

# Risk and Financial Reporting in the Insurance Industry

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# Insurance and risk

- Insurance provides economic protection from identified risks occurring or discovered within a specified period
  - Unique product: the ultimate cost is often unknown until long after the sale → main source of uncertainty and risk
- Primary role of insurance: spread risk
  - Diversification: the total risk of a portfolio of policies is smaller than the sum of the policies' risks
- Insurers invest the premiums in (primarily) fixed income securities
  - Diversification again: large portfolios → low idiosyncratic risk

# Insurance and risk

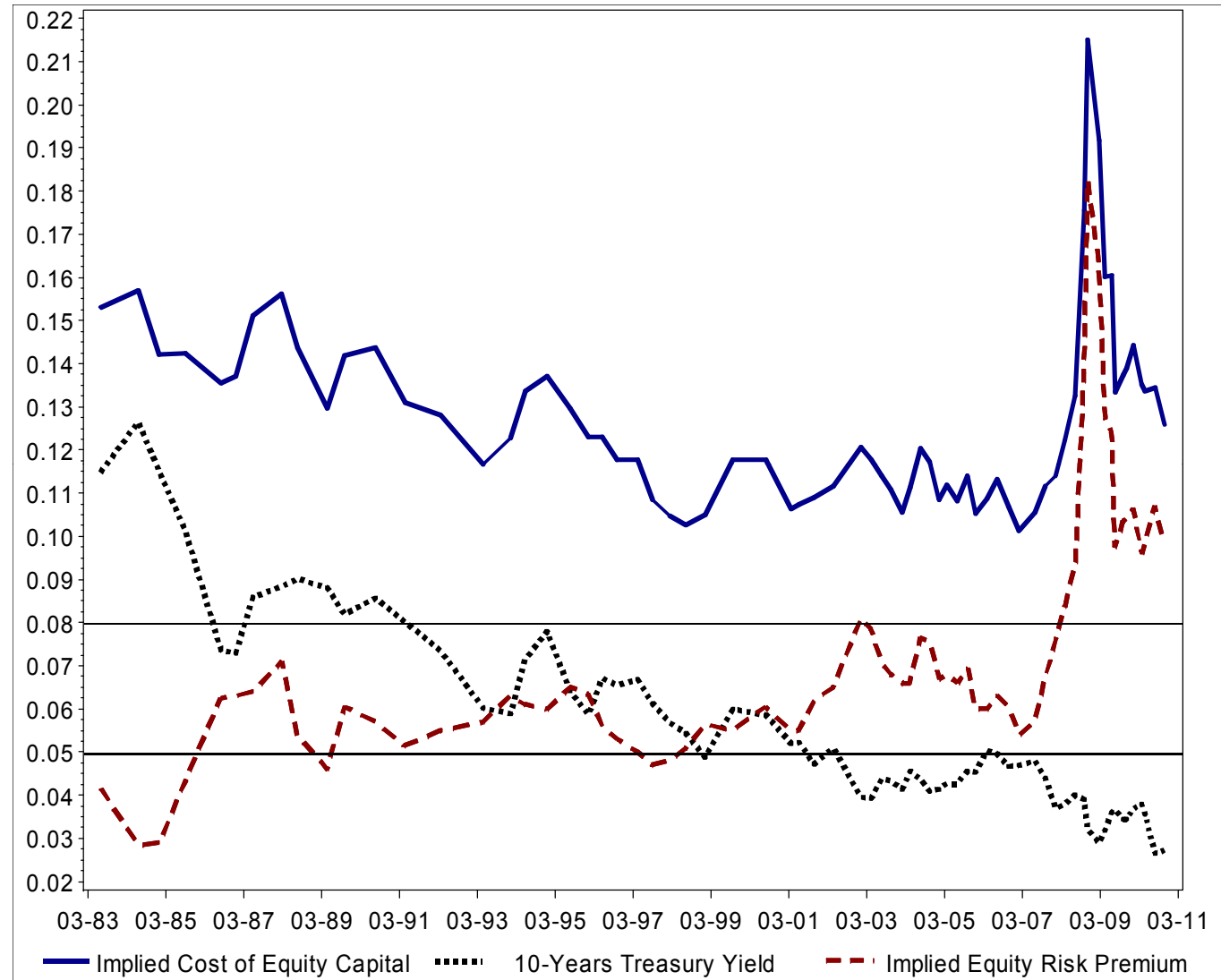
- Retained risk
  - Systematic (catastrophes, longevity / mortality, market risks, ...)
  - Limits of diversification (size, cost, skills, line / geographic concentration, speculation, ...)
- Risk mitigation
  - Reinsurance, capital market solutions, asset/liability management, capital and contingent capital resources, ...
  - Limits again (size, cost, skills, ...)
- Residual risk is (or should be) borne by equity holders

# Objectives of first study

- The pricing of insurers' equity (residual) risk
  - Time-series and cross-sectional determinants
  - Differences among Life and Health (LH), Property and Casualty (PC), and other insurers
  - Impact of the 2007-2009 financial crisis
- Insights regarding risk premiums in general
  - Proxies: Implied Cost of Equity Capital (**ICEC**)  
Implied Equity Risk Premium (**IERP** = ICEC – risk free rate)
    - ICEC is IRR given price and individual analysts' earnings forecasts
  - ICEC and IERP used in many contexts: identify priced risks, required returns, expected returns, valuation, mispricing, market risk premium
  - Insurance industry – a setting that yields relatively precise residual earnings-based estimates

## U.S. Insurers' Median Implied Cost of Equity Capital and Its Components

- The plots present median values of consecutive 100 observations over time.
- For most of the sample period, the median IERP was quite stable, fluctuating between 5% and 8%.
- In the early 1980s the median IERP was less than 5%, and in 2008-2011 it exceeded 8%, passing 15% in late 2008 and early 2009.
- Extreme median IERP were associated with less abnormal ICEC values due to a negative correlation between the IERP and the 10-year Treasury yield.
- The ten year rate declined monotonically throughout the sample period, causing a negative trend in the ICEC.



- The negative trend of the ICEC was abruptly broken during the financial crisis of 2007-2009, which drastically increased the median IERP and hence median ICEC.
- In the two years following its peak in early 2009, the median IERP has declined significantly. However, in January 2011—the end of the sample period—the median IERP was still high compared to historical levels.

# Insurance industry

- **Life and Health (LH)** – provide primarily life, disability, indemnity or supplemental health insurance (excluding managed care companies)
- **Property and Casualty (PC)** – provide primarily property and casualty insurance
- **Multi-line Insurers (ML)** – diversified interests in life, health and property and casualty insurance
- **Reinsurers (Re)** – provide primarily reinsurance (insurance sold to insurers)
- **Insurance Brokers (IB)** – insurance and reinsurance brokerage firms

# LH versus PC Insurers

- Different financial profile
  - LH insurers have higher leverage and larger scale
  - PC insurers invest in more liquid and less risky financial instruments
- Different operations
  - PC insurers are generally exposed to higher underwriting risks
    - Frequency and magnitude of PC claims are more volatile, skewed, and heavy-tailed
      - Catastrophic events such as hurricanes, earthquakes and terrorism acts
      - Claim payment depends on (volatile) loss rather than face value of policy
  - LH insurers have significant exposure to market risks
    - Spread business – interest rate, credit and related risks
    - Fee income from variable annuities, AUM and similar services
    - Non linear exposure due to various minimum benefit guarantees

# LH versus PC Insurers

	Life and Health (Max N = 2,030)			Property and Casualty (Max N = 2,784)			Other Insurers (Max N = 1,932)		
	Med.	Mean	SD	Med.	Mean	SD	Med.	Mean	SD
Equity risk premium	0.062	<b>0.075</b>	0.045	0.064	<b>0.007</b>	0.034	0.069	<b>0.082</b>	0.045
Total assets (million)	28,363	70,580	101,566	8,237	24,952	37,694	9,156	40,367	76,946
Market value of equity (million)	2,676	7,898	10,528	2,460	6,393	8,462	3,207	5,406	6,404
Equity-to-asset ratio	0.092	<b>0.132</b>	0.121	0.231	<b>0.263</b>	0.132	0.223	<b>0.255</b>	0.184
Book-to-market ratio	0.790	<b>0.952</b>	0.621	0.721	<b>0.786</b>	0.376	0.622	<b>0.72</b>	0.459
Market beta	0.937	<b>1.049</b>	0.597	0.816	<b>0.824</b>	0.401	0.766	<b>0.891</b>	0.562
Idiosyncratic volatility	0.016	<b>0.021</b>	0.014	0.016	<b>0.018</b>	0.009	0.015	<b>0.019</b>	0.011
Co-skewness	-0.014	<b>-0.022</b>	0.174	-0.001	<b>-0.004</b>	0.169	-0.011	<b>-0.007</b>	0.177
Kurtosis / 100	0.032	0.056	0.068	0.028	0.047	0.057	0.036	0.065	0.075
Subsequent year excess return	0.122	<b>0.113</b>	0.367	0.064	<b>0.068</b>	0.318	0.066	<b>0.065</b>	0.34

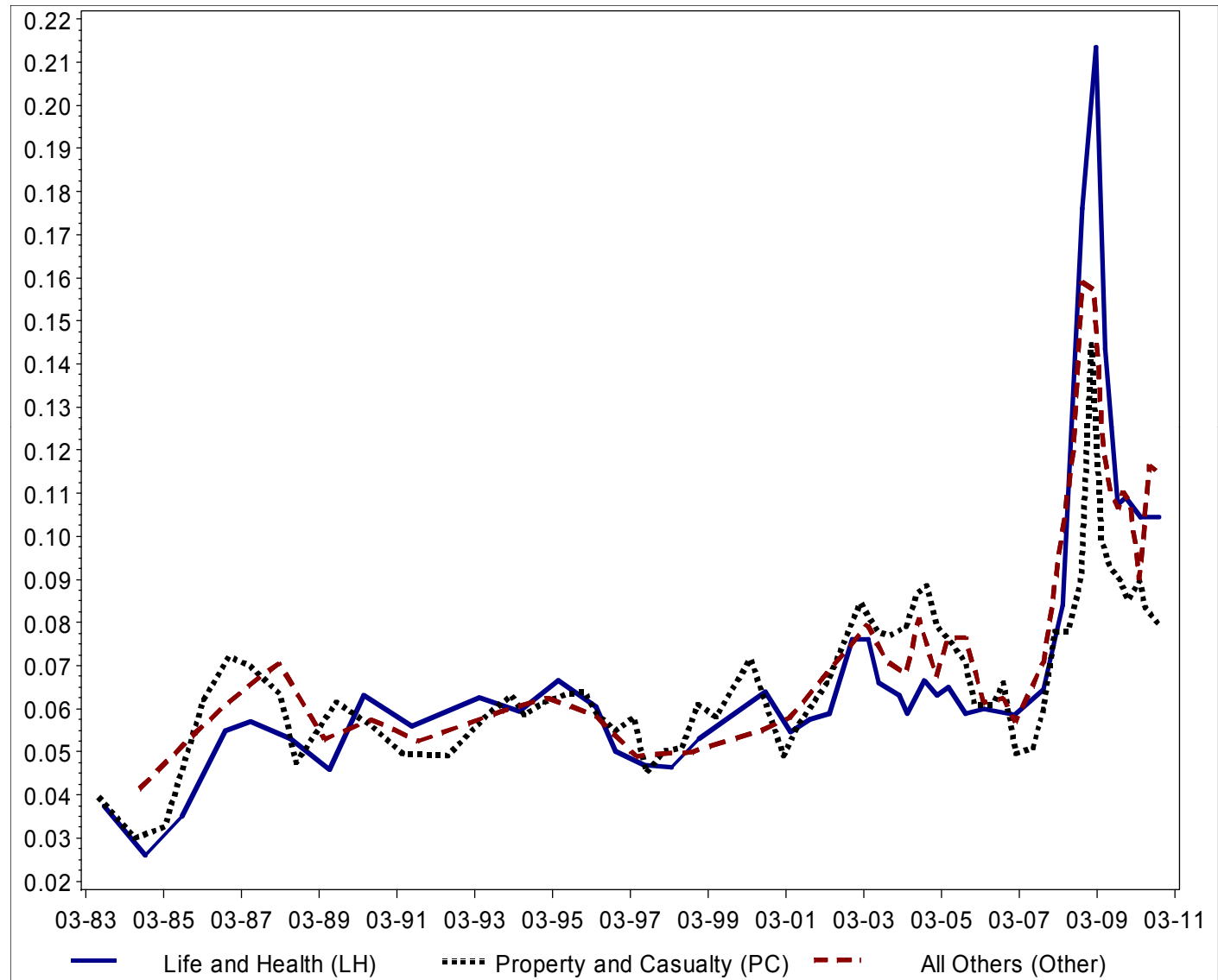
Are LH insurers more risky than other insurers?

- LH insurers have higher financial leverage, higher return-based risk proxies, larger realized subsequent year excess return, and (compared to PC) higher implied equity risk premium.
- On the other hand, LH insurers are relatively large and are (or were?) perceived to have less risky operations.



## U.S. Insurers' Median Equity Risk Premium by Sub-industry

- The plots present median values of consecutive 50 observations over time.
- During most of the sample period the three median IERP series were similar.
- Starting in 2007 the median IERP of LH insurers increased dramatically.
- The median IERP of PC and “Other” insurers also increased significantly during the financial crisis, but by far less than the increase for LH insurers.
- In early 2009, the median IERP exceeded 20% for LH insurers, 14% for PC insurers, and 15% for other insurers.



## Regressions of the IERP on macro and firm-specific risk factors:

- Investors demand relatively high expected returns in periods of poor economic performance or high uncertainty, and for high risk insurers

- IERP is positively related to credit spread, term spread, inflation, and unemployment, and negatively related to 10-year Treasury yield

- IERP is positively related to market beta, idiosyncratic volatility, and book-to-market ratio, and negatively related to co-skewness, size, and equity-to-assets ratio

- Most significant are the **10-year Treasury yield, credit spread, idiosyncratic volatility, equity-to-asset ratio, and book-to-market ratio**

- Results are robust to the inclusion of fixed firm and time effects and to the exclusion of the financial crisis (post June 2007 observations – Model 2\*)

	Model 1	Model 2	Model 2*	Model 3	Model 4	Model 5
Intercept / Firm / Time / Firm & Time	0.0525 10.2	0.0576 12.1	0.0618 10.3	Firm	Time	Firm& Time
10 year Treasury yield	-0.4625 -11.8	-0.4921 -16.9	-0.6595 -19.5	-0.7247 -15.7		
Term spread	0.1705 4.3	0.1588 4.2	0.1419 3.0	0.1433 4.5		
Credit spread	2.292 12.2	2.1233 15.0	1.5893 7.7	1.9602 16.8		
VIX / 100	-0.0109 -1.5					
Inflation	0.2463 6.3	0.2617 7.0	0.3974 8.8	0.201 6.5		
Production growth	0.0977 6.9	0.0893 6.9	0.1226 6.9	0.0804 8.2		
Unemployment	0.1728 4.0	0.1838 4.4	0.4786 5.9	0.0597 1.7		
Market beta	0.0029 2.2	0.0039 3.1	0.0039 2.5	0.006 4.7	-0.0024 -1.5	0.0015 0.8
Idiosyncratic volatility	1.0626 13.6	1.0502 15.0	0.7727 8.0	0.7648 11.8	1.4945 14	1.2275 10.4
Co-skewness	-0.0112 -4.1	-0.01 -4.2	-0.0051 -2.0	-0.0039 -1.9	-0.0078 -3.0	-0.0014 -0.6
Kurtosis / 100	0.01 1.5	0.0062 1.0	-0.0022 -0.3	0.0142 2.4	-0.0026 -0.4	0.008 1.3
Equity-to-asset ratio	-0.0188 -5.2	-0.0234 -6.9	-0.0193 -5.5	-0.0621 -7.7	-0.0255 -6.8	-0.0673 -8.8
Log of market value of equity / 100	-0.0397 -1.1	-0.1066 -2.9	-0.2559 -6.4	-0.9315 -9.2	0.0259 0.6	-0.853 -6.1
Log of the book-to-market ratio	0.0162 16.6	0.0131 15.1	0.0072 7.7	0.0161 11.0	0.0118 12.2	0.0106 5.6
Dummy for LH insurers	-0.011 -11.7	-0.0119 -13.3	-0.009 -10.4		-0.0105 -9.4	
Dummy for PC insurers	-0.0074 -8.1	-0.0066 -7.6	-0.0015 -1.6		-0.0072 -7.1	
R-square	0.5025	0.4756	0.2253	0.6765	0.7557	0.8569
Number of observations	5,325	5,981	4,481	5,981	6,378	6,378

## Regression of the IERP on macro and firm-specific risk factors, by sub-industry:

- Results are similar across the sub-industries, except that most relationships are stronger for LH insurers
- Results are robust to the inclusion of fixed firm and time effects
- Production growth – proxy for the demand for equity capital?

	Life and Health (LH) Insurers		Property Casualty (PC) Insurers		Other Insurers (Other)	
	Model 2	Model 5	Model 2	Model 5	Model 2	Model 5
Intercept / Firm & Time	0.044 5.7	Firm& Time	0.0733 9.5	Firm& Time	0.0593 6.4	Firm& Time
10 year Treasury yield	-0.6807 -13.3		-0.385 -8.8		-0.5112 -9.1	
Term spread	0.1298 2.0		0.2655 4.3		0.2088 3.2	
Credit spread	3.4844 15.1		0.9905 4.7		2.3275 10.3	
Inflation	0.4962 7.8		0.1245 2.1		0.2951 4.6	
Production growth	0.1787 8.1		0.0461 2.2		0.0807 3.5	
Unemployment	0.1377 1.6		0.0125 0.2		0.2791 3.9	
Market beta	0.0044 2.2	-0.0019 -0.5	0.0097 4.6	-0.0002 -0.1	-0.002 -0.8	0.0027 0.6
Idiosyncratic volatility	1.4083 12.3	1.4598 6.3	0.85 7.0	0.9348 5.1	0.7201 5.1	1.1729 4.0
Co-skewness	-0.017 -4.1	-0.0043 -1.1	-0.0102 -3.0	-0.0003 -0.1	0.0044 0.9	0.0068 1.3
Kurtosis / 100	0.0151 1.3	0.0137 1.1	-0.009 -0.8	-0.0008 -0.1	0.0099 1.0	0.0421 3.8
Equity-to-asset ratio	-0.0529 -7.3	-0.2048 -7.8	-0.0219 -4.2	-0.0620 -5.2	-0.0178 -3.3	-0.0441 -3.0
Log of market value of equity / 100	-0.259 -3.6	-0.0034 0.0	-0.1609 -3.1	-1.1246 -6.3	-0.1072 -1.7	-0.5958 -2.0
Log of the book-to-market ratio	0.0071 4.6	0.0182 4.2	0.0153 8.4	0.0162 4.6	0.0155 11.3	0.0093 2.3
R-square	0.6473	0.948	0.3321	0.8948	0.5113	0.927
Number of observations	1,786	1,934	2,497	2,661	1,698	1,783

## Regressions of subsequent annual excess stock returns on the IERP:

- The regressions demonstrate strong predictive ability
- Predictive ability holds both across firms and over time
- As expected, the inclusion of macro and firm-specific risk factors reduces the significance of the IERP, but does not eliminate it
- Predictive ability is particularly strong for LH insurers

### Panel A: OLS regressions

	All	LH	PC	Other
Intercept	-0.0632	-0.1324	0.0266	-0.0777
	-5.2	-6.6	1.4	-3.7
Equity risk premium	1.9557	3.3686	0.5981	1.7594
	11.2	11.6	2.1	6.2
R-square	0.0518	0.1546	0.0039	0.0509
Number of observations	6,096	1,837	2,537	1,722

### Panel B: Fixed firm and time regressions

	All	LH	PC	Other
Equity risk premium	2.5370	2.9188	1.4635	2.3882
	12.4	5.6	4.6	6.1
R-square	0.7956	0.9158	0.8808	0.8678
Number of observations	6,096	1,837	2,537	1,722

### Panel C: Fixed firm and time regressions, controlling for firm characteristics

	All	LH	PC	Other
Equity risk premium	1.0994	1.8032	0.6009	0.1008
	5.1	4.1	2.0	0.2
Market beta	-0.0348	-0.0655	-0.0814	-0.0879
	-2.0	-1.7	-2.8	-1.9
Idiosyncratic volatility	4.5148	-0.8276	9.5327	2.7875
	3.7	-0.4	5.2	0.9
Co-skewness	0.0198	-0.0226	-0.0369	0.0968
	0.9	-0.6	-1.1	1.4
Kurtosis / 100	-0.1964	-0.4625	-0.1822	0.334
	-3.0	-3.5	-1.7	2.5
Equity-to-asset ratio	0.0600	-0.5134	-0.0422	0.554
	0.8	-2.2	-0.3	3.4
Log of market value of equity / 100	-7.4069	-9.8962	3.2000	-14.9877
	-5.4	-3.9	1.6	-4.1
Log of the book-to-market ratio	0.0923	0.2226	0.2778	-0.0096
	3.7	4.9	5.9	-0.2
R-square	0.824	0.9348	0.8963	0.9064
Number of observations	5,875	1,772	2,481	1,622

# Objectives of second study

- Compare the accuracy of alternative multiple-based methods for valuing U.S. insurance companies
- Two of the comparisons concern income / book value volatility and risk
  - Impact of excluding **realized investment gains and losses** from earnings
  - Impact of excluding unrealized securities gains and losses (**AOCI**) from book value

# AOCI in the insurance industry

“Our price target is derived using blended multiples of 1.1x our 12/31/10 **BV ex. AOCI forecast** (50% weight), 1.0x our 12/31/10 total **BV projection** (25% weight), and 8.5x our 2010 **EPS estimate** (25% weight). ... The company currently trades at 0.9x BV ex. AOCI, roughly in line with the group level. On a P/E basis, MET trades at 7.8x our 2010 EPS estimate, close to the group median of 7.2x.”

A research report by JP Morgan on MetLife (MET), February 3, 2010

**Table 2.1.1: Primary Asset Categories**

	All	LH	PC	ML	Re	IB
Cash	2%	2%	3%	1%	4%	2%
Investment Assets (including ST)	<b>56%</b>	<b>57%</b>	<b>62%</b>	<b>44%</b>	<b>70%</b>	26%
Accounts Receivable (including premium)	3%	1%	6%	2%	5%	37%
Reinsurance Assets	5%	2%	9%	7%	11%	0%
Intangible Assets (other than DAC)	2%	1%	4%	1%	0%	20%
Deferred Policy Acquisition Costs	4%	4%	2%	4%	4%	3%
Separate Account Assets	<b>20%</b>	<b>28%</b>	<b>2%</b>	<b>35%</b>	<b>0%</b>	0%
Other Assets	7%	5%	12%	5%	5%	12%
Total Assets	100%	100%	100%	100%	100%	100%

- The largest asset category is **investments**.
- **Separate account assets** constitute the second largest asset category. They are reported primarily by LH and ML insurers. Similar to assets under management (AUM), insurers generally do not bear the risk of or receive the return on separate accounts but rather earn administrative and management fees. Therefore, removing separate accounts from the balance sheet yields a more informative representation.
- The **sample** includes all insurer-year observations during the period 1999-2009 with data available in COMPUSTAT North America using the Financial Services format.
- The **table** presents time-series averages of annual common-size analyses. Common-size statistics are calculated using the aggregate values of the numerator and denominator for the relevant group.

**Table 2.1.2: Primary Asset Categories Excluding Separate Accounts**

	All	LH	PC	ML	Re	IB
Cash	3%	3%	3%	1%	4%	2%
Investment Assets (including ST)	<b>71%</b>	<b>79%</b>	<b>63%</b>	69%	70%	26%
Accounts Receivable (including premium)	4%	2%	<b>6%</b>	4%	5%	37%
Reinsurance Assets	7%	3%	<b>10%</b>	11%	11%	0%
Intangible Assets (other than DAC)	3%	2%	4%	1%	0%	20%
Deferred Policy Acquisition Costs	4%	<b>6%</b>	2%	6%	4%	3%
Other Assets	9%	7%	<b>12%</b>	8%	5%	12%
Assets excluding separate account assets	100%	100%	100%	100%	100%	100%

- When **separate accounts** are excluded, investments account for more than 70% of total assets.
- For LH insurers, investment assets constitute almost 80% of adjusted assets, and deferred policy acquisition costs (DAC) constitute 6%.
- For PC insurers, investments account for only 63% of adjusted assets, and DAC constitute a mere 2%. Instead, PC insurers have substantial reinsurance assets, receivables, and other assets.



**Table 2.6.1: Investment Assets**

	<b>All</b>	<b>LH</b>	<b>PC</b>	<b>ML</b>	<b>Re</b>	<b>IB</b>
Short term investments	0%	0%	0%	0%	1%	0%
Investments in securities	<b>83%</b>	80%	<b>89%</b>	85%	82%	38%
Investments in loans	9%	<b>15%</b>	2%	5%	3%	0%
Investments in real estate	1%	1%	0%	0%	0%	0%
Other investments	7%	4%	9%	9%	14%	62%
Total invested assets	100%	100%	100%	100%	100%	100%

- Investments in securities constitute the majority of invested assets, especially for PC insurers.
- Loans are significant for LH insurers, but not for PC insurers.

**Table 2.6.2: Investment in Securities**

	<b>All</b>	<b>LH</b>	<b>PC</b>	<b>ML</b>	<b>Re</b>	<b>IB</b>
Fixed income securities	<b>91%</b>	<b>97%</b>	86%	90%	94%	86%
Equity securities	7%	2%	<b>14%</b>	10%	5%	14%
Other securities	1%	2%	1%	0%	0%	0%
Total investments in securities	100%	100%	100%	100%	100%	100%

- Investments in debt securities constitute the majority of securities holdings, especially for LH
- PC insurers have significant investments in equity securities, which are generally very liquid
- The differential investment compositions of PC and LH insurers reflect differences in focus – liquidity for PC insurers versus yield and asset-liability match for LH insurers.

# Accounting for investment in securities

- Most investments are classified as “available for sale” (AFS)
  - AFS investments are marked-to-market (or marked-to-model) on the balance sheet date
  - Unrealized gains and losses are recorded directly in equity, net of deferred taxes
    - Net income and retained earnings generally do not reflect unrealized gains and losses, but book value (equity) does
    - The equity account reflecting net unrealized gains and losses is called “Accumulated Other Comprehensive Income” (AOCI)

Assets	Liabilities	Equity
Investments ↑↓		Contributed capital Retained earnings AOCI ↑↓

**Table 2.1.3: Primary Liabilities and Equity Categories**

	All	LH	PC	ML	Re	IB
Insurance reserves	48%	53%	45%	41%	56%	11%
Unearned premiums	4%	0%	9%	4%	7%	9%
Reinsurance liabilities	1%	0%	1%	0%	2%	0%
Debt	6%	5%	9%	4%	6%	8%
Separate account liabilities	<b>20%</b>	<b>28%</b>	<b>2%</b>	<b>35%</b>	<b>0%</b>	0%
Other liabilities	8%	7%	10%	5%	4%	56%
Non-controlling interest and preferred stock	1%	0%	1%	1%	1%	1%
Common equity	<b>13%</b>	<b>7%</b>	<b>24%</b>	<b>9%</b>	<b>24%</b>	19%
Total liabilities and equity	100%	100%	100%	100%	100%	100%

- Similar to other financial firms, insurers have **high leverage** (low common equity ratios)
- The equity ratios of PC and Re insurers are about three times those of LH and ML insurers
- The differences in leverage are partially due to differences in **separate accounts**, which effectively inflate the balance sheet

**Table 2.1.3: Primary Liabilities and Equity Categories Excluding Separate Accounts**

	All	LH	PC	ML	Re	IB
Insurance reserves	60%	73%	46%	63%	56%	11%
Unearned premiums	5%	0%	9%	6%	7%	9%
Reinsurance liabilities	1%	0%	1%	1%	2%	0%
Debt	7%	7%	9%	6%	6%	8%
Other liabilities	10%	9%	10%	8%	4%	56%
Non-controlling interest and preferred stock	1%	0%	1%	1%	1%	1%
Common equity	17%	10%	25%	15%	24%	19%
Total	100%	100%	100%	100%	100%	100%

- **Excluding separate accounts** increases the equity ratios of LH and ML insurers, but they remain significantly smaller than those of PC and Re insurers
- PC insurers report considerable amounts of unearned premiums, while LH insurers generally recognize premium revenue when payments are received and so have little or no unearned revenue
- For LH insurers, **insurance reserves** constitute 73% of total adjusted liabilities and equity, which is about 60% larger than the corresponding ratio for PC insurers
- PC insurers have relatively high equity ratios because they are exposed to high underwriting risks: PC losses are highly sensitive to catastrophic events, and payments depend on the (uncertain) amount of loss as opposed to the policy face value

**Table 2.2.1: Insurance Reserves**

	All	LH	PC	ML	Re	IB
Reserves for benefits	46%	61%	21%	54%	0%	46%
Reserves for claims	35%	15%	71%	41%	5%	40%
Reinsurance reserves	3%	1%	1%	0%	93%	0%
Policyholders' accounts and sundry reserves	16%	24%	8%	5%	1%	14%
Total	100%	100%	100%	100%	100%	100%

- **Claim reserves** represent estimated future payments to settle claims related to insured events that have occurred by the balance sheet date (e.g., property damage, professional liability). Claims reserves are generally reported undiscounted
  - **Benefit reserves** represent the present value of future benefits to be paid to or on behalf of policyholders, including related expenses, less the present value of expected future net premiums (e.g., term and whole life)
  - **Reinsurance reserves** are primarily claim reserves
  - **Policyholders' account balances** represent an accumulation of account deposits plus credited interest less withdrawals, expenses and mortality charges (e.g., universal life, investment contracts)
- Insurance reserves are generally reported based on historical amounts and rates, and are not adjusted for changes in fair value
  - The investments that fund the reserves are generally marked-to-market
  - An increase (decrease) in interest rates generally decreases (increases) the reported fair value of investments, but the change in the liabilities' fair value is not recognized → **artificial volatility in book value**

**Table 2.1.5: Common-size Income Statements**

	All	LH	PC	ML	Re	IB
Insurance premium	64%	54%	71%	65%	86%	26%
Investment income	19%	35%	11%	18%	14%	5%
Fee income	8%	12%	5%	8%	0%	72%
<b>Realized investments gains (losses), net</b>	0%	-2%	1%	-2%	0%	0%
Other revenue	9%	2%	12%	11%	0%	0%
Total revenue	100%	100%	100%	100%	100%	100%

- **Insurance premiums** constitute the majority of reported revenue (64%), primarily for Re and PC insurers
- **Investment income** constitutes 19%, and is particularly large for LH insurers
- LH insurers generate much of their income from a **spread business**: they obtain relatively inexpensive funds from policy and contract holders, and invest the funds in higher yield instruments
- LH insurers generate substantial **fee income** from insurance activities (e.g., fees on universal life contracts) and non-insurance activities (e.g., asset management fees)
- Fees are the primary source of revenue for insurance brokers
- The statistics related to **realized investment gains and losses** substantially understate their economic significance due to offsetting positive and negative amounts over time and across insurers

**Table 2.1.5: Common-size Income Statements**

	<b>All</b>	<b>LH</b>	<b>PC</b>	<b>ML</b>	<b>Re</b>	<b>IB</b>
Benefits and claims	<b>54%</b>	<b>59%</b>	51%	55%	<b>64%</b>	14%
Amortization of deferred acquisition costs	<b>8%</b>	<b>4%</b>	10%	12%	11%	0%
Other operating expenses	<b>26%</b>	24%	26%	23%	<b>13%</b>	76%
Investment expense	<b>1%</b>	2%	0%	1%	1%	0%
Interest expense	2%	2%	2%	2%	1%	2%
Total pretax expenses	90%	91%	89%	92%	90%	89%

- Insurance expenses (the first three items) constitute a high percentage of total revenues, consistent with the relative magnitude of insurance revenues
- Investment expenses are very small compared to investment income
- LH insurers have relatively high “benefits and claims” expense ratios, which is offset by low DAC amortization due to the long expected maturity of the policies
- Reinsurers have the highest “benefits and claims” ratio but the lowest “other operating expenses” ratio, consistent with the wholesale nature of reinsurance which is substantially less expensive to underwrite

**Table 2.1.5: Common-size Income Statements**

	<b>All</b>	<b>LH</b>	<b>PC</b>	<b>ML</b>	<b>Re</b>	<b>IB</b>
Total revenue	100%	100%	100%	100%	100%	100%
Total pretax expenses	90%	91%	89%	92%	90%	89%
<b>Special pretax items</b>	0%	0%	0%	-1%	0%	-1%
Pretax income	9%	9%	10%	7%	10%	10%
Income taxes	2%	2%	3%	2%	2%	3%
Discontinued operations and extra. items	0%	0%	0%	1%	0%	1%
Minority interest and preferred dividend	1%	1%	0%	1%	0%	0%
Net income available to common	6%	<b>5%</b>	<b>7%</b>	<b>5%</b>	<b>8%</b>	<b>8%</b>

- While the revenue and expense composition are quite different across the five sub-industries, **net income margin** is comparable suggesting that some pricing multiples may be similar across the sub-industries
- The statistics related to **special items** understate their economic significance due to offsetting positive and negative amounts



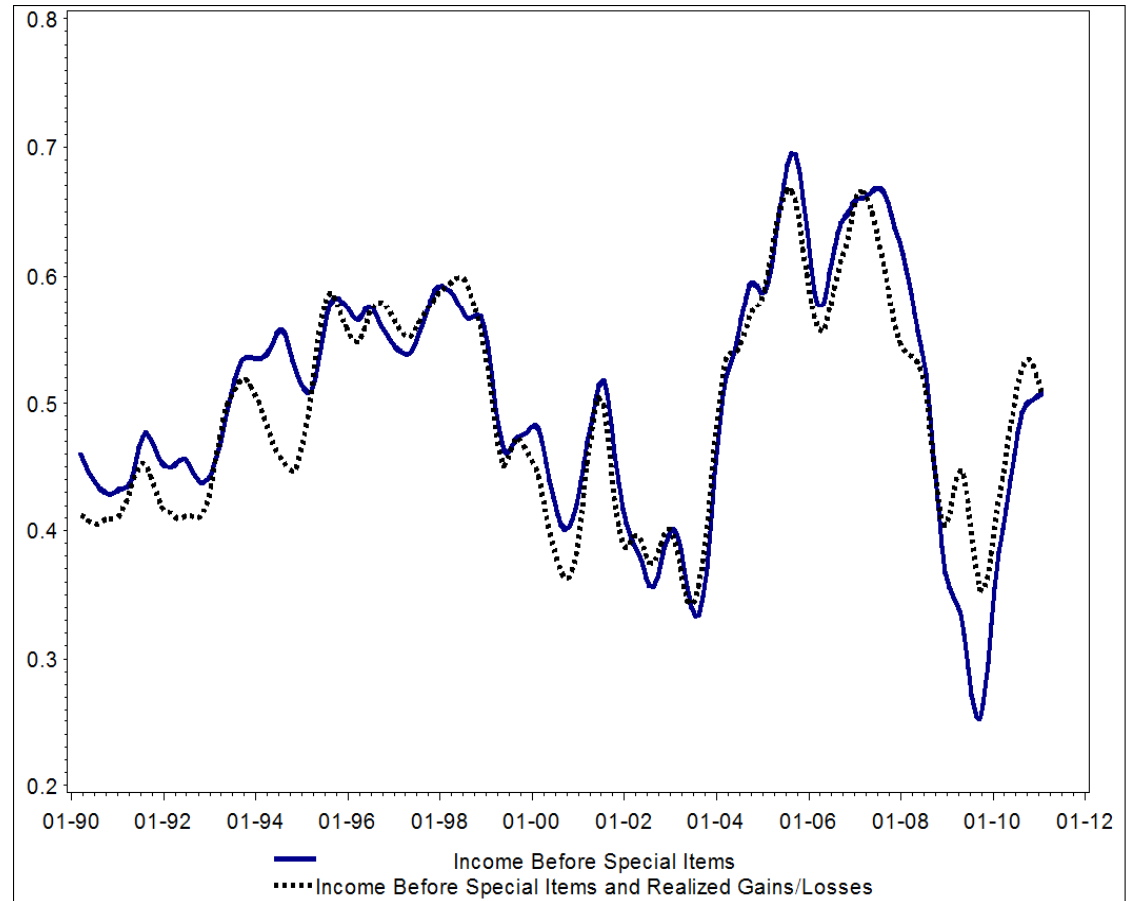
	Valuations within				
	10% of price	25% of price	50% of price	75% of price	90% of price
<b>Income before special items</b>	21.7%	50.1%	78.7%	90.9%	95.0%
<b>Income bef. special items and G/L</b>	21.6%	49.3%	78.4%	90.7%	95.0%
Difference	0.2%	0.8%	0.4%	0.2%	0.0%
t-statistic	0.3	1.2	0.6	0.5	0.1

- Surprisingly, income before both special items and investment gains and losses does not outperform income before special items.

- Possible explanations:

- Companies use investment gains and losses to smooth earnings over time
- Investors do not fully understand the discretionary and transitory nature of investment gains and losses

Proportion Within 25% of Price each Month



# AOCI in the insurance industry

- Insurance analysts often exclude AOCI from book value when measuring ROE and the price-to-book ratio
  - Excluding AOCI mitigates distortions caused by the mixed attributes model of historical cost and fair value
    - Investments are reported at fair value, with unrealized gains and losses included in AOCI
    - The liabilities that the investments are expected to fund are generally not marked-to-market
    - The values of the investments and liabilities are positively correlated, particularly for LH insurers (both are interest rate sensitive; impact of ALM)
    - The inclusion of unrealized investment gains and losses in AOCI causes an artificial volatility in book value
  - AOCI increases the volatility of book value, similar to the effect of transitory earnings items on reported income

# AOCl in the insurance industry

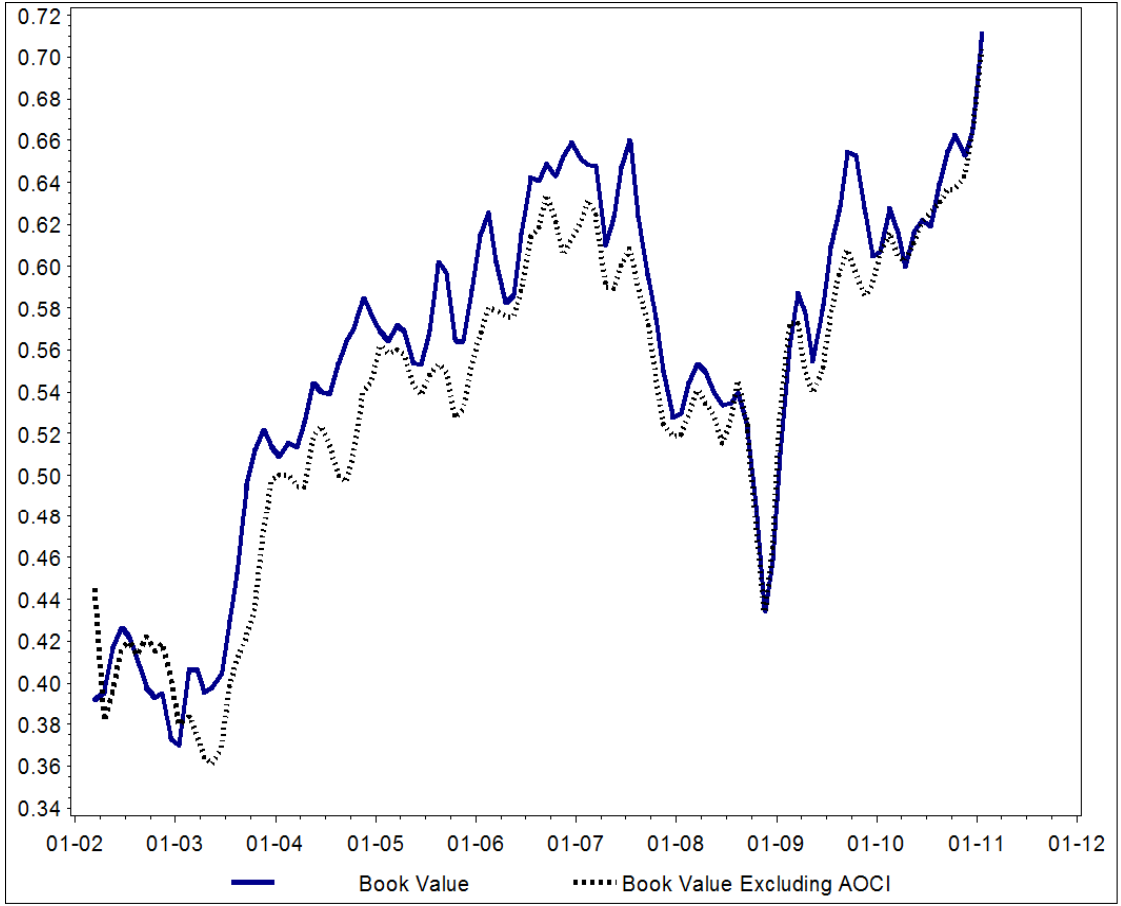
- Excluding AOCl from book value is problematic
  - Removing transitory items (e.g., realized gains and losses) from reported income yields a measure of non-discretionary, “real” earnings. In contrast, removing AOCl actually makes the resulting book value discretionary
    - For example, selling a security with unrealized gains reduces AOCl and increases ex-AOCl book value, but does not change total book value
  - In multiple valuation, earnings serve as a proxy for recurring cash flows while book value serves as a proxy for net invested assets, which in turn are expected to generate cash flows
    - All economic profits contribute to net assets and should therefore be reflected in book value
- Thus, *a priori* it is not clear whether excluding AOCl improves the accuracy of valuations or earnings forecasts

Valuations within

	10% of price	25% of price	50% of price	75% of price	90% of price
<b>Book value</b>	24.0%	55.4%	83.9%	93.9%	95.8%
<b>Book value excluding AOCI</b>	23.2%	53.4%	82.0%	92.7%	95.0%
Difference	0.8%	2.0%	1.9%	1.2%	0.8%
t-statistic	1.8	5.0	5.6	7.5	8.1

- Inconsistent with analysts' practice, excluding AOCI from book value significantly worsens rather than improves valuation accuracy, and this is true in almost all months.

Proportion Within 25% of Price each Month



# Related work

- Implied cost of equity capital in the U.S. insurance industry (*working paper*)
- Relative valuation of U.S. Insurance companies (*working paper*)
- Analysis and valuation of insurance companies (*CEASA Industry Study #2*)
- Earnings and stock return predictability in the insurance industry (*work in progress*)