DVfVW Jahrestagung

# Derivatives Usage, Disclosure standards, and Risk in the U.S. Insurance sector: an Investor's View

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# Motivation I

- Derivatives are important to insurers for managing their **risks**, e.g., interest rates, currency, or market risk, and **ALM**.
- **Derivatives trading (for speculative purposes)** has been named as a potential **source of systemic risk** (IAIS,2012).
- In 2008, the **Financial Accounting Standards Board** (FAS board) updated the derivatives disclosure standard (FAS 161).
- Since November 2008, insurance companies are required to explicitly disclose their derivatives usage (at fair value).
- Insurers also need to disclose their **objective** to use derivatives: **hedging VS. risk-taking.**
- **Is derivatives usage good or bad?**

# Motivation II

**Perhaps even more important...**

**What are the effects on insurers of increased transparency concerning derivatives usage?**

# Contribution

Empirical assessment of the **effects of derivatives disclosure and usage** in U.S. insurance companies on **idiosyncratic risk**.

**Main findings**:

- Insurers that disclose the usage of derivatives before it became mandatory have a **significantly higher MES, volatility, and default risk** than non-disclosers.
- Insurers that did not disclose the purpose of their use of derivatives before 2008 had a **significantly lower systemic risk exposure and lower default risk after the FAS update.**
- Higher transparency requirements thus help investors decrease information asymmetries in case firms were reluctant to disclose information in the past. If firms, however, disclosed these information voluntarily, tougher disclosure rules force additional costs on already compliant firms.

# Overview


1. Data on derivatives disclosure and usage
2. Empirical setup
3. The effect of voluntary derivatives disclosure on risk
4. Derivatives usage and hedging purposes
5. Conclusion

# Sample and 10K filings

- Publicly listed life and non-life U.S. insurance companies from Q1:2005 (Q1:2000) to Q4:2012.
- **Data sources**: CRSP (stock data), Compustat (balance-sheet items), Morningstar Document Research (10K/10Q filings).
- Manually **screen 10K/10Q filings** for information on derivatives usage/disclosure (keyword search, respective chapters, etc.).
- **Before Q4:2008/FAS No. 161**: Derivatives disclosure standards (and format) vary across firms. Some firms disclose derivatives (non-)usage and objectives, some do not.
- **After 2008/FAS No. 161**: Insurers **must disclose derivatives usage** and **explain their objectives** (hedging/non-hedging) [and disclose fair values of derivative instruments and their gains and losses].

# Derivatives variables

## Discloser/Non-Discloser

**Dummy variable**: 1/0 if insurers disclosed information on derivatives activities before FAS update/else.

## Purpose

**Dummy variable**: 1/0 if insurers disclosed information on derivatives activities before FAS update **and** information on hedging purposes/else.

## User/Non-User

**Dummy variable**: 1/0 if **disclosing insurers** indicate usage of derivatives/else.

## Intensity

**Variable**: Number of different types of derivatives used (0-4: none, swaps, options, forwards, futures).

# Risk measures

We employ the following risk measures on a quarterly basis as dependent variables:

- **Marginal Expected Shortfall (MES)**: Exposure to extreme market movements (S&P 500; worst 5%).
- **Volatility**: Standard deviation of daily stock returns in a given quarter, $\sigma(R_{i,t})$.
- **(Inverse) Z-score**[1]: Average daily stock returns (plus one) over standard deviation, $\frac{1+\bar{R}_{i,t}}{\sigma(R_{i,t})}$.

[1] See, e.g., Laeven/Levine (2009); Barth/Schnabel (2013); Schäfer/Schnabel/Weder di Mauro (2015)

# Empirical setup I

## Empirical challenge

Identification of the isolated effect of an increase in transparency.
Solution: DID approach with focus on insurers that did not disclose any information before FAS update.

- FAS update as **exogenous event** affecting all (listed) U.S. insurers.
  $\rightarrow$ POST-FAS$_t$ is 1 starting in Q4:2008; zero before.
- **Difference-in-difference (DID)**: Control group are "disclosers" (before FAS update):

$$Y_{i,t} = \alpha + \mu_t + \beta \cdot \text{NON-DISCLOSER}_i + \gamma \cdot (\text{NON-DISCLOSER}_i \times \text{POST-FAS}_t) + \varepsilon_i$$

where $Y_{i,t}$ is either **MES, volatility**, or **inverse z-score**.

# Empirical setup II

- **Second treatment group**: Subsample of disclosing insurers that **also (did not) disclose a hedging purpose** before Q4:2008 $\rightarrow$ NO-PURPOSE$_i$.

$$\text{Y}_{i,t} = \alpha + \mu_t + \beta \cdot \text{NO-PURPOSE}_i + \gamma \cdot (\text{NO-PURPOSE}_i \times \text{POST-FAS}_t) + \varepsilon_{i,t}.$$

# Difference-in-difference regressions I - Full sample

| | (1) | (2) | (3) |
|---|---|---|---|
| Dependent variable: | MES | Volatility | Inv. z-score |
| Non-Discloser | **-0.0033**** | **-0.0039**** | **-0.0018**** |
| | **(0.050)** | **(0.001)** | **(0.037)** |
| Non-Discloser × Post-FAS | 0.0030 | -0.0020 | 0.0017 |
| | (0.300) | (0.287) | (0.247) |
| Quarter dummies | x | x | x |
| Controls | x | x | x |
| $N$ | 2,025 | 1,999 | 2,032 |
| Adj. $R^2$ | 0.617 | 0.493 | 0.585 |

**Result**: New disclosure rule has no significant effect on sample firms.
→ Possibly due to the fact that non-disclosers either were non-users or simply chose not to disclose information!

# Difference-in-difference regressions II - Sub-sample of disclosers

| | (1) | (2) | (3) |
|---|---|---|---|
| Dependent variable: | MES | Volatility | Inv. z-score |
| User | -0.0013 | 0.0001 | 0.0009 |
| | (0.313) | (0.923) | (0.304) |
| User × Post-FAS | **0.0066**$^{***}$ | **0.0042**$^{***}$ | **0.0031**$^{***}$ |
| | **(0.000)** | **(0.004)** | **(0.007)** |
| Quarter dummies | x | x | x |
| Controls | x | x | x |
| $N$ | 1,859 | 1,816 | 1,866 |
| Adj. $R^2$ | 0.625 | 0.486 | 0.581 |

**Result**: Insurers that disclosed information volutarily AND used derivatives suffer from significant increases in idiosyncratic risk as perceived by market investors.

# Hedging-purpose DID regressions

| | (1) | (2) | (3) |
|---|---|---|---|
| Dependent variable: | MES | Volatility | Inv. z-score |
| No-Purpose | 0.0012 | 0.0043 | 0.0051 |
| | (0.739) | (0.209) | (0.136) |
| No-Purpose × Post-FAS | **-0.0109**** | -0.0030 | **-0.0077**** |
| | **(0.010)** | (0.446) | **(0.043)** |
| Quarter dummies | x | x | x |
| Controls | x | x | x |
| $N$ | 1,163 | 1,161 | 1,164 |
| Adj. $R^2$ | 0.660 | 0.505 | 0.591 |

**Results**: Increase in transparency decreases the systemic/idiosyncratic risk exposure of disclosing insurers.

# Robustness

## Placebo experiment

- Assume that FAS update took place **four years earlier**: Q1:2000-Q4:2007; event dummy 1 in Q4:2004-Q4:2007; 0 before.
- Run difference-in-difference analyses using this fictional setting. $\rightarrow$ Results are substantially different!
- Original DID analysis reflects the true effect of the FAS update on risk measures.

# Conclusion I

## Main findings

- Financial derivatives (and esp. derivatives trading): one potential source of systemic risk of insurers.
- Response by regulators: Increased transparency concerning derivatives usage (FAS 161 update).
- DID-analyses with FAS update as exogenous event, pre-2008 non-disclosers as treatment group, and hand-collected data from 10K/10Q filings on derivatives usage and its purpose.

# Conclusion II

## Main findings

- Main findings in a nutshell:
  - **Increased transparency is "good" for non-users, "bad" for users when looking at different market-based measures of firm risk / systemic risk.**
  - From this, one can conclude that market investors view derivatives (esp. for risk-taking) as potentially destabilizing. Increased transparency amplifies this view.
  - **Disclosure of hedging/trading purpose** significantly reduces the idiosyncratic risk of insurers.

# Thank you very much for your attention!