

# Risks of Life Insurers: Recent Trends and Transmission Mechanisms

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# Overview

- Traditional risks:
  - 1 Interest rates
  - 2 Aggregate longevity or mortality
  - 3 Policyholder behavior
- Modern risks:
  - 1 Minimum-return guarantees (variable annuities)
  - 2 Shadow insurance
  - 3 Securities lending
  - 4 Derivatives

# Overview

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- Modern risks:
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  - 2 Shadow insurance
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- Objectives:
  - 1 Summarize recent trends for U.S. life insurers.
  - 2 Discuss potential amplification and transmission mechanisms.
  - 3 Suggest improvements in financial disclosure.

# Themes

- 1 Risk concentration: Aggregate activity for industry mostly due to top 10 financial groups.
- 2 Individual risk exposure easier to quantify, but overall risk mismatch is much harder.
- 3 Poorly designed accounting standards and capital regulation can have unintended consequences. Life insurers increase risk to improve RBC.
  - Investment: Ellul et al. (2011), Ellul et al. (2012), and Merrill et al. (2012).
  - Derivatives: Credit Suisse (2012).
  - Product market: Koijen and Yogo (2015).

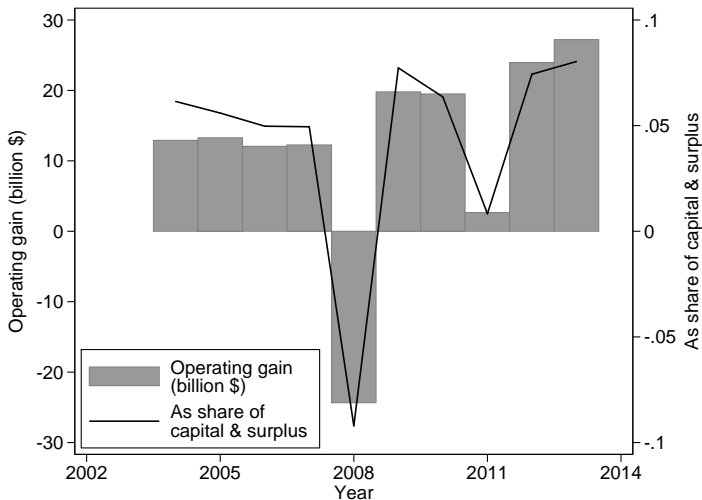
# Life insurers during the 2008 financial crisis

- AIG lost \$21 billion from securities lending, compared with \$34 billion from CDS (McDonald and Paulson 2014).
- Hartford also received TARP because of VA losses.
- Others involved in VA or securities lending applied for TARP: Allstate, Genworth Financial, and Prudential Financial.

# Operating gain in 2008 for top 10 financial groups by variable annuity account value

Financial group	Account value (billion \$)	Operating gain (share of capital and surplus)
MetLife	143	-0.05
AXA Financial	139	-0.18
Hartford Life	119	-0.52
AIG Life	105	0.00
ING USA Life	98	-0.14
Lincoln Financial	97	-0.01
Manulife Financial	94	-0.46
Prudential of America	79	-0.28
Aegon USA	61	-0.26
Ameriprise Financial	57	-0.44
Total for life insurers		
with VA guarantees	1,460	-0.09
without VA guarantees	0	0.01

# Operating gain from annuities for life insurers with variable annuity guarantees

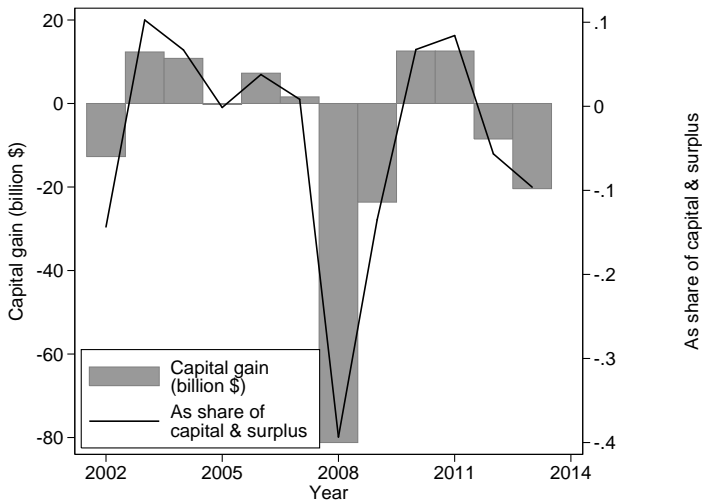


## Capital gain in 2008 for top 10 financial groups by securities lending agreements

Financial group	Amount of assets (billion \$)	Capital gain (share of capital and surplus)
AIG Life	54	-1.69
MetLife	38	-0.07
New York Life	6	-0.34
Prudential of America	5	-0.28
Northwestern Mutual	4	-0.52
Hartford Life	2	-0.07
Genworth Financial	2	0.12
Allstate Financial	2	-0.48
Manulife Financial	2	-0.07
Woodmen Life	1	-0.26
Total for life insurers		
with securities lending	128	-0.39
without securities lending	0	-0.18



# Capital gain for life insurers with securities lending agreements



# Shadow insurance

- **Shadow insurance**: Affiliated reinsurance with an unauthorized and unrated reinsurer.
- Some captives are actually authorized.

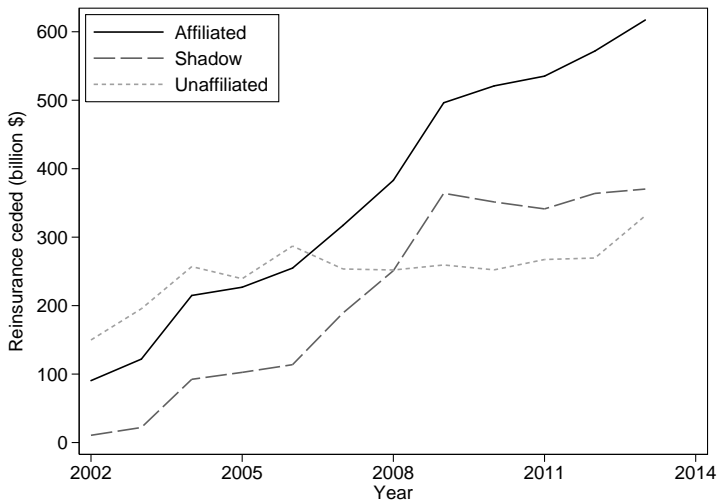
# Shadow insurance

- **Shadow insurance:** Affiliated reinsurance with an unauthorized and unrated reinsurer.
- Some captives are actually authorized.
- ① Liquidity risk from mismatch between LOC and insurance liabilities.
- ② More investment risk?
- ③ Less equity and higher leverage?
  - Lawsky (2013): Conditional LOC and naked parental guarantees.
  - Iowa released financial statements for 8 captives in 2014. Under statutory accounting, surplus would be  $-\$2.663$  billion (instead of  $\$1.497$  billion).

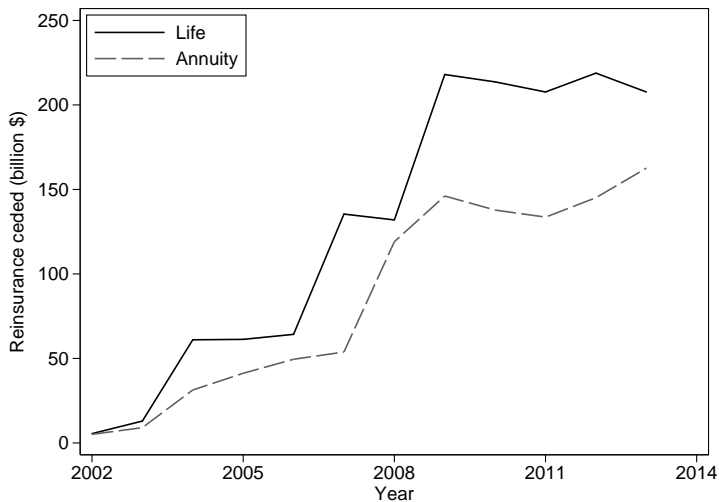
# Top 10 financial groups by shadow insurance

Financial group	Reinsurance ceded (billion \$)
John Hancock Life Insurance	118
MetLife	45
Athene USA	40
Hartford Life	40
Aegon USA	30
Great-West Life	14
Voya Financial	13
AIG Life and Retirement	12
Global Atlantic	11
Lincoln Financial	7

# Reinsurance ceded to affiliated, shadow, and unaffiliated reinsurers



# Life versus annuity reinsurance ceded to shadow reinsurers



# Do derivatives hedge volatility?

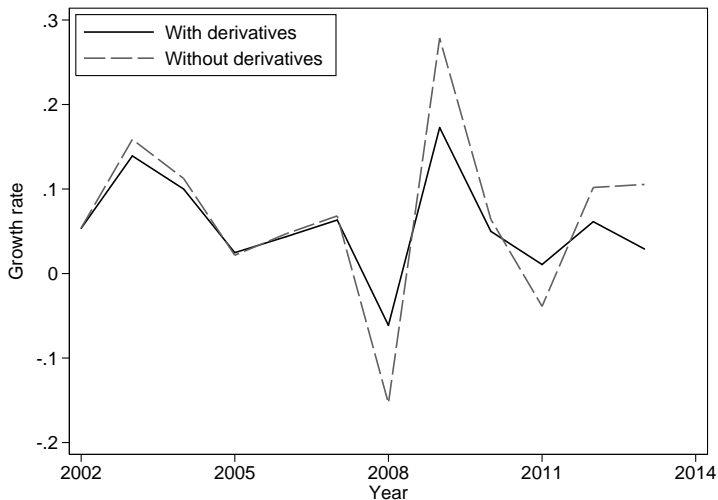
- Total notional amount of OTC derivatives held by U.S. life insurers was \$1.1 trillion in 2014 (Berends and King 2015).
- **Question:** Hedge or amplify volatility? Derivatives amplify volatility for banks (Begenau et al. 2015).

## 1 Basis risk

- Long duration of VA guarantees.
- Hedge statutory, GAAP, or economic capital?

## 2 Counterparty risk

# Growth rate of capital and surplus with and without derivatives





# Potential transmission mechanisms

## 1 Banks:

- Captive reinsurance funded by LOC.
- Counterparties in securities lending and derivatives.
- Funding through corporate bonds.

## 2 Corporate bond market:

- Fire-sale dynamics (Ellul et al. 2012).
- Higher borrowing costs for firms.

## 3 Households:

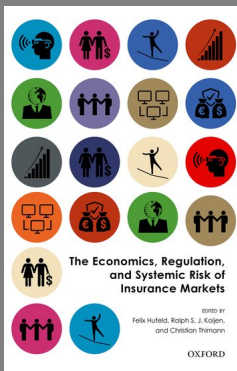
- Solvency worries could lead to debt overhang and collapse in demand.
- Increase in precautionary saving and welfare loss.

# Improvements in financial disclosure

- 1 Variable annuities: Type and quantity of guaranteed benefits by product.
- 2 Interest-rate risk: Market value and duration of liabilities (analogous to reporting on the asset side).
- 3 Captive reinsurance: Release financial statements following Iowa.
- 4 Derivatives: More detail on which derivatives hedge which risks.
- 5 International activity: Detailed financial statements not available for Europe (depends on Solvency II disclosure).

# More on systemic risk in the insurance sector

- The Economics, Regulation, and Systemic Risk of Insurance Markets, Oxford University Press.



- Available as of November 4, 2016 (Amazon and OUP).

# Surplus of Iowa captives based on Iowa versus statutory accounting

Captive	Iowa	Statutory
Cape Verity I	27	-432
Cape Verity II	140	-548
Cape Verity III	54	-169
MNL Reinsurance	118	118
Solberg Reinsurance	207	207
Symetra Reinsurance	20	-51
TLIC Riverwood Reinsurance	817	-1,113
TLIC Oakbrook Reinsurance	114	-675
Total	1,497	-2,663