The Value of S&P Data Solutions in Empirical Research: FIG and Trucost

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My Background

- Ph.D. in Finance, University of Texas at Austin
- Research areas: financial institutions, climate finance
- Current position: Assistant Professor, City University of Hong Kong

S&P Data Solutions and Finance Research

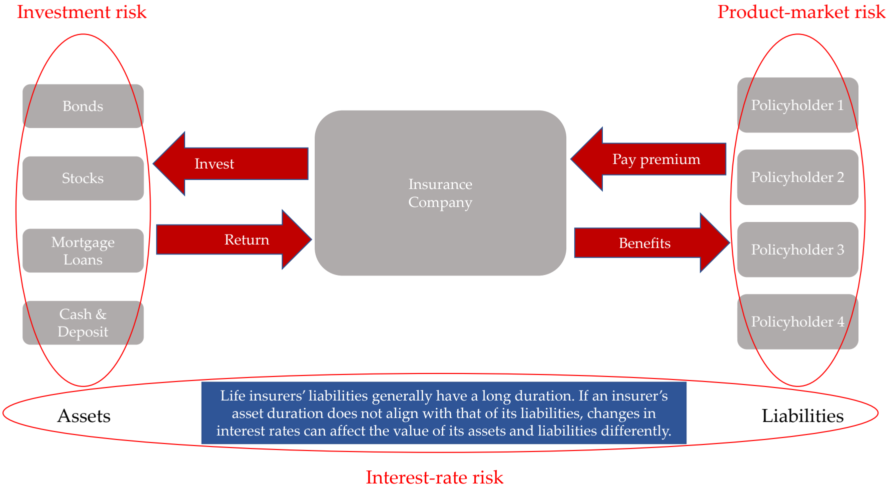
- Data solutions provided by S&P Global Market Intelligence fit my research interests:
  - Research on U.S. insurance companies' investment and risk management — **FIG**;
  - Research on ESG-related themes, climate risk in particular: **Trucost**;
- I will briefly talk about these S&P data sets and show examples of how they help fulfill the related research agenda.

Research with FIG

Research on U.S. Insurance Companies

- The FIG data set compiles regulatory filings by banks and insurance companies, where my use case has been focusing on its coverage of U.S. insurance companies.
- Some background of U.S. insurance companies:
  - Daily business operations of insurers are at the individual firm level, and it is common for individual firms to form an insurance group.
  - Individual insurance firms underwrite insurance policy plans ("products"), collect premiums, and invest the premiums in financial assets ("investment portfolio").
  - Regulation of U.S. insurers is at the state level — each state is in charge of regulating insurance business activities conducted within its own border
  - Regulation responsibilities: licensing businesses, monitoring prices and product offerings, and ensuring capital adequacy.

Research on U.S. Insurance Companies



Source: Liu and Xiong (2023)

Research on U.S. Insurance Companies

How does the FIG data set fit in here?

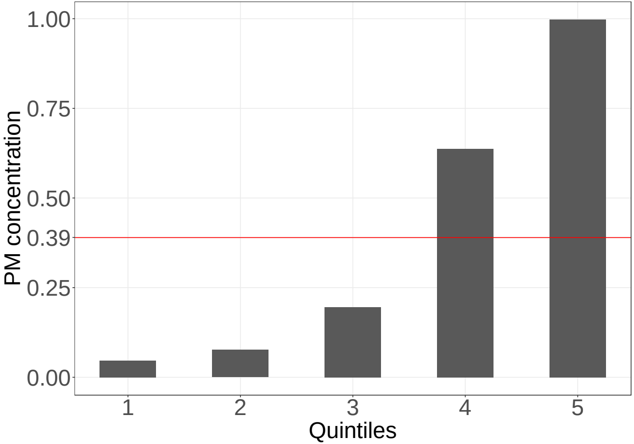
- Financial data. Insurance companies' financial statement variables.
- Investment holdings. Security-level investment portfolio holdings, annual (original filing) and quarterly (estimated).
- Product-market status. Insurers' operating conditions in each state at the end of each calendar year, including such variables as market share, premiums written, premiums earned, loss ratio, etc.
- Product filings (P&C Insurers). U.S. state regulators mandate that if a P&C insurer wishes to introduce new products or change existing product rules, prices, or forms in a given state, it must file a detailed application to the corresponding state regulator for approval.

Example: Liu and Xiong (2023)

- We ask the question: does business risk from product-market concentration affect U.S. life insurers' portfolio choice, and how?
- We focus on the geographic concentration of insurer's product market. If an insurer is geographically highly concentrated, the insurer would be exposed to a higher risk of local economic shock or local regulation changes.
- We measure the insurer's product market geographic concentration by calculating the HHI index based on the insurer's direct premiums written (DPW) in states where the insurer has operations. A higher HHI index indicates that the insurer is more geographically concentrated (less diversified) in its operations and is exposed to higher risk.

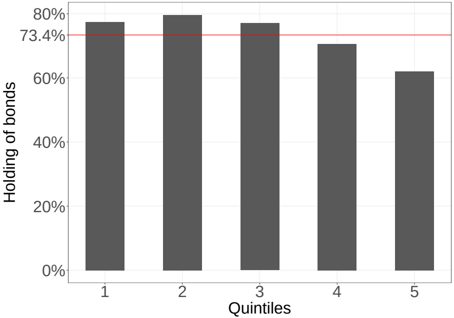
U.S. Life Insurers' Product-Market Concentration

- Significant cross-sectional variation in product market concentration.

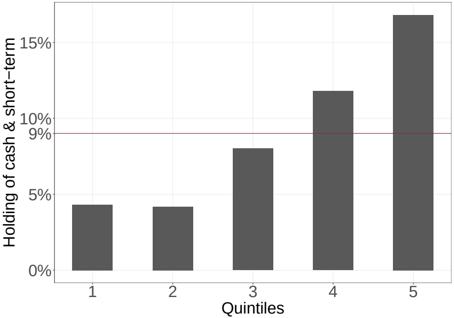


Average product market concentration in each quintile

Product-Market Concentration and Investment Allocation



Holding of bonds
(% of total invested assets)



Holding of cash & short-term investments
(% of total invested assets)

Product-Market Concentration and Investment Allocation

$$\textit{Holding of certain assets}_{i,t+1} = \alpha_t + \beta \textit{PM concentration}_{i,t} + \gamma Z_{i,t} + \epsilon_{i,t}$$

	Bond	Stock	Mortgage loan	Cash & short-term
PM concentration	-11.097^{***}	2.142	1.995	4.451^{**}
	(3.356)	(1.392)	(1.466)	(1.865)
Leverage	15.544^{**}	-7.762^{**}	2.212	-13.640^{***}
	(6.073)	(3.114)	(3.303)	(3.039)
Log(Total Assets)	0.056	-0.477^{**}	0.849^{***}	-0.872^{***}
	(0.434)	(0.171)	(0.255)	(0.217)
Observations	3,927	3,927	3,927	3,927
Other Controls	Y	Y	Y	Y
Year FE	Y	Y	Y	Y

- A one-std increase in PM concentration → 4.24% decrease in bond holdings ($639 Million), and 1.71% ($258 Million) increase in cash & short-term investment holdings.

Product-Market Concentration and Bond Investment Preferences

	Log(# Unique Issuer States)	Geographic HHI of Issuers	Geographic Similarity with PM	Share of Issuers in PM States
PM concentration	-0.430^{***}	0.115^{***}	-0.228^{***}	-0.676^{***}
	(0.099)	(0.026)	(0.036)	(0.048)
Leverage	0.358^{*}	-0.098^{*}	0.031	0.198^{***}
	(0.176)	(0.052)	(0.050)	(0.064)
Log(Total Assets)	0.133^{***}	-0.006^{*}	0.045^{***}	0.038^{***}
	(0.012)	(0.003)	(0.005)	(0.007)
Observations	3,883	3,883	3,883	3,927
Other Controls	Y	Y	Y	Y
Year FE	Y	Y	Y	Y

- Higher PM concentration $\rightarrow$ more likely to invest in bonds of a geographically concentrated group of non-local issuers.

Quick Summary

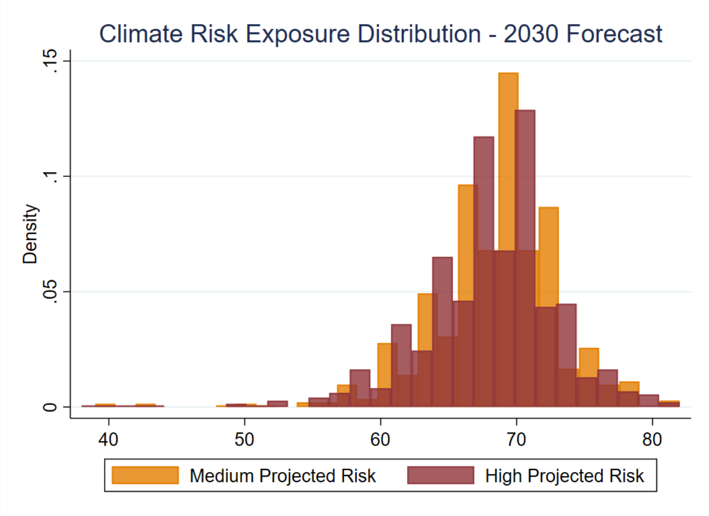
- Product market geographic concentration is an important factor for insurers' risk-taking in investments. Insurers who are geographically more concentrated in product markets tend to be more risk-averse in portfolio investments. These insurers allocate less wealth to bonds and invest more in cash & short-term investments.
- Insurers with higher product market concentration tend to allocate less wealth to local bonds.
- The full paper will be presented at CICF 2023 in Shanghai.

Research with Trucost

Research on ESG-related Themes

- I have recently started to explore the Trucost Physical Risk data set provided by S&P that contains the following:
  - Company- and asset-level physical risk exposure to climate change, reported as an index at both the overall and the individual climate-event-category level.
  - Time period: one data point per 10 years, starting from 2020 and ending in 2090 (based on the projected risk of climate change).
  - This data set is potentially very helpful for empirical finance research that has an ESG-related theme.

- Sample visualization of the Trucost Physical Risk data set:



Research on ESG-related Themes

- Possible ideas to explore:
  - Firm-level climate risk exposure and expected stock returns;
  - Aggregate climate risk exposure and market risk premium;
  - Perceived climate risk and labor-market dynamics.
- Besides Physical Risk, the Trucost data solution offers many other modules that are essential for ESG-themed research, such as data on revenue exposure to carbon pricing, ESG scores, etc.
- Example: Ehlers, Torsten, Benoit Mojon, and Frank Packer, 2020, Green Bonds and Carbon Emissions: Exploring the Case for a Rating System at the Firm Level, *BIS Quarterly Review, September 2020*.

Example: The Climate-Risk Management of U.S. P&C Insurers

- The total economic costs of natural disasters in the U.S. reached $232 billion in 2019, of which $71 billion is covered by insurance claim payments made by (predominantly) P&C insurers.
- An important question: Will climate risk contribute to the financial sector's systemic risk through its direct impact on P&C insurers?
  - As the Wall Street Journal reported on September 23, 2021, the Treasury Secretary Janet Yellen stated that "*Maintaining the financial stability of the insurance sector will involve identifying and filling gaps (if any) in insurance supervision with a focus on assessing climate-related financial risks*" (https://www.wsj.com/articles/treasury-department-seeks-public-input-on-insurance-companies-climate-risk-data-11630433854)

Example: The Climate-Risk Management of U.S. P&C Insurers

How can data sets provided by S&P help?

- Merge the FIG and Trucost Physical Risk data sets.
- Construct measures of exposure to climate risk for U.S. P&C insurers' liability side of their balance sheet.
- Evaluate whether U.S. P&C insurers actively manage the exposure to climate risk. Potential implication: whether or not there is a need for climate-risk-specific regulatory capital requirements for U.S. P&C insurance companies.
- This is my work-in-progress under the General Research Fund awarded by the Hong Kong Research Grants Council.

Final Remarks

- Data solutions offered by S&P Global Market Intelligence have been very useful for my research agenda, which focuses on financial institutions and touches upon the ESG theme.
- The potential value of S&P data sets goes beyond what I have shown.
  - I have a working paper that uses S&P's Leveraged Commentary & Data and finds that more intense underwriter competition leads to reduced market power of underwriters and thus lowers the financing costs of leveraged-loan borrowers.
- In general, the availability of good data has become crucial for empirical research in the finance academia, where I expect to find continued synergy with S&P in the future.