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

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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).

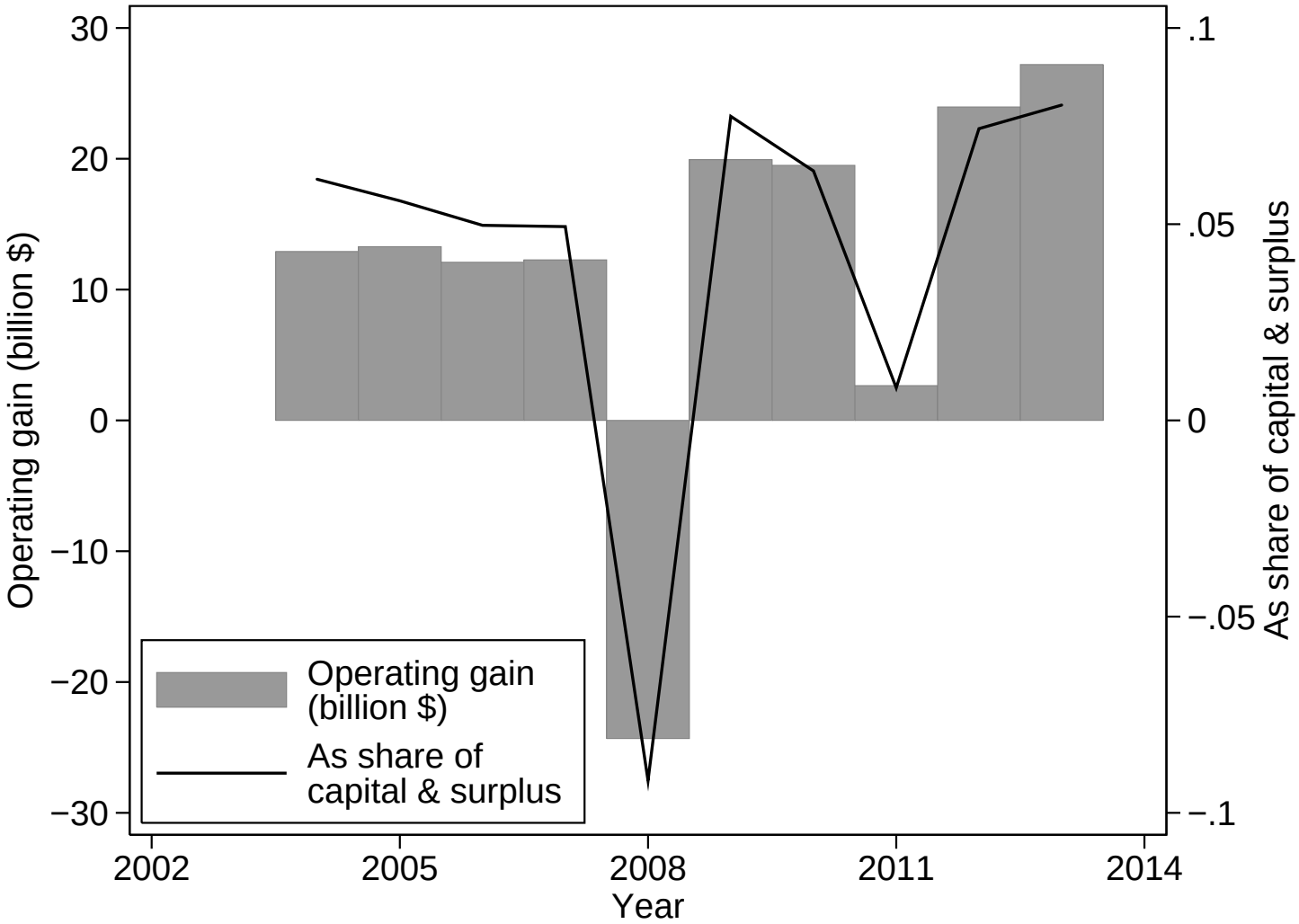
Life insurers during the 2008 financial crisis

- 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)
AXA Financial	179	-0.18
MetLife	143	-0.05
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
Genworth Financial	60	-0.13
Total for life insurers		
with VA guarantees	1,521	-0.09
without VA guarantees	0	0.01

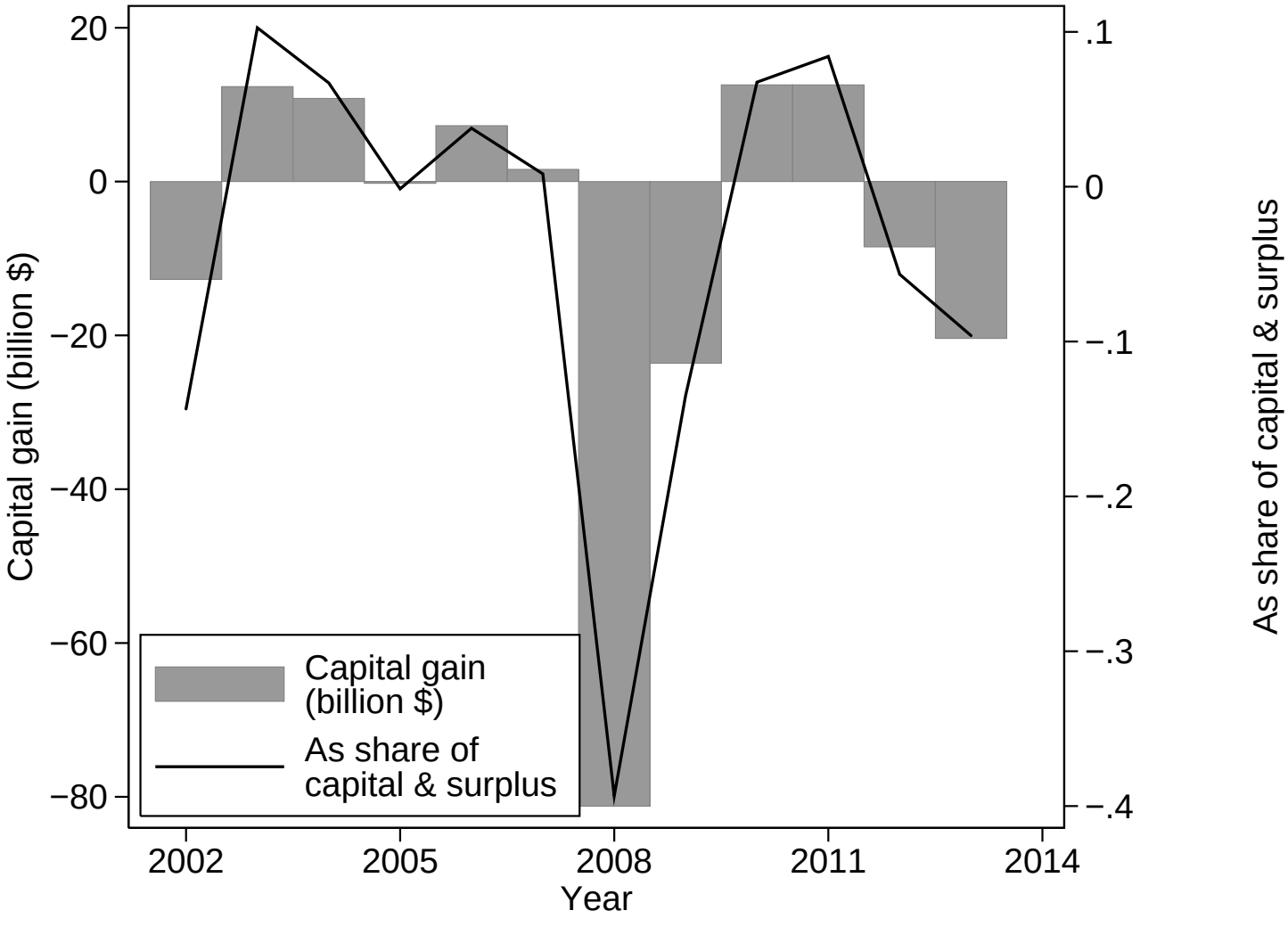
Operating gain from annuities for life insurers with variable annuity guarantees



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

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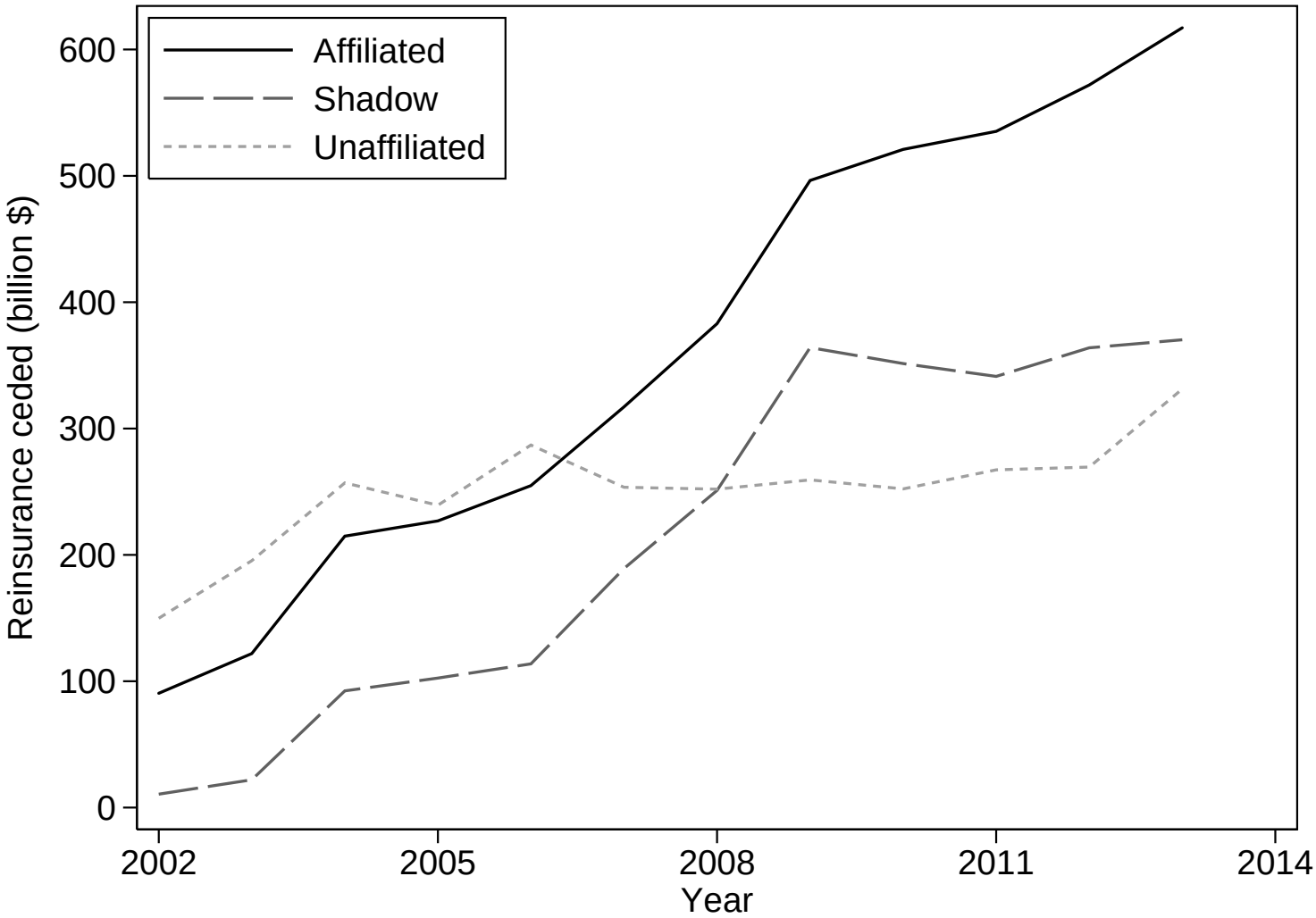
1. Liquidity risk from mismatch between LOC and insurance liabilities.
2. More investment risk?
3. Less equity and higher leverage?
    - Lawsky (2013): Conditional LOC and naked parental guarantees.
    - Iowa released financial statements for 8 captives in 2014. Under statutory accounting, surplus would be −$2.663 billion (instead of $1.497 billion).

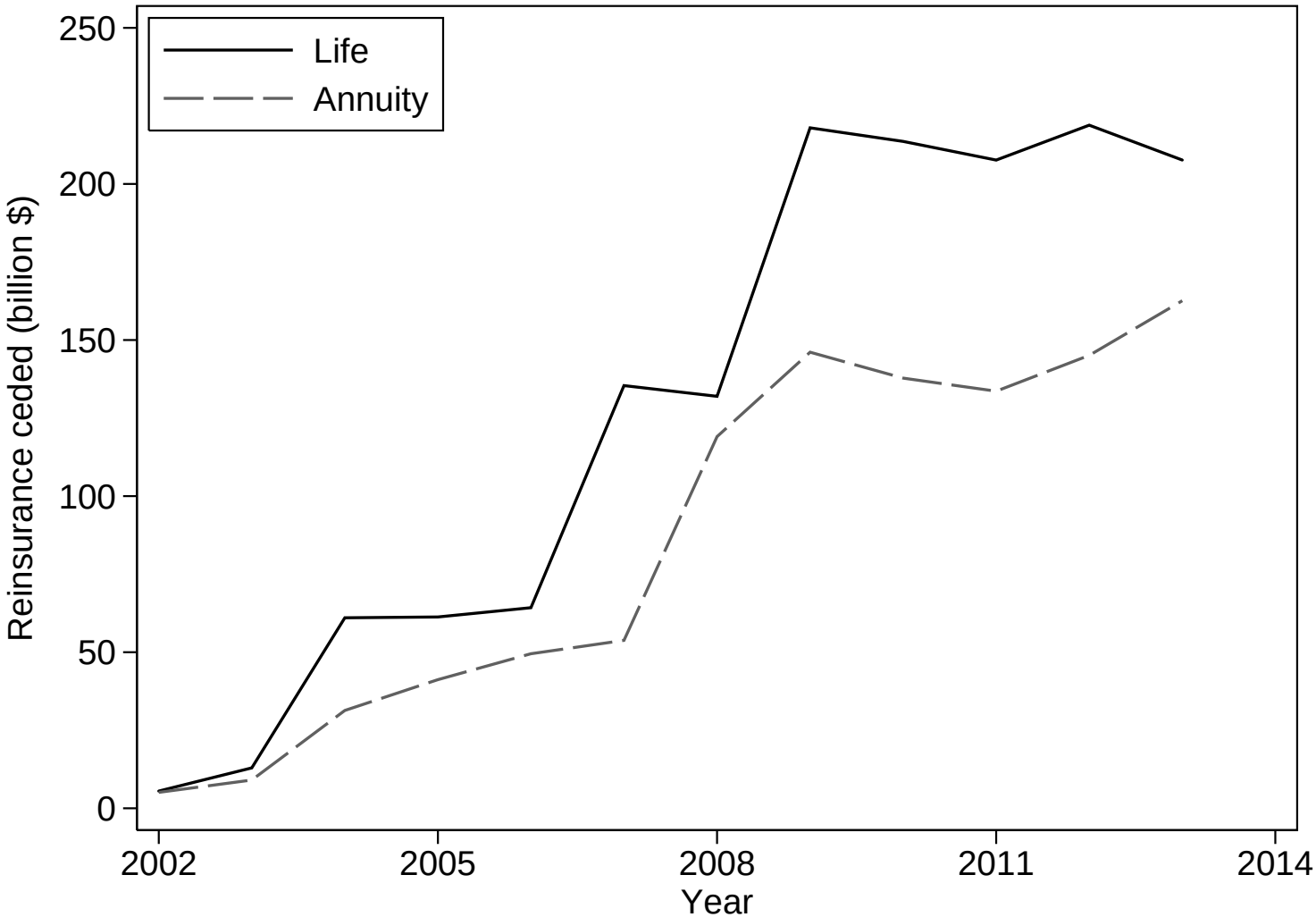
Top 10 financial groups by shadow insurance

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

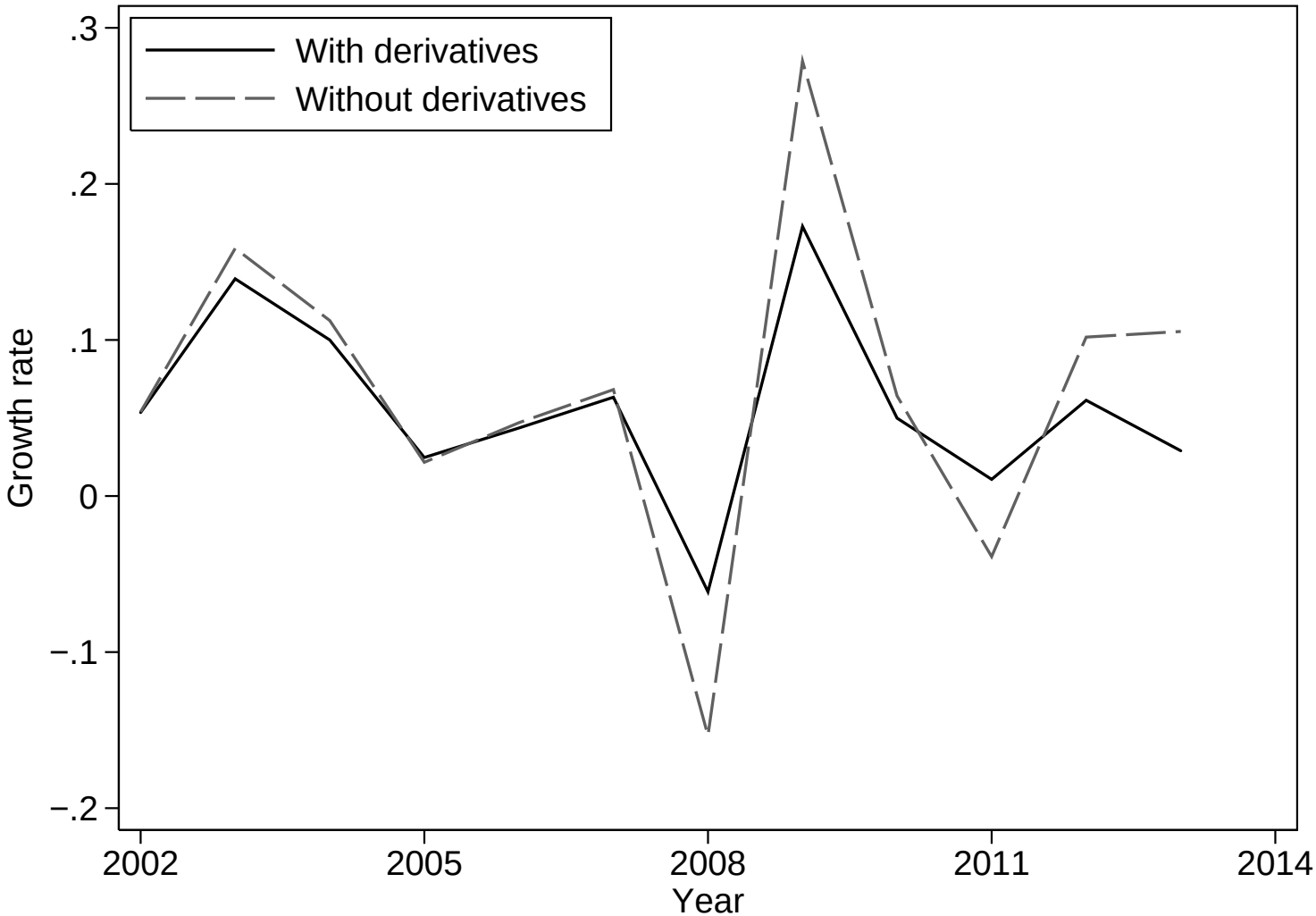


Do derivatives hedge volatility?

- 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.

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