Can Risk be Shared Across Investor Cohorts? Evidence from a Popular Savings Product

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Twelfth Paul Woolley Annual Conference
6^{th} June 2019

Motivation

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- Financial markets: cross-sectional risk sharing
    - cross-sectional risk sharing $\rightarrow$ someone must bear market risk
- First best: risk sharing between investor cohorts (Gordon-Varian 88, Allen-Gale 97)
    - optimal mechanism: build reserves to buffer shocks to asset returns; reserves are passed on between successive cohorts

      a) can be implemented by monopoly financial intermediary

      b) unravels if competition, because investors time reserves

This paper

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    competing financial intermediaries, yet no unravelling — why?

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   key parameter: elasticity of investor flows to predictable returns

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   inter-cohort risk sharing possible only if elasticity is low

3. Micro evidence: Elasticity is low

   related to lack of sophistication

Euro contracts

- Popular retail savings product in France

  sold by life insurers, but not life insurance in traditional/U.S. sense

  similar products in other European countries: “participating contracts” $\sim$ 80% agg. life insurers provisions

- AUM = €1.4 trillion = 1/3 agg. household financial wealth

- Reserves mechanism

Euro contracts

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- By law, insurer must pay at least 85% of asset returns to investors

  either immediately or later

  if immediately: credited to investors accounts ($y_t V_{t-1}$)

  if later: retained as fund reserves ΔR_t

  the rest is insurer profit Π_t

Euro contracts

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- Fund reserves = Asset value − Account value, are:
  1. **owned by** (but not yet credited to) investors
  2. **passed on** between successive cohorts of investors

Euro contracts

- Asset returns split into three parts:

$$x_t A_{t-1} = \underbrace{\overbrace{y_t V_{t-1} + \Pi_t}^{\text{cross-sectional risk sharing}} + \Delta R_t}_{\text{inter-cohort risk sharing}}$$

$x_t A_{t-1}$	$y_t V_{t-1}$	Π_t	ΔR_t
asset returns	contract returns	insurer profits	reserves past & future investors

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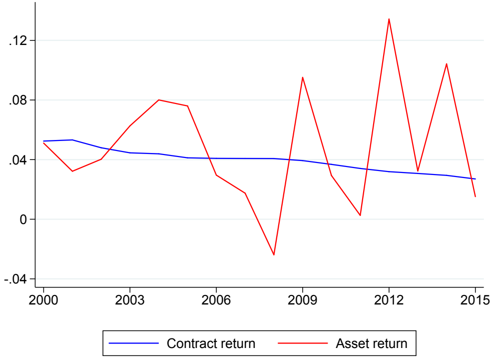
Insurance against market risk

- Data: regulatory filings, 1999–2015
- Contract return vs. Asset return (value-weighted average)



- Cross-sectional or inter-cohort risk sharing?

Transfer from reserves

- Contract return − Asset return = Transfer to current investors

  $-\Delta R_t$ = Transfer from reserves, i.e., from past and future investors

⇒ Market risk almost entirely absorbed by fund reserves

Inter-cohort redistribution

- Year τ-transfer to current investors

$$= \quad (-\Delta R_\tau)$$

Inter-cohort redistribution

- Year τ-transfer to investor cohort i

$$= \quad (-\Delta R_\tau) \frac{V_{i,\tau-1}}{V_{\tau-1}}$$

Inter-cohort redistribution

- Net transfer to investor cohort i

$$= \frac{V_{i,t-1}}{\sum_\tau V_{i,\tau-1}} \sum_\tau (-\Delta R_\tau) \frac{V_{i,\tau-1}}{V_{\tau-1}}$$

investors hold contracts for several years (12 on avg) $\rightarrow$ net across years

Inter-cohort redistribution

- Net transfer to investor cohort *i*

$$= \frac{V_{i,t-1}}{\sum_\tau V_{i,\tau-1}} \sum_\tau (-\Delta R_\tau) \frac{V_{i,\tau-1}}{V_{\tau-1}}$$

- $\sum_i |\text{Net transfer}_i|$ = 1.4% of account value/year on avg

  Agg. account value = €1.4 trillion = 1/3 household financial wealth

  $\rightarrow$ **0.8% of GDP redistributed across investor cohorts each year**

Taking stock

- Large amount of inter-cohort risk sharing
- Allen-Gale 97: (perfect) competition unravels risk sharing
- $\Rightarrow$ Competition must not be perfect
- What is the economics of imperfect competition in this market?

Model

- $t = 1, \ldots, \infty$
- Mass of short-lived investors each period
- J long-lived intermediaries offering one-period contracts

Model: supply

- Intermediary j maximizes $\sum_t E[\Pi_{j,t}]/(1+r)^t$
- by choice of contract return policy $y_{j,t}$ contingent on end-of-period t info
- subject to:

  regulatory constraint $\Pi_{j,t} \leq \phi V_{j,t-1}$

  budget constraint $x_{j,t} A_{j,t-1} = y_{j,t} V_{j,t-1} + \Pi_{j,t} + (R_{j,t} - R_{j,t-1})$

  transversality condition

- Exogenous asset return $x_{j,t} = r + \epsilon_{j,t}$

Model: demand

- Investor i's expected utility from buying contract with j

$$U_{i,j,t} = \underbrace{\alpha E_{t-1}[u(y_{j,t})]}_{\substack{\text{preference} \\ \text{for return}}} + \underbrace{\xi_j}_{\substack{\text{common} \\ \text{preference} \\ \text{for insurer}}} + \underbrace{\psi_{i,j,t}}_{\substack{\text{idio} \\ \text{preference} \\ \text{for insurer}}}$$

- **Key parameter:** $\alpha =$ elasticity to expected returns
- Outside option $j = 0$: $y_{0,t} = r - \phi + \epsilon_{0,t}$
- $\psi_{i,j,t}$ distributed extreme value $\Rightarrow$ Logit demand function

$$V_{j,t-1} = \frac{\exp\{\alpha E_{t-1}[u(y_{j,t})] + \xi_j\}}{\sum_{k=0}^{J} \exp\{\alpha E_{t-1}[u(y_{k,t})] + \xi_k\}}$$

Equilibrium: Contract return policy

- Return of contract j in period t:

$$\boxed{y_{j,t} \simeq r\,\frac{R_{j,t}}{V_{j,t}} + g(\alpha)\,x_{j,t} + cste_t}$$

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$\alpha \simeq 0$: $g(\alpha) = 0 \rightarrow$ asset risk shared between current and future investors

$\alpha > 0$: $g(\alpha) \in (0, 1)$ because reserves predict contract returns, so investors time reserves

$\alpha \simeq \infty$: $g(\alpha) = 1 \rightarrow$ unraveling as in Allen-Gale 97

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- Can be estimated by OLS

Equilibrium: Flow-reserves relation

- Investor flows to contract j in period t:

$$\boxed{Flow_{j,t} \simeq \alpha\, r\, \frac{R_{j,t-1}}{V_{j,t-1}} + cste_j}$$

Reserves predict contract returns $\rightarrow$ flows react with sensitivity α

- Can be estimated by OLS

Test: contract return policy

- Return of contract j in period t:

$$y_{j,t} \simeq r \frac{R_{j,t}}{V_{j,t}} + g(\alpha)\, x_{j,t} + cste_t$$

where $g(\alpha)$ increases from 0 to 1 when α goes from 0 to ∞

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- OLS estimation

	$y_{j,t}$	
$R_{j,t-}$	.026***	.035***
	(.0078)	(.0081)
$x_{j,t}$	-.017	-.018**
	(.011)	(.0079)
Year FE	✓	✓
Insurer FE		✓
Adjusted-R2	.69	.81
Observations	978	978

Consistent with $r \simeq 3\%$

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Test: Flow-reserves relation

- Do flows react to predictable returns?

	NetFlow	= Inflow	− Redemption	− Termination
$R_{j,t-1}$	.086 (.098)	-.02 (.091)	-.078* (.041)	-.025 (.02)
Year FE	✓	✓	✓	✓
Insurer FE	✓	✓	✓	✓
Adjusted-R2	.66	.77	.75	.8
Observations	859	859	859	859

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- Precisely estimated zero
- Again, consistent with $\alpha \simeq 0$

Why is $\alpha \simeq 0$?

- Not explained by taxes or fee structure

    tax rate decreases with holding period; entry fees $\rightarrow$ switching cost

    focusing on new investors, who don't face these costs, flow-reserves sensitivity is still zero

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  tax rate decreases with holding period; entry fees $\rightarrow$ switching cost

  focusing on new investors, who don't face these costs, flow-reserves sensitivity is still zero

- Not explained by fees adjusting to reserves

  insurers don't increase fees for investors joining when reserves are high

Why is $\alpha \simeq 0$?

- Hypothesis: investors don't understand that reserves predict returns

    anecdotal evidence

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- Proxy for investor sophistication = investment amount

    variation across insurers

    variation across contracts within insurer-year

Investor sophistication

	Contract-level net flows	
Reserves x (Avg investment 0–50 k€)	-.059	
	(.17)	
Reserves x (Avg investment 50–250 k€)	.014	.13
	(.17)	(.076)
Reserves x (Avg investment 250+ k€)	.36*	.41***
	(.13)	(.0031)
Avg investment FE	✓	✓
Insurer FE	✓	
Year FE	✓	
Insurer x Year FE		✓
Adjusted-R2	.13	.16
Observations	7,272	7,272

- Higher elasticity in contracts with large invested amounts

Take-away

- Inter-cohort risk sharing in euro contracts

  large from macro perspective $\simeq$ 0.8% GDP

- Sustained by low elasticity to predictable returns

  related to lack of sophistication