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Motivation and Research Question

- Financial crisis (capital market): workers lost a substantial portion of their retirement saving
- Economic crisis (labor market): high unemployment and lower earnings; lower contributions to Social Security and private pensions

- How should individuals (optimally) react to the combined financial & economic crisis?
- Which age groups are most affected?
- What are possible long term consequences for individuals?
Our Findings

We find both short- and long term (‘scarring’) effects of crises:

Young workers:
- Work less at the beginning and more later in life
- Retire later
- Substantially reduce consumption early and late in life
- Invest less (more) riskier in the short (long) term; buy less longevity risk insurance

Older workers (near retirement):
- Work more
- Retire later
- Consume less
- Invest less (more) riskier in the short (long) term; buy less longevity risk insurance
Literature & Contribution

Recent literature on LC-portfolio choice
- Stock returns: i.i.d. normal distributed
- Labor income: Permanent & transitory shocks i.i.d.
- Relation: Correlation (Cocco et al. 2005 RFS) Cointegration (Benzoni et al. 2007 JF)

Empirical evidence
- Finance Lit.: Time-varying investment opportunity set: bull/bear market → low/high vola & high/low mean returns (Guidolin/Timmermann 2008 RFS)
- Macro: Countercyclical dynamics of labor income risk (Storesletten et al. 2004 JPE)

Our Contribution
- Extension of LC-portfolio model using joint process for stock/labor market risk under a business cycle
- Incorporating endogenous work effort, retirement and annuitization decisions
**LC-Modell Building Blocks**

Utility function (consumption & leisure)

\[ V_t = \frac{(C_t L_t^\alpha)^{1-\rho}}{1-\rho} + \beta E_t (p_t^s V_{t+1}) \]

**Labor market:** Wage rate stochastic; eco. state dependent

**Capital market:** Deferred annuity, bond, eco. state dep. risky stock

**Housing:** Age dependent (det.) costs

**Regulation:** US SoSe-rules, tax rates

**Household:** US female; mid-income; RRA=5; \( \alpha=1.3 \); WIR(55)=9

- Consumption
- Leisure / labor supply
- Asset allocation, annuitization
- Retirement

Numerical dynamic optimization; simulation of 100,000 life cycles
Crisis Definitions

Financial/Economic crisis:
- 1st year: -30% downturn in the stock market
- First 4 years contraction (business cycle)
- Exogenous into the model (i.e. for all 100,000 simulated LC with optimal feedback controls)

Individual crisis:
- Starting in financial/economic crisis
- At least 2 years unemployed in the first 4 years;
- Average yearly stock return before age 62 less than 1st quintile;
- Methodology: Selection from 100,000 simulated LC-Profiles (with optimal feedback controls)
Work Hours and Retirement Age

Age 20

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Avg. Ret. Age 64.82

Age 55

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Avg. Ret. Age 65.08
Consumption Loss: Crisis relative to Normal

Age 20

Age 55

- Substantial and persistent for both age groups
  - The Young: Initial loss partly compensated by increased leisure
  - The Elderly: Consumption loss despite higher work effort
Asset Allocation: Crisis relative to Normal

Age 20

Age 55

Short Term

Long Term

Short Term

Long Term

- Stock weight difference
- Annuity weight difference
- Wealth difference

- Stock weight fraction
- Annuity wealth difference
- Wealth difference
Summary

We explore the short and long term impact of the financial/economic crisis on (optimal) portfolio choice, labor supply and retirement decisions by using LC-model;

Incorporation of the financial/economic crisis by using a model of the business cycle driving the stochastic dynamics of stock market and labor market risk

Short and long term (“Scarring”) effects of crises:
  - Young workers: Work less at the beginning and more later in life; retire later; substantial consumption reduction early and late in life; invest less (more) riskier early (late) in life; buy less longevity risk insurance
  - Older workers (near retirement): Work more, retire later, consume less, invest riskier; buy less longevity risk insurance