Unemployment Insurance, Disability Insurance, and Social Security Policies

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[1]With editing and conceptual assistance from ChatGPT and Cursor.

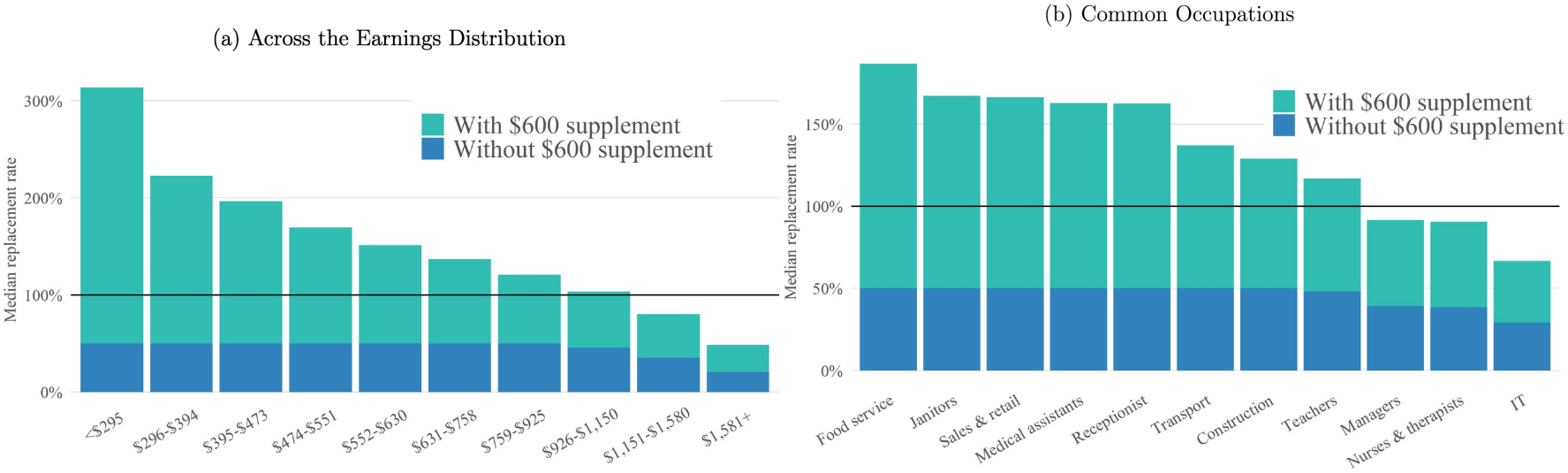
Pandemic UI Program Expansions

During the COVID-19 pandemic, UI programs were greatly expanded:

- **Federal supplement:** Extra \$600/week (Mar–Jul 2020 *CARES Act*), then \$300/week (*Lost Wages Assistance*, Aug/Sep; *American Rescue Plan*, through Sep 2021)
- **Eligibility widened:** Self-employed, gig, and contract workers
- **Benefit duration:** Extended by up to 53 weeks
- **Key result:** Many received more UI than prior wages
- **Debate:**
  - Did generous UI slow labor market recovery?
  - Was the program efficient?

Policy research: Expansions offered natural experiments for studying UI effects on duration and labor supply (moral hazard)

Replacement Rate



Ganong et al., "US unemployment insurance replacement rates during the pandemic," 2020. Journal of Public Economics. Data from JP Morgan Chase Institute. this figure shows the fraction of pre-tax earnings that are replaced by unemployment benefits (statutory replacement rates). In panel (a) the bins correspond to deciles of the pre-job loss weekly earnings distribution for the unemployed and we report replacement rates for the median unemployed worker in each bin. Panel (b) shows the median fraction of pre-tax earnings that are replaced by unemployment benefits (statutory replacement rates) for workers in eleven of the most common occupations.

Learning goals

- Learn the technical details of Unemployment Insurance, Disability Insurance, and Social Security
- Evaluate where these programs alleviate or exacerbate market failures
- Critically assess the arguments for and against these programs
- Understand existing problems and potential reforms with these programs

Government-provided insurance

- Today we are discussing government-provided insurance!
- Three types:
  - Unemployment Insurance
  - Disability Insurance
  - Social Security
- Help individuals insure agaifnst different types of risk
- They are much more complicated than the insurance models we have discussed, but the principles are the same
- They exist due to underprovision in the private market
- Mandatory and funded by broad-based taxes
- Eligibility requirements to determine whether you can receive insurance payout
- What market failure does mandatory participation solve?

14.1

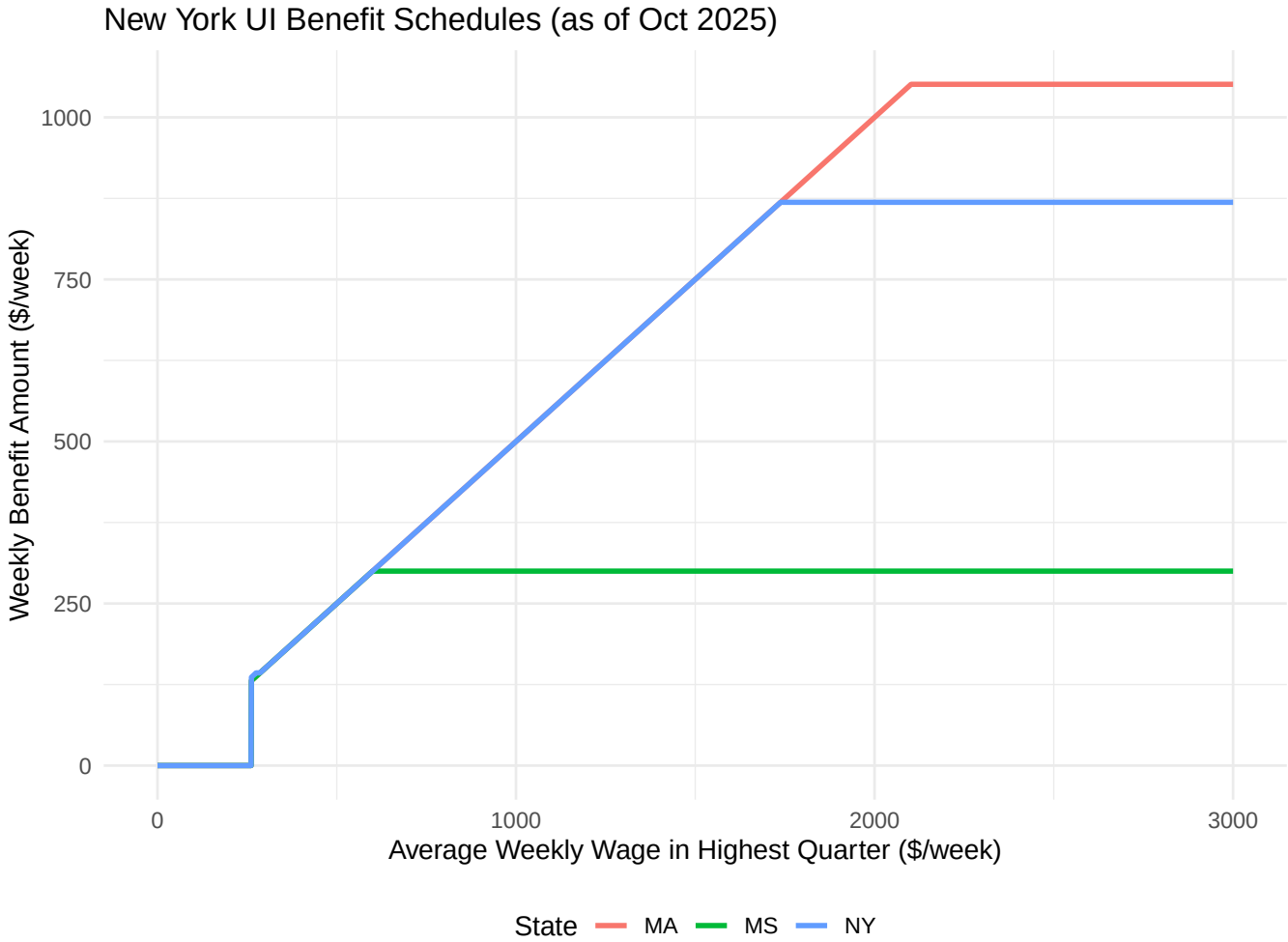
Comparison of the Features of UI, DI, and WC

Characteristic	UI	DI	WC
Qualifying Event	Job loss, job search	Disability	On-the-job injury
Duration	26-65 weeks	Indefinite	Indefinite (if verified)
Difficulty of verification	Job loss: easy Search: impossible	Somewhat difficult	Very difficult
Average after tax replacement rate	47%	60%	89%
Variation across states	Benefits and other rules	Only disability determination	Benefits and other rules

Unemployment Insurance

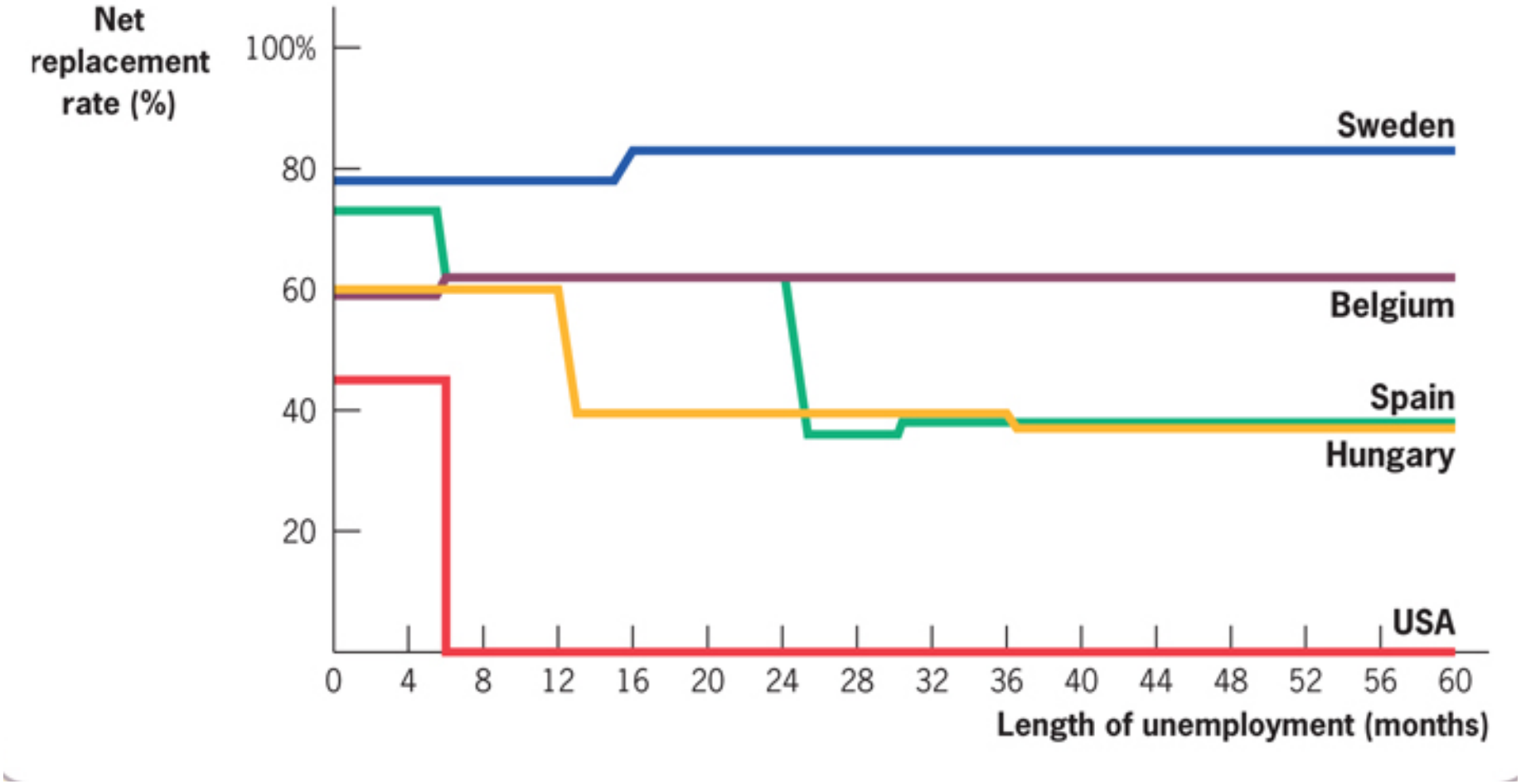
- Mandated by the federal government, run by states
- Funded by payroll tax levied on employers, partially "experience-rated" (firms with more layoffs pay more)
- Eligibility: minimum earnings, layoffs only, looking for a job.
- Imperfect take-up (2/3 of eligibles claim benefits)
- Minimum and maximum benefits, average replacement rate of 46% (benefits divided by previous earnings)
- Benefits last for 26 weeks, extensions possible depending on macroeconomic conditions (up to 99 weeks during recessions)

Selected unemployment benefit schedules in 2025



Max weekly UI benefits in 2025: from $235 in MS to $1,051 in MA and $869 in NY. Sources: DOL, https://oui.doleta.gov/unemploy/content/sigpros/2020-2029/January2025.pdf, NY State Department of Labor https://dol.ny.gov/system/files/documents/2025/10/p832-how-your-weekly-ui-benefits-are-calculated-10-25_0.pdf.

Duration of UI Benefits



For 2002, see Gruber

Optimal search effort model[2]

- How does someone who is unemployed respond to insurance?
- Employed consume $c_E = w - \tau$; unemployed get $c_U = B$.
- Choose search effort $e \in [0, 1]$.

$$\max_e \; e\,u(w-\tau) + (1-e)\,u(B) - e^2$$

$$\implies \; e^*(B) = \tfrac{1}{2}\big[u(w-\tau) - u(B)\big]$$

Higher benefits make unemployment less painful $\Rightarrow e(B)$ tends to fall, so unemployment share $1 - e(B)$ tends to rise.

[2] This mirrors that scary-looking Pset question

Why search effort matters for financing

- Government balances the budget each period: taxes on e workers finance benefits to $(1-e)$ unemployed

$$e\,\tau = (1-e)\,B \quad \Rightarrow \quad \tau(B,e) = \frac{1-e}{e}\,B.$$

Government's goal:

$$\max_{e} \quad e\,u(w-\tau) + (1-e)\,u(B) - e^2$$
$$\text{s.t.} \quad \tau(B) = \frac{1-e}{e}\,B$$
$$e = e^*(B) \quad \textit{from moral hazard}$$

- If $B \uparrow$, two effects:
  - *Mechanical:* $c_U \uparrow$, $c_E \downarrow$ via higher τ.
  - *Behavioral:* $e \downarrow$ (moral hazard) $\Rightarrow$ smaller tax base.
- Ideally B perfectly smooths consumption, but moral hazard on effort constrains choices.

Balancing insurance and incentives

Chetty's sufficient-statistic formula (see derivation) and

Using similar steps with envelope theorem as optimal income tax

$$\underbrace{\frac{u'(c_U) - u'(c_E)}{u'(c_E)}}_{\Delta\text{MU of cons. smoothing}} = \underbrace{\frac{1}{e}\frac{d(1-e)}{dB} \cdot \frac{u(c_E) - u(c_U)}{u'(c_E)}}_{\text{moral-hazard (fiscal) cost}}$$

Using the budget constraint, we can simplify the fiscal cost to:

$$\frac{u'(c_U) - u'(c_E)}{u'(c_E)} = \frac{\varepsilon_{1-e,\,B}}{e}$$

- The $1/e$ factor: benefits are financed by the employed share.
- $\varepsilon_{1-e,\,B} \equiv \dfrac{d(1-e)}{dB} \cdot \dfrac{B}{1-e}$ is benefit elasticity of nonemployment.
- Raise B til **insurance gain per \$** equals the **incentive cost per \$**.

Consumption-based rule (CRRA punchline)

- With CRRA utility $u(c) = \frac{c^{1-\gamma}}{1-\gamma}$, $-u''/u' = \gamma/c$.
- For a small consumption gap:

$$u'(c_U) - u'(c_E) \approx -u''(c_E)(c_E - c_U).$$

- Substitute into the MU formula:

$$\boxed{\gamma \left(\frac{c_E - c_U}{c_E} \right) = \frac{\varepsilon_{1-e,\,B}}{e}}$$

- Bigger $|\varepsilon_{1-e,\,B}|$ or smaller $\gamma \Rightarrow$ less generous UI.
- **Goal:** Measure c_E, c_U, employment rate, and estimate $\varepsilon_{1-e,\,B}$ and γ to evaluate UI generosity.

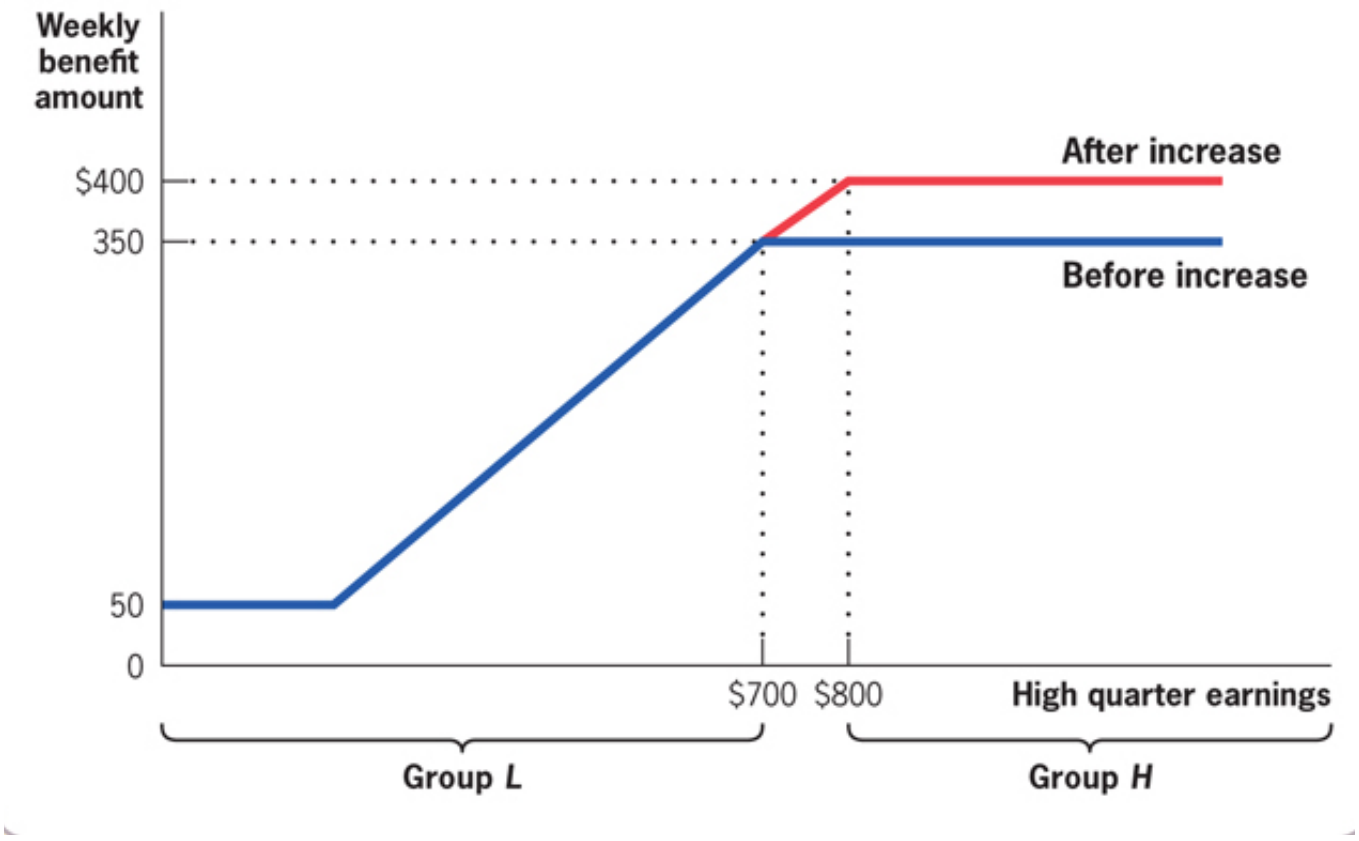
Evaluating UI

UI programs vary widely in their benefit levels, duration, and how benefits change over the course of an unemployment spell.

Factors influencing the optimal structure of UI:

- value of insurance (affected by risk aversion and presence of alternative means of consumption smoothing)
- moral hazard estimates:
  - state-level and earnings variation provides natural experiments
  - Challenge: as people find jobs, they exit sample – causing bias in estimation of job finding rates
  - evidence that jobs may be found when benefits are about to expire.
  - Controversy regarding measurement — exit from UI not the same as finding a job.
- insuring against aggregate risk requires changing UI duration/structure with macroeconomic conditions

Diff-in-diff UI studies (eg. Meyer 1989)



Meyer (1989): Difference-in-differences comparison of workers earning more than \$800 (who received a benefit increase) to workers earning less than \$700 (who did not). Finds that a 10% increase in UI benefits led to an 8% increase in UI duration, implying an elasticity of 0.8.

Hazard Rate for UI Effects with Survival Analysis

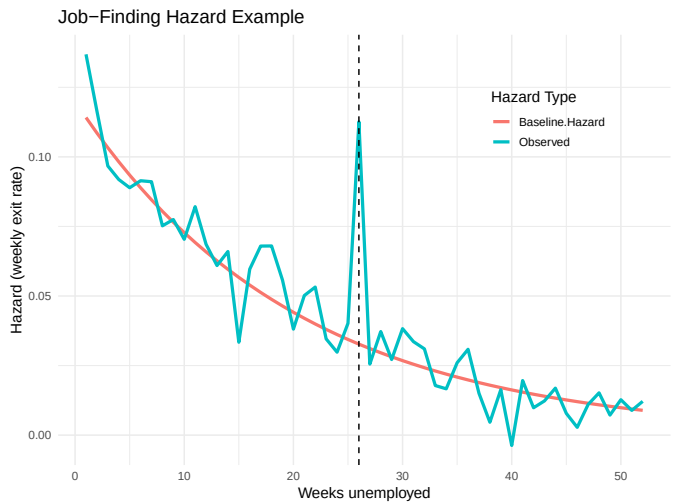
- **Goal:** Estimate how benefits affect job finding hazard:

$$h_t = \frac{\text{exits}_t}{\text{still unemployed}_t}.$$

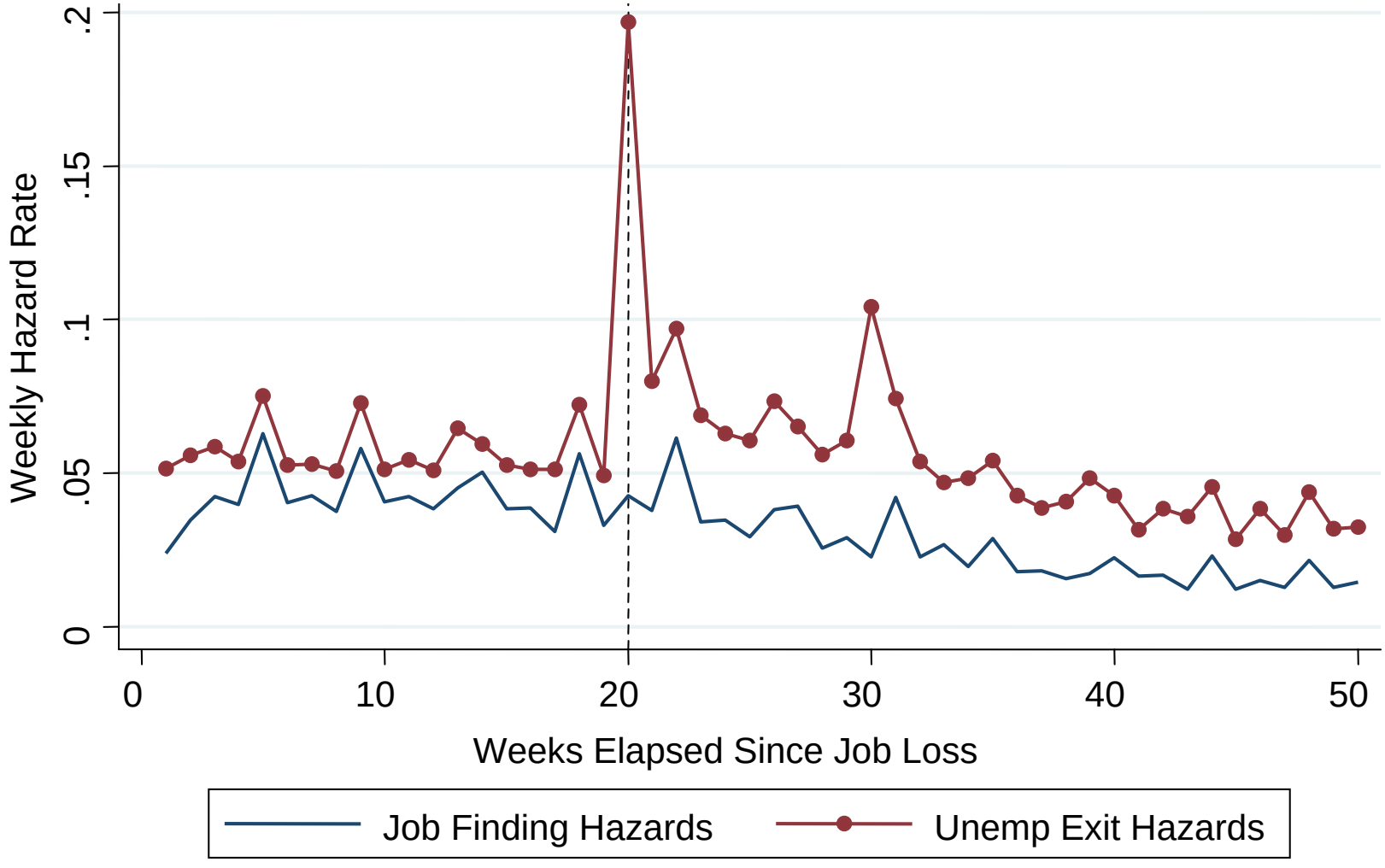
- **Problem:** As people find jobs, h_t biased by selection.
- **Solution:** Estimate **hazard rate** from survival function:

$$S_t = \prod_{k=1}^{t} (1 - h_k)$$

- *Intuition:* Deviations when UI changes imply moral hazard.



Job finding and unemployment exit rates



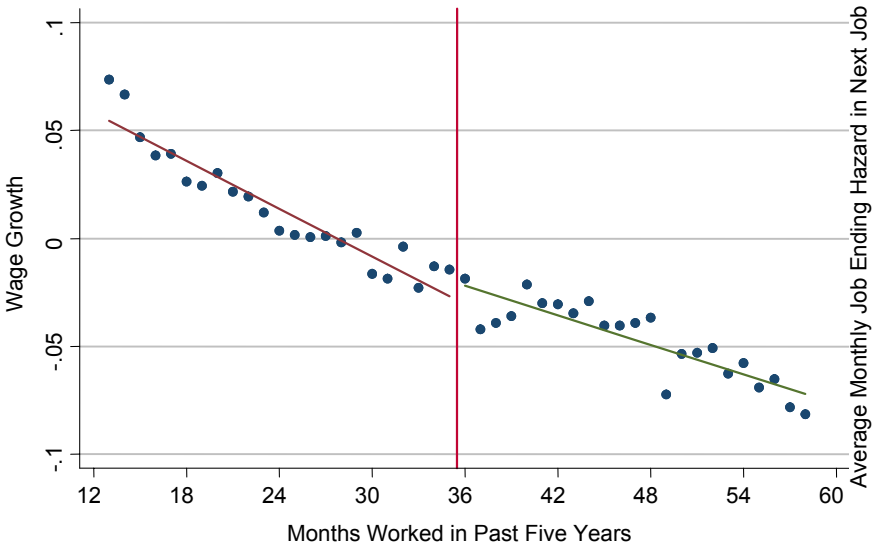
Card, David, Raj Chetty, and Andrea Weber "The Spike at Benefit Exhaustion: Leaving the Unemployment System or Starting a New Job?" American Economic Review Papers and Proceedings, May 2007, 97(2): 113-118.

Duration effects

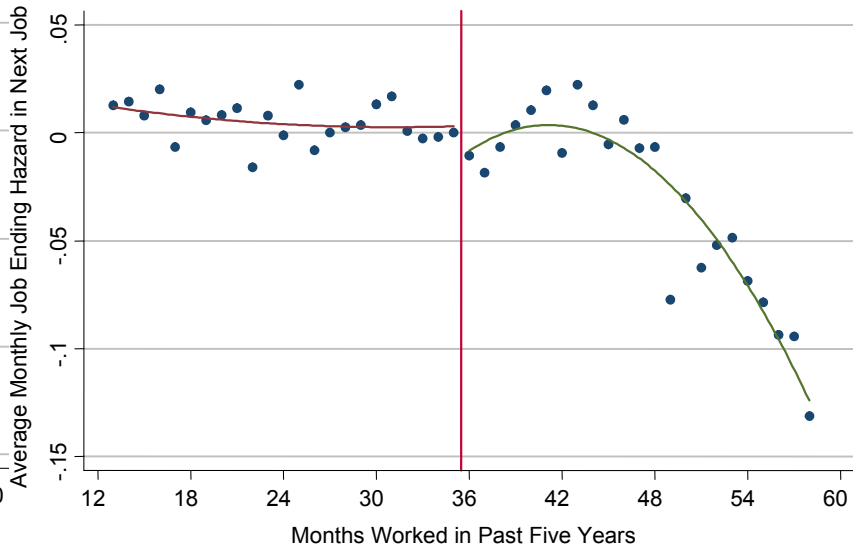
Some caveats to interpreting the duration effect as moral hazard:

- Quality of the job match may increase with a longer search, i.e. higher wages/stability (mixed evidence)
- The duration effect *may* be due to relaxing liquidity constraints rather than just consumption vs leisure trade-off. This suggests UI addresses a market failure (inability to borrow), strengthening the case for UI.

RDD in duration/severance by work history (Card et al. 2007)



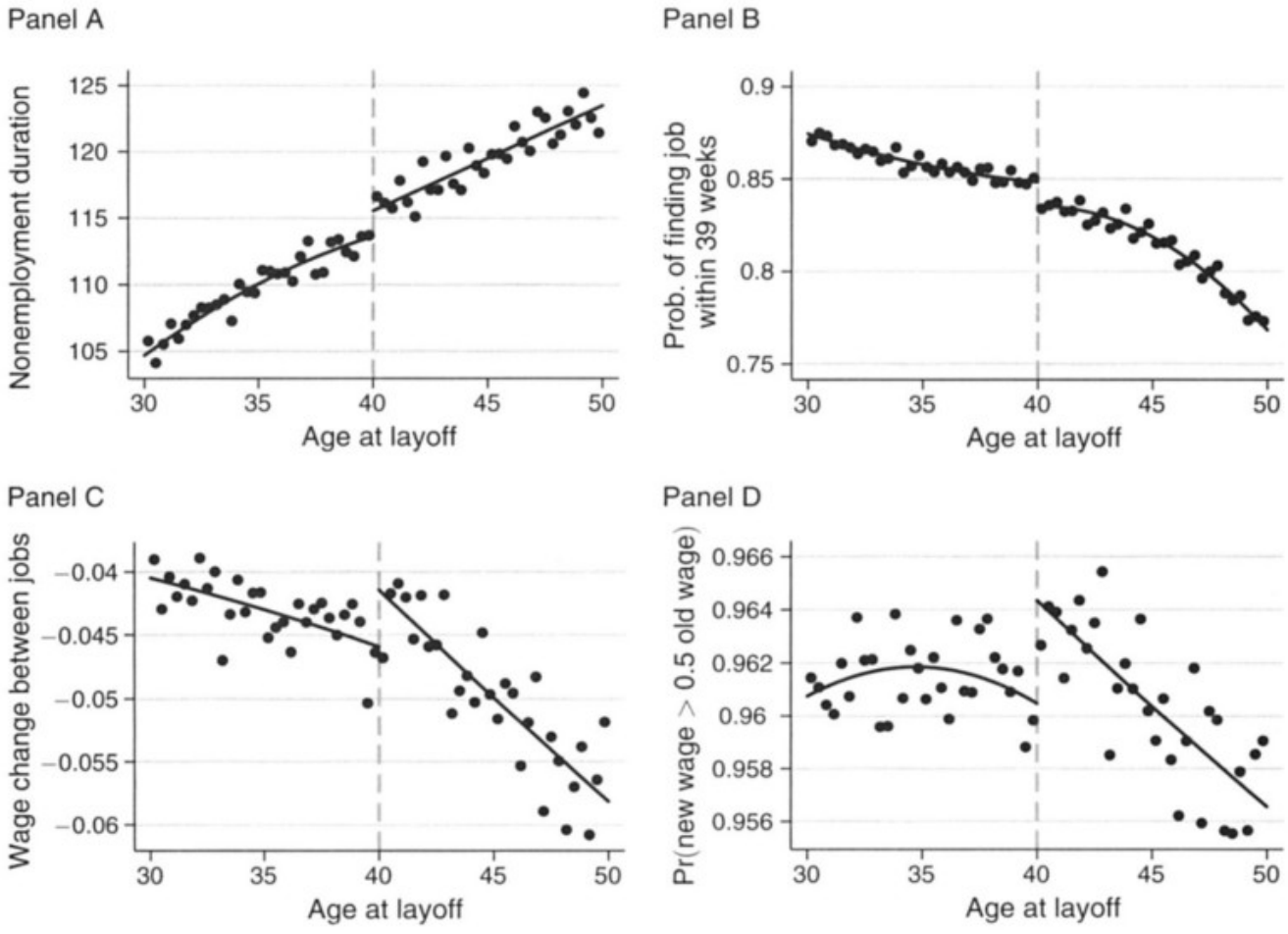
(a) Subsequent wages



(b) Job duration

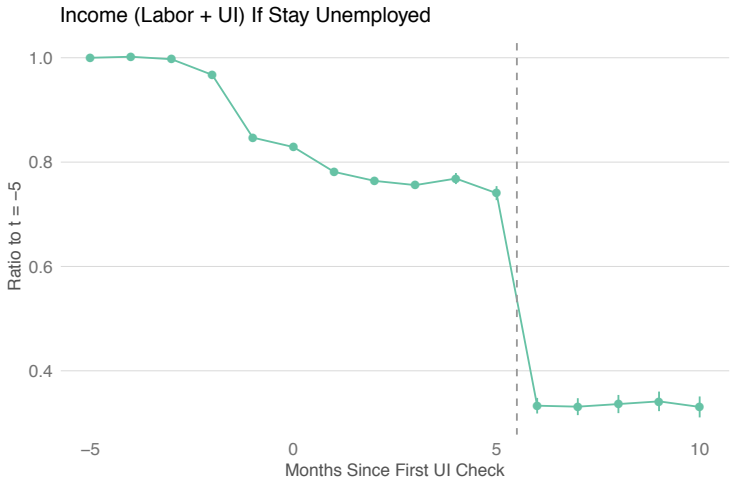
Card, Chetty and Weber, "Cash-On-Hand and Competing Models of Intertemporal Behavior: New Evidence from the Labor Market," The Quarterly Journal of Economics, 2007. Data from Austria. Individuals with less than 36 months of employment in the past 5 years receive 20 weeks of benefits, those with 36 months or more receive 30 weeks and severance pay.

RDD by age of worker (Nekoei and Weber 2017)

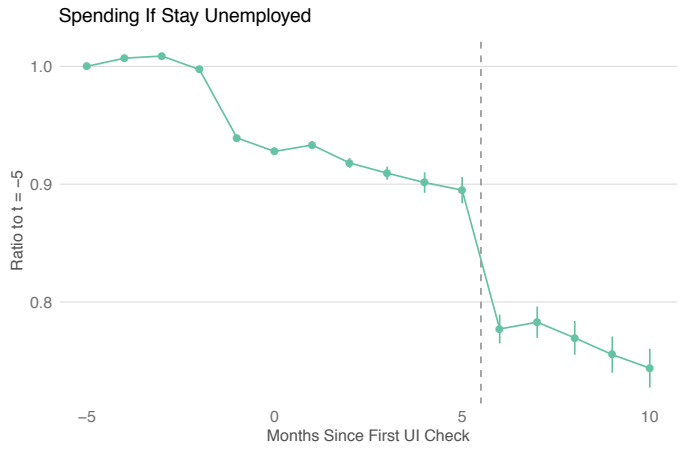


Regression discontinuity (RDD) at age 40 in Austria, where a 9-week UI extension kicks in. Running variable is age at layoff. Panels: (A) nonemployment duration, (B) probability of finding a job, (C) wage, (D) probability new wage $>$ 0.5 $\times$ old wage. Figure source: Nekoei and Weber (2017), American Economic Review.

Consumption smoothing (Ganong and Noel 2019)



(a) Income relative to $t = -5$



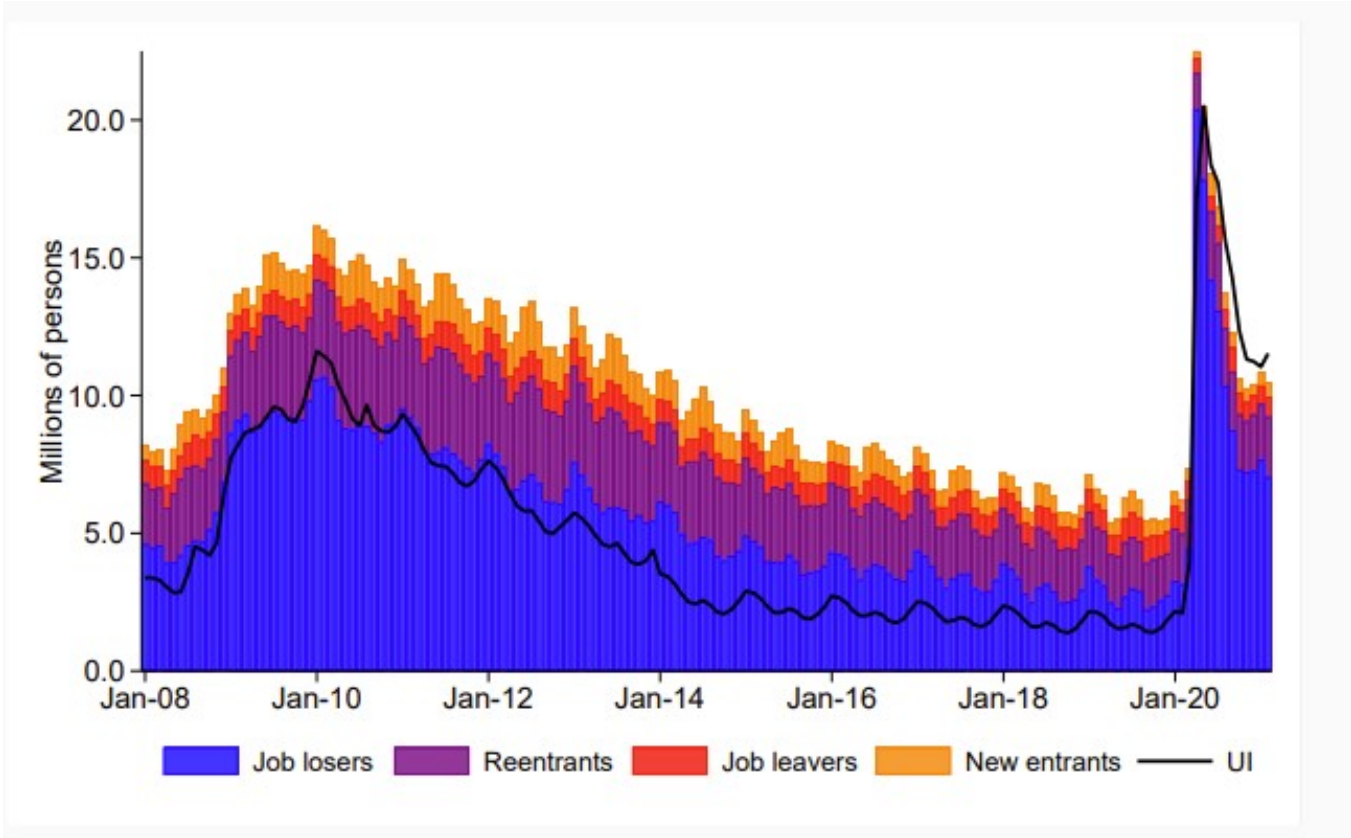
(b) Consumption relative to $t = -5$

Both panels use JPMorgan Chase Institute (JPMCI) account data from Ganong and Noel (2019) showing the share of income (left) and consumption (right) relative to five weeks before UI receipt ($t = -5$) for individuals who remain unemployed. The results illustrate how UI receipt affects income and spending dynamics around the time of job loss and benefit exhaustion.

Automatic extension triggers

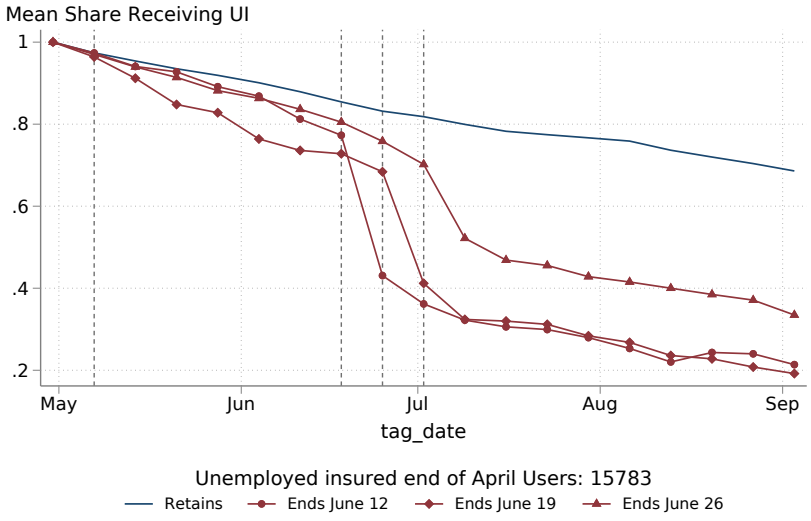
- During times of crisis, UI benefits are extended upon a vote
- Some argue that this is inefficient and creates uncertainty
- Others argue an auto-trigger based on economic conditions would be better
- How does an auto-trigger improve efficiency?
- How does an auto-trigger potentially reduce efficiency?

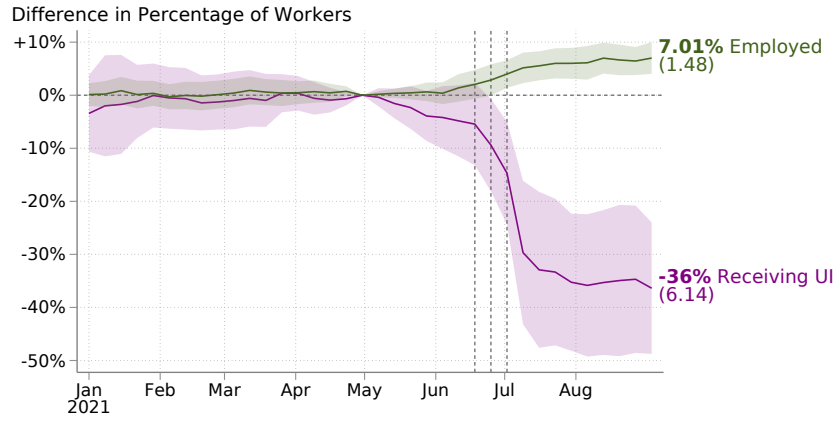
Pandemic spike

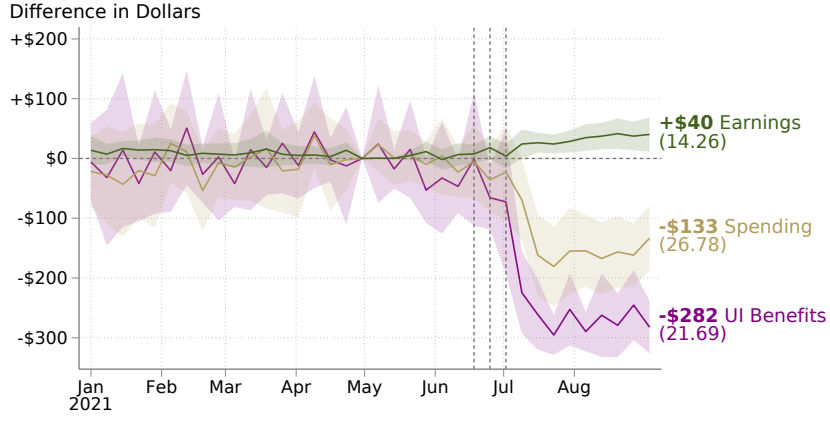


Source: Chodorow-Reich via Ganong, building on work in Chodorow-Reich and Karabarbounis 2016

June 2021 Withdrawals







Coombs et al., "Early Withdrawal of Pandemic Unemployment Insurance: Effects on Earnings, Employment and Consumption," Working Paper. Data from Earnin. Individuals that were unemployed and receiving UI in the last week of April. UI recipient cohorts assigned by week that their state withdrew from expanded unemployment benefits.

Aside: Workers' Compensation

- Insurance against on-the-job accidents. This is no-fault insurance, it eliminates potentially costly lawsuits.
- Mandated by states (all states adopted), provided in most cases by private companies, no federal standard.
- Some groups covered by separate federal programs (federal employees, miners with black lung disease, some others)
- Medical costs coverage and compensation for lost wages.
- Approximately 2/3 of wages supposed to be replaced in most states, but details vary substantially.

Disability Insurance

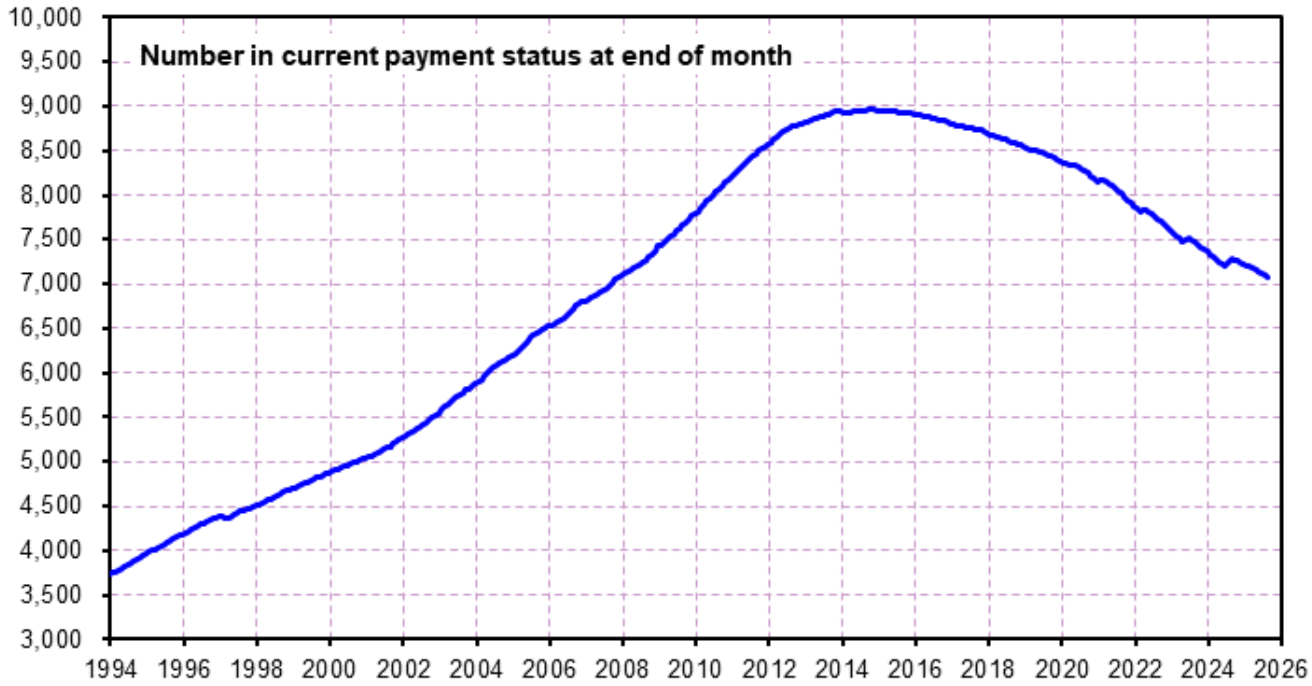
Work capacity is uncertain: illness, injury, or chronic conditions can permanently reduce earnings ability.

- Provides **long-term earnings protection** for workers unable to work
- Private DI is **underprovided** due to adverse selection and moral hazard
  - 51M workers lack private coverage (Council for Disability Income Awareness)
- **Key challenge:** verifying disability is costly and prone to false positives/negatives

Disability Insurance in the U.S.

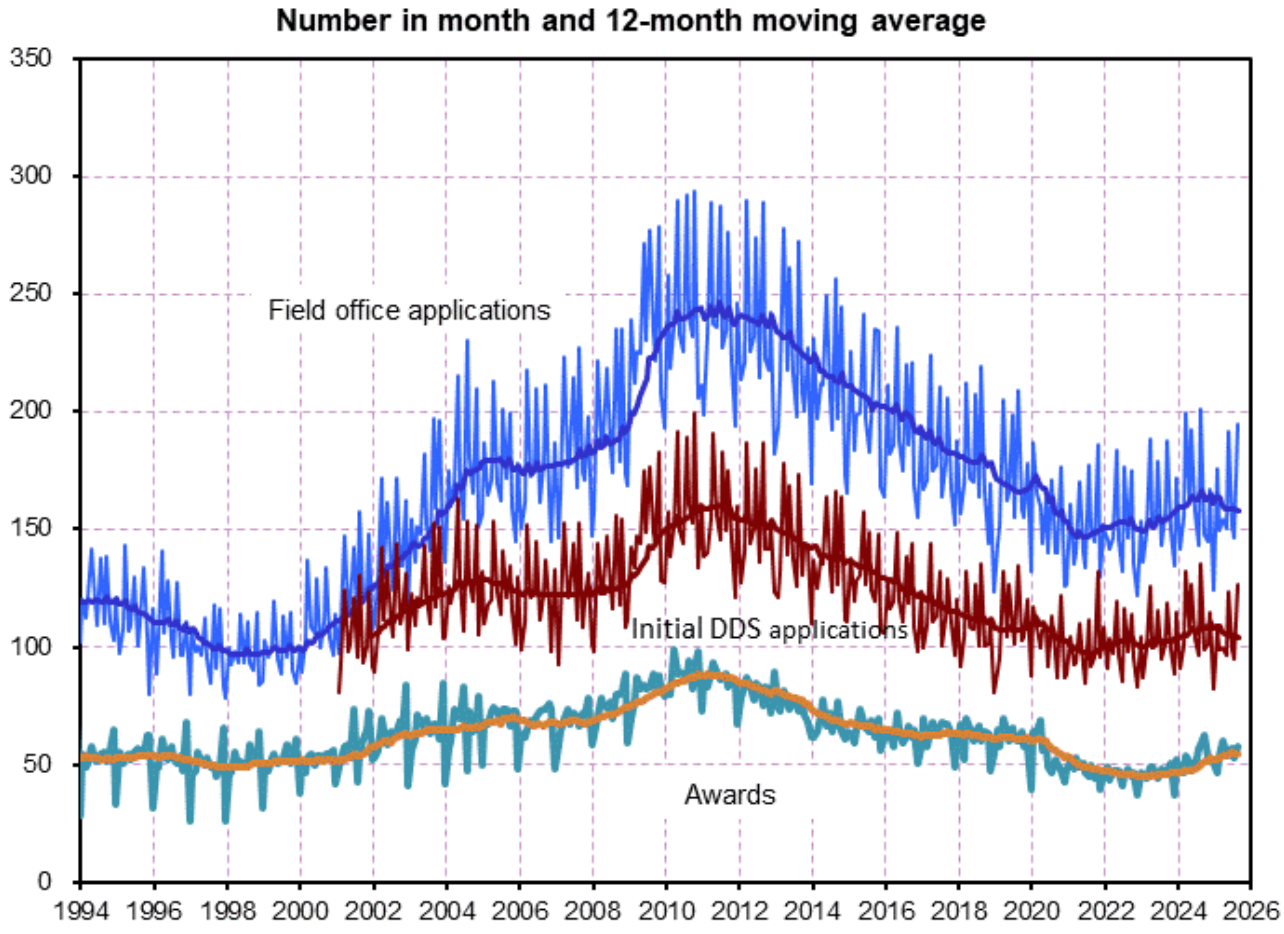
- Part of Social Security's **OASDI** program (Old Age, Survivors, Disability Insurance)
- Spending: **$155B in 2024** ($\approx 11.6\%$ of OASDI)
- Enrollment peaked in mid-2010s, now declining
- **Why the change?**
  - More insured (higher female labor force participation)
  - Drop in applications and higher denial rates
  - Expanded qualifying conditions (back pain, arthritis, mental illness)
  - Aging population: many transition to retirement benefits
- Applications rose 30% during the Great Recession, then fell back
- 80% leave DI through retirement or death—why are spells so long?

DI recipients



In millions. Source: http://www.ssa.gov/OACT/STATS/dibGraphs.html

DI applications



Source: http://www.ssa.gov/OACT/STATS/dibGraphs.html

Eligibility and Benefits

- **Eligibility:**
  - Unable to work for at least 12 months
  - 40 "work credits", determined by earnings history (20 in last 10 years)
  - State Disability Determination Services decide medical eligibility ($\approx$ 33% initially approved)
  - Appeals process is lengthy and complex
- **Benefits:**
  - Replacement rate $\approx$ 60% of prior earnings
  - Average monthly benefit (2023): \$1,805
  - Eligible for Medicare after 2 years on DI

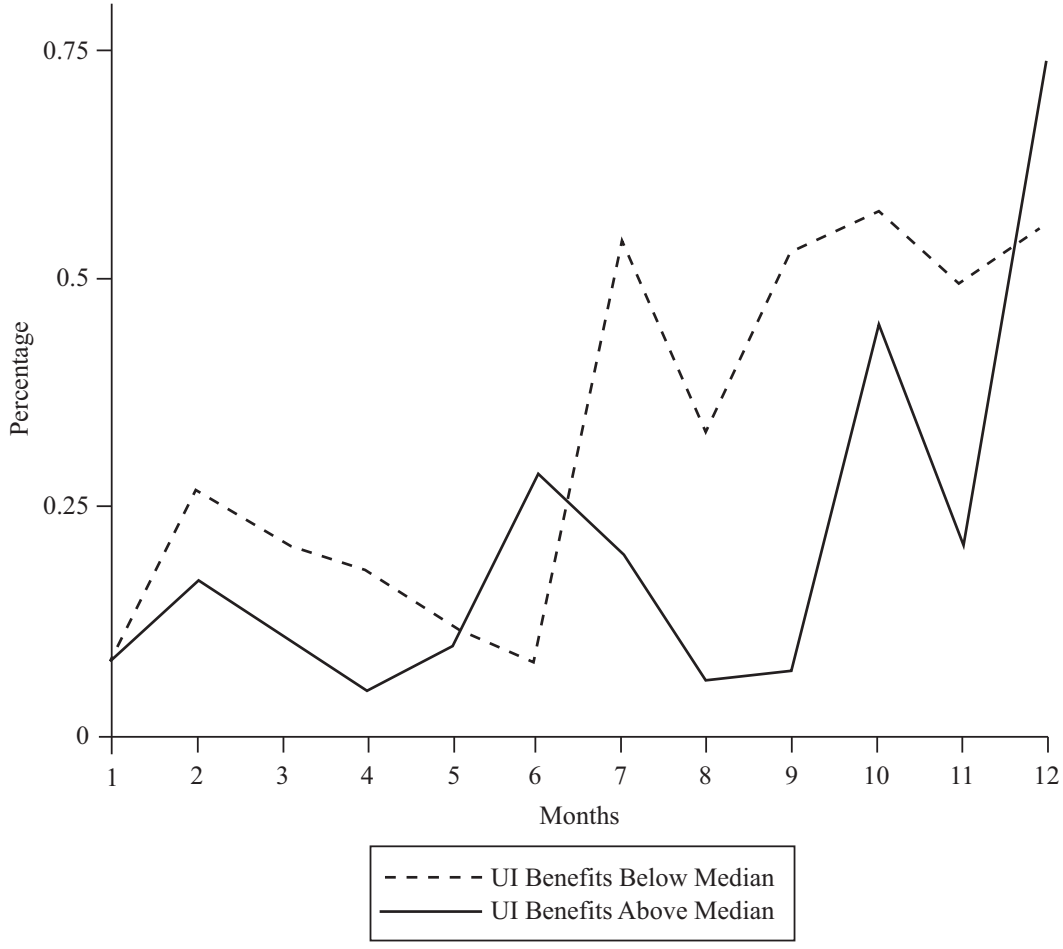
Problems with Assessing Eligibility

- DI assumes a binary state: disabled or not $\rightarrow$ often unrealistic
- Work ability may decline gradually, not disappear
- Two types of errors:
  - Type I: truly disabled individuals rejected
  - Type II: able-bodied individuals accepted
- Take-up is imperfect $\rightarrow$ many eligible individuals never apply

Moral Hazard in Disability Programs

- **Moral hazard:** withdrawing from labor force or exaggerating impairment
- Higher DI benefits $\Rightarrow$ more applications
- DI claims rise in recessions and when UI is less generous
- What other explanations could there be?

Does worse UI increase disability rates or applications?



Lindner, J., 2016. "How Do Unemployment Insurance Benefits Affect the Decision to Apply for Social Security Disability Insurance?" Journal of Human Resources 51(2): 406–446.

Let us talk about retirement

- How much income do you need each year to retire comfortably?
- How much do you need in total to fund that?
- How much should you save per week to reach that goal?
- How do your answers change if you expect to live to 120?
- Retirement planning is difficult without insurance.

Survey: Most Millennials and Gen Z Would Cut Retirement Savings Before Missing Debt Payments

Why retirement is a risk

- Everyone eventually reduces or stops working.
- The timing is uncertain (health shocks, job loss, preferences).
- Longevity is uncertain: you do not know how long you will live.
- Savings and annuities provide insurance against these risks.

Why is government involved?

- **Insurance failures**: private annuity markets are thin due to adverse selection.
- **Behavioral econ**: people undersave due to myopia/optimism.
- **Redistribution**: reducing poverty among the elderly; minimum income floor for life.
- **Generational consumption smoothing**: older generation can benefit from growth they helped create.
- **Pareto efficiency**: pay-as-you-go system meant first generation gained and others benefit if system remains solvent.
- **Economies of scale**: government can save on admin and marketing costs with a "one-size-fits-all" solution.

Annuities

- Paid for up front; benefits are paid only if the individual survives.
- Annuities insure against the risk of outliving one's savings.
- Without annuities, individuals risk either underconsuming or running out of money.

A simple model of annuities

- Two periods; survive to period 2 with probability $p = \frac{1}{2}$.
- Saving \$100 for period 2: consume \$100 if alive, leave \$100 if not.
- With an insurer: pay \$100 now, receive B if alive in period 2.
- Fair pricing: expected payout $pB = 100 \Rightarrow B = 200$.
- Mortality pooling increases *expected* consumption.

Annuities in practice

- Individually purchased annuities are rare; most insurance is employer-based.
- Two major plan types:
  - **DB**: defined benefit (pension-style fixed payment).
  - **DC**: defined contribution (401(k), IRA); no required annuitization.
- DC has displaced DB over time.
- Risk: DB (tenure, sponsor solvency), DC (investment risk, drawdown decisions, inflation risk).

Private annuity markets: why government?

- Money's worth of private annuities is typically 0.75–0.93.
- Adverse selection: purchasers tend to be longer-lived.
- Screening for longevity is difficult $\rightarrow$ overpriced annuities.
- Contrast with life insurance (opposite selection problem).

Social Security: Old-Age & Survivors Insurance

- Government-run retirement insurance (OASI; part of OASDI).
- Funded by payroll tax of 12.4%: 6.2% employee and 6.2% employer.
- Tax applies up to $160,200 (2023).
- Benefits based on Average Indexed Monthly Earnings (AIME).

How AIME is computed

1. Index each year's earnings by average wage growth.
2. Select highest 35 years of indexed earnings.
3. Compute average monthly earnings $\rightarrow$ AIME.

Maximum PIA at FRA (2023): \$3,627/month.

AIME	**PIA**
$\leq$ \$1,115	$0.90 \times$ AIME
\$1,115 $<$ AIME $\leq$ \$6,721	\$1,003.50 $+ 0.32 \times$ (AIME $-$ \$1,115)
\$6,172 $<$ AIME $<$ \$13,350	\$2,797.42 $+ 0.15 \times$ (AIME $-$ \$6,172)

Progressive formula for PIA.

Claiming age and adjustments

- Full Retirement Age (FRA) depends on birth year:
  - 1943–1954: 66; 1955–1959: $+2$ months per year; $\geq$ 1960: 67.
- Claiming at age 62 reduces benefits by about 30%.
- Delayed retirement credits: $+8\%$ per year up to age 70.
- Examples (2023): 62: \$2,572; FRA: \$3,627; 70: \$4,555.
- Earnings test before FRA: benefits reduced above a threshold.
- Spousal benefit: up to 50% of primary earner.

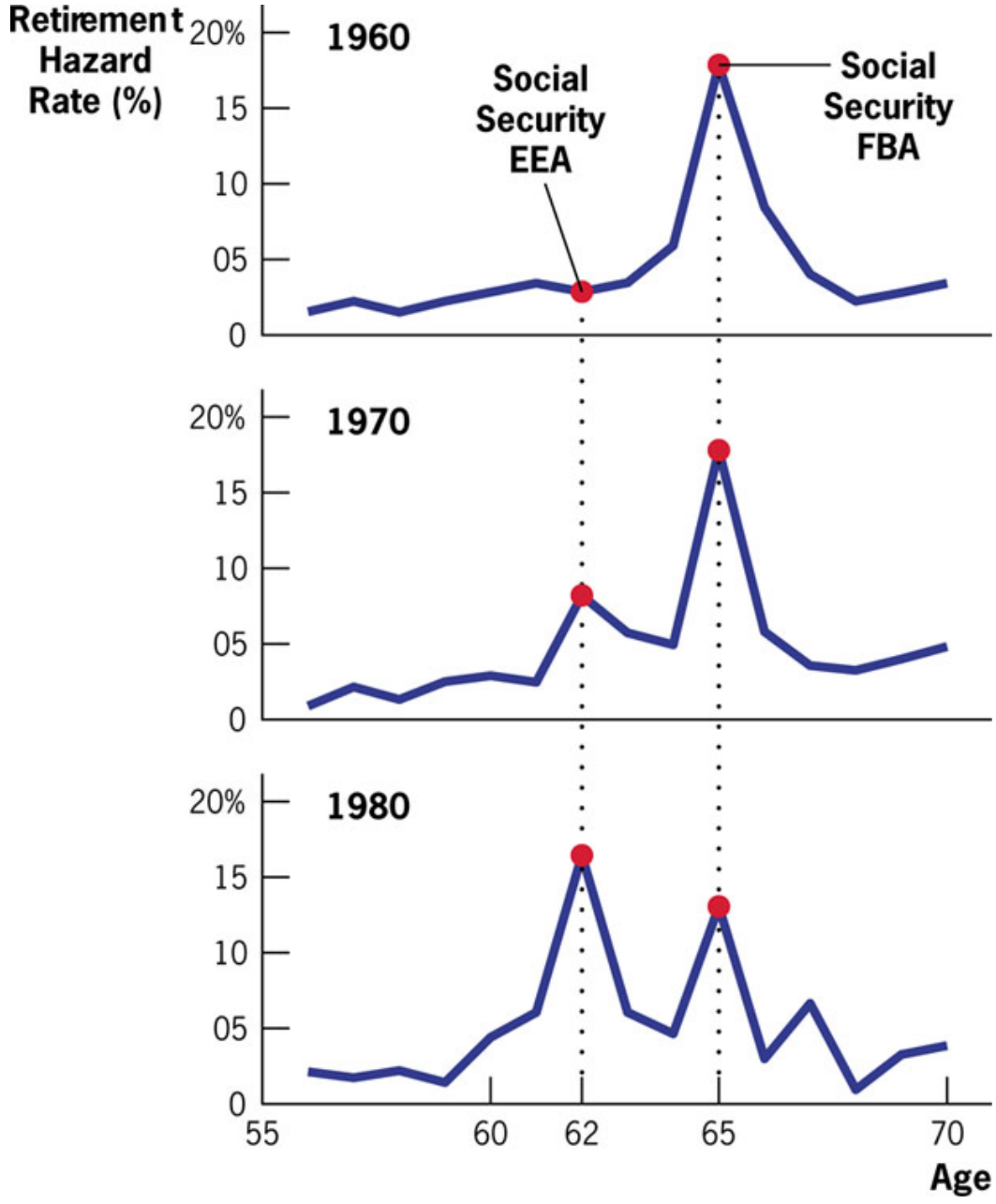
Implicit tax on work after age 62

- Payroll taxes still apply to earnings.
- Earnings test reduces benefits before FRA.
- Replacement rates flatten as earnings increase.
- These incentives discourage continued labor supply.

Moral hazard in retirement programs

- Does the program encourage earlier retirement?
- Consider: payroll taxes, earnings test, claiming-age adjustments.
- Cross-country evidence: high implicit taxes $\Rightarrow$ earlier retirement.
- Possible broader effects (fertility, savings).

Retirement hazard rate (EEA = 62)



Funding Social Security

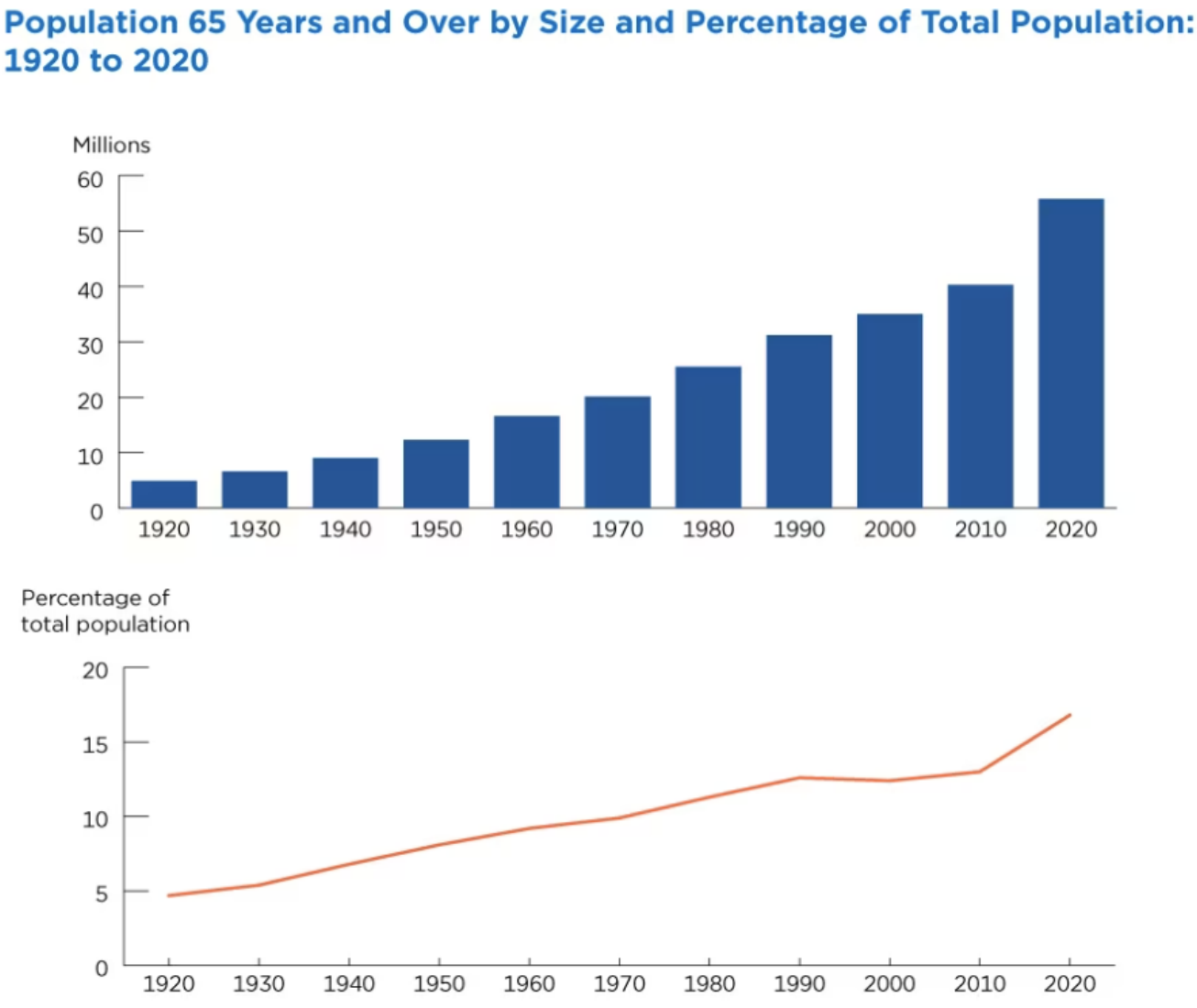
- Pay-as-you-go: early generations gain; sustainability depends on demography.
  - Benefits paid (2024): \$1,477.3B
  - Admin costs (2024): \$7.4B
  - Payroll + benefit taxes (2024): \$1,294.9B
  - Interest income (2024): \$69.1B
- Trust fund assets (2024): $\sim$ \$2.7T in Treasury securities.
- What problems could occur?

	OASI	DI	OASDI	HI
Benefits $>$ contributions	2010	2044[3]	2010	2025
Benefits $>$ contributions + interest	2021	$>$ 2099	2021	2028
Trust fund depleted	2033	$>$ 2099	2034	2033

Key dates from the Summary of the 2025 Annual OASDI Trustees' Report. OASDI means legally combining OASI and DI; HI is Medicare Hospital Insurance.

[3] Note: in the 2023 report DI cost exceeds income first in 2044; in the 2024/2025 report the Trustees project DI remains solvent through 2099.

Risks from an aging population



Source: U.S. Census Bureau.

Reform options

- Delaying reform increases necessary changes.
- Ways to reduce benefits:
  - Raise retirement age (EEA and/or FRA).
  - Modify PIA formula or index to CPI rather than wages.
  - Reduce COLA.
  - Means-test benefits for high earners.
- Ways to increase revenue:
  - Raise payroll tax rate.
  - Increase or eliminate the taxable earnings cap.
- Structural reforms:
  - Create a publicly managed investment fund.
  - **Privatization**: individual retirement accounts.
- Trade-offs: solvency, risk exposure, equity, transition costs, administrative complexity.

Conclusion

- Unemployment Insurance, Disability Insurance, and Social Security are critical government programs
- They fill market gaps created by imperfect markets
- They also have major flaws and create distortions
- They are also very popular, but haphazardly funded and administered
- Big opportunities to improve these programs and make them more efficient and equitable

Appendix A: From welfare to the first-order condition

Step 1. Welfare with endogenous effort Back

$$W(B) = e(B)\,u(c_E) + (1 - e(B))\,u(c_U), \qquad c_E = w - \tau, \;\; c_U = B.$$

Step 2. Balanced budget

$$e\tau = (1 - e)B \;\Rightarrow\; \tau(B, e) = \frac{1 - e}{e} B.$$

Differentiate $W(B)$:

$$\frac{dW}{dB} = e\,u'(c_E)\frac{dc_E}{dB} + (1 - e)\,u'(c_U)\frac{dc_U}{dB} + \big[u(c_U) - u(c_E)\big]\frac{d(1 - e)}{dB}.$$

Plug in: $dc_U/dB = 1$, $dc_E/dB = -\,d\tau/dB$, and from the budget

$$\frac{d\tau}{dB} = \frac{1 - e}{e} + \frac{B}{e^2}\frac{de}{dB}.$$

Appendix B: Simplifying the first-order condition

Back

Substitute the budget derivative into $\frac{dW}{dB} = 0$ and rearrange:

$$(1-e)\big[u'(c_U) - u'(c_E)\big] + \big[u(c_U) - u(c_E)\big]\frac{d(1-e)}{dB} = 0.$$

Divide by $(1-e)u'(c_E)$:

$$\boxed{\frac{u'(c_U) - u'(c_E)}{u'(c_E)} = \frac{u(c_E) - u(c_U)}{u'(c_E)} \cdot \frac{1}{e}\frac{d(1-e)}{dB}.}$$

Interpretation

- LHS: gain from smoothing consumption.
- RHS: fiscal cost: benefits shrink tax base; $1/e$ term scales by employed share.

If we approximate $\frac{u(c_E)-u(c_U)}{u'(c_E)} \approx \frac{B}{1-e}$, we reach Chetty's compact form:

$$\boxed{\frac{u'(c_U) - u'(c_E)}{u'(c_E)} = \frac{\varepsilon_{1-e,B}}{e}, \quad \varepsilon_{1-e,B} \equiv \frac{d(1-e)}{dB}\frac{B}{1-e}.}$$