augmented with job finding expectations:

$$\Delta \ln c_{it} = \alpha + \beta_1 \,\mathrm{Unemp}_{it} + \beta_2 \,\widehat{\lambda}_{i,t-1} + \beta_3 \,\widehat{f}_{i,t-1} + \beta_4 \,(\mathrm{Unemp}_{it} \times \widehat{f}_{i,t-1}) + \mathbf{X}'_{it}\Gamma + \mu_i + \tau_t + \varepsilon_{it}. \quad (18)$$

The interaction term captures the persistence mechanism: the unemployment-induced consumption drop is smaller when job finding expectations are higher. X_{it} yields a vector of control variables, including gender, age, presence of a partner, number of children in the house-hold and educational level Been et al. (2024) and consistent with a.o. Stephens (2004). μ_i are the individual Fixed Effects and τ_t the time Fixed Effects. The error term assumes $\varepsilon_{it} \sim N(0, \sigma^2)$.

2.7 Empirically Testable Hypotheses

From our theoretical framework, we outline the empirically testable hypothesis below.[5]

H1. Subjective job findings expectations measure persistence. Subjective job finding expectations $\widehat{f}_{i,t-1}$ contain information about individuals' expectations regarding the duration of unemployment and, hence, approximate the persistence of an unemployment shock.

H2. Unexpectedness channel (job loss risk). Among the employed, higher subjective job loss probabilities $\widehat{\lambda}_{i,t-1}$ are associated with lower consumption:

$$\beta_2 = \frac{\partial C_{it}}{\partial \widehat{\lambda}_{i,t-1}} < 0.$$

H3. Persistence channel (job finding beliefs). Among the employed, higher job finding probabilities $\widehat{f}_{i,t-1}$ increase consumption:

$$\beta_3 = \frac{\partial C_{it}}{\partial \widehat{f}_{i,t-1}} > 0.$$

H4. Heterogeneous consumption drop at unemployment. For individuals transitioning into unemployment,

$$\beta_4 = \frac{\partial}{\partial \widehat{f}_{i,t-1}} \Big(\Delta \ln C_{i,t+1} \Big) > 0,$$

i.e., the consumption drop is smaller when expected unemployment duration is shorter ($\widehat{f} \to 1$), i.e. more transitory.

H5. Bias from omitting persistence. β_1 measures the average effect of the unemployment shock which is a mix of transitory and permanent components. Estimations of (18) that exclude $\widehat{f}_{i,t-1}$ conflate unexpectedness and persistence, biasing β_1 toward larger magnitudes (excessive permanent-shock interpretation).

2.8 Institutional Framework

Prior studies analyzing subjective job finding expectations often focus on the US or UK (Mueller et al., 2021; Mueller and Spinnewijn, 2023; Adams-Prassl et al., 2022; Faberman

[5] Prior papers have shown the predictive power of subjective expectations for realized outcomes. Stephens (2004) and Been et al. (2024) have proven the predictive power of subjective job loss expectations. Mueller et al. (2021) and Adams-Prassl et al. (2022) have shown the predictive power of subjective job finding expectations. We build on this literature and do not consider this as a formal hypothesis in this paper. Nonetheless, we show the predictive power of both in this paper.

et al., 2022; He and Kircher, 2025). Both countries exhibit relatively short unemployment duration compared to continental Europe (Elsby et al., 2013). We exploit the Dutch context because of rich longitudinal data. The Dutch context entails relatively high persistence of unemployment and a generous unemployment insurance (UI) system (replacement rates of 75% for the first two months and 70% thereafter, with benefit duration tied to work history up to 24 months, and stringent search requirements including acceptance of lower-skill jobs after 26 weeks). Prior research has found that consumption responses to unemployment are about 5% (Been et al., 2024) and considerably smaller than estimates from Anglo-Saxon countries which typically range from 5%-15% (Stephens, 2004).

Despite strong institutionalized incentives for active job search, Dutch unemployment is comparatively persistent; for example, in 2019 less than 10% exited within a month and over 31% remained unemployed for more than a year, while in the US more than 87% found a job within a year.

3 Data

3.1 Longitudinal Internet Studies for the Social Sciences (LISS)

We draw on the Dutch LISS panel, a probability-based survey that is representative of the Dutch population and follows approximately 5,000 households and 7,500 individuals on a yearly basis. A key advantage is its unusually long horizon of 17 consecutive waves from 2008 to 2024, which allows us to exploit within-individual variation over more than a decade and a half. The panel provides rich information, including labor market status, household spending, and subjective expectations regarding job loss probabilities, job finding probabilities, and unemployment duration. This combination enables us to separately identify the unexpectedness and persistence of unemployment shocks.

Compared to the SCE—which follows a rotating panel of roughly 1,300 individuals over at most 12 months—the LISS offers a substantially larger and more stable panel, a richer set of expectations measures, and greater power to capture the dynamics of unemployment risk and household responses. Most importantly for our study, the LISS contains information on both job finding expectations and expectations regarding unemployment duration, unlike widely used panels of SCE, HRS, and ALP data.

3.2 Summary Statistics

Our empirical analysis relies on the LISS panel explained above. We restrict to individuals aged 25–64. Table 2 provides summary statistics for the core data set spanning 2008-2024.

Table 2: Descriptive Statistics - TO UPDATE

Variable	N	Mean	SD	Min	Max
Subjective expectations					
Job loss	23,946	0.177	0.262	0	1
Job find	6,371	0.222	0.332	0	1
Expectation t to find job 2–4 weeks	4,356	0.053	0.223	0	1
Expectation t to find job 4–12 weeks	4,356	0.129	0.335	0	1
Expectation t to find job 12–26 weeks	4,356	0.186	0.389	0	1
Expectation t to find job 26–52 weeks	4,356	0.271	0.444	0	1
Expectation t to find job $\geq$ 52 weeks	4,356	0.246	0.431	0	1
Expectation t to find job = 0	4,356	0.093	0.290	0	1
Outcomes					
Job loss	20,623	0.044	0.204	0	1
Job find	7,534	0.074	0.262	0	1
Unemployment duration 12–24 months	9,071	0.134	0.340	0	1
Unemployment duration 24–36 months	9,071	0.100	0.300	0	1
Unemployment duration $\geq$ 36 months	9,071	0.694	0.461	0	1
Unemployment					
Consumption					
Controls					
Age	39,776	46.913	11.241	25	64
Kids (0, 1)	39,776	0.474	0.499	0	1
Single (0, 1)	39,776	0.255	0.436	0	1
Number of job applications	3,772	7.178	30.253	0	1000
Year 2009	39,776	0.091	0.287	2009	2009
Year 2010	39,776	0.091	0.287	2010	2010
Year 2011	39,776	0.081	0.273	2011	2011
Year 2012	39,776	0.088	0.284	2012	2012
Year 2013	39,776	0.075	0.263	2013	2013
Year 2014	39,776	0.087	0.281	2014	2014
Year 2015	39,776	0.087	0.281	2015	2015
Year 2016	39,776	0.079	0.269	2016	2016
Year 2017	39,776	0.071	0.257	2017	2017
Year 2018	39,776	0.076	0.265	2018	2018
Year 2019	39,776	0.067	0.250	2019	2019

3.3 Eliciting Expectations

The LISS elicits expectations about labor market risks through targeted probability and categorical questions. Employed respondents are asked: "What is the probability of losing your job in the next 12 months on a scale from 0 to 100, where 100 means absolutely certain?" Unemployed respondents are asked: "What is the probability of finding a job in the next 12 months on a scale from 0 to 100?" and "Within what period do you expect to find the kind of job you are looking for?" with seven options ranging from "within 1–2 weeks" to "never." These conditional questions ensure that job loss expectations are only collected from those at risk of separation, while job finding and unemployment duration expectations are collected from those in unemployment.

Figures 3–5 illustrate the predictive power and consistency of these measures.

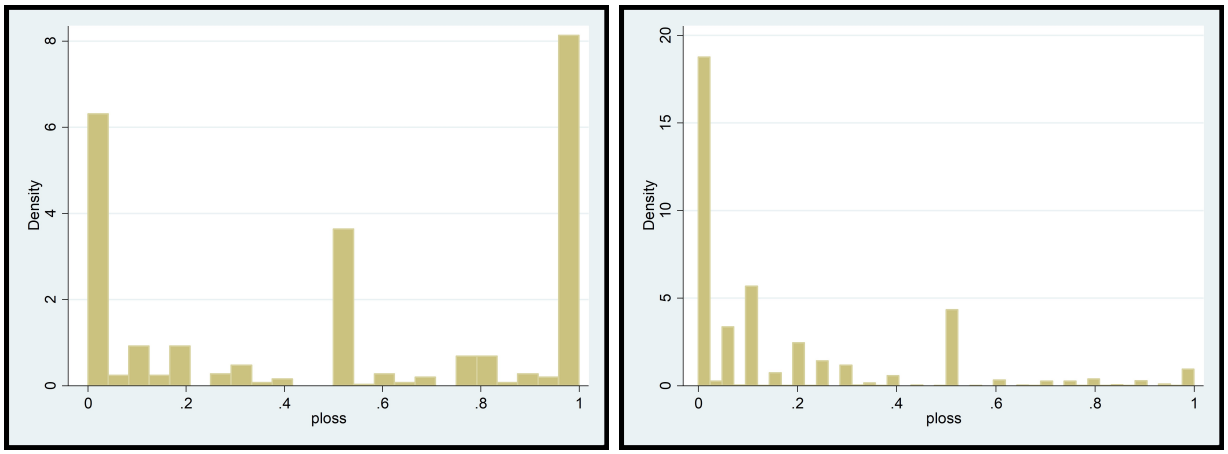


Figure 3: Distribution of job loss probabilities at t for those who lose their job (left) and those who do not (right) at $t+1$.

4 Subjective Job Loss and Finding Expectations

In this section we provide evidence for the predictive power of job loss and job finding expectations. Furthermore, we corroborate the most important job finding expectations dynamics found in Adams-Prassl et al. (2022), Mueller et al. (2021), and Faberman et al. (2022). Ultimately, we test our **H1** in this section: the extent to which subjective job finding expectations include information on individuals' expectations regarding the duration of unemployment, i.e. the persistence of an unemployment shock.

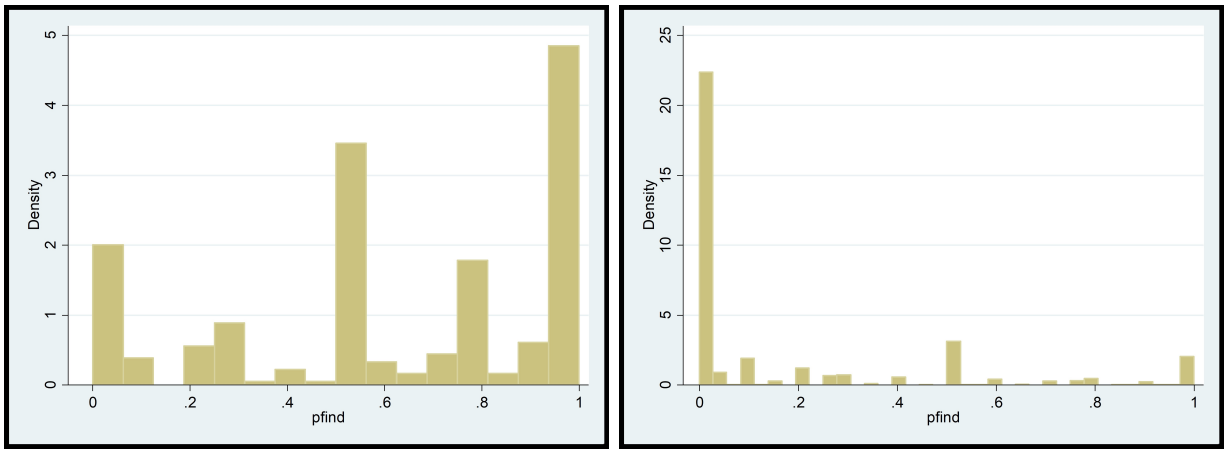


Figure 4: Distribution of job finding probabilities at t for those who find a job (left) and those who do not (right) at $t+1$.

4.1 Predictive Power of Subjective Job Loss Expectations

Consistent with Stephens (2004), job loss expectations have substantial predictive power of job loss realizations. Table 3 reports estimates across specifications with/without controls and fixed effects (FE). Being certain to become unemployed next year increases the probability of job loss by about 14.6 percentage points with controls and individual FE, comparable to Stephens (2004).

Table 3: Predictive power of job loss expectations

	(1)	(2)	(3)
$\mathbb{P}$(job loss at t) at $t-1$	0.164***	0.162***	0.146***
	(0.009)	(0.009)	(0.011)
Controls	No	Yes	Yes
Individual FE	No	No	Yes
N	24,327	24,327	24,327
R^2	0.058	0.073	0.088

Notes: SEs clustered at the individual level. Controls include age, age^2, partner, # children, and year dummies.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4.2 Predictive Power of Subjective job finding Expectations

Table 4 presents estimates among the unemployed. Adding individual FE reduces the coefficient from 27.2% to 10.0%, indicating time-invariant unobserved heterogeneity matters. Compared to OLS estimates of the US CSE (around 50%) in Mueller et al. (2021), our FE

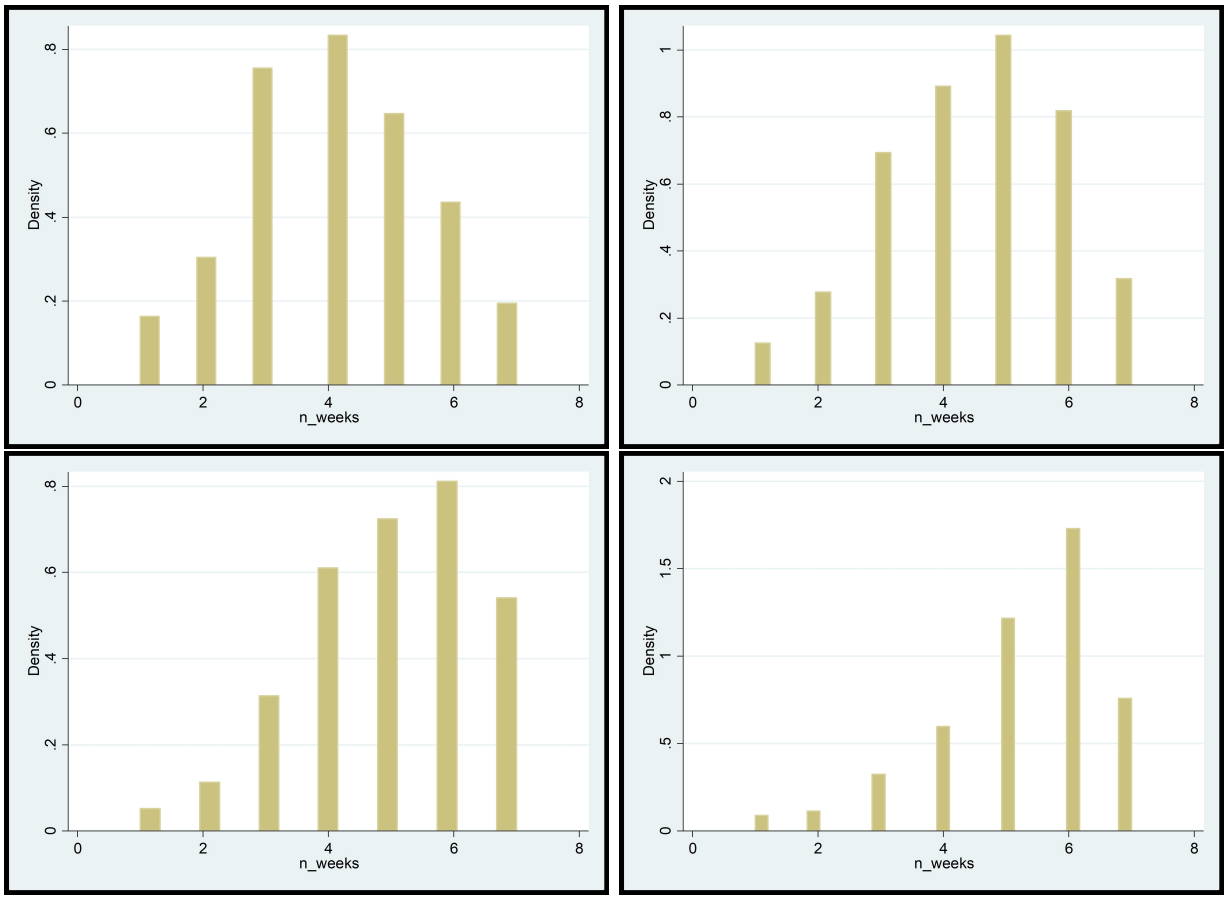


Figure 5: Unemployment duration expectations by realized duration bins: <12m, 12–24m, 24–36m, >36m. Horizontal axis: seven categories from "1–2 weeks" to "never."

estimate is smaller, aligning more closely with Adams-Prassl et al. (2022) (UK).

4.3 Dynamics of Subjective job finding Expectations

Autoregressive models (Table 5) show high persistence of job finding expectations over one to three years of unemployment. To avoid the Nickell bias, we do not include FE in these AR regressions. The results indicate substantial persistence consistent with Mueller et al. (2021).

4.4 Expectations of job finding and Unemployment Duration

We also relate realized unemployment spell length to job finding probabilities (Table 6). With FE and controls, being unemployed >1 year decreases job finding probabilities by about 5 p.p.; differences across 12–23, 24–35, and 36+ months are not statistically distinct once FE are included. Consistent with Mueller et al. (2021), this implies that there is little

Table 4: Predictive power of job finding expectations

	(1)	(2)	(3)
$\mathbb{P}$(job find at t) at $t-1$	0.272***	0.246***	0.100***
	(0.018)	(0.018)	(0.024)
Controls	No	Yes	Yes
Individual FE	No	No	Yes
N	4,639	4,639	4,639
R^2	0.120	0.147	0.075

Notes: SEs clustered at the individual level. Controls include age, age^2, partner, # children, and year dummies.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Persistence in job finding expectations

	(1)	(2)	(3)
$\mathbb{P}$(job find $t+1$) at t	0.470***	0.333***	0.306***
	(0.023)	(0.032)	(0.049)
$\mathbb{P}$(job find t) at $t-1$		0.242***	0.171***
		(0.031)	(0.052)
$\mathbb{P}$(job find $t-1$) at $t-2$			0.196***
			(0.047)
Controls	Yes	Yes	Yes
N	3,631	2,036	1,086
R^2	0.412	0.415	0.444

Notes: SEs clustered at the individual level. Controls include age, age^2, partner, # children, and year dummies.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

updating of job finding beliefs over the course of unemployment. This implies that job finding expectations are likely to predict future job finding persistently. Table 7 uses the panel dimension to test predictive power of lagged job finding expectations for realizations. Expectations formed up to $t-2$ retain predictive power in some specifications. However, the expectations formed at time $t-1$ are most important for the outcome at time t.

4.5 Subjective Unemployment Duration Expectations

Unlike SCE/HRS/ALP data, the LISS also measures unemployment duration expectations. Table 8 tests whether these expectations predict job finding within the next year. OLS shows strong negative gradients for expectations of 26–52 weeks and $\geq$52 weeks; conditioning on search effort (applications) yields similar patterns. With individual FE, significance

Table 6: Unemployment duration and job finding expectations

	(1)	(2)	(3)
Base: Duration < 12 months at t			
Duration 12–23 months at t	-0.098^{***}	-0.067^{***}	-0.053^{***}
	(0.017)	(0.015)	(0.014)
Duration 24–35 months at t	-0.227^{***}	-0.160^{***}	-0.077^{***}
	(0.017)	(0.015)	(0.023)
Duration 36+ months at t	-0.327^{***}	-0.238^{***}	-0.060^{***}
	(0.013)	(0.012)	(0.013)
Controls	No	Yes	Yes
Individual FE	No	No	Yes
N	6,587	6,587	6,587
R^2	0.158	0.357	0.394

Notes: SEs clustered at the individual level. Controls include age, age^2, partner, # children, and year dummies. In col. (3), coefficients for the three >12m bins do not significantly differ from each other.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

weakens—suggesting time-invariant traits (e.g., preferences for work, search costs) play an important role.

In Table 9 we test *H1* by estimating the predictive power of unemployment duration expectations on job finding expectation. Longer expected duration (especially ≥26 weeks) predicts lower job finding probabilities (Model 3); the relationship persists with FE, albeit attenuated (model 4). Those who report that they expect unemployment duration to take at least 26 weeks also report a probability of finding a job in the next twelve months that is 25.2 p.p. lower than those who expect to find a job within 26 weeks. This is driven by both people who believe to find a job within a year and after a year (Models 1 and 2). This results is regardless of controlling for job search effort, measured by the number of job applications submitted. Including individual FE reduces the predictive power of job finding expectations for unemployment duration to 10.1 p.p.

These estimates imply that job finding expectations contain information on individuals' expectations regarding the duration of unemployment, i.e. the persistence of the unemployment shock. As a result, subjective job finding expectations can be used to measure the persistence of unemployment. Our results also suggest that individual Fixed Effects may pick up important traits that are related to persistence, but correcting for individual Fixed Effects without incorporating job finding expectations may be insufficient to control for the persistence channel of the unemployment spell. Therefore, the combination of subjective job loss and job finding probabilities provides information on the unexpectedness and the

Table 7: Predictive power of lagged job finding expectations

	(1)	(2)
$\mathbb{P}$(job find t) at $t-1$	0.105***	0.104**
	(0.033)	(0.051)
$\mathbb{P}$(job find $t-1$) at $t-2$	0.015	0.078**
	(0.024)	(0.032)
$\mathbb{P}$(job find $t-2$) at $t-3$		0.002
		(0.029)
Controls	Yes	Yes
Individual FE	Yes	Yes
N	2,716	1,567
R^2	0.084	0.021

Notes: SEs clustered at the individual level. Controls include age, age^2, partner, # children, and year dummies.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

persistence of unemployment shocks, as outlined in our theoretical model of the PIH above.

5 Empirical Test of the PIH

In Section 4 we produced the important result that subjective job finding expectations contain information about the perceived persistence of an unemployment shock. In this section, we show how important such information is in estimating the effects of unemployment on consumption and empirically test our hypotheses **H2-H5**.

Building on our theoretical model, we augment PIH-style specifications (e.g., Stephens, 2004; Hendren, 2017; Hartmann and Leth-Petersen, 2024) by incorporating job finding expectations to capture perceived persistence and effectively estimate Equation 16 empirically. We present the estimation results in Table 10 below.

1. Model 1 (à la Stephens): Eq 16 without f and $Unem \cdot f$
2. Model 2 (preferred model): Eq 16
3. Model 3 (check importance FE): Eq 16 w/o μ_i
4. Model 4 (comparison w prior papers): Eq 16 for food consumption

Table 8: Unemployment duration expectations and job finding realizations

	(1)	(2)	(3)
Base: Expect find < 2 weeks at t			
2–4 weeks	0.040	0.052	0.084
	(0.075)	(0.078)	(0.102)
4–12 weeks	0.035	0.049	−0.002
	(0.068)	(0.071)	(0.078)
12–26 weeks	−0.025	−0.009	0.004
	(0.067)	(0.069)	(0.075)
26–52 weeks	−0.174**	−0.149**	−0.079
	(0.065)	(0.068)	(0.075)
≥ 52 weeks	−0.317***	−0.292***	−0.112
	(0.066)	(0.069)	(0.076)
Never (0)	−0.348***	−0.307***	−0.103
	(0.067)	(0.068)	(0.075)
Individual FE	No	No	Yes
Conditional on # applications	No	Yes	No
N	1,863	1,604	1,863
R^2	0.383	0.421	0.218

Notes: SEs clustered at the individual level. Controls include age, age^2, partner, # children, and year dummies.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

6 Implications for Optimal Unemployment Insurance

Our empirical model has confirmed the importance of the two separate channels of unexpectancy and persistency outlined in our theoretical life-cycle model with subjective expectations of job loss and job find. Most importantly, we have shown that consumption responses to unemployment are heterogeneous with respect to subjective job finding expectations. This section illustrates how separating the *unexpectedness* (λ) and *persistence* (f) channels in the life-cycle model provides clear implications for the optimal design of unemployment insurance (UI). The welfare-improving role of UI depends not only on the probability of job loss but crucially on the *expected duration* of unemployment spells, proxied by subjective job finding probabilities.

Our analysis builds on the framework of Hendren (2017), who emphasizes the role of private information about future job loss in shaping both consumption responses and the normative value of unemployment insurance. While Hendren models expectations about *the likelihood of job loss*, our paper extends this insight to expectations about *the persistence of unemployment* once job loss occurs. In our model, individuals form subjective beliefs not

Table 9: Relation between unemployment duration expectations and job finding expectations

	(1)	(2)	(3)	(4)
Base: Expect find < 2 weeks at t				
2–4 weeks	0.046	0.049		
	(0.081)	(0.085)		
4–12 weeks	0.048	0.054		
	(0.073)	(0.077)		
12–26 weeks	−0.015	−0.008		
	(0.072)	(0.075)		
26–52 weeks	−0.159**	−0.141*		
	(0.071)	(0.075)		
≥ 52 weeks	−0.299***	−0.281***		
	(0.070)	(0.075)		
Never (0)	−0.325***	−0.291***		
	(0.071)	(0.075)		
Base: Expect find < 26 weeks at t				
Expect ≥ 26 weeks			−0.252***	−0.101***
			(0.018)	(0.022)
Individual FE	No	No	No	Yes
Conditional on # applications	No	Yes	No	No
N	1,863	1,863	1,863	1,863
R^2	0.371	0.414	0.339	0.120

Notes: SEs clustered at the individual level. Controls include age, age^2, partner, # children, and year dummies.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

only about the probability of becoming unemployed but also about the expected duration of unemployment, proxied by their subjective job finding probability. This distinction is crucial for optimal UI design: when workers expect longer unemployment spells, the value of insurance increases due to a lower perceived human wealth and stronger consumption-smoothing needs. By incorporating heterogeneity in expected unemployment duration, our analysis complements Hendren's focus on job loss risk and demonstrates that differences in perceived persistence generate distinct welfare implications and policy prescriptions for optimal benefit generosity.

Table 10: Estimation results - TODO

		Dependent variable: $\Delta \ln c_{it}$			
Variable	**Coeff.**	(1)	(2)	(3)	(4)
Unemployment indicator $Unemp_{it}$	β_1				
		( )	( )	( )	( )
Subjective job loss prob. $(\hat{\lambda}_{i,t-1})$	β_2				
		( )	( )	( )	( )
Subjective job finding prob. $(\hat{f}_{i,t-1})$	β_3				
		( )	( )	( )	( )
Unemp. $\times$ job finding prob. $(\hat{f}_{i,t-1})$	β_4				
		( )	( )	( )	( )
Controls X_{it}	Γ				
Age					
Partner (1 = yes)					
Number of children					
Education dummies					
Constant	α				
		( )	( )	( )	( )
Individual FE μ_i		Yes	Yes	No	Yes
Time FE τ_t		Yes	Yes	Yes	Yes
Observations					
R^2					

Notes: Table reports coefficients from estimating Equation (18): $\Delta \ln c_{it} = \alpha + \beta_1 Unemp_{it} + \beta_2 \hat{\lambda}_{i,t-1} + \beta_3 \hat{f}_{i,t-1} + \beta_4 (Unemp_{it} \times \hat{f}_{i,t-1}) + X'_{it}\Gamma + \mu_i + \tau_t + \varepsilon_{it}$. Standard errors (in parentheses) are clustered at the individual level. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

6.1 Optimal UI with subjective unemployment expectations.

6.1.1 Environment and budget constraint

We follow Chetty (2006) in the concept of optimal design of UI. Let individuals face a job loss probability λ and a job finding probability f. The replacement rate $\rho \in [0, 1)$ determines

$$y_U(\rho) = \rho\, y_E^0, \qquad y_E(\rho) = y_E^0 - \tau(\rho),$$

where y_E^0 is pre-tax employed income and $\tau(\rho)$ the tax financing UI. In steady state,

$$\pi_U = \frac{\lambda}{\lambda + f}, \qquad \pi_E = \frac{f}{\lambda + f}.$$

A balanced budget requires $\pi_U b(\rho) = \pi_E \tau(\rho)$, implying

$$y_E(\rho) = y_E^0\left(1 - \rho\,\frac{\lambda}{f}\right), \qquad y_U(\rho) = \rho\, y_E^0.$$

To allow for moral hazard, let $f = f(\rho)$ with $f'(\rho) < 0$. Define the semi-elasticity and elasticity:

$$\phi(\rho) = -\frac{f'(\rho)}{f(\rho)} > 0, \qquad \varepsilon_{f,\rho} = \rho\,\phi(\rho).$$

6.1.2 Consumption and welfare

Under the certainty-equivalence PIH rule, consumption is proportional to total wealth:

$$c_s(\rho) = 0.0589\Big(a + H_s(\rho)\Big), \qquad s \in \{E, U\}, \qquad 0.0589 \in (0, 1),$$

where $H_s(\rho)$ denotes human wealth. Two results from the model are central:

$$\frac{\partial c_U}{\partial \rho} > 0, \quad \frac{\partial c_E}{\partial \rho} < 0, \qquad \text{(transfer and tax effects)}, \tag{19}$$

$$\frac{\partial}{\partial f}\Big(c_U - c_E\Big) > 0, \qquad \text{(higher } f \text{ reduces the consumption drop)}. \tag{20}$$

Assume CRRA utility $u(c) = c^{1-\gamma}/(1-\gamma)$, $\gamma > 0$. Steady-state welfare W is

$$W(\rho) = \pi_E(\rho)\, u(c_E(\rho)) + \pi_U(\rho)\, u(c_U(\rho)).$$

6.1.3 Sufficient-statistics condition for optimal UI

Differentiating welfare and setting $dW/d\rho = 0$ gives the canonical insurance–incentives trade-off:

$$\frac{dW}{d\rho} = \underbrace{\pi_U u'(c_U)\,\frac{\partial c_U}{\partial \rho} + \pi_E u'(c_E)\,\frac{\partial c_E}{\partial \rho}}_{\text{consumption-smoothing gain}} + \underbrace{\frac{d\pi_U}{d\rho}\,[u(c_U) - u(c_E)]}_{\text{moral-hazard cost}}. \tag{21}$$

Using $d\pi_U/d\rho = -\lambda f'(\rho)/(\lambda + f)^2$, the first-order condition becomes:

$$\boxed{\pi_U u'(c_U)\,\frac{\partial c_U}{\partial \rho} + \pi_E u'(c_E)\,\frac{\partial c_E}{\partial \rho} = \frac{\lambda[-f'(\rho)]}{[\lambda + f(\rho)]^2}\,[u(c_E) - u(c_U)].} \tag{22}$$

The left-hand side represents the *insurance gain*, and the right-hand side the *incentive cost* from longer unemployment durations.

Approximating the direct consumption effects of ρ:

$$\frac{\partial c_U}{\partial \rho} \approx 0.0589 y_E^0, \quad \frac{\partial c_E}{\partial \rho} \approx -0.0589 y_E^0 \frac{\lambda}{f}.$$

Also,

$$\frac{\lambda[-f'(\rho)]}{(\lambda + f)^2} = \pi_U \pi_E \phi(\rho).$$

Substituting these into (22) gives a compact sufficient-statistics expression:

$$\boxed{\frac{\pi_U}{\pi_E}\,\frac{u'(c_U)}{u'(c_E)}\left(1 + \frac{\lambda}{f}\right) \approx \pi_U\,\phi(\rho)\,\frac{u(c_E) - u(c_U)}{u'(c_E)\,0.0589\,y_E^0}.} \tag{23}$$

The left-hand side captures the consumption-smoothing benefit of UI. Note that the consumption drop empirically estimated above is $\Delta \ln C = u'(c_U)/u'(c_E)$ under CRRA. Similarly, $\pi_U = \lambda/(\lambda + f)$ is estimated from subjective $\widehat{\lambda}$ and $\widehat{f}$ in our empirical model. The right-hand side captures the cost of lower job finding rates.

6.2 Comparative Statics

Three comparative statics follow from Equation 23:

1. **Duration and need for insurance.** Higher f (shorter expected unemployment) reduces the consumption gap $c_E - c_U$, lowering optimal ρ: $\frac{\partial \rho^\star}{\partial f} < 0$.

2. **Duration and incentive costs.** Higher f decreases π_U and can raise $\phi(\rho)$, amplifying the incentive cost of more generous UI.

3. **Belief heterogeneity.** Since f varies across individuals, the welfare-improving $\rho^\star$ should be lower for those expecting short unemployment (high f) and higher for those expecting persistent unemployment (low f).

Figure 6 provides a schematic illustration of the insurance–incentives trade-off that differs between those with low and high f. The blue curves show the marginal insurance benefit of higher UI generosity for two groups differing in job finding probabilities. The dashed line corresponds to high f (short expected duration): its flatter shape represents smaller potential welfare gains from insurance. The solid blue line (low f) represents longer expected unemployment and larger consumption gaps, implying a higher optimal replacement rate $\rho^\star$. The red curve shows the moral-hazard cost that increases with ρ. The intersection of the benefit and cost curves determines the optimal UI level with $\rho^\star_{\text{high } f} < \rho^\star_{\text{low } f}$.

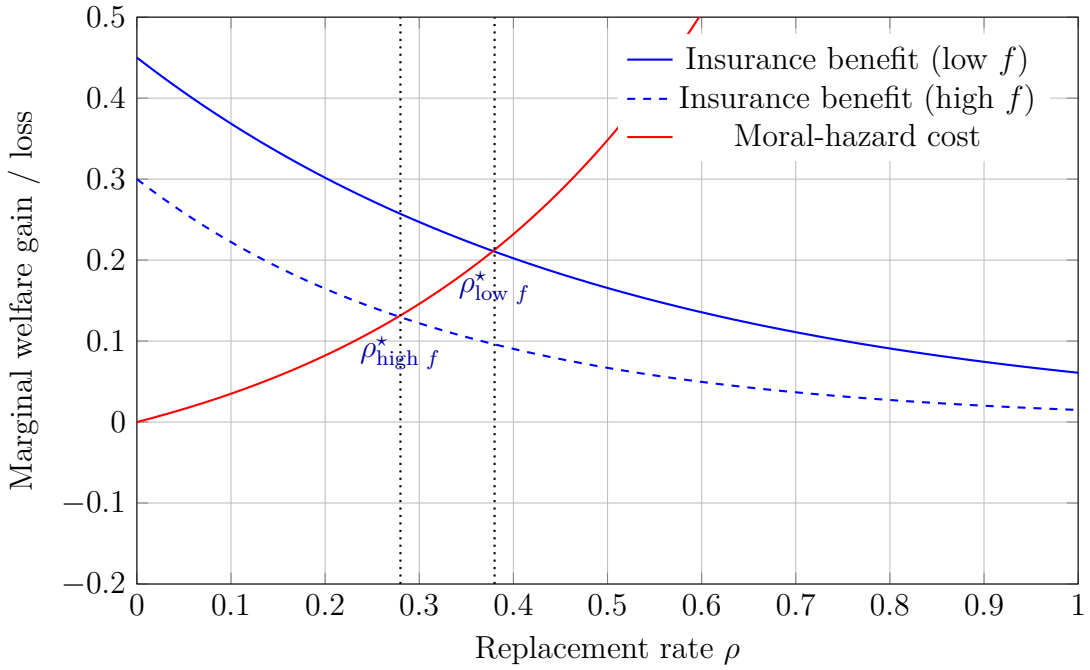


Figure 6: Insurance–incentives trade-off and optimal UI generosity for different f.

6.2.1 Calibrating Belief–Conditioned UI

From previous sections, we know that (i) consumption responses are heterogeneous with respect to f and (ii) optimal UI benefits are smaller (larger) for those with a larger (smaller) f. In this section, we quantify welfare under (i) a *uniform* replacement rate and (ii) a *belief-conditioned* schedule that varies by subjective job finding probability f.

We consider five representative groups with subjective job finding probabilities f_g and

population weights w_g:

$$\underbrace{(f_1, \ldots, f_5)}_{\text{representative } f} = (0.05,\ 0.25,\ 0.55,\ 0.78,\ 0.95), \qquad \underbrace{(w_1, \ldots, w_5)}_{\text{LISS-mapped shares}} = (0.12,\ 0.10,\ 0.30,\ 0.18,\ 0.30).$$

The five groups are based on the histogram shown in Figure 4 and assigns weights that reproduce its pronounced masses near $f \approx 0$, $f \in [0.5, 0.6]$, $f \in [0.75, 0.8]$, and $f \approx 1$.[6]

Preferences follow a CRRA utility function: $u(c) = c^{1-\gamma}/(1-\gamma)$ with $\gamma = 2$. Furthermore, similar to our prior numerical example, we assume a discount factor $\beta = 0.96$; gross return $R = 1.02$; job loss probability $\lambda = 0.05$; and add the assumption that pre-tax employed income $y_E^0 = 1$. The certainty-equivalent marginal propensity to consume is $0.0589 = 1 - \beta/R \approx 0.0588$. Balanced-budget contemporaneous incomes are $y_U(\rho) = \rho y_E^0$, $y_E(\rho, f) = y_E^0\,(1 - \rho\,\lambda/f)$.

We compare the current Dutch regime with a belief-conditioned schedule:

$$\textbf{Uniform (status quo):} \quad \rho^U = 0.70 \quad \text{for all } g,$$
$$\textbf{Belief-conditioned (heterogeneous):} \quad (\rho_1^H, \rho_2^H, \rho_3^H, \rho_4^H, \rho_5^H) = (0.75,\ 0.70,\ 0.60,\ 0.55,\ 0.50),$$

which implements our theoretical prescription that optimal generosity declines with f (shorter expected duration).

Table 11 reports the group composition and the policy schedule. Table 12 summarizes steady-state welfare by group and in the aggregate under each policy. Welfare is in utility units (higher/less negative is better); the last row converts aggregate differences to *consumption-equivalent (CE)* gains.

Table 11: Belief groups and LISS-mapped population shares

Group g	Representative f_g	Share w_g	Heterogeneous ρ_g^H
1 (very low f)	0.05	0.12	0.75
2 (low f)	0.25	0.10	0.70
3 (f near mode)	0.55	0.30	0.60
4 (high f)	0.78	0.18	0.55
5 (very high f)	0.95	0.30	0.50
Total		1.00	

Our belief–conditioned UI calibration delivers a consumption–equivalent welfare gain of **about 0.6%** relative to a uniform 70% replacement rate with about two-thirds of the gain

[6] Bins were chosen to match the evident modes in the figure. We later show robustness to alternative bin edges and quantile weights.

Table 12: Steady-state welfare by policy

	Uniform $\rho^U = 0.70$	Belief-conditioned ρ^H
Group 1 (f=0.05)	−0.540	−0.528
Group 2 (f=0.25)	−0.418	−0.410
Group 3 (f=0.55)	−0.377	−0.372
Group 4 (f=0.78)	−0.368	−0.366
Group 5 (f=0.95)	−0.365	−0.364
Aggregate $\overline{W}$ (weighted)	−0.403	−0.397
CE welfare gain (hetero vs uniform)	**0.6**%	

Notes: Welfare $W = \pi_E u(c_E) + \pi_U u(c_U)$ with $\pi_U = \lambda/(\lambda + f)$; c_s follows the PIH rule with human wealth constructed from the two-state Markov income process. Numbers are rounded; CE gain Δ solves $W^H = (1+\Delta)^{1-\gamma} W^U$ and is reported in percent.

coming from better insurance for the two lowest-f groups and one-third from reducing over-insurance for the highest-f group. The magnitude of 0.6% is quantitatively meaningful and sits in the mid–range of modern UI evaluations: our welfare gain is larger than many "light targeting" adjustments (roughly 0.2–0.4%; see, e.g., Spinnewijn, 2015), is comparable to moving from a fixed benchmark to a static optimal replacement rule (about 0.5–0.8%; Landais et al., 2018), and below full system re–designs that can reach 1–1.3% in richer macro settings (Kekre, 2023).

Mechanisms that drive the welfare gain. Three forces underlie the positive welfare gain from belief-conditioned UI: (i) *targeted insurance*—higher generosity for very low f raises c_U where the perceived persistence and mass of unemployment are largest; (ii) *avoiding over-insurance*—lower generosity for high f reduces taxes on the employed and the incidence of insurance where spells are short; (iii) *composition*—the LISS distribution places substantial weight both near $f \approx 0.55$ and near $f \approx 1$, so reallocating generosity across these groups improves average welfare with limited fiscal cost.

Robustness to moral hazard. The results above do not yet consider effects from moral hazard. Introducing a moderate duration semi-elasticity $f(\rho) = f_0 e^{-\phi(\rho-\rho_0)}$ with $\phi = 0.5$ and $\rho_0 = 0.7$ dampens (but does not reverse) the gain; the CE improvement remains around **0.4**%. This is because the heterogeneous policy reduces generosity mainly where f is already high, limiting adverse duration responses, while concentrating insurance where persistent unemployment is expected.

Robustness to group-specific optimal UI. Thus far, we have assumed a relatively arbitrary belief-dependent UI scheme. Here, we check the robustness of our conclusions to group-wise optimal replacement rates. Calibration gives the following optimal replacement rates:

Optimal belief-conditioned: $(\widehat{\rho}_1^H, \widehat{\rho}_2^H, \widehat{\rho}_3^H, \widehat{\rho}_4^H, \widehat{\rho}_5^H) = (0.720,\ 0.720,\ 0.700,\ 0.650,\ 0.595),$

This optimal belief-conditioned UI schedule yields a *consumption-equivalent* welfare improvement of about **0.46**% relative to the uniform replacement rate of 0.70 under the same resource envelope. Roughly 60% of the welfare gain comes from better insurance for $g \in \{1, 2\}$ (long expected duration), with the remainder from reducing over-insurance in $g = 5$.

6.3 Policy Implementation

The belief-contingent optimal unemployment UI schedule derived above suggests that individuals with lower subjective job-finding probabilities—and thus longer expected unemployment durations—should receive higher replacement rates. However, a key challenge in translating this principle into policy is incentive compatibility: if benefits depend directly on self-reported beliefs, claimants would have an incentive to understate their job-finding probability to qualify for more generous benefits. In practice, policy must therefore rely on verifiable proxies for beliefs rather than subjective reports.

Observable belief proxies. Policymakers can approximate the subjective job-finding probability f_i using observable or behavioral characteristics that correlate strongly with both perceived and actual reemployment risk. One approach is to infer beliefs statistically from longitudinal survey data, such as the LISS or SCE panels, by estimating a mapping

$$\hat{f}_i = g(X_i, Z_i),$$

where X_i includes demographics (age, education, tenure) and Z_i includes labor-market conditions (industry demand, regional unemployment, past spell durations). The estimated $\hat{f}_i$ can then serve as the conditioning variable for a replacement rate schedule $b^*(\hat{f}_i)$, yielding a belief-consistent but administratively verifiable rule.

Behavioral and administrative inference. A complementary strategy is to infer beliefs from observable search behavior or administrative risk scores. Empirical work (Faberman

et al., 2022; Mueller et al., 2021) shows that search effort, application rates, and reservation wages are tightly linked to subjective job-finding expectations. Similarly, public employment agencies already construct *reemployment risk profiles* using administrative data (e.g. in the Netherlands, the UWV's *Werkverkenner*). Such predictive scores, often based on age, occupation, and sectoral demand, can serve as policy instruments for implementing belief-conditioned UI benefits:

$$b_i = b^*(\hat{f}_i^{\text{admin}}),$$

where $\hat{f}_i^{\text{admin}}$ denotes an administratively predicted reemployment probability. This approach is both incentive-compatible and empirically grounded.

Self-selection and screening. An alternative implementation involves offering workers a menu of benefit–tax contracts that induces self-selection among types with different expected job-finding rates. In this setting, the planner designs $(b(f), \tau(f))$ to satisfy the incentive-compatibility constraint

$$U_i(b(f_i), f_i) \geq U_i(b(f_j), f_i) \quad \forall j \neq i,$$

ensuring that individuals with genuinely low f_i choose higher insurance levels while others opt for lower, cheaper coverage. This logic parallels classical screening models (Mirrlees, 1999) and can be applied to unemployment insurance with observable indicators of search effort or employment history.

Policy relevance. In practice, the planner does not need to elicit beliefs directly. The core policy insight is that belief heterogeneity—as captured by subjective or predicted job-finding probabilities—is welfare-relevant and should guide benefit differentiation. Hence, the belief-weighted optimal policy can be operationalized as a *risk-profile–contingent replacement rate*: higher benefits for workers with verifiably low reemployment prospects and lower benefits for those with stronger job-finding opportunities.

7 Conclusion

This paper integrates subjective expectations into a life-cycle model of unemployment and consumption to study how job loss beliefs and job finding beliefs shape household behavior and welfare. We show theoretically that two dimensions of expectations, i.e. unexpectedness and perceived persistence, jointly determine the consumption response to unemployment. Subjective job finding probabilities serve as a sufficient statistic for expected unemployment

duration and, consequently, for the marginal value of unemployment insurance.

Empirically, we demonstrate using unique Dutch panel data that job finding beliefs strongly predict realized unemployment durations and consumption adjustments at job loss. Accounting for belief heterogeneity aligns observed consumption dynamics with the predictions of the Permanent Income Hypothesis and substantially reduces unexplained heterogeneity across households. Without correcting for subjective job-finding expectations, estimates of consumption responses to unexpected job loss—such as in Stephens (2004)—are attenuated and biased upwards. Individual Fixed Effects are insufficient to separate the expectancy and persistence channels in the empirical application of the PIH.

Our welfare calibration highlights the policy relevance of these insights. A uniform replacement rate, while approximately optimal on average, fails to capture large heterogeneity in perceived unemployment persistence. A system that conditions benefits on subjective job finding beliefs yields welfare gains of around 0.6% of consumption—comparable to substantial reforms in the modern optimal-UI literature. This result implies that incorporating beliefs into social insurance design can substantially improve welfare without increasing fiscal costs. For practical policy implementation, we argue that the planner does not need to elicit beliefs directly. The core policy insight is that belief heterogeneity—as captured by subjective job-finding probabilities—is welfare-relevant and should guide benefit differentiation.

References

Adams-Prassl, A., Boneva, T., Golin, M., and Rauh, C. (2022). Perceived returns to job search. *Labour Economics*, 80:1–34.

Been, J., Suari-Andreu, E., Knoef, M., and Alessie, R. J. M. (2024). Consumption and time use responses to unemployment: Implications for the life-cycle model. *Economica*, 91(361):1–32.

Carroll, C. D. (1997). Buffer-stock saving and the life cycle/permanent income hypothesis. *Quarterly Journal of Economics*, 112(1):1–55.

Chetty, R. (2006). A general formula for the optimal level of social insurance. *Journal of Public Economics*, 90(10–11):1879–1901.

Chetty, R. (2008). Moral hazard versus liquidity and optimal unemployment insurance. *Journal of Political Economy*, 116(2):173–234.

D'Acunto, F. and Weber, M. (2024). Why survey-based subjective expectations are meaningful and important. *Annual Review of Economics*, 16:329–357.

Dominitz, J. (1998). Earnings expectations, revisions, and realizations. *Review of Economics and Statistics*, 80(3):374–388.

Dominitz, J. (2001). Estimation of income expectations models using expectations and realizations data. *Journal of Econometrics*, 102(2):165–195.

Dominitz, J. and Manski, C. F. (1997). Using expectations data to study subjective income expectations. *Journal of the American Statistical Association*, 92(439):855–867.

Elsby, M. W. L., Hobijn, B., and Şahin, A. (2013). The decline of the u.s. labor share. *Brookings Papers on Economic Activity*, 2013(2):1–63.

Faberman, J., Mueller, A. I., Şahin, A., and Topa, G. (2022). Job search behavior among the employed and non-employed. *Econometrica*, 90(4):1743–1779.

Friedman, M. (1957). *A Theory of the Consumption Function*. Princeton University Press, Princeton, NJ.

Guiso, L., Jappelli, T., and Pistaferri, L. (2002). An empirical analysis of earnings and employment risk. *Journal of Business & Economic Statistics*, 20(2):241–253.

Hartmann, F. and Leth-Petersen, S. (2024). Subjective unemployment expectations and (self-)insurance. *Labour Economics*, 90.

He, Q. and Kircher, P. (2025). Understanding expectations in job search: Subjective duration dependence, aggregate labor market shocks and overreaction. Technical report, Unpublished Manuscript.

Hendren, N. (2017). Knowledge of future job loss and implications for unemployment insurance. *American Economic Review*, 107(7):1778–1823.

Kaplan, G., Violante, G. L., and Weidner, J. (2014). The wealthy hand-to-mouth. *Brookings Papers on Economic Activity*, 45(1):77–138.

Kekre, R. (2023). Unemployment insurance in macroeconomic stabilization. *Review of Economic Studies*, 90(5):2439–2480.

Landais, C., Michaillat, P., and Saez, E. (2018). A macroeconomic approach to optimal unemployment insurance: Theory. *American Economic Journal: Economic Policy*, 10(2):152–181.

Manski, C. F. (2004). Measuring expectations. *Econometrica*, 72(5):1329–1376.

Manski, C. F. and Straub, J. D. (2000). Worker perceptions of job insecurity in the mid-1990s: Evidence from the CPS job tenure and occupational mobility supplement. *Journal of Human Resources*, 35(3):447–479.

Mirrlees, J. A. (1999). The theory of moral hazard and unobservable behaviour. *The Review of Economic Studies*, 66(1):3–21.

Mueller, A. I. and Spinnewijn, J. (2023). Expectations data, labor market, and job search. In Bachmann, R., Topa, G., and der Klaauw, W. V., editors, *Handbook of Economic Expectations*, pages 677–713. Academic Press / Elsevier.

Mueller, A. I., Spinnewijn, J., and Topa, G. (2021). Job seekers' perceptions and employment prospects: Heterogeneity, duration dependence, and bias. *American Economic Review*, 111(1):324–363.

Pistaferri, L. (2001). Superior information, income shocks, and the permanent income hypothesis. *The Review of Economics and Statistics*, 83(3):465–476.

Rendahl, P. (2016). Fiscal policy in an unemployment crisis. *Journal of the European Economic Association*, 14(1):1–41.

Spinnewijn, J. (2015). Unemployed but optimistic: Optimal insurance design with biased beliefs. *Journal of the European Economic Association*, 13(1):130–167.

Stephens, M. (2004). Job loss expectations, realizations, and household consumption behavior. *Review of Economics and Statistics*, 86(1):253–269.