Retirement Consumption and Pension Design

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Federal Reserve Board of Governors

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Motivation: Evaluating Welfare Effects of Pension Reforms

- **Large pension reforms in last 25 yrs**
  - Probably most substantial reforms in social insurance
  - Emphasis on incentives to **induce workers to retire later**

    ⇒ Steeper pension profiles

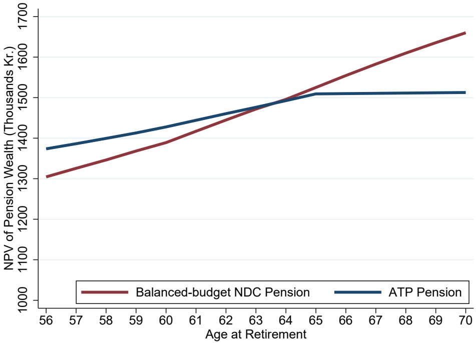

Figure: Profile of Swedish Pension Benefits: Pre vs Post NDC Reform

Motivation: Evaluating Welfare Effects of Pension Reforms

- **How to evaluate welfare effects of steeper profiles?**
    - Trade-off btw providing incentives and smoothing consumption
    - Yet, relatively little progress (relative to UI, DI, HI, etc.)

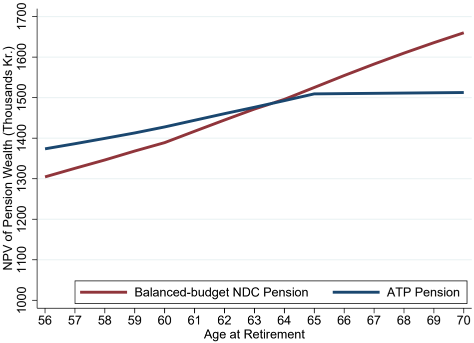

Figure: Profile of Swedish Pension Benefits: Pre vs Post NDC Reform

Motivation: Evaluating Welfare Effects of Pension Reforms

- **Challenges:**
  - Complex dynamic environment (labor supply, savings, real estate, health expenditures, death, bequests,...)
  - Complex institutions (pension rules, etc.)
  - Data limitations (esp. on value of pensions)

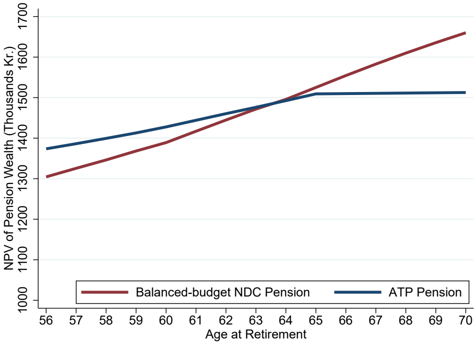

Figure: Profile of Swedish Pension Benefits: Pre vs Post NDC Reform

This Paper

1. Provide framework to assess welfare effects of pension reforms
   - Allows for general & complex environment
   - Expresses welfare impacts in simple terms
     - consumption smoothing vs. incentives
   - Can easily connect to the data under transparent assumptions

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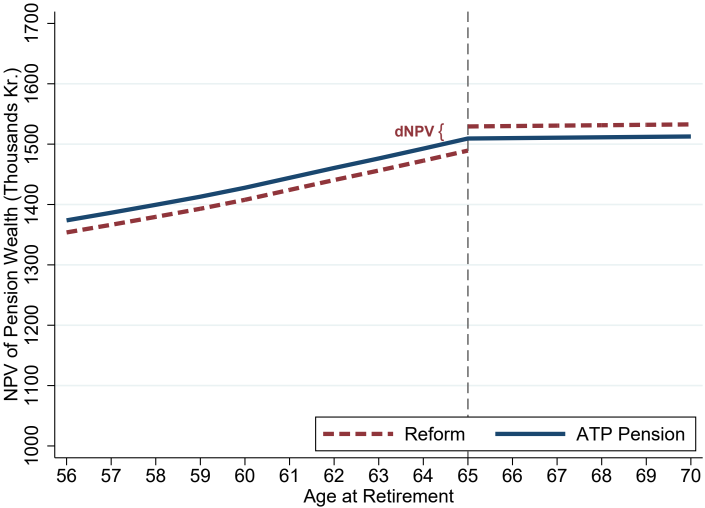
1. Provide framework to assess welfare effects of pension reforms
   - Allows for general & complex environment
   - Expresses welfare impacts in simple terms
     - consumption smoothing vs. incentives
   - Can easily connect to the data under transparent assumptions
2. Study welfare consequences of steeper pension profile in Sweden
   - Use rich admin data from Swedish registers
   - Estimate consumption smoothing costs
     - Revealed by consumption & selection patterns by retirement age
   - **Main Findings**:
     1. High cost of steeper profile after 65 ($\sim$ pension rewards after NRA)
     2. High cost of steeper profile before 61 ($\sim$ pension penalties before EEA)
     3. Lower cost of steeper profile btw 61 and 65

Conceptual Framework: Stylized Reforms

Figure: Steepening Pension Profile At Retirement Age r=65



Conceptual Framework: Evaluate Pension Reform

- Focus on within-cohort welfare effects
- Start from rich life-cycle model, build on **"variational" approach**
  - Exploit envelope conditions and focus on first-order impacts
- 'Baily-Chetty' formulae for small changes to pension profile:

$$\Delta \mathcal{W} = \underbrace{\frac{CS_{r>65}}{CS_{r\leq 65}}}_{Consumption\ \ Smoothing} - \underbrace{\frac{1+FE_{r>65}}{1+FE_{r\leq 65}}}_{Fiscal\ \ Externality}$$

- CS_r depends on marginal utility of consumption in retirement for individuals who retire at age r

▸ Model ▸ Planner's pb ▸ Fiscal Externality ▸ Behavioral

Measuring Consumption Smoothing Costs ▸ Summary Table

1. Differences in **Consumption Levels in Retirement**: ▸ Details

$$\frac{CS_{r\leq 65}}{CS_{r>65}} \cong \theta \cdot \left(1 + \gamma \times \frac{c_{r>65} - c_{r\leq 65}}{c_{r>65}}\right)$$

   - Differences in **consumption levels** by retirement age are key
   - Consumption difference is scaled with curvature of utility γ
   - θ captures further differences in MUC at *same* consumption level
2. Differences in **Consumption Drops** at retirement (e.g., Gruber '97)
3. Differences in **MPCs** when retired (Landais & Spinnewijn '20)

Measuring Consumption Smoothing Costs ▸ Summary Table

1. Differences in **Consumption Levels in Retirement**: ▸ Details
2. Differences in **Consumption Drops** at retirement (e.g., Gruber '97)

$$\frac{CS_{r\leq 65}}{CS_{r>65}} \cong \frac{1+\gamma_{r>65}\times E_{r>65}(\Delta c/c)}{1+\gamma_{r\leq 65}\times E_{r\leq 65}(\Delta c/c)}$$

   - Captures insurance value against work longevity risk
     - Diamond & Mirrlees '86, Golosov & Tsyvinski '06
   - Assumption:
     - diff. in C pre retirement are either irrelevant to the planner or addressable by other policy tools
3. Differences in **MPCs** when retired (Landais & Spinnewijn '20)

Measuring Consumption Smoothing Costs ▸ Summary Table

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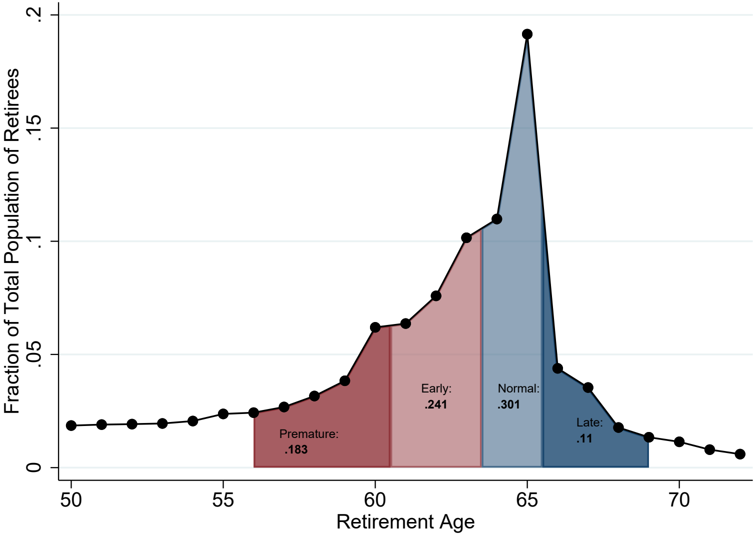
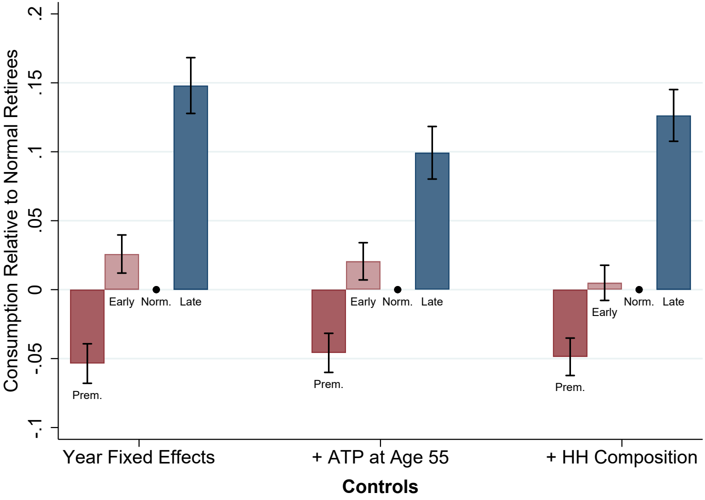
$$\frac{CS_{r\leq 65}}{CS_{r>65}} \cong \frac{\frac{mpc_{r>65}}{1-mpc_{r>65}}}{\frac{mpc_{r\leq 65}}{1-mpc_{r\leq 65}}}$$

- Identifies liquidity value of pension
  - MPC captures implicit price of raising additional dollar of consumption

Distribution of Retirement Age ‣ Data

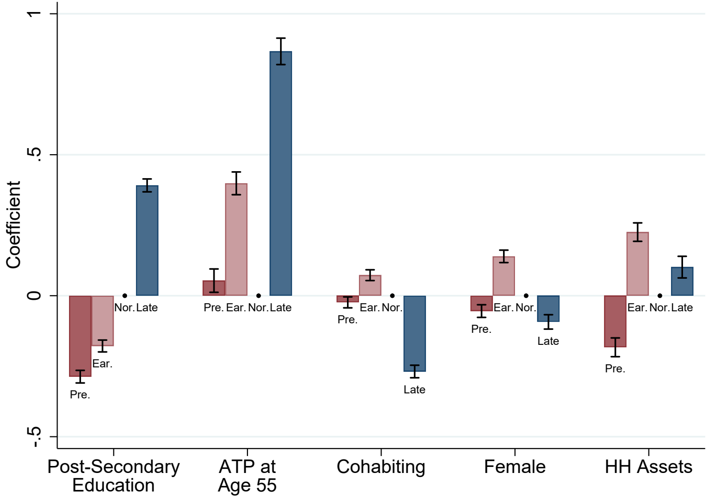


Consumption At Age 68 By Retirement Age

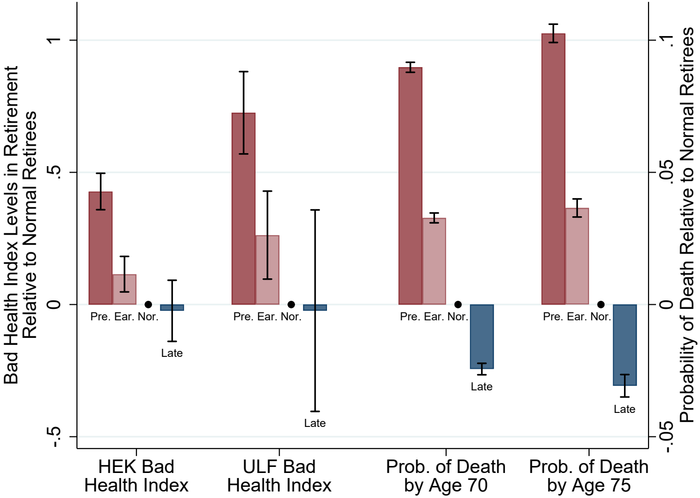


▸ Singles vs Married/Cohabit. ▸ All Ages ▸ Disaggregated Ages ▸ US-HRS ▸ Decomposition of Consumption

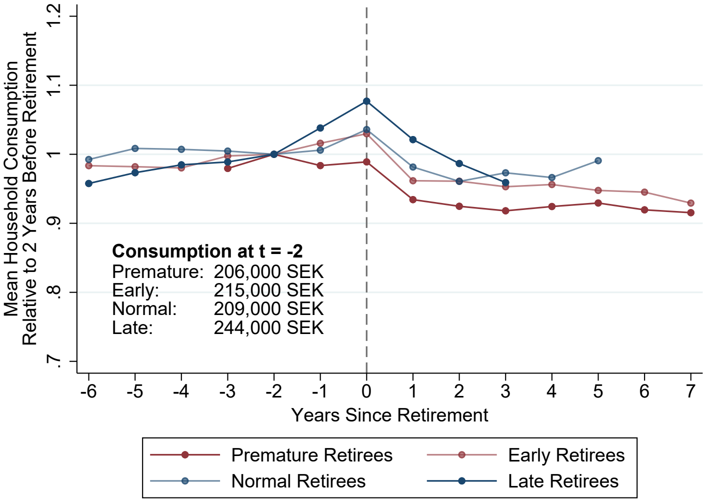
Selection Into Retirement Age: Socio-Econ Characteristics



Selection Into Retirement Age: Post-Retirement Health



Consumption Drops At Retirement



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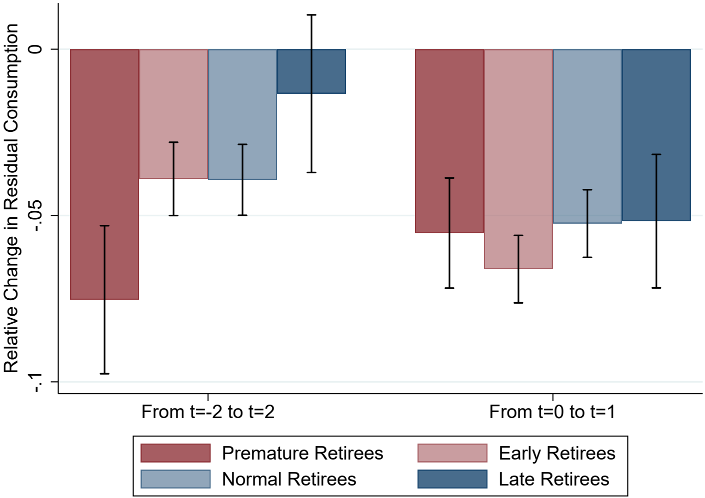
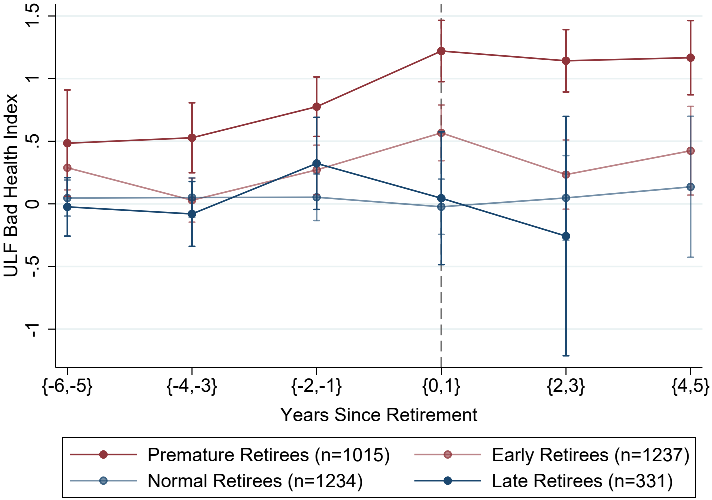


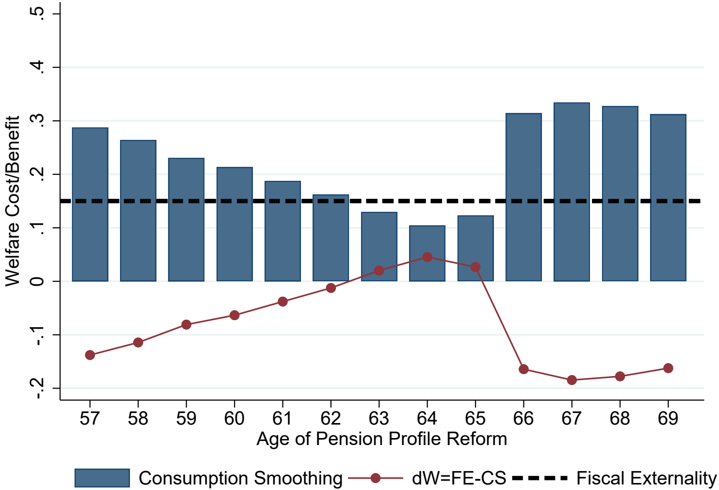
Consumption Dynamics & Health Shocks



MPCs By Retirement Age

- **Identification**:
  - Use random shocks to price of stocks ▸ Passive KG shocks ▸ Distribution
  - Shocks generate random permanent variation in wealth ▸ Portfolio Value
  - Regress evolution of cons around time of passive KG shocks
- **Key findings**:
  - Average MPC out of wealth $\approx .15$ ▸ Average MPC
  - MPC before retirement $\leq$ MPC after retirement ▸ By Retirement Status
  - Strong negative gradient of MPC with retirement age ▸ By Retirement Age

Welfare Implications: Consumption Level Implementation



▸ Sensitivity

Policy Implications

- **Significant consumption smoothing costs of steeper profile**
  1. Steep positive gradient of consumption with retirement age
  2. Selection on health / life exp. make steeper profiles more regressive
  3. Similar conclusion when focusing on insurance/liquidity value only
- Suggests optimality of **S-shaped** pension profile
  - Providing incentives is costly at premature retirement ages
  - But also at late retirement ages
  - Selection effects: providing higher incentives is most sensible btw 60-65
- Implications are local & conditional on rest of tax/transfer system

Incentives: Career Length vs Retirement Age

- $b(r, \text{Career Length}, w)$
  - In France, huge emphasis on increasing ret. age r
  - But can increase incentives to work longer through $\partial b/\partial CL$
- Evidence from Sweden:
  - Strong negative gradient btw CL and consumption
  - Suggests increasing profile through CL incentives is welfare improving

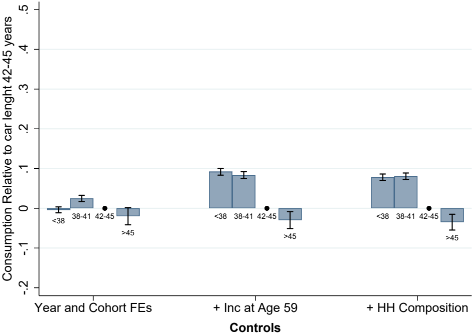


Figure: Consumption in Retirement By Career Length

APPENDIX SLIDES

Conceptual Framework

$$U_i\left(b,\tau\right)=max\Sigma_{t=0}^{T}\beta^t\int u\left(c\left(\pi_{i,t}\right),\zeta\left(\pi_{i,t}\right)\right)dF\left(\pi_{i,t}\right)$$

subject to

$$\begin{aligned} a_{i,t+1} &= R\left(\pi_{i,t}\right)\left[a_{i,t}+y\left(\pi_{i,t}\right)-c\left(\pi_{i,t}\right)\right] \\ y\left(\pi_{i,t}\right) &= \begin{cases} w\left(\pi_{i,t}\right)-\tau(\pi_{i,t}) \text{ if } s\left(\pi_{i,t}\right)=1 \\ b\left(\pi_{i,t}\right) \text{ if } s\left(\pi_{i,t}\right)=0 \end{cases} \end{aligned}$$

- $c(\pi_{i,t})$: consumption
- $\zeta(\pi_{i,t})$: other choices (e.g., labor supply) and characteristics (e.g., productivity)
- $\pi_{i,t}$ is individual state history at age t
  - Contains relevant determinants of utility, choices and policy
  - Includes earlier choices, but also shocks to human capital, financial capital, health capital, etc
- $b(\pi)$ and $\tau(\pi)$ pension benefit/tax function

Evaluating Pension Reforms

- Planner's problem: Government's probem:

$$\max \mathcal{W}(b,\tau) = \int_i \omega_i U_i(b,\tau) + \lambda GBC(b,\tau)$$

subject to

$$GBC(b,\tau) = \Sigma_r \left[S(r)\frac{\tau_r}{R^r} + [S(r-1) - S(r)]\, NPV_r \right] - G_0.$$

- Pension reforms
  - Change in profile of pension as a function of retirement age r
  - Approach valid for any other marginal reform

Back

A Stereotypical Reform: The Swedish 1998 Pension Reform

- **Old system** - ATP Pension:
  - Defined Benefit system
  - accumulate pension points up to age 65 or 30 yrs of career
  - replacement rate applied to average of highest 15 yrs of earnings
- **New system** - NDC Pension:
  - Notional Defined Contribution system
  - stronger link between contributions and benefits
    - eliminate age and career length cap for accumulation of points
    - use all contribution years for calculation of replacement rate
    - higher maximum pension benefit
    - BUT more generous minimum pension benefit
  - gradually phased in over cohorts 1938-1953

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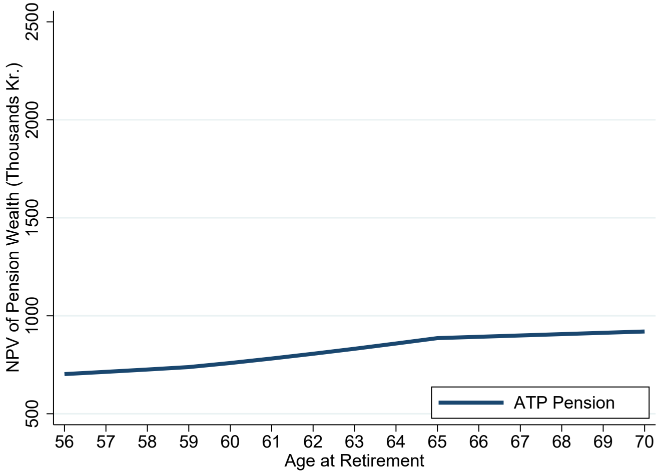
Context: NPV of Pension Wealth By Retirement Age

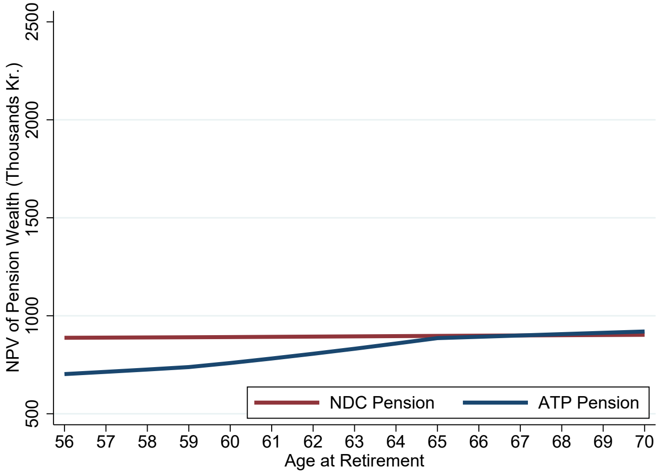
Old ATP System - 1st ATP Decile



Back to Context
Back to Welfare Analysis

Context: NPV of Pension Wealth By Retirement Age

New NDC System - 1st ATP Decile



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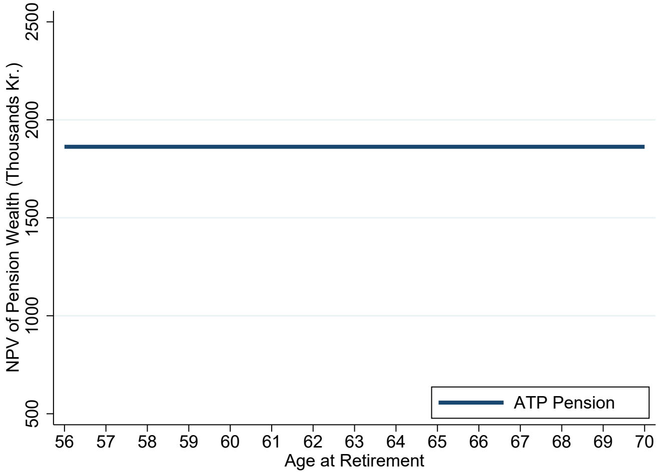
Context: NPV of Pension Wealth By Retirement Age

Old ATP System - 10th ATP Decile



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Context: NPV of Pension Wealth By Retirement Age

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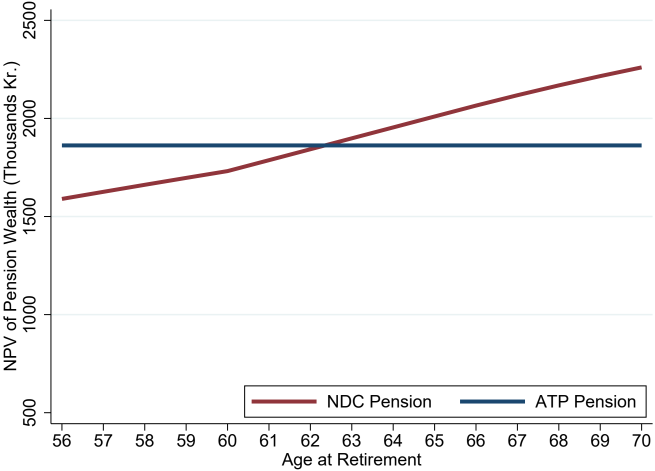

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Evaluate Pension Reform: Fiscal Externality

- **Fiscal Externality:**
  - Depends on overall response in survival in employment $S(t)$ at age t, but response around reform age is presumably key

$$FE_{r\leq 65} \quad \approx \quad \lambda[1-\Sigma_{r'} \underbrace{[\tau_{r'} - [NPV_{r'} - NPV_{r'-1}]]}_{\text{Participation Tax Rate}} \times \frac{\partial S_{r'}}{\partial NPV_{r\leq 65}}]$$

  - Swedes retire later in response to steeper profile Labor Supply Responses

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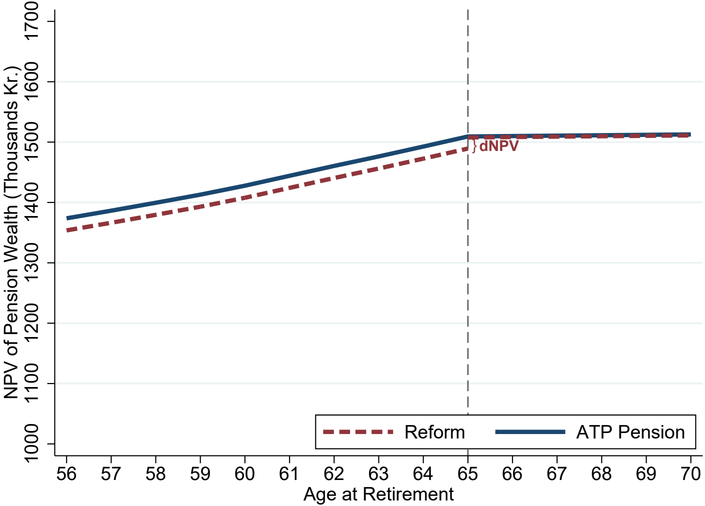
Marginal Reform Combination: $dNPV_{r \leq 65} < 0$



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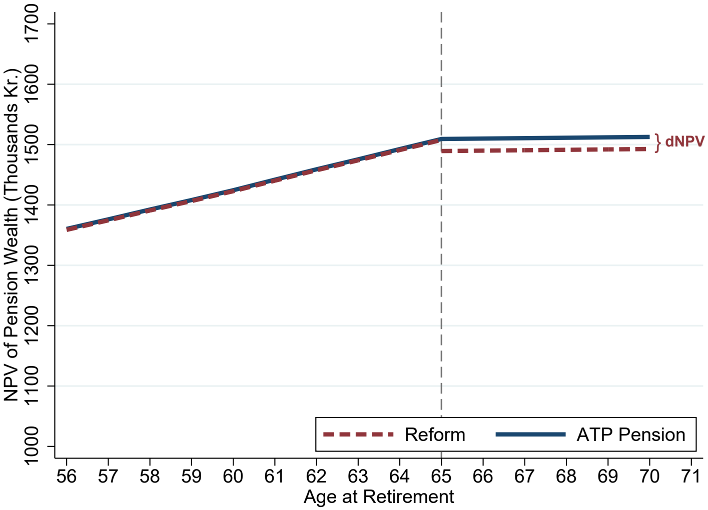
Marginal Reform Combination: $dNPV_{r>65} < 0$



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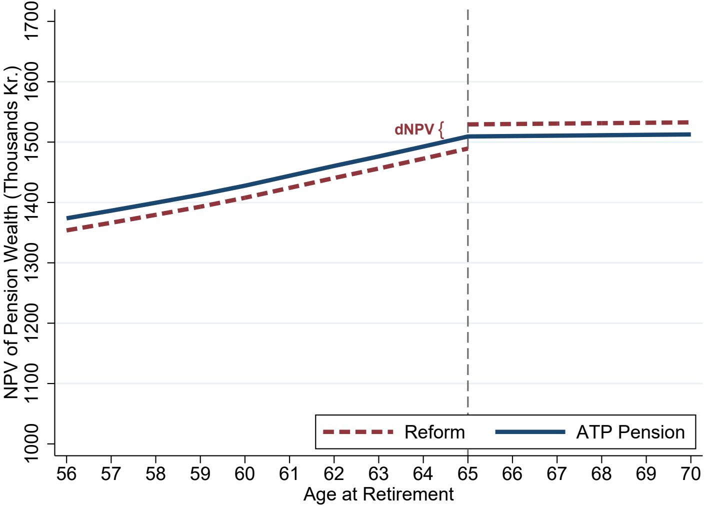
Marginal Reform Increasing Incentives at 65



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Data

- **Consumption**: Registry data on all earnings/income, transfers/taxes, debt & assets (balance & transactions), some durables
  - Consumption as a residual expenditure measure (Kolsrud et al. '18,'20)

$$consumption_t = income_t - \Delta assets_t$$

▸ Details ▸ Consistency with survey data ▸ Lifetime Consumption Profile

  - Consumption-expenditure measure for universe of HH for 2000-2007
- **Labor Market**: Full labor market history since 1993
  - Retirement = year when earnings fall permanently below PBA
- **Pensions**: Universe of HH since 1920s cohorts
  - State ATP and NDC contributions, rights, claims, benefits, etc.
  - Occupational pensions & Individual pension savings
- **Health**: Death registries + Rich survey info matched with admin data

▸ Back

Registry-based Measure of Consumption

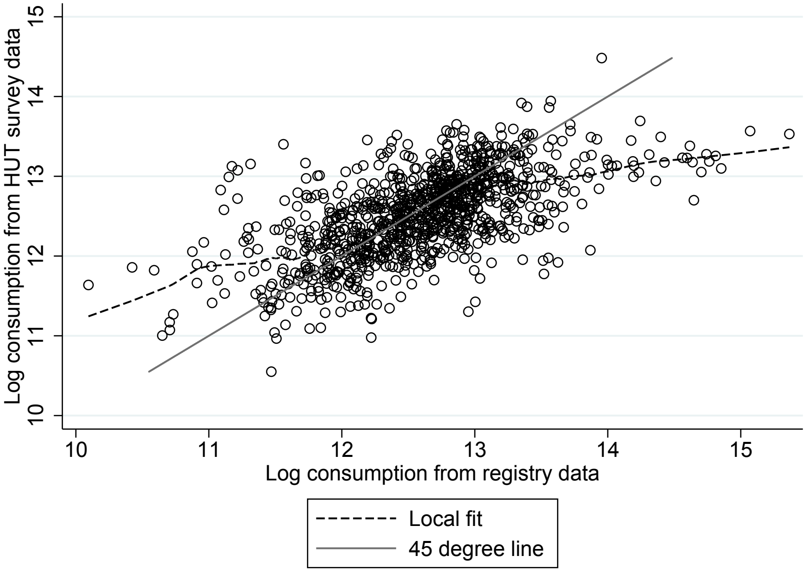
- Simple idea: consumption as a residual expenditure measure,

$$consumption_t = income_t - \Delta assets_t$$

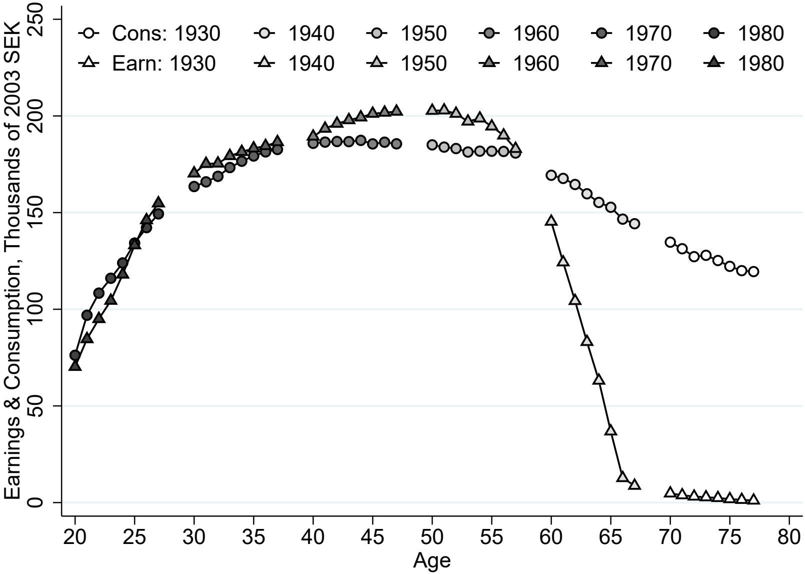
- We use admin data (from tax registers) on earnings y, transfers T, bank savings b, outstanding debt d, other financial assets v and real assets h.
  - Account for returns from assets and changes in stock value Details

- Note that we check consistency with consumption survey data

Consistency with survey data



Lifetime Consumption & Earnings Profiles



Consumption Equation

$$c_t = y_t + T_t + \tilde{c}_t^b + \tilde{c}_t^d + \tilde{c}_t^v + \tilde{c}_t^h$$

- Bank savings: $\tilde{c}_t^b = y_t^b - \Delta b_t$
  - y_t^b : earned interests ; Δb_t : change in bank savings
- Debt: $\tilde{c}_t^d = -y_t^d + \Delta d_t$
  - y_t^d : paid interests ; Δd_t : change in debt
- Other financial assets: $\tilde{c}_t^v = y_t^v - \Delta v_t$
  - y_t^v : interests, dividends, price change $\Delta p_t^v \times q_{t-1}^v$
  - Δv_t : change in stock value $p_t^v q_t^v - p_{t-1}^v q_{t-1}^v$
- Real assets: $\tilde{c}_t^h = y_t^h - \Delta h_t$
  - y_t^h : rent, imputed rent, price change
  - Δh_t : change in stock value

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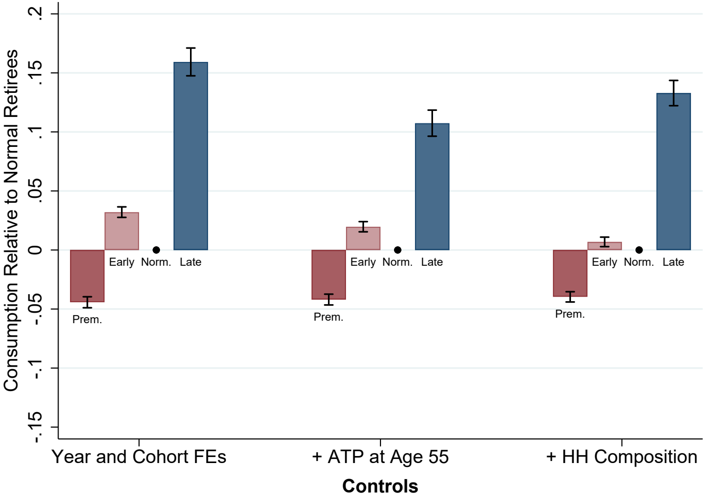
Consumption (At All Ages) By Retirement Age



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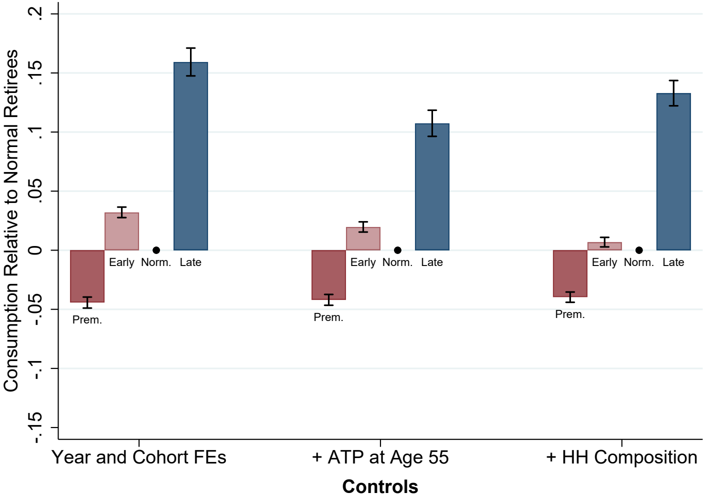
Consumption (At All Ages) By Retirement Age: Retired



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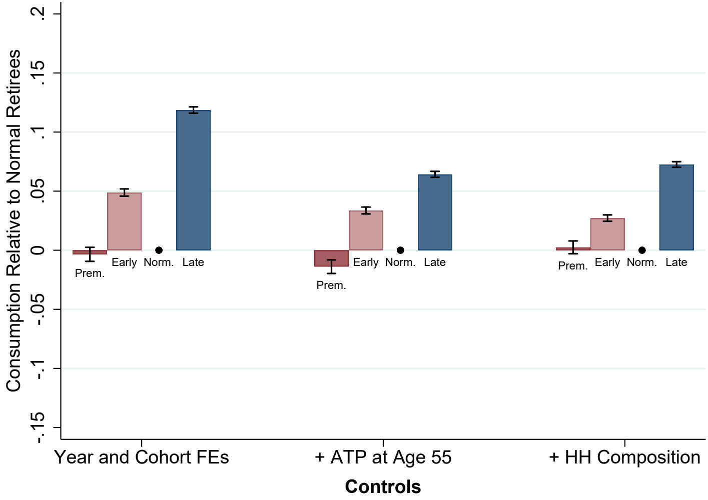
Consumption (At All Ages) By Retirement Age: Not Ret.



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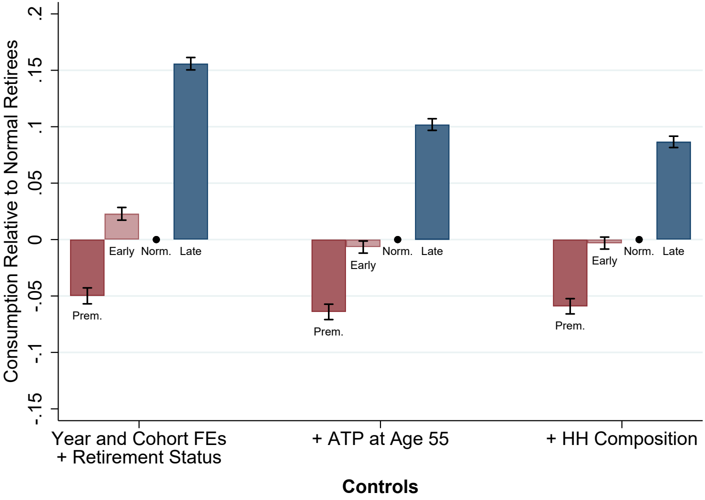
Consumption By Retirement Age: Singles



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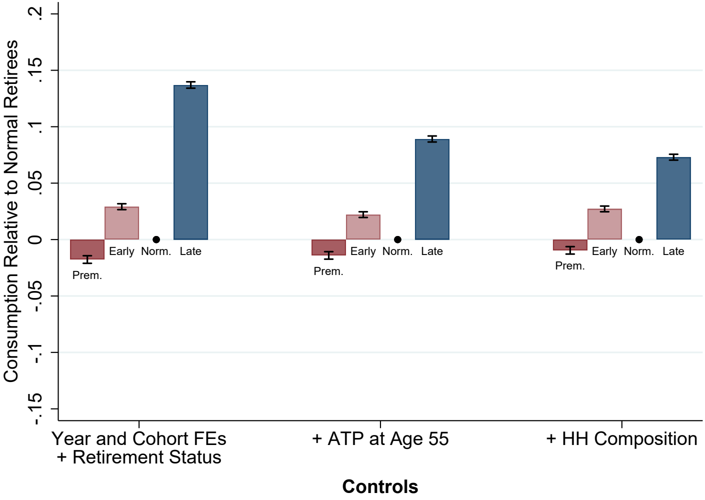
Consumption By Retirement Age: Married/Cohabiting



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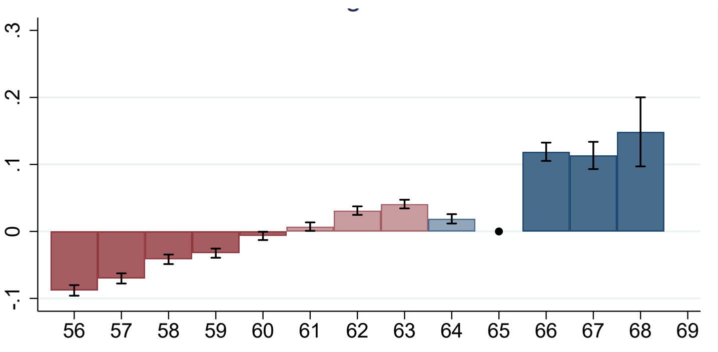
Consumption By Disaggregated Retirement Age



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Consumption By Retirement Age: Gender, Wealth Controls

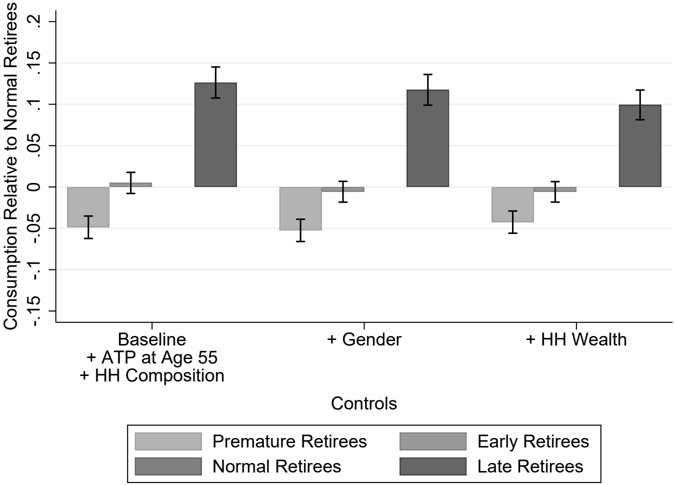

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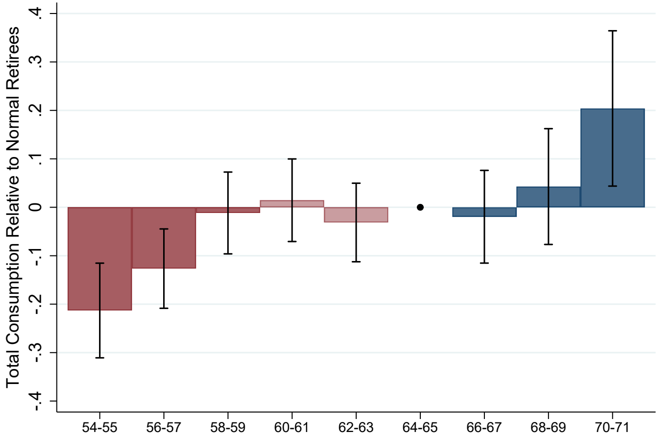
Figure: CONSUMPTION LEVELS BY RETIREMENT AGE IN THE US: HRS DATA



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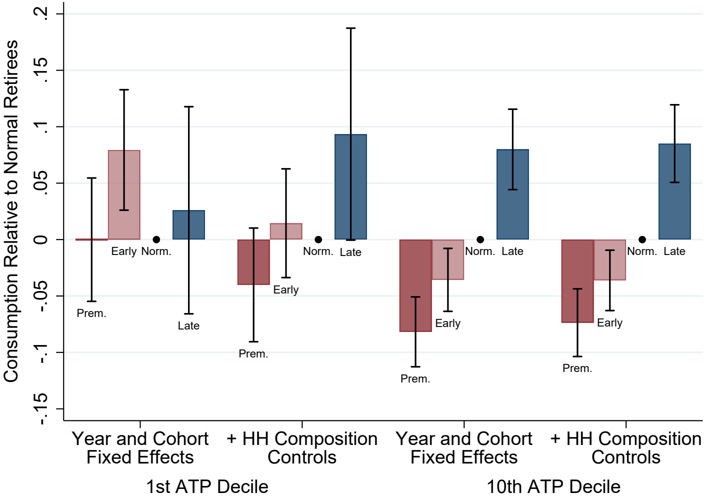
Consumption By Retirement Age: By ATP Decile



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Distribution of Retirement Age By Cohorts

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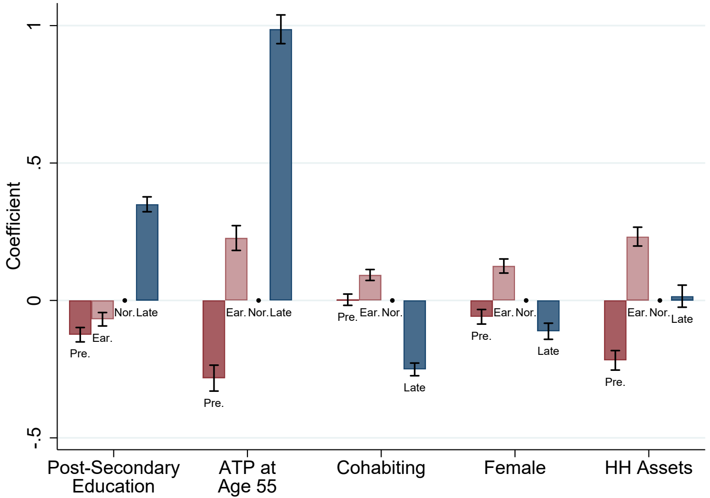
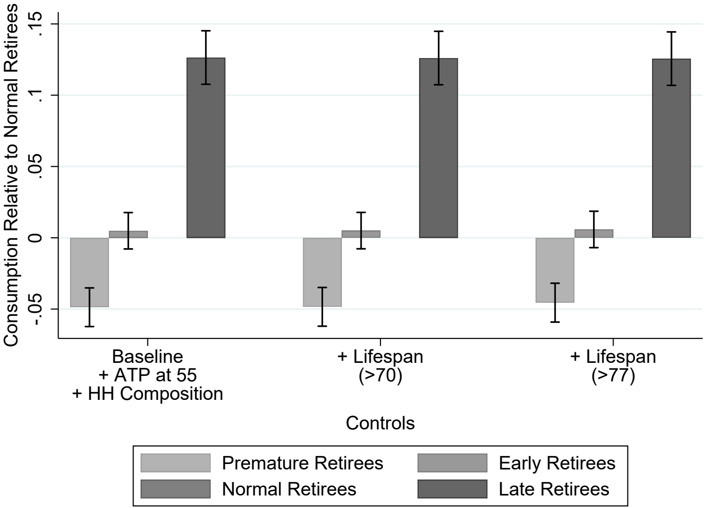
Selection Into Retirement Ages



▸ Baseline Consumption Differences with Wealth Controls ▸ Back

Consumption By Retirement Age: Lifespan Controls



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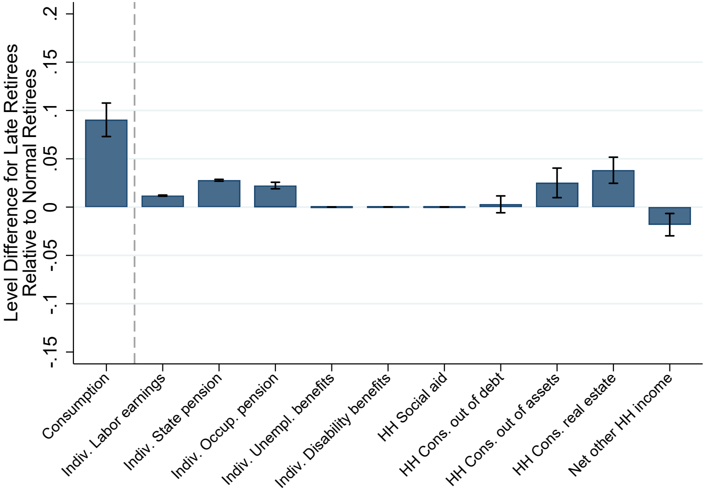
Consumption Decomposition - Age 68: Late Retirees



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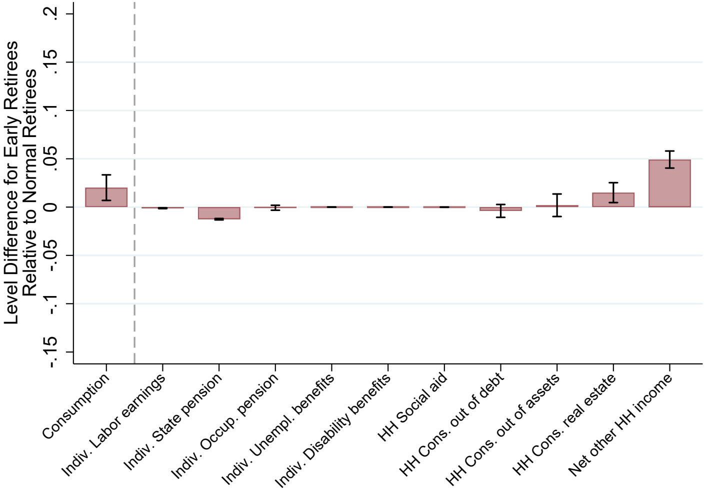
Consumption Decomposition - Age 68: Early Retirees



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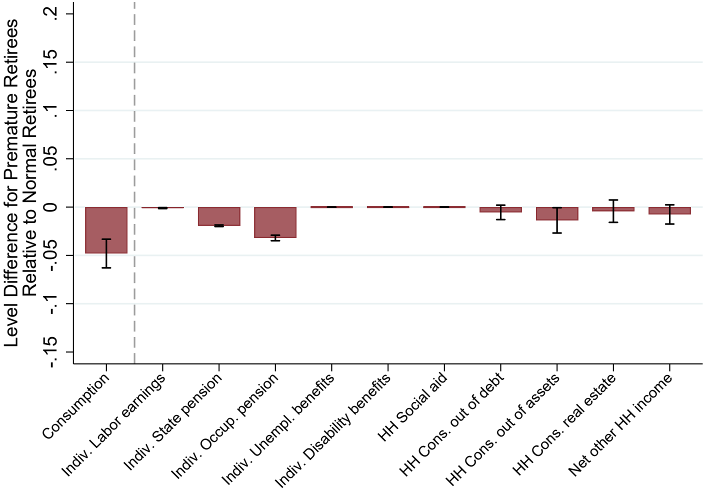
Consumption Decomposition - Age 68: Premature Retirees



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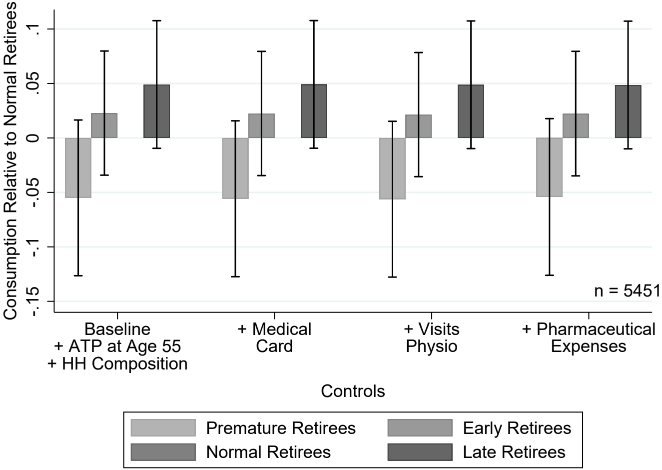
Consumption (At All Ages) By Retirement Age: Health Controls



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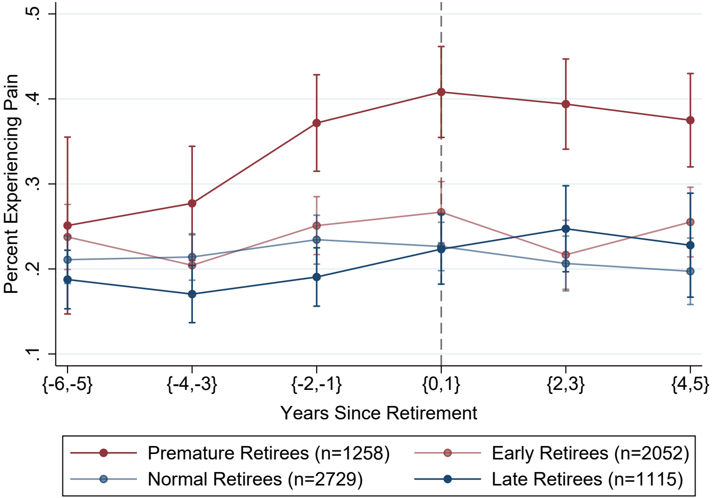
Event Study Health Outcomes: Pain



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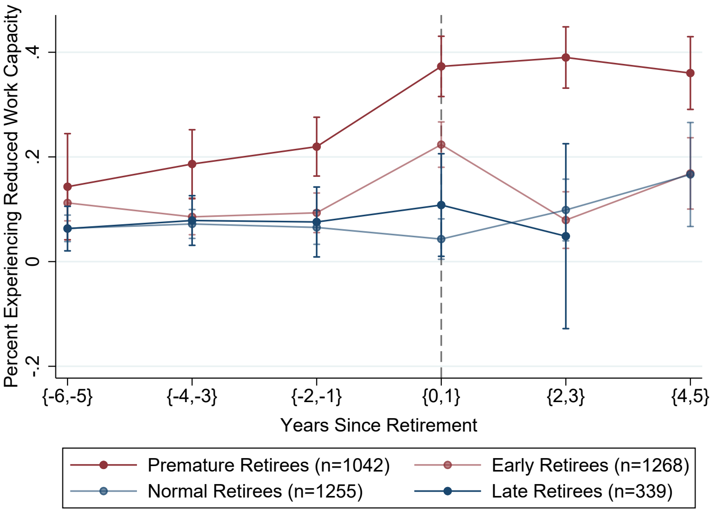
Event Study Health Outcomes: Reduced Work Capacity



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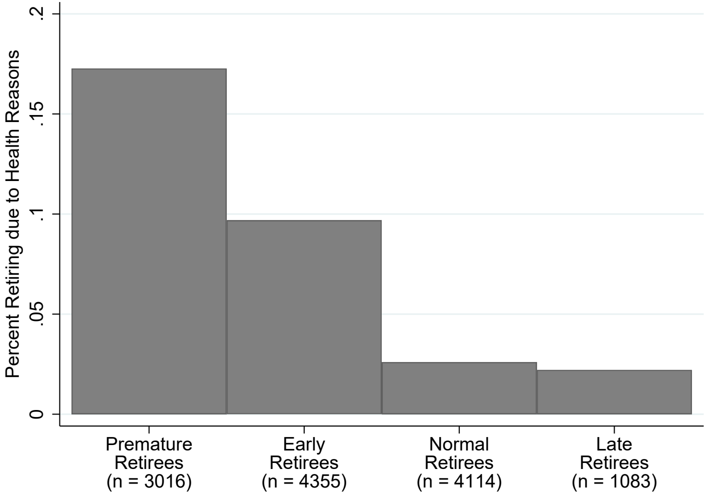
Health As Reason For Retirement By Retirement Age



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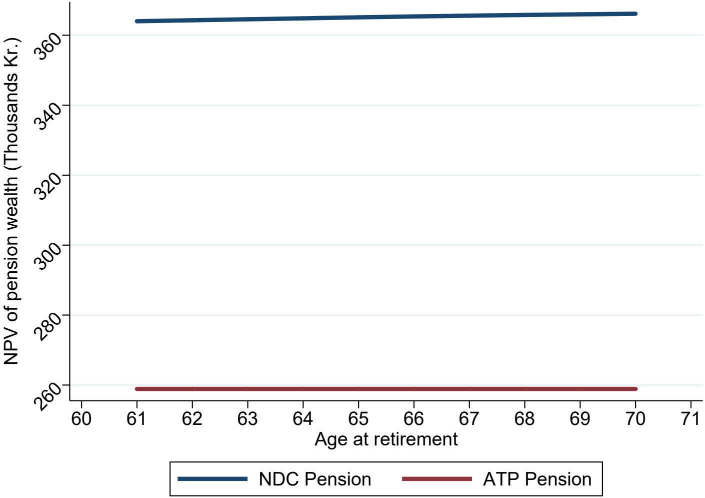
NPV of Pension Wealth By Retirement Age: $\mathbf{w} = P10$



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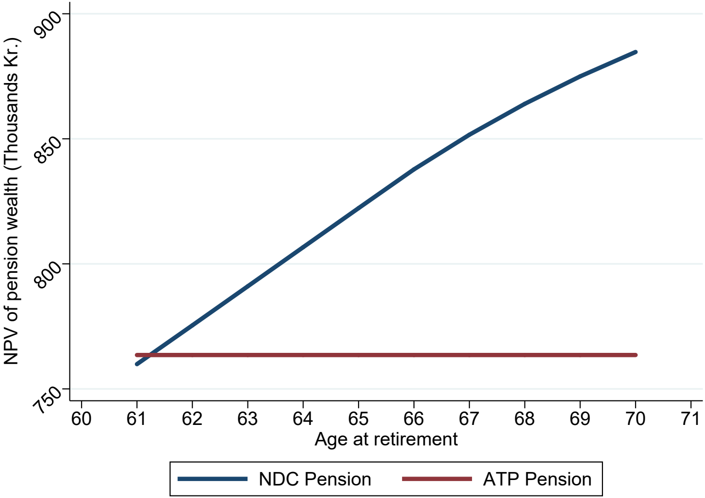
NPV of Pension Wealth By Retirement Age: $\mathbf{w} = P90$



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Summary: CS Implementation Approaches ▸ Back

Empirical Inputs	Economic Interpretation	Assumptions	Challenges
		Implementation 1: Consumption Levels – Equation 9	
$E_{r>\tilde{r}}(c), E_{r\leq\tilde{r}}(c)$: Average consumption levels of individuals retiring before vs after $\tilde{r}$	Captures both the redistributive and insurance value of profile reform	Homogeneous relative risk aversion γ $\omega_r \frac{\partial u(\bar{c},\zeta_{r,t})}{\partial c}$ constant across retirement ages r Taylor approximation (Chetty [2006]) Heterogeneity within retirement age group negligible (Andrews and Miller [2013])	Measuring γ Gauging selection into retirement ages based on *SMU* of consumption, driven by ω_r or $\zeta_{r,t}$
		Implementation 2: Consumption Drops – Equation 10	
$\Delta c_{r>\tilde{r}}, \Delta c_{r\leq\tilde{r}}$: Average drop in consumption around retirement of individuals retiring before vs after $\tilde{r}$	Captures only the insurance value of profile reform	Homogeneous relative risk aversion γ $\omega_r \frac{\partial u\left(c_{r,pre},\zeta_{r,t}\right)}{\partial c}$ constant across retirement ages r Taylor approximation (Chetty [2006]) Heterogeneity within retirement age group negligible (Andrews and Miller [2013])	Measuring γ Gauging selection into retirement ages based on *changes* in *SMU* of consumption around retirement, driven by $\frac{\zeta_{r,t}}{\zeta_{r,pre}}$
		Implementation 3: Marginal Propensities to Consume – Equation 11	
$mpc_{r>\tilde{r}}, mpc_{r\leq\tilde{r}}$: Average marginal propensity to consume in retirement of individuals retiring before vs after $\tilde{r}$	Captures the liquidity value of profile reform	Constant relative curvature of u over consumption c and resources in ζ across retirement ages (Landais and Spinnewijn [forthcoming]) Heterogeneity within retirement age group negligible (Andrews and Miller [2013])	Finding exogenous unanticipated income shocks to identify MPCs across retirement ages

Behavioral Biases

- Important concern that people do not prepare adequately for retirement (e.g., Blundell et al. '98, Chetty et al '14)

$$\Delta W \approx \text{Cons. smoothing effects} + \text{FE} * \text{Behavioral Resp.} \\ + \text{Marginal Internalities} * \text{Behavioral Resp.} \tag{1}$$

- Behavioral biases can affect the redistributive impact of the pension policy, but impact is still fully captured by *CS*
  - e.g., myopic agents retire prematurely and have too little savings
  - our measures of CS do not rely on indiv. optimization
- Behavioral biases give rise to 'internalities': magnitude of welfare impact depends on behavioral response to policy
  - e.g., myopic agents save too little but do not respond to pension profile incentives (Chetty et al '14) $\Rightarrow$ small first-order welfare effect

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Consumption Smoothing Gains

- Marginal value of increasing pension benefits depends on consumption of retirees:

$$CS_{b(x)} = E_{b(x)}\left(\omega_i \frac{\partial u\left(c_i,\zeta_i\right)}{\partial c}\right)$$
$$\cong E_{b(x)}\left(\omega_i \frac{\partial u\left(c_0,\zeta_i\right)}{\partial c}\left[1+\frac{\partial^2 u\left(c_0,\zeta_i\right)/\partial c^2}{\partial u\left(c_0,\zeta_i\right)/\partial c}\left[c_i-c_0\right]\right]\right)$$

- Relative consumption smoothing gains are:

$$\frac{CS_{b(x)}}{CS_{b(x')}} \cong \frac{\omega_{b(x)}}{\omega_{b(x')}}\frac{\frac{\partial u\left(c_{b(x')},\zeta_{b(x)}\right)}{\partial c}}{\frac{\partial u\left(c_{b(x')},\zeta_{b(x')}\right)}{\partial c}}\left[1+\frac{\partial^2 u\left(c_{b(x')},\zeta_{b(x)}\right)/\partial c^2}{\partial u\left(c_{b(x')},\zeta_{b(x)}\right)/\partial c}\left[E_{b(x)}\left(c_i\right)-E_{b(x')}\left(c_i\right)\right]\right]$$

- This uses a Taylor expansion around $c_0 = E_{b(x')}\left(c_i\right)$ and relies on no within-group heterogeneity in ω_i and ζ_i.

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Insurance Value: Consumption Drops at Retirement

- Marginal value of increasing pension benefits depends on consumption of retirees:

$$CS_{b(x)} \cong E_{b(x)} \left(\omega_i \frac{\partial u(c_0, \zeta_i)}{\partial c} [1 + \frac{\partial^2 u(c_0, \zeta_i) / \partial c^2}{\partial u(c_0, \zeta_i) / \partial c} [c_i - c_0]] \right)$$

- Relative consumption gains can be approximated using:
  - Differences in **consumption drops** at retirement:

$$\frac{CS_{b(x)}}{CS_{b(x')}} \cong \theta \times \frac{1 + \sigma_{b(x)} [c_i - c_{r-1}]]}{1 + \sigma_{b(x')} [c_i - c_{r-1}]]}$$

    - Relies on Taylor expansion around pre-retirement consumption $c_0 = c_{r-1}$ and assumes $\frac{\partial u(c_{r-1}, \zeta | r)/\partial c}{\partial u(c_{r-1}, \zeta | r-1)/\partial c} = 1$
    - Focuses purely on insurance aspect for $\theta = 1$ (i.e., taking pre-retirement redistribution as desirable):

$$\theta = \frac{\omega_{b(x)}}{\omega_{b(x')}} \frac{\partial u \left(c_{r-1}, \zeta_{b(x)} \right) / \partial c}{\partial u \left(c_{r-1}, \zeta_{b(x')} \right) / \partial c}$$

    - Insurance can be against unanticipated shock to earnings ability, or against myopia/lack of self insurance

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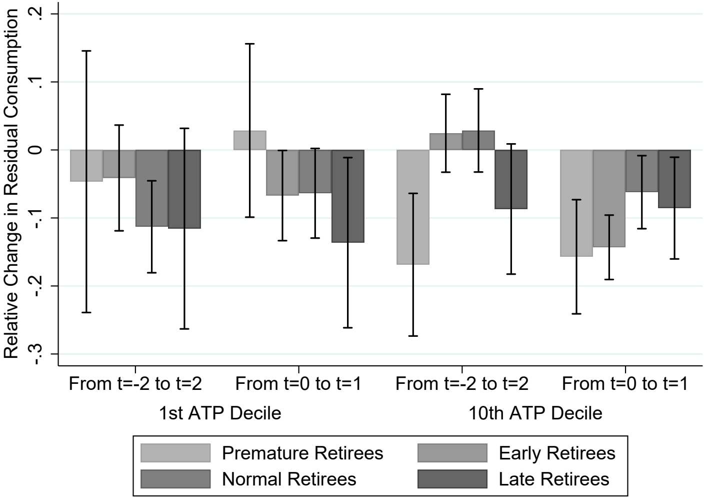
Consumption Drops At Retirement: ATP Deciles



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Liquidity Value: MPC

- Marginal value of increasing pension benefits depends on consumption of retirees:

$$CS_{b(x)} \cong E_{b(x)} \left(\omega_i \frac{\partial u(c_0, \zeta_i)}{\partial c} [1 + \frac{\partial^2 u(c_0, \zeta_i) / \partial c^2}{\partial u(c_0, \zeta_i) / \partial c} [c_i - c_0]] \right)$$

- Relative CS gains can be approximated using:
  - Differences in **MPCs** :

$$\frac{CS_{r<65}}{CS_{r\geq 65}} \cong \frac{E_{r<65}\left(\frac{dc_{it}/dy_{it}}{1-dc_{it}/dy_{it}}\right)}{E_{r\geq 65}\left(\frac{dc_{it}/dy_{it}}{1-dc_{it}/dy_{it}}\right)}$$

    - Focuses on ability to smooth consumption (Landais & Spinnewijn '20) (i.e., marginal value of transfer depends on its shadow price)
    - Assumes curvature in preferences is the same across groups (i.e., to infer shadow price from MPC)

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Sample Descriptive Stats

	Retirement Sample		Retirement x Stock Sample	
	Mean	(s.d.)	Mean	(s.d.)
I. Retirement				
Premature Retirement Probability	14.63 %		15.12 %	
Early Retirement Probability	35.2 %		38.86 %	
Normal Retirement Probability	35.62 %		33.77 %	
Late Retirement Probability	14.56 %		12.24 %	
II. Demographics				
Cohort	1941.71	(5.25)	1940.67	(4.19)
Fraction Men	49.49 %	(50)	52.79 %	(49.92)
Fraction Married	62.45 %	(48.42)	70.88 %	(45.43)
Post-Secondary Education	25.71%	(43.71)	31.04 %	(46.26)
III. Income and Wealth at 59, SEK 2003(K)				
Total Earnings	227.66	(170.19)	226.99	(195.89)
Net Wealth	906.30	(2,595.50)	1,366.60	(3,062.00)
Bank Holdings	103.50	(404.00)	142.80	(572.80)
Portfolio Value	319.28	(14,612.60)	332.95	(15,077.30)
Consumption	224.95	(720.72)	242.25	(1,158.50)
N	1,328,268		372,831	

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MPCs: Empirical Implementation

- Define passive KG

$$\text{Passive KG}_{i,t+k} = \sum_j (p_{j,t+k} - p_{j,t+k-1}) \cdot a_{ijt} = \sum_j \Delta p_{j,t+k} \cdot a_{ijt}$$

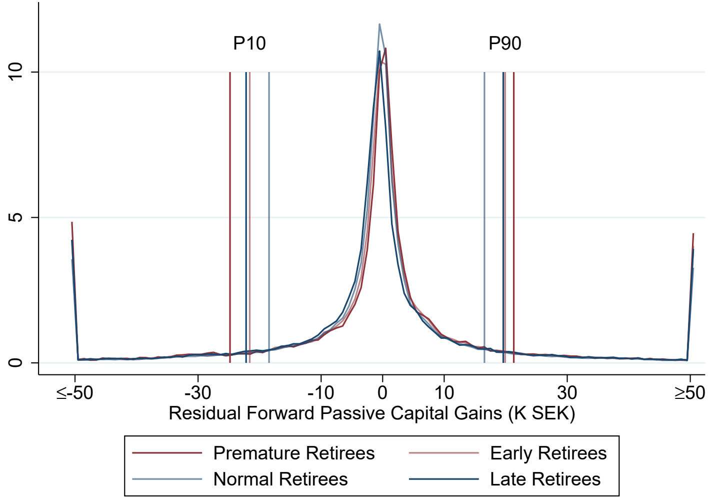
  - a_{ijt} : number of stocks of company j held by individual i in t
  - Δp_{jt+k} : change in price of stock j between t+k-1 and t+k

- Show that conditional on **X** price follow are random walk
- For all years $k \in \{-6, ..., 6\}$, regress :

$$\text{Passive KG}_{i,t+k} = \alpha_{t+k}\text{Passive KG}_{i,t+1} + \mathbf{X}'\beta$$

- **X**: previous returns and variance of portfolio

Distribution of Residual Passive K Gains



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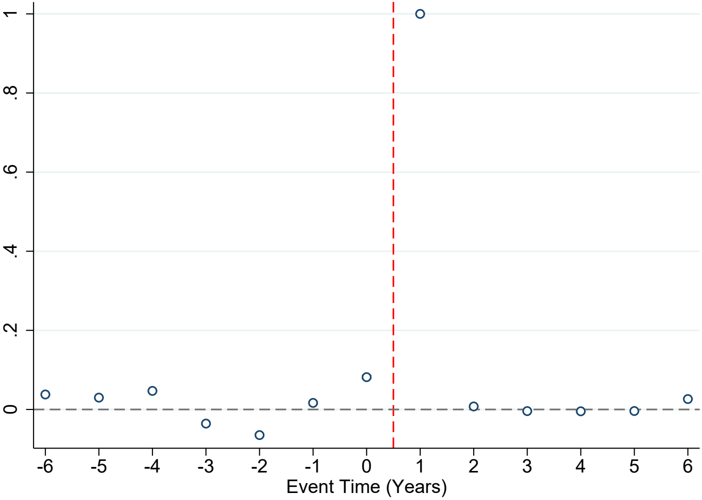
Serial Correlation In Residual Passive K Gains



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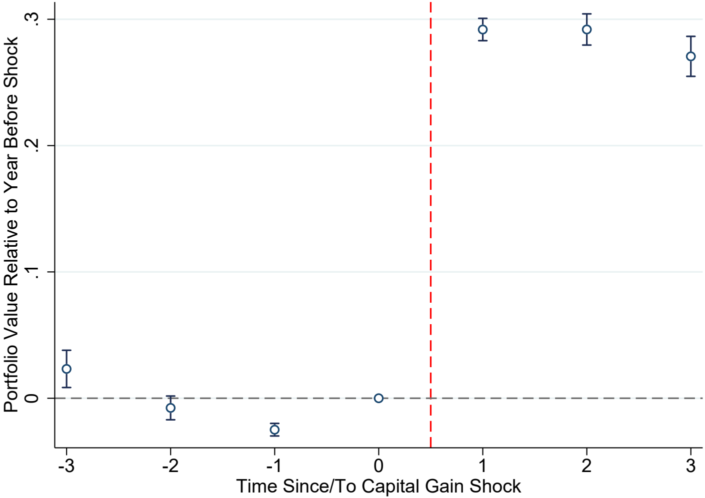
Predicted Passive Value of Portfolio



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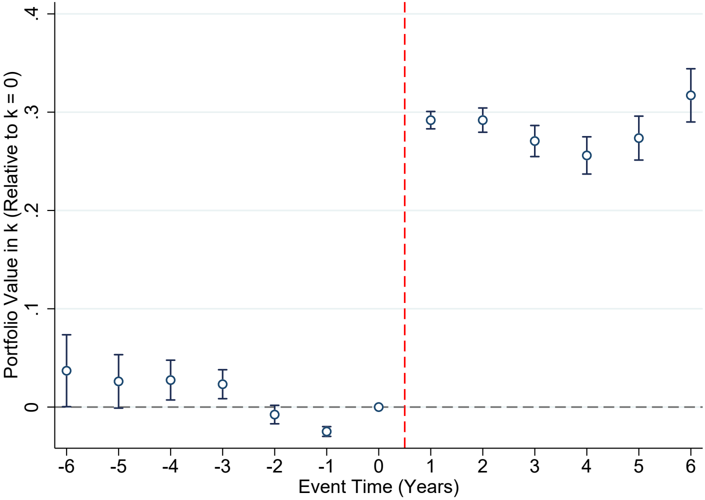
True Value of Portfolio



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MPCs: Methodology (continued)

- For all years $k \in \{-6, ..., 6\}$, regress :

$$\Delta C_{i,t+k} = \alpha^C_{t+k} \text{Passive KG}_{i,t+1} + \mathbf{X}'\beta$$

$$\Delta V_{i,t+k} = \alpha^V_{t+k} \text{Passive KG}_{i,t+1} + \mathbf{X}'\beta$$

$$\textit{Cumulative MPC}_t = \sum_{k=1}^{t} \frac{\hat{\alpha}^C_{t+k}}{\hat{\alpha}^V_1}$$

Average MPCs

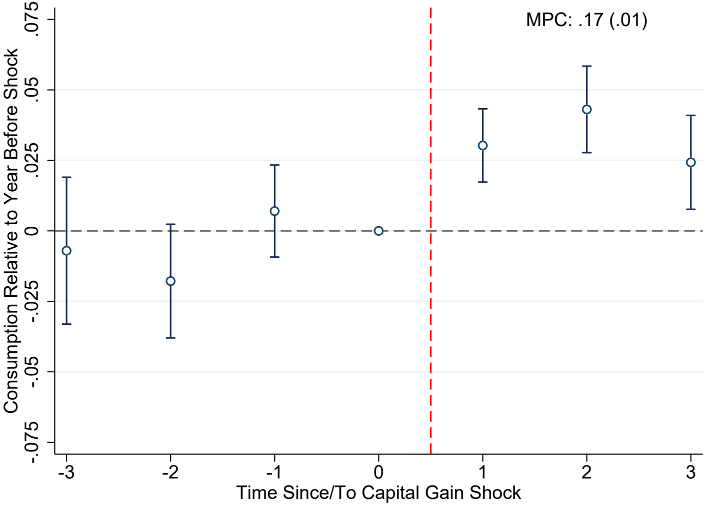

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Table: 2SLS Estimates of MPC Out of Wealth Shocks

	First Stage α_1^V	Reduced Form	IV Result MPC	Placebo Test α_1^P
	B. By Retirement Status			
Non Retired in t	.66	.09	.13	-.01
	(.01)	(.01)	(.01)	(.02)
Retired in t	.71	.21	.30	.07
	(.03)	(.03)	(.04)	(.05)
	C. By Retirement Age Group			
Premature Retirees	.69	.23	.34	-.01
	(.04)	(.03)	(.04)	(.07)
Early Retirees	.63	.22	.34	.03
	(.02)	(.02)	(.03)	(.03)
Normal Retirees	.68	.06	.09	.03
	(.01)	(.01)	(.02)	(.02)
Late Retirees	.70	0.01	.01	(.06)
	(.03)	(.03)	(.04)	(.05)

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Table: Consumption Smoothing Cost of Steeper Pension Profile

	Baseline	Sensitivity		Alternative	
		γ	θ	ΔC	MPC
	(1)	(2)	(3)	(4)	(5)
A. Age-Specific Profile Change: $\frac{CS_{r\leq\tilde{r}}-CS_{r>\tilde{r}}}{CS_{NRA}}$					
$\tilde{r} \in [57;60]$	.25	.13	.32	.17	-.39
$\tilde{r} \in [61;63]$	.16	.08	.22	.12	-.09
$\tilde{r} \in [64;65]$	.11	.06	.16	.09	.26
$\tilde{r} \in [66;69]$	.32	.16	.35	.12	.88
B. Swedish Pension Reform: $\Sigma_r \mu_r \frac{CS_r}{CS_{NRA}}$					
	.15	.07	.18	.11	.21

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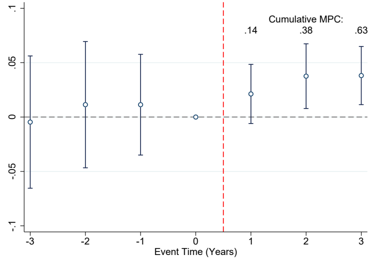
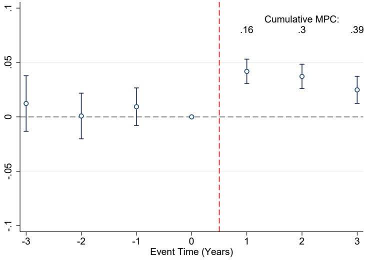
MPCs by Retirement Age Group

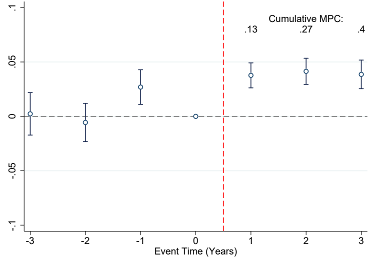
Premature Retirees



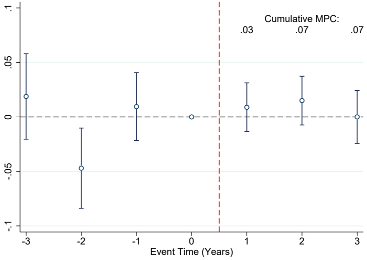
Early Retirees



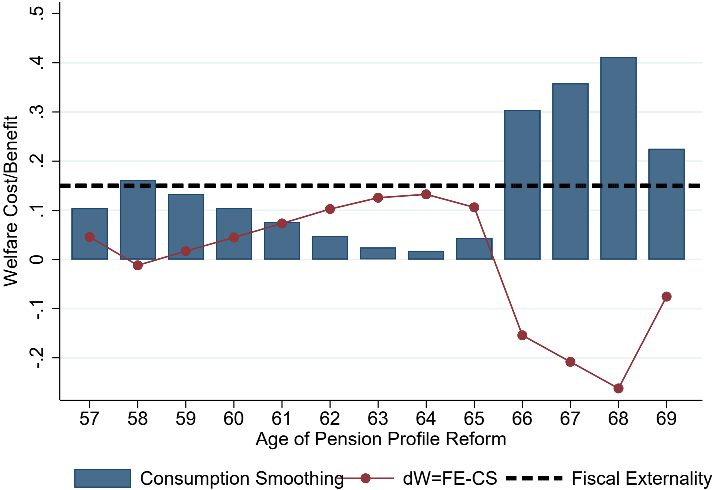
Normal Retirees



Late Retirees



Implementation: Insurance Value Only



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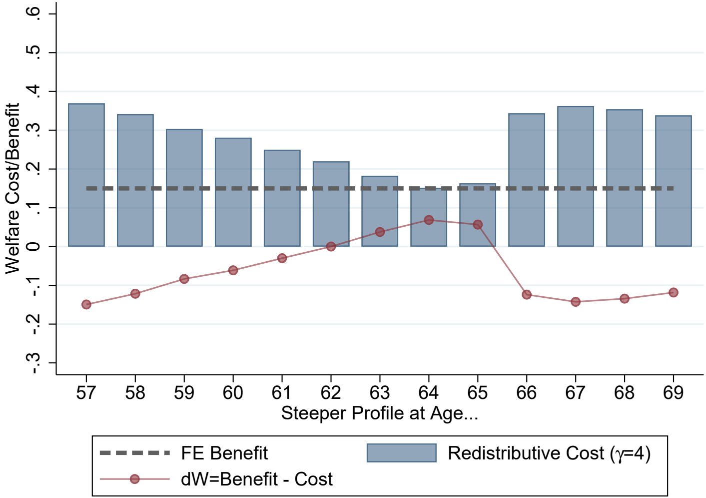
Implementation: Welfare Weight ($\theta \sim$ Life Expectancy)



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Expected Lifetime: Descriptives

	Expected Discounted Lifetime ($\beta = 0.98$)	Expected Undiscounted Lifetime
Premature	15.49	23.94
Early	16.26	25.02
Normal	16.68	25.54
Late	16.70	25.46

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