

Saving and Portfolio Allocation Before and After Job Loss

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Research Questions

To what extent do households ...

- ① Rely on prior savings during unemployment?
- ② Save more before (and after) job loss?
- ③ Re-allocate savings to safer / more liquid assets before?

Outline

- ① Literature (non-exhaustive)
- ② Simple model of saving and portfolio choice (Leland 1968)
- ③ **Data & Institutional Context**
- ④ **Empirical strategy**
- ⑤ **Results**
- ⑥ **Robustness Checks: Plant Downsizings & Placebo Sample**
- ⑦ Appendix: Additional Results & Companion Paper

Lit. 1/4: On Optimal Unemployment Insurance

- Key papers:
 - ▶ Baily, *Some aspects of optimal unemployment insurance*, JPubE 1978
 - ▶ Chetty, *A general formula for the optimal level of social insurance*, JPubE 2006
- Private savings and unemployment insurance (UI) as substitutes:
 - ▶ “Hand-to-Mouth” consumers cut consumption 1-for-1 with income; Evidence e.g. in Browning & Crossley 2001 (for Canada)
 - ▶ Households with sufficient savings might need no UI at all
- So understanding use of private savings is important for optimizing UI
- Benefits of UI: Income effect of UI resolves liquidity constraints, which prevent households from choosing consumption optimally
- Costs: Price effect of UI causes Moral Hazard

Lit. 2/4: On Liquidity Constraints of the Unemployed

- Key papers:
 - ▶ Card, Chetty & Weber, *Cash-on-Hand and Competing Models of Intertemporal Behavior: New Evidence from the Labor Market*, QJE 2007
 - ▶ Basten, Fagereng & Telle, *Cash-on-Hand and the Duration of Job Search: Quasi-Experimental Evidence from Norway*, SSB 2012
- They show that unemployment duration, a form of consumption, responds to one-off severance payments
- Can be interpreted as evidence of liquidity constraints: Absent severance payments, or more generous UI, some households must accept a new, thus sub-optimal job too early...

Lit. 3/4: On wealth and its use during unemployment

- So far, the data situation has limited how much we know about households' saving and dissaving behavior around job loss
- Exception is Gruber 2001 ("*The Wealth of the Unemployed*"):
 - ▶ Data from US Survey of Income and Program Participation (SIPP)
 - ▶ Compares wealth at 2 points in time: before and after job loss
 - ▶ Drawback: Bound to underestimate true extent of dissaving
 - ▶ Also, he cannot cover how much is being saved before, and in which assets

Lit. 4/4: Labor income risk and household investment

- Guiso et al (AER 1996): Income risk and borrowing constraints reduce share Italian households hold in risky assets
- Betermier et al (JFE 2012): Swedish households moving from a low- to a high-wage-volatility job reduce risky share
- This is where effects of the labor market on household finance can start to matter for financial stability...

Model 1/4: Saving and Portfolio Choice

- Households work and consume in two periods, and may save a fraction s of their period 1 income for period 2
- Households place a fraction $(1 - \alpha)$ of savings in assets with fixed return R_F and (α) in risky assets with risky returns
- With probability $1 - q$ the risky returns are high, $R_H > R_F$ and with probability q low, $R_L < R_F$.
- Expected returns on risky assets are higher than the fixed return:
 $R_H(1 - q) + R_Lq > R_F$

Model 2/4: Job Risk

- With probability p the worker is unemployed (low income) in period 2, and with probability $(1 - p)$ keeps the job, so ...
 - ▶ With $\text{Pr} = (1 - p) * (1 - q)$: Employed, high returns
 - ▶ With $\text{Pr} = p * (1 - q)$: Unemployed, high returns
 - ▶ With $\text{Pr} = (1 - p) * q$: Employed, low returns
 - ▶ With $\text{Pr} = p * q$: Unemployed, low returns

Model 3/4: Optimization Problem

- The maximization problem:

$$\begin{aligned} \text{Max}_{\alpha, s} \quad & u((1-s)y_1) + \\ & \beta[(1-p)(1-q)u(c_2^{EH}) + (1-p)q \cdot u(c_2^{EL}) \\ & + p(1-q) \cdot u(c_2^{UH}) + pq \cdot u(c_2^{UL})] \end{aligned}$$

subject to: $0 \leq s, \alpha \leq 1$.

$$c_2^{i,j} = y_i + (\alpha R_j + (1-\alpha)R_f)sy_1,$$

where $i = E, U$ and $j = H, L$

Model 4/4: Predictions

- **Prediction 1:** A positive probability of future unemployment increases savings
- **Prediction 2:** A positive probability of future unemployment reduces the share held in risky/illiquid assets
- **Prediction 3:** A positive probability of returning to work induces depletion of wealth during unemployment
- **Note:** To simplify, we currently focus only on whether households are unemployed next period; ignore probabilities

Data & Context 1/4: What we Observe

- Best-available data so far, because ...
- Gruber 2001 uses SIPP *survey* data, observing wealth only *once before and once after* job loss
- We have *annual* tax data on pensionable income & financial wealth (bank deposits, bonds, stocks, funds) for all Norwegians
- With data for 1995-2007, we *track individuals for 9 years around job loss*, from U-4 through U+4 – more years to be added hopefully!
- Like Gruber, we focus on financial wealth only (Chetty&Szeidl 2010 argue a house cannot easily be liquidated)
- In addition to total financial wealth we also observe its main components (bonds, stocks, mutual funds, bank deposits)

Data & Context 2/4: Risky Assets, Household Debt

- The risky assets we look at are directly held, not in retirement account
- Norwegians do not typically hold equity in their employer
- Credit card debt is not a big issue in Norway

Data & Context 3/4: The Sample

- We balance the sample the over the whole observation window (1995-2007)
- To track all households 4 years before and 4 years after job loss, focus on households with job losses between 1999 and 2003
- Yields 8,645 households involved in exactly 1 unemployment spell
- Follow Chetty (JPE 2008) in excluding those who return immediately to the same plant (...), so get base line sample of 5,513 households

Data & Context 4/4: Comparison with the US

- Comparison to US: Until the median, Norwegians are richer; above Americans are richer (relative to income)
- The unemployed are poorer than the employed
- At 60% replacement rate, median unemployed could finance \geq 23 weeks of unemployment, more than the median spell duration
- Note: Even in Norway, the poorest decile can only finance about 2 weeks

Strategy 1/3: Estimated equation

Estimate for outcomes income, financial wealth, wealth components:

$Outcome_{i,t} = \alpha_i + \beta(RY_{i,t}) + \gamma_t + \varepsilon_{i,t}$, where:

- α_i is an individual (household) fixed effect
- γ_t is a vector of calendar year fixed effects
- Vector β contains the effects of the different Relative Years $[-4, \dots, 0, \dots, +4]$ around lay-off, which we will plot below

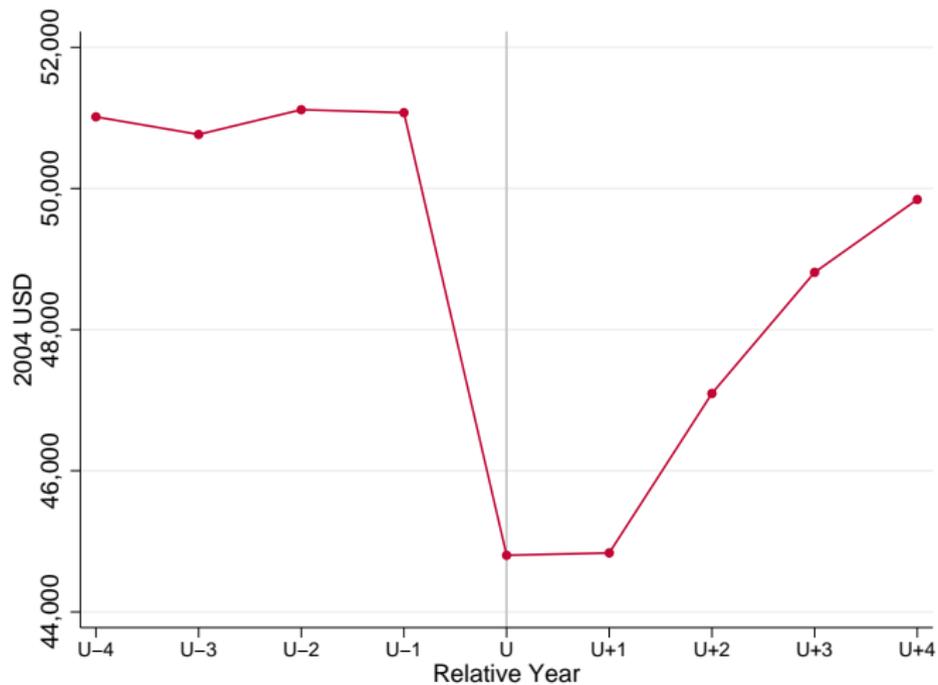
Strategy 2/3: On the omitted relative year

- Estimating 9 relative year coefficients from 13 annual observations means we use 4 years as omitted category
- These are different relative years for different individuals: $(-8,-7,-6,-5)$ or $(-7,-6,-5,+5)$ or ... or $(+5,+6,+7,+8)$
- Which ones will matter for the constant, but differences in the constant are soaked up by different individual fixed effects
- It does not matter for the comparison of interest, that between different relative year coefficients

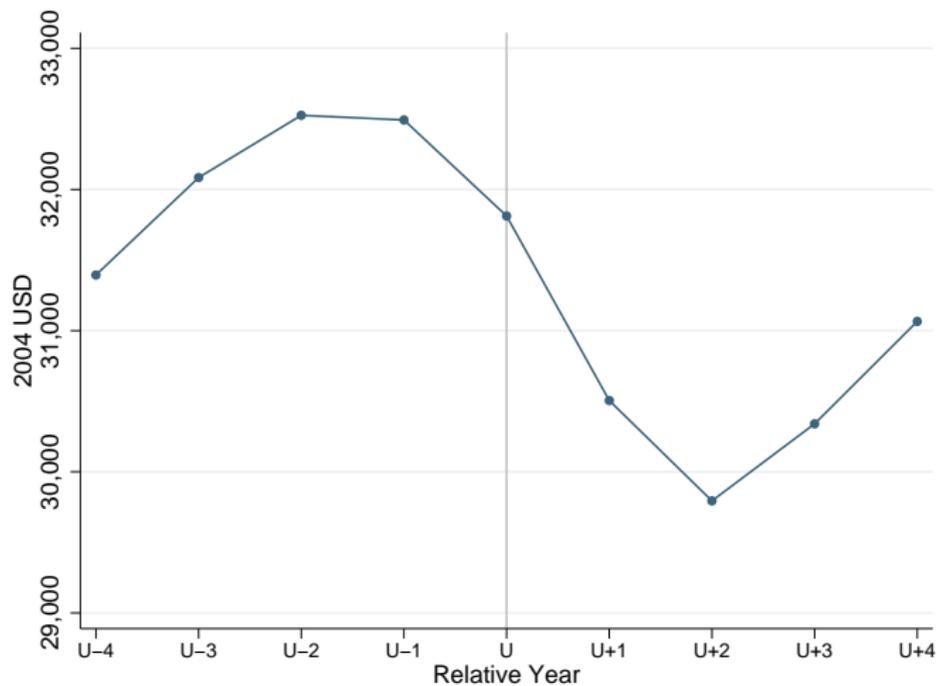
Strategy 3/3: Dependent variables

- Have also used income and wealth scaled by average pre-unemployment income, and the log of that; results (not shown) are similar
- All variables winsorized at 99th percentile to deal with outliers

Results 1/3: Income around Unemployment:



Results 2/3: Financial Wealth around Unemployment



Results on Income and Wealth

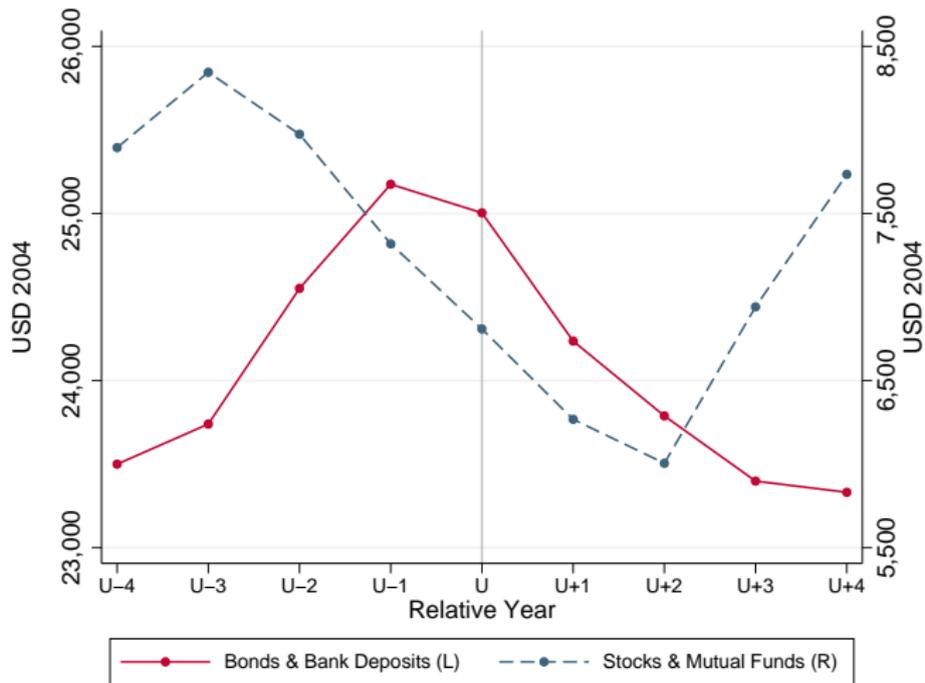
Income

- *On average and at annual level*, income drops from \$51,000 to \$45,000 (about 12%) in calendar years U and U+1
- Reflects a drop by $\geq 38\%$ (given 62% UI replacement rate) for each day of unemployment – understated by calendar year average
- Note: Income of average household recovers almost fully by U+4
- Total cumulative “shortage” (to 100%) is on average about $12\%+12\%+8\%+4\%+2\%=38\%$ (**\$20,000**) until U+4

Financial Wealth:

- Average household depletes about \$ 3,000 – some, but not much
- Almost entirely compensated by extra saving before and after

Results 3/3: Portfolio Reallocation



Results on Portfolio Reallocation

- Pre-unemployment, holdings of safe/liquid assets increase, holdings of risky/illiquid decrease
- During unemployment, both are depleted, but the liquid ones more so
- Afterwards most re-saving is placed in the risky asset again, so that by U+4 the risky share is about where it was in U-4

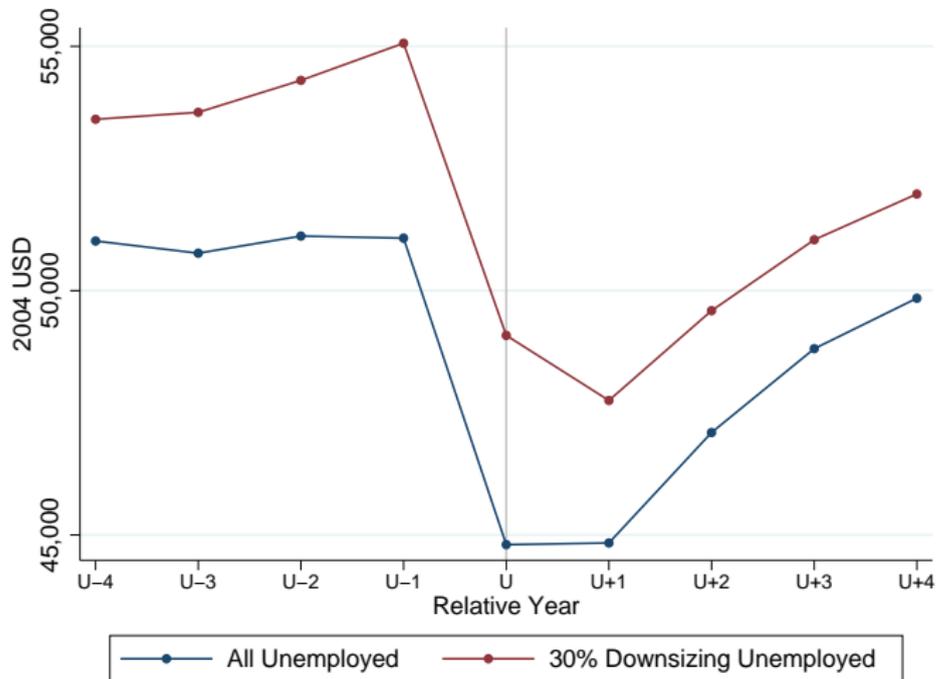
Robustness 1/2: Exploiting Plant Downsizings

- The above methodology with calendar year and individual fixed effects removes any confounding factors that:
 - ▶ vary by individual, but for a given individual are the same each period
 - ▶ vary by period, but for a given period are the same for each individual
- But what if there are confounding factors varying by both individual and period at the same time?
 - ▶ A confounding factor scenario: Someone going through a personal crisis in some periods might then become unemployed and change his saving behavior
 - ▶ A reverse causality scenario: Someone winning big in the stock exchange in some period might therefore decide to become unemployed

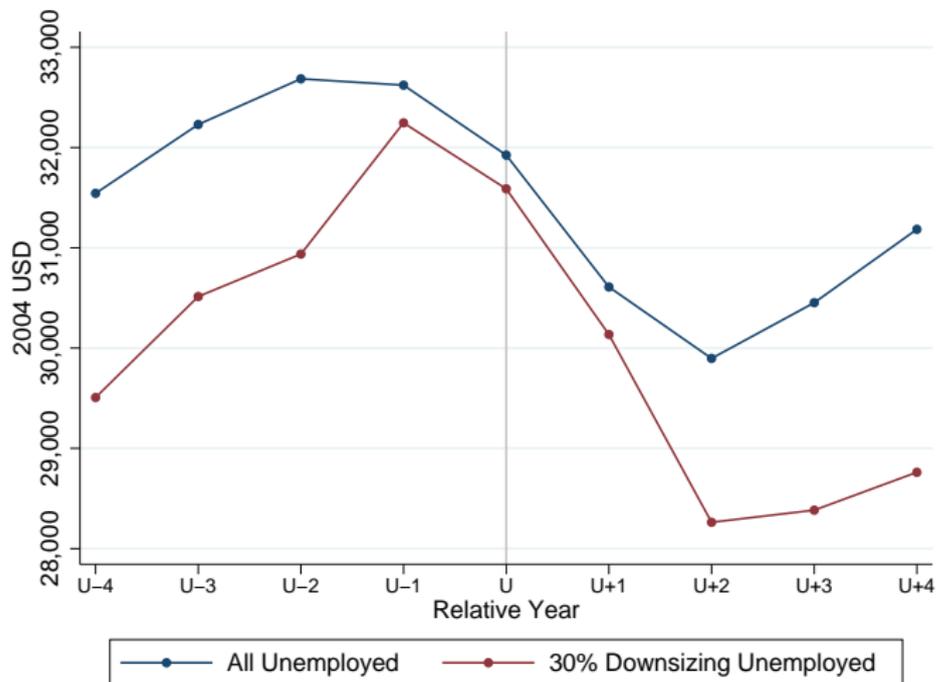
Robustness 1/2: Exploiting Plant Downsizings

- To remove such personal idiosyncracies, a robustness analysis focuses on job losses due to plant downsizings
- We require plant downsizing rates $\geq 30\%$ (robust to other fractions, e.g. 50% as in earlier version), excluding within-firm movers
- Plant age ≥ 4 yrs, workforce ≥ 10 , no downsizing in last 3 years
- The following graphs show that our main results (all unemployed, to keep a larger sample size) do not differ in a relevant way from the downsizing ones: Suggests the extreme scenarios pondered above are not of relevance in our sample

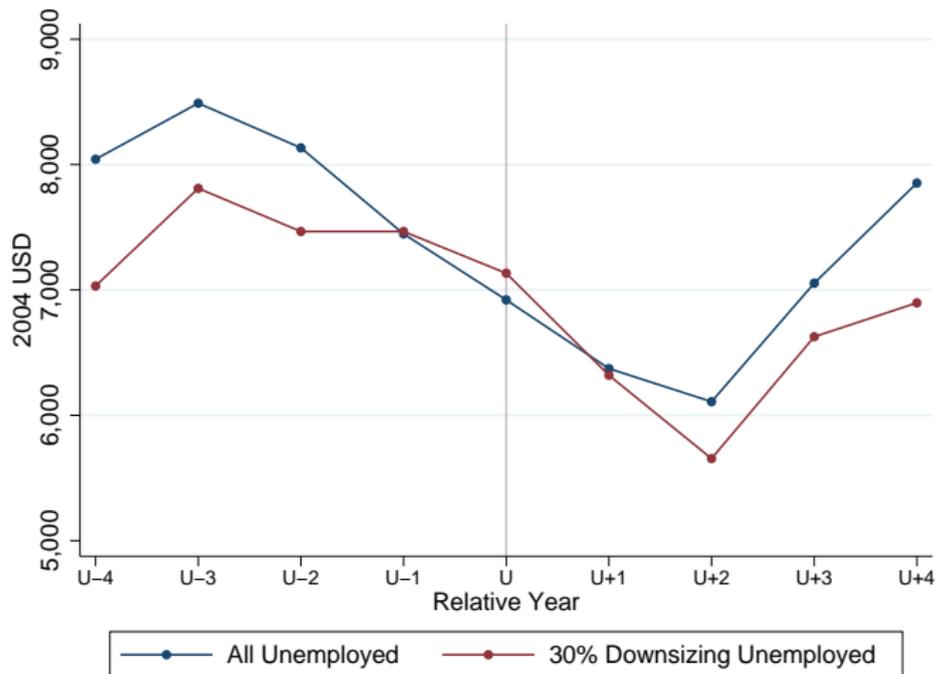
Exploiting Plant Downsizings: Income



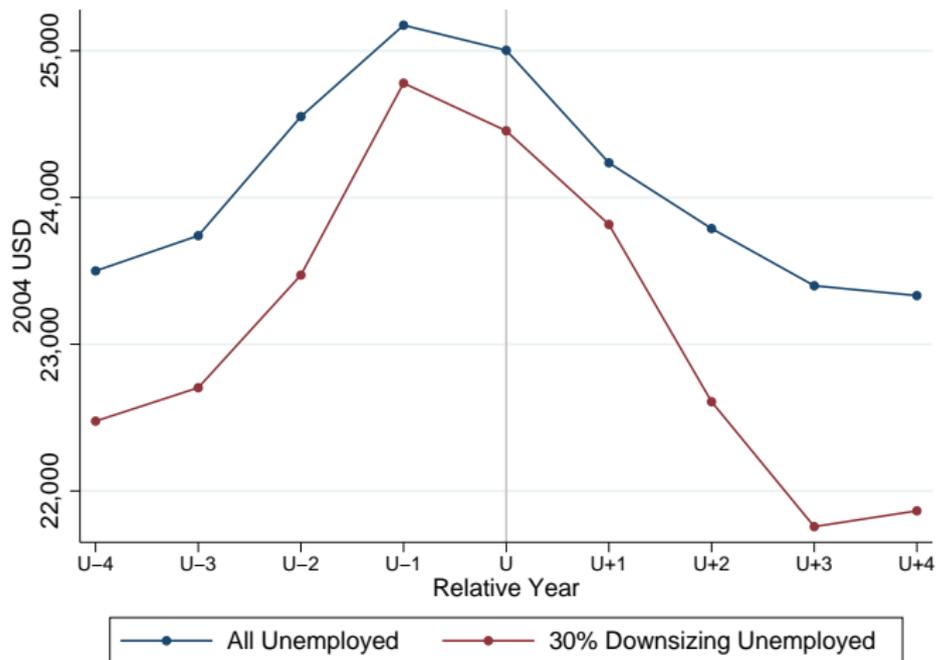
Exploiting Plant Downsizings: Financial Wealth



Exploiting Plant Downsizings: Risky Assets



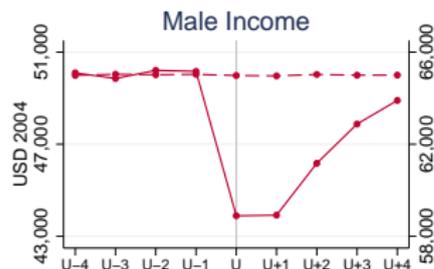
Exploiting Plant Downsizings: Safe Assets



Robustness 2/2: Placebo Sample

- To illustrate how well our fixed effects remove any influences not due to the job loss, we apply the same methodology to households that do not suffer job loss
- We match them to the job-losing households by age and education
- Placebo households are randomly allocated "job loss" year in one of our base years (1999-2003)

Robustness 2/2: Placebo Sample



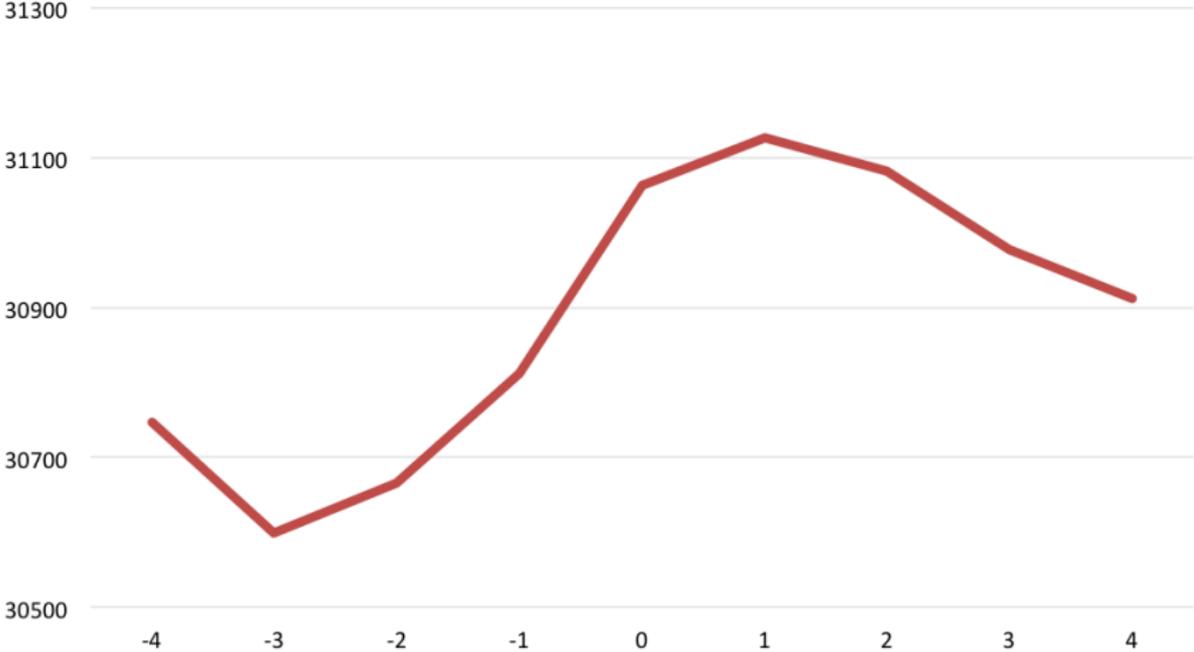
—●— Unemployed sample (Left) - -●- - - Placebo (Right)

Summary

- Find that even in Norway, with its relatively extensive UI benefits, households do also draw on private wealth
- On average no permanent traces in their wealth, extra spending compensated for by extra saving before and after
- This has to be seen in a context in which income does also almost entirely recover by U+4
- They also change the way they invest: Could affect financial markets when there is a lot uncertainty in the labor market!
- Note these are all averages:
 - ▶ Some households may be in more trouble: See our companion paper
 - ▶ Yet policy must be made for some average household...

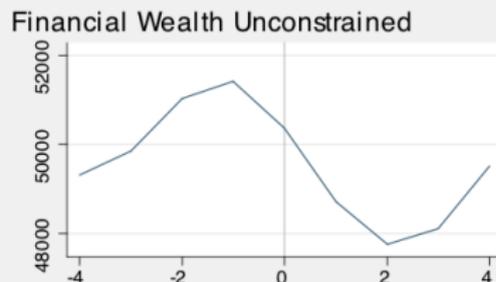
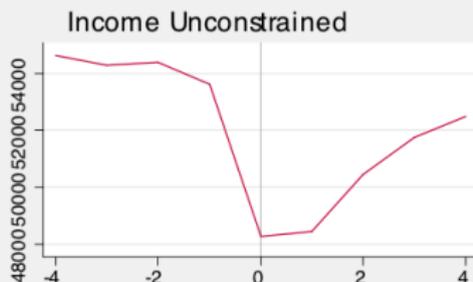
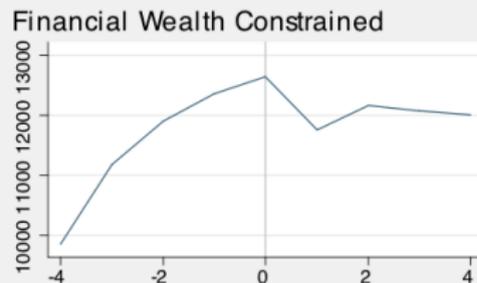
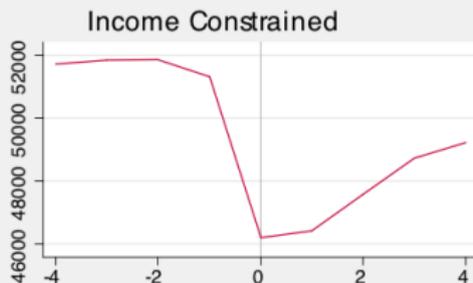
Appendix: Spousal Labor Income Response

Spousal Labor Income

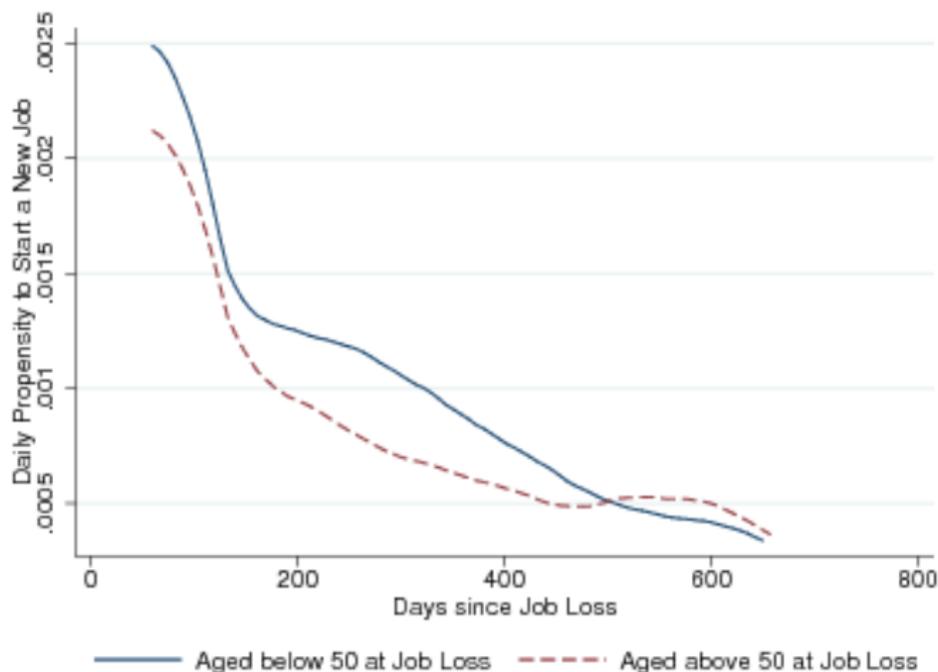


Appendix: Prepared vs. Non-Prepared

Sample split by Financial Preparedness



Companion Paper 1/3: Hazard with vs. without Severance Pay



Companion Paper 2/3: Effect of Severance Pay on Search Duration

Table : Baseline Specification, Main Outcomes

	Completed Duration	Fraction Re-Employed After: 12 Months	15 Months	18 Months
T	45.16 (33.43)	-6.20* (3.56)	-7.76** (3.54)	-7.06** (3.55)
z	20.20 (19.65)	-1.41 (2.17)	-0.90 (2.15)	-2.44 (2.11)
Tz	-6.06 (19.69)	0.64 (3.16)	0.94 (3.12)	3.31 (3.07)
Cons	336.24*** (16.26)	59.78*** (2.60)	63.39*** (2.55)	64.80*** (2.53)
N	2,882	2,882	2,882	2,882

Note: The table provides the regression discontinuity estimates based on Equation ?? and using our baseline bandwidth of 2 years on each side. T is the indicator for being aged above 50 and hence eligible for severance pay, z is the age control (age-50) on the left side and Tz allows another age control on the right side of the threshold. The effect on non-employment duration in days is estimated with durations censored after 2 years. Standard errors, clustered by plant, are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Companion Paper 3/3:

Effect of Severance Pay decreasing in prior Savings

Table : Stratifying By Wealth Measures: Above Median (D). Outcome: Re-Employment 15 Months

	Income	Wealth	Fin Wealth	Deposits
T	-12.20** (5.34)	-9.35* (5.40)	-15.09*** (5.36)	-16.41*** (5.38)
T*D	9.85 (7.56)	4.16 (7.57)	15.50** (7.56)	17.88** (7.55)
T + T*D	-2.34	-5.19	0.41	1.46
Prob > F(1,2684)	0.66	0.33	0.94	0.78
N	2,882	2,882	2,882	2,882

Note: This table provides the regression discontinuity estimates of Equation ??, augmented by an indicator variable for whether the value of different income and wealth measures (all deflated to 2004 values) exceeds the sample median, as well as interactions between that indicator and the other regressors. Standard errors, clustered by plant, are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The table does also provide the sum of the coefficient on being above the threshold and the coefficient on the interaction of the threshold dummy with the dummy for income or wealth above the median. The p-value for the F-test with the null hypothesis that this sum is zero is reported in the line below. None of these 16 tests rejects this Null at the 10% level.