

## Motivation

### Idea:

- Heterogeneity in job stability is a salient feature of the labor market  
⇒ persistent differences in employment risk: source of lifetime earnings inequality
- Job stability remains unobservable during working life
- Pension systems redistribute earnings based on labor market histories
- Progressive pension systems insure against realization of lifetime earnings risk

### Trade-offs:

- Redistribution and insurance against unstable career paths
- Distortions on incentives for retirement and human capital investment decisions

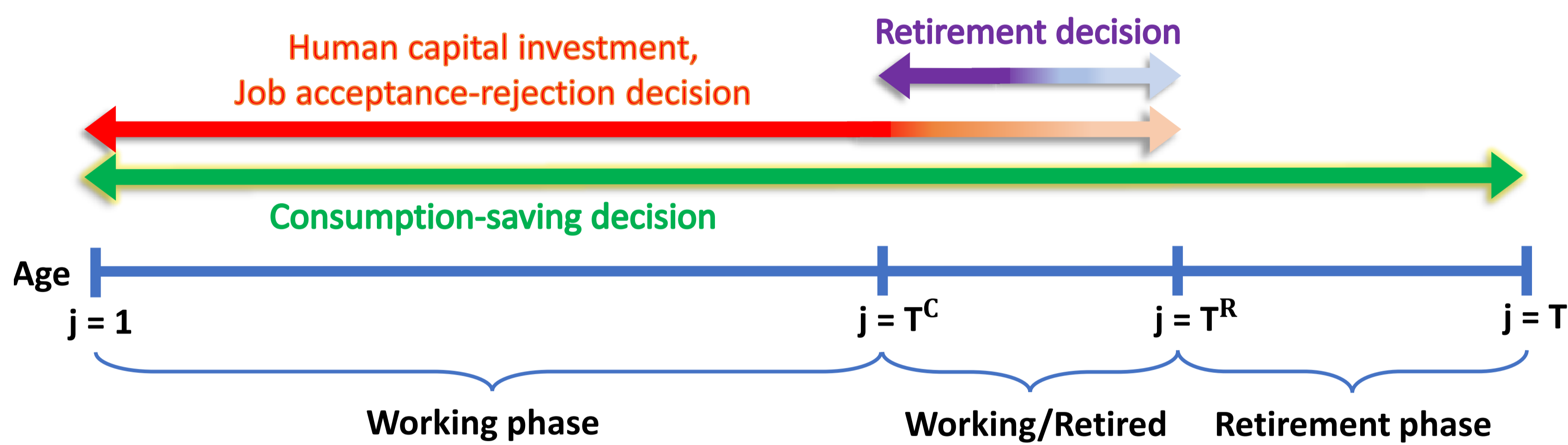
### Question:

How should an optimal pension system consider heterogeneity in job stability?

## Model

### Framework:

- Life-cycle consumption-saving model with incomplete financial markets
- Heterogeneity in job stability: jobs differ in wages and separation probabilities
- Incomplete markets and frictional labor market with human capital investment



### Human capital investment:

- Investment productivity decreases with workers' age
- Only employed workers can invest in human capital  
⇒ human capital upon retirement approximates pre-retirement earnings

### Retirement decision:

- Agents make retirement decision based on human capital  $h$ , assets  $a$ , current wage  $w$ , and age  $j$

$$V'(a, h, j) + \varepsilon \geq V^w(a, w, \lambda, h, j), \quad \varepsilon \sim \text{Logistic}(\mu, s)$$

- $\varepsilon$ : non-pecuniary shock that shapes retirement decision

### Pension system:

- Benefit function:  $\omega(h^*) = \phi \cdot \hat{y}(h^*)^{1-\gamma}$
- $\gamma = 0$ : Benefits increase linearly with pre-retirement earnings
- $\gamma > 0$ : Progressive pension benefits
- $\hat{y}$ : Approximate pre-retirement earnings using human capital upon retirement  $h^*$
- Payroll tax ⇒ budget balance for the government

## Calibration and life-cycle behavior

### Calibration:

- Calibration to the U.S. economy (baseline)
- Fit pension parameters to the U.S. Social Security system
- Match to empirical moments: labor market transition rates, tenure, earnings, and wealth
- Model matches a rich set of facts on labor markets, earnings, consumption, and savings dynamics

### Life-cycle behavior:

- Heterogeneity in job stability: key driver of inequality in lifetime earnings
- Stable jobs allow to invest in human capital and climb the job ladder
- Unstable jobs lead to poor life-cycle outcomes of human capital, earnings, wealth, and consumption

⇒ Heterogeneity in job stability shapes the optimal design of pension systems

## Optimal pension system

### Welfare analysis:

- Optimal pension system: **increase in pension progressivity** from 0.32 to 0.89
- **Welfare gain of 0.52%** in terms of lifetime consumption for labor market entrants

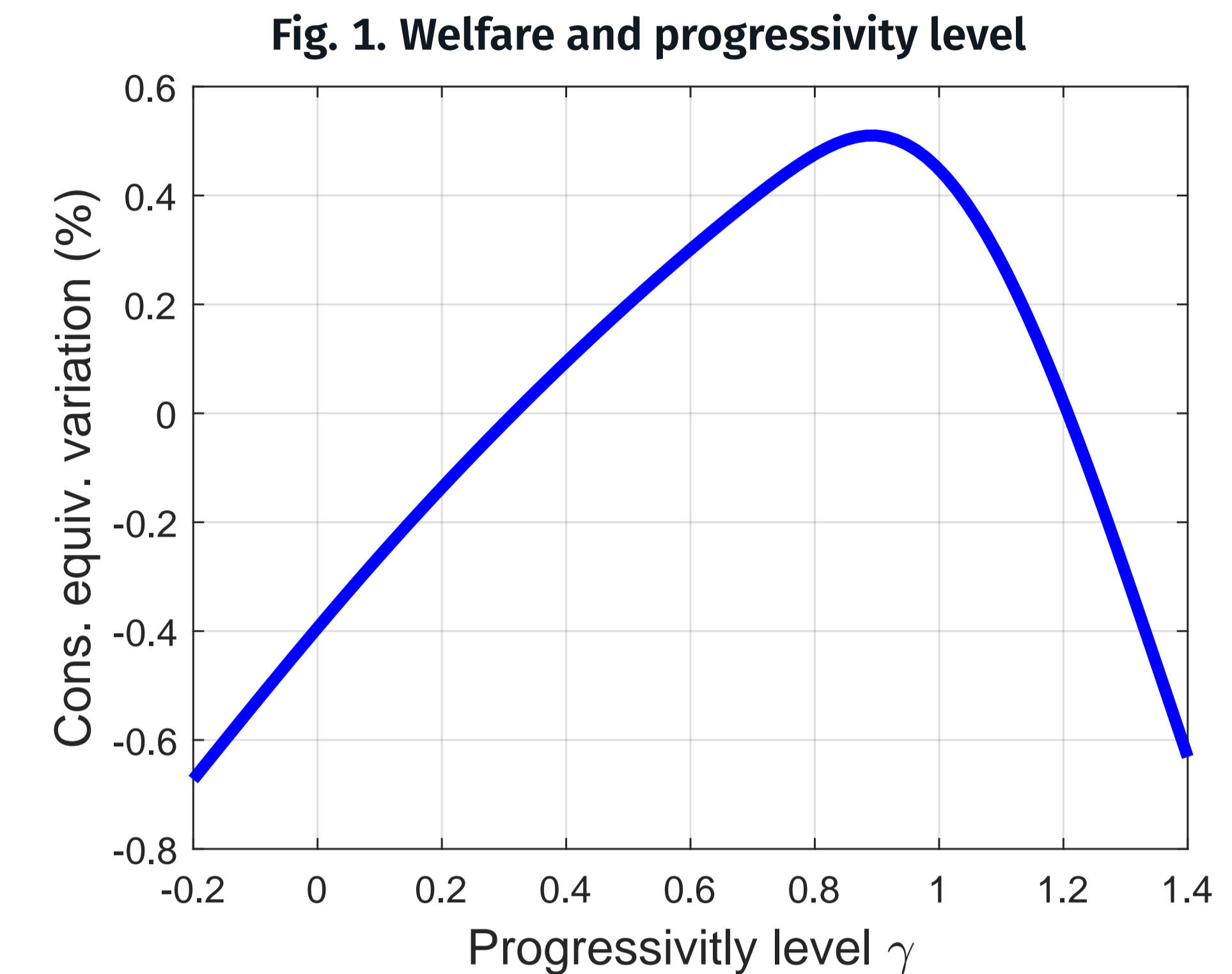
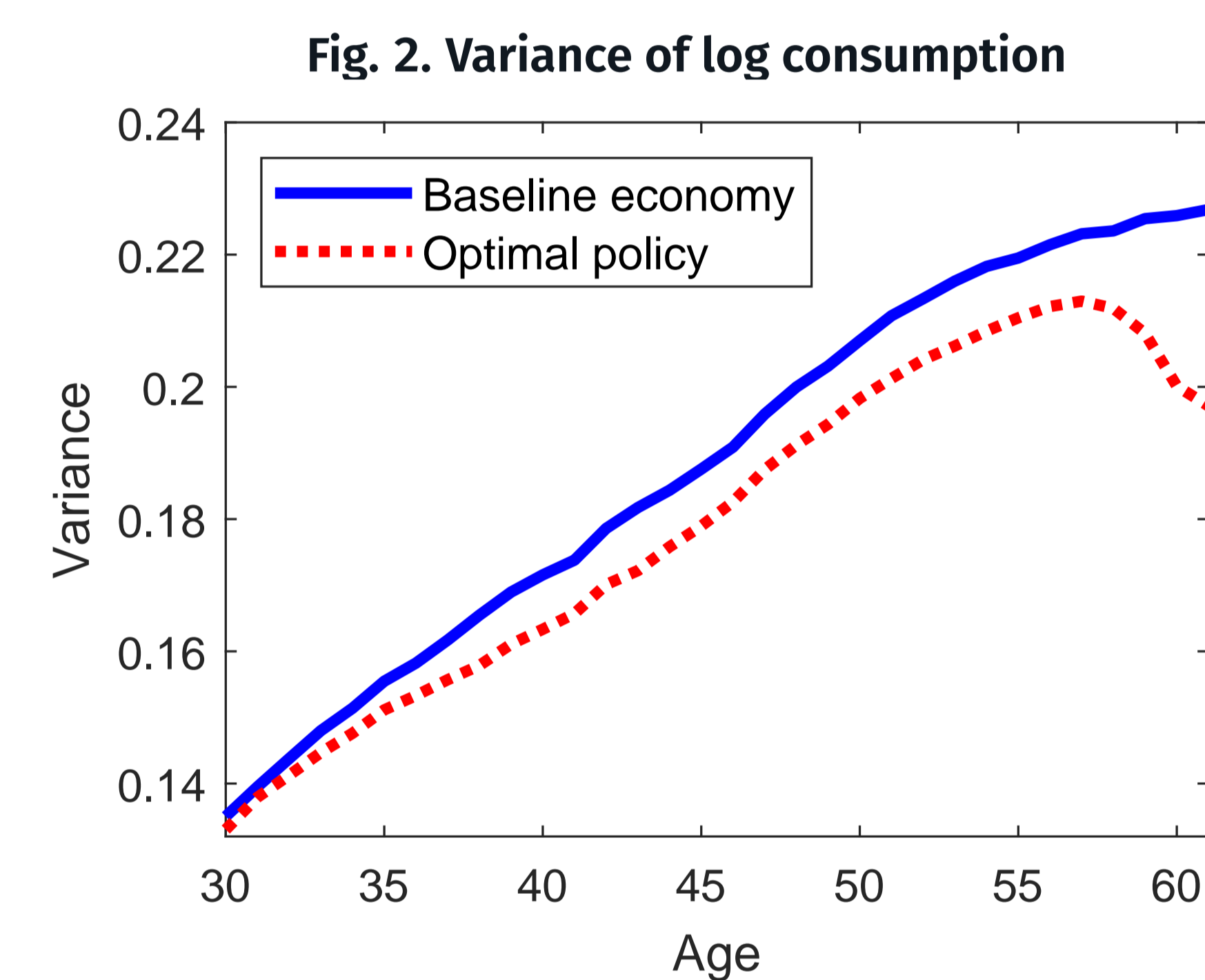


Table 1. Policy parameters and welfare change

Model	$\gamma$	$\phi$	Tax (%)	Welfare change (%)
Baseline	0.32	0.63	8.63	–
Optimal policy	0.89	1.12	8.71	0.52

### Optimal pension system: Insurance

- Optimal policy **reduces consumption variance** over the life cycle
- Redistribution and insurance to workers with unstable jobs



### Optimal pension system: Distorted incentives

- Increase in progressivity distorts **retirement** and **human capital investment** decision. BUT:
- **Low-productivity** workers retire **earlier**, whereas **high-productivity** workers retire **later**
- Policy change does **not distort** human capital investment of **young** workers

## Macroeconomic shift in the distribution of job stability

### Empirical observation:

- Increase in job stability since the 1990s in the United States
- **Decline in short-duration jobs** explains a large portion of this trend

### Question:

How does a change in short-duration jobs affect the optimal pension system?

### Results:

- Decline in job-separations for young workers
- Increase in average human capital, earnings, consumption, and wealth
- Optimal level of **progressivity increases in the economy with higher job stability**

Table 2. Optimal policy comparison: baseline and higher job stability

Optimal policy	$\gamma$	$\phi$	Tax (%)	Welfare change (%)
Baseline	0.89	1.12	8.71	0.52
Higher job stability	0.93	1.16	8.47	0.53

- Decrease in short-duration jobs primarily affects young workers: lower unemployment risk and higher earnings
- Increase in pension progressivity can be achieved with lower increase in payroll tax rate compared with baseline economy

## Summary of results

1. Progressive pension systems provide insurance against unstable employment histories
2. Increase in pension progressivity of the current U.S. pension system achieves a welfare gain of 0.52% of lifetime consumption

3. Increase in pension progressivity makes productive workers retire later and unproductive workers retire earlier
4. A shift in the job-stability distribution towards more stable jobs implies that a pension system with a higher degree of redistribution is optimal