International Portfolio Frictions

Wenxin Du (Columbia Business School, NBER and CEPR)
Alessandro Fontana (EIOPA)
Petr Jakubik (IMF)
Ralph S.J. Koijen (Chicago Booth, NBER, and CEPR)
Hyun Song Shin (BIS)

Conference on "Banking, Insurance and Financial Stability"
Bank of Italy and IVASS – Rome

December 6, 2024

Background and Disclaimers

- The work presented is based on the cooperation with external researchers under the external research platform launched by EIOPA in 2020.
- The views expressed in this presentation are those of the authors and not necessarily those of the Bank for International Settlements, the European Insurance and Occupational Pensions Authority, and the International Monetary Fund. All errors are our own.

Motivation

- Government bonds have favorable regulatory treatments, but are in scarce supply relative to the size of insurance companies and pension funds (ICPF) in Europe.
- Newly available data shed light on global fixed-income allocation:
  - EIOPA Solvency II regulatory filings for European insurers
  - Enhanced BIS Locational Banking Statistics on banks' securities portfolios
- Connect cross-country heterogeneity in the domestic financial market structure with heterogeneity in global portfolio holdings

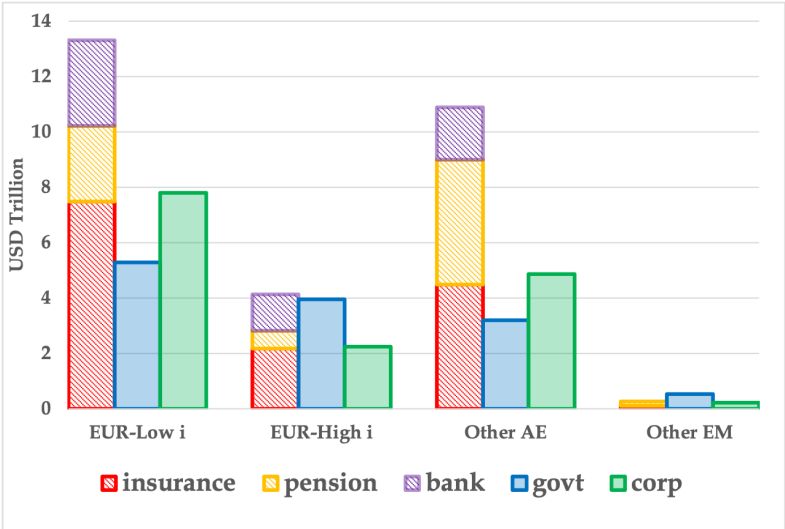
Overview of Results

- The size of the ICPF sector is closely related to the development of domestic corporate bond markets.
- Despite high international diversification, fixed-income portfolios closely mimics characteristics of domestic markets due to new international portfolio frictions
  1. Domestic projection bias
     - Characteristics of domestic markets spillover to the insurers/banks' choice of foreign investments.
  2. Going native bias
     - Foreign insurers/banks operating in local markets exhibit the same biases as domestic insurers/banks.
- Theoretical framework to explain empirical findings featuring the convenience yield on government bonds and regulatory and internal risk management constraints.
- We refer to these portfolio frictions as "biases," but the root causes may be either rational or behavioral.

1. Macro Facts: ICPF Sector, Bond Outstanding, Country Risk

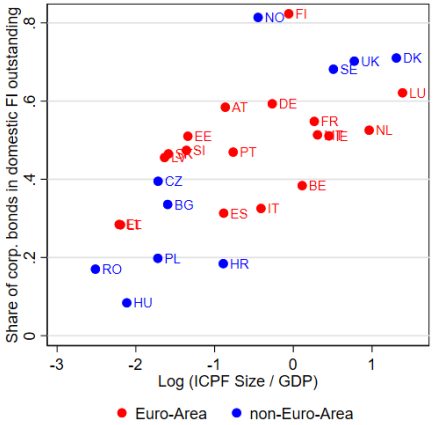
In Search of Government Bonds

Figure 1: Size Comparison for ICPF Total Assets, Banks' Debt Securities Holdings, and Outstanding Government and Corporate bonds in Europe (2019Q4)



ICPF Sector Size and Composition of Fixed Income

Figure 2: ICPF size vs. Relative Supply of Corporate Bonds

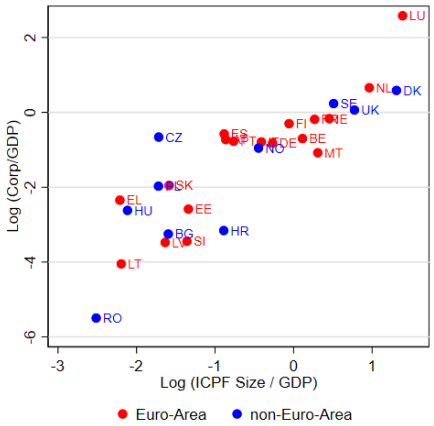


- The size of the ICPF sector is strongly correlated with the share of corporate bonds in domestic fixed income.

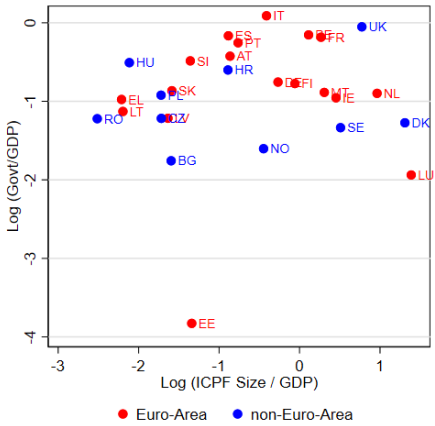
- The outstanding amount of domestic corporate bonds is strongly correlated with the ICPF sector size, the outstanding amount of government bonds is not.

Figure 3: ICPF Sector Size vs. Corp/Govt Bonds

(a) Corp vs. ICPF



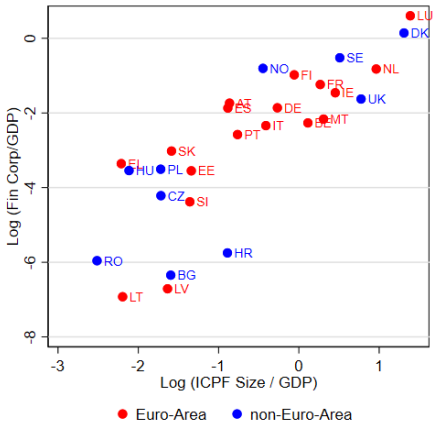
(b) Govt vs. ICPF



- Outstanding amounts for both financial and non-financial corporate bonds are strongly correlated with the ICPF sector size.

Figure 4: ICPF Sector Size vs. Financial / Non-Financial Corporate Bonds

(a) Fin Corp vs. ICPF



(b) Non-Fin Corp vs. ICPF

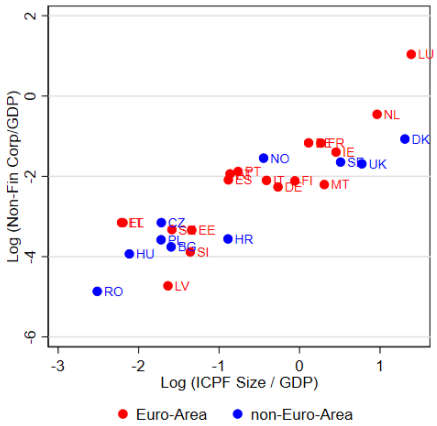


Table 1: Regressions of Composition of Domestic Fixed-Income Securities on Macro Variables

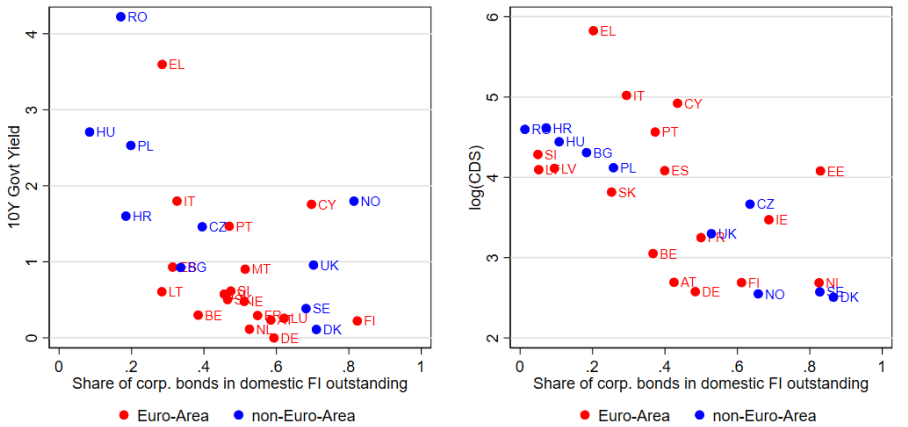
	(1) Ratio Corp/FI	(2) Ratio Corp/FI	(3) Ratio Corp/FI	(4) Ratio Corp/FI
Log(ICPF/GDP)	0.219***	0.103**	0.156**	0.130**
	(0.0290)	(0.0470)	(0.0572)	(0.0562)
Log(Per Capita GDP)		0.138***	0.125**	0.138***
		(0.0380)	(0.0549)	(0.0397)
Log(Bank Securities/GDP)			-0.0110	
			(0.0332)	
Log(Bank Assets/GDP)				0.0110
				(0.0253)
Constant	0.556***	-1.794**	-1.613	-1.834**
	(0.0346)	(0.650)	(0.950)	(0.702)
Observations	28	28	15	16
R-squared	0.588	0.658	0.796	0.796

- The size of the ICPF sector remains strongly correlated with the share of corporate bonds in domestic fixed income after macro controls.

Supply of Corporate Bonds and Country Risk

Figure 5: Interest Rate, Sovereign Risk, Composition of Domestic Fixed-Income

(a) Interest Rate vs. FI Composition (b) Sovereign CDS Spread vs. FI Composition



- Countries with larger shares of corporate bonds in total fixed income tend to have lower interest rates and lower sovereign risk.

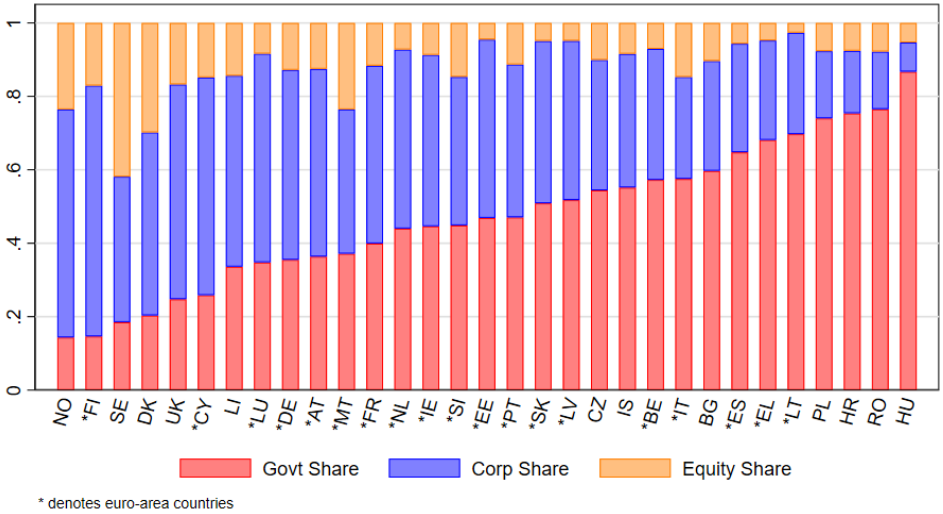
2. Stylized Facts on Global Portfolio Allocations

Data Construction

- EIOPA Solvency II Regulatory Filings
  - Scope: life and composite insurers, solo, exclude unit-linked products.
  - Period: 2016Q4-2021Q1.
  - Countries: 30 EEA countries, and the UK (pre-Brexit).
  - Look-through all CIUs and assign them to the respective asset class/currency/country group.
  - Main asset groups: govt bonds, corp bonds, and equities
- Enhanced BIS Locational Banking Statistics (LBS)

Large Heterogeneity in Portfolio Allocations Across Countries

Figure 6: Insurers' average portfolio shares by major asset class

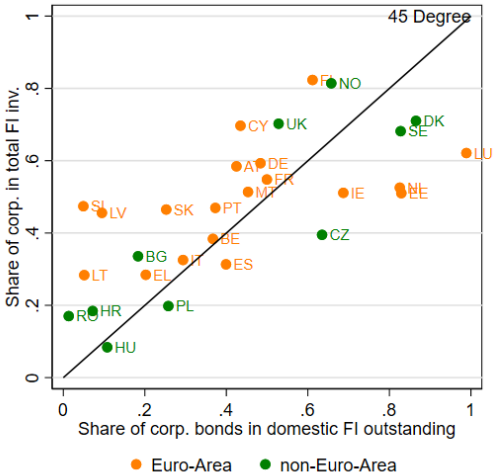


* denotes euro-area countries

Portfolio Allocation Mimics Domestic Characteristics

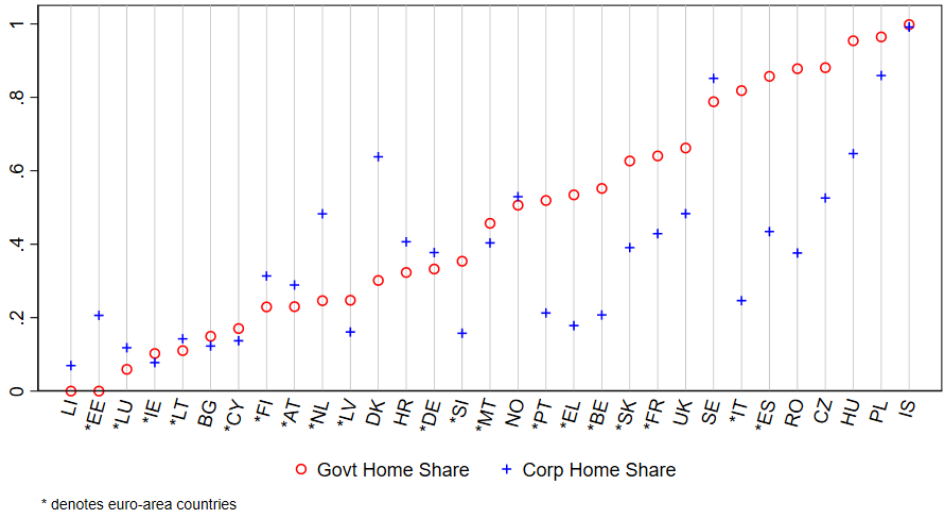
- Key Fact: Overall fixed income allocation for insurers strongly mimics domestic fixed income composition

Figure 7: Portfolio Share vs. Domestic Share of Corp Bonds in Total FI Outstanding



Sizable Foreign Investments in Majority of Countries

Figure 8: Insurers' portfolio shares invested in domestic govt and corp bond markets.



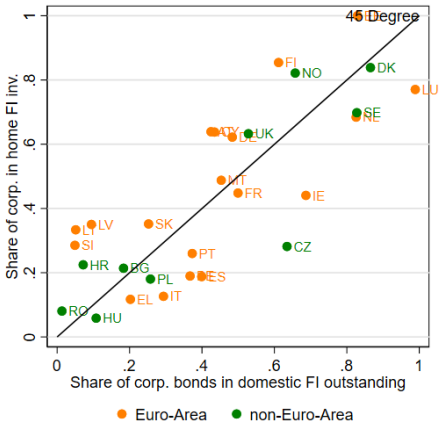
* denotes euro-area countries

Do Foreign Investments Undo Domestic Biases?

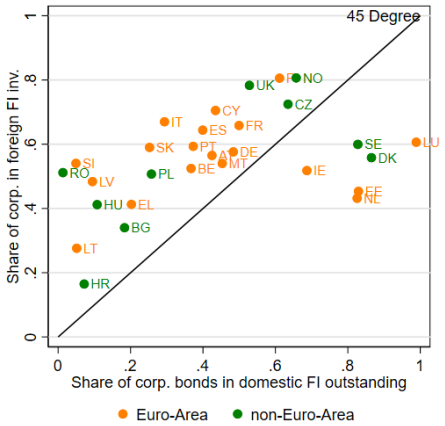
- Domestic Projection Bias: Domestic bias spillovers to foreign investments.

Figure 9: Domestic/Foreign Portfolio Share vs. Domestic Share of Corp Bonds in FI

(a) Domestic portfolio share in C



(b) Foreign portfolio share in C

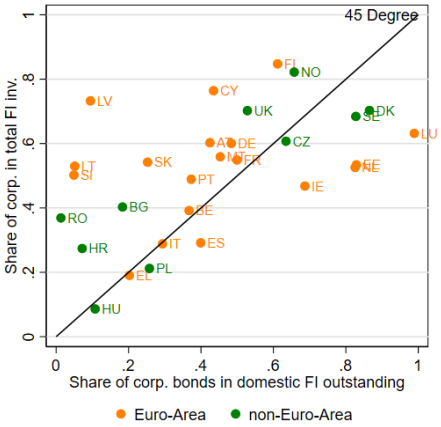


Do Foreign Insurers Undo these Biases?

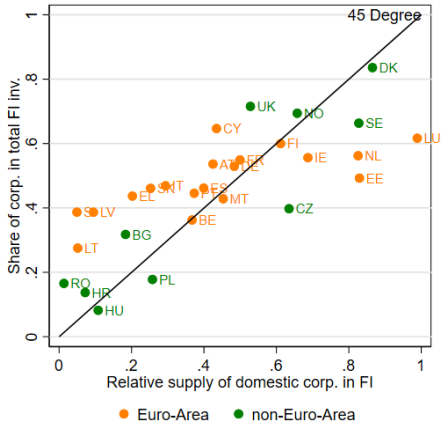
- Going Native Bias: Foreign solos behave like domestic solos in local markets.

Figure 10: Portfolio Share vs. Domestic Supply for Domestic vs. Foreign Insurers

(a) Domestic Solos



(b) Local Subsidiaries of Foreign Groups

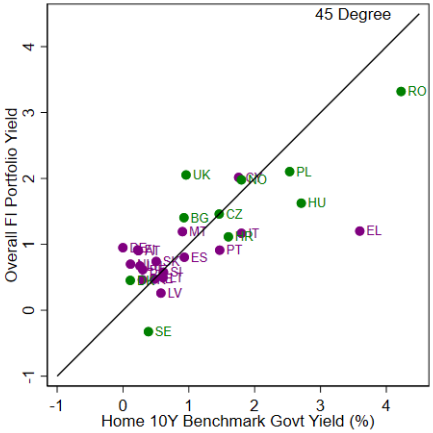


Portfolio Yields/Risk Mimic Domestic Interest Rates

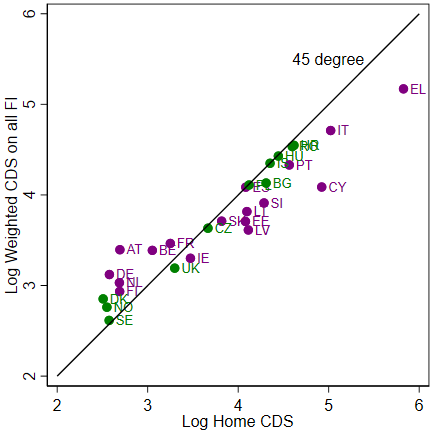
- Key Fact: The yield and risk on the overall fixed-income portfolio mimics the yield/risk in the domestic market.

Figure 11: Portfolio Yields/Risks vs. Domestic Interest Rates

(a) Based on CSDB Yields

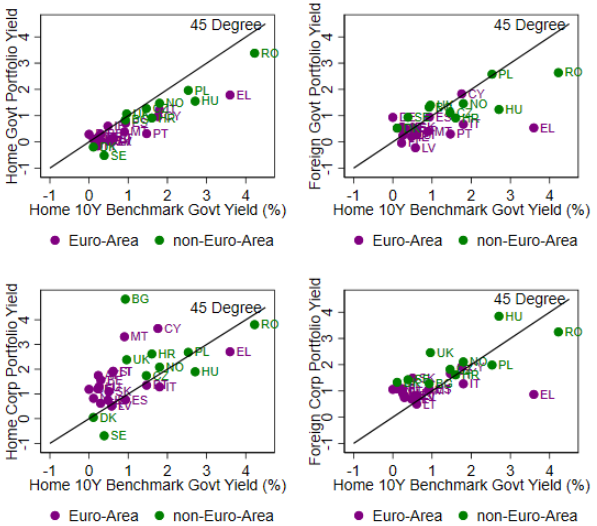


(b) Based on Country Risk (5Y CDS)



- Domestic Projection Bias: Yields on foreign government (upper right) and foreign corporate bonds (bottom right) are positively correlated with domestic interest rate

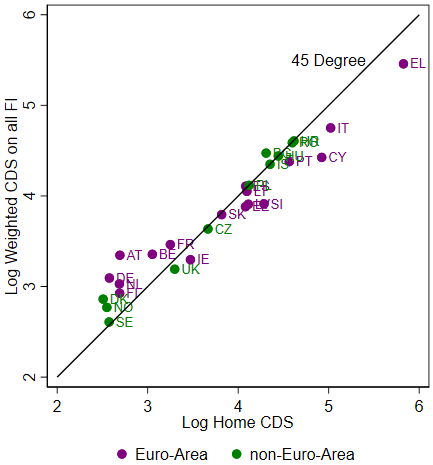
Figure 12: Yields on Domestic and Foreign Bonds vs. Domestic Interest Rate



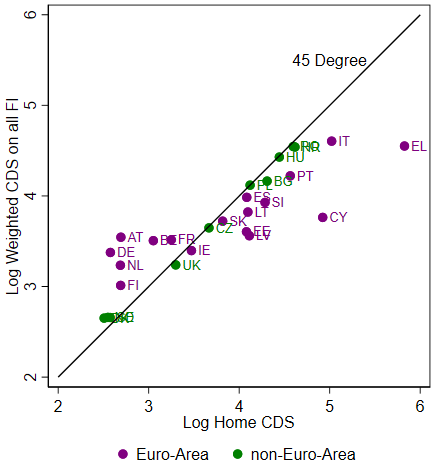
- Going Native Bias: Foreign solos mimic domestic solos in choosing portfolio risk.

Figure 13: Portfolio Sovereign CDS vs. Home Sovereign CDS

(a) Domestic Solos



(b) Local Subsidiaries of Foreign Groups



3. How do Insurers Manage Higher Credit Risk?

Different Margins to Manage Credit Risk

- Investing in corporate bonds is more costly than investing in sovereign bonds in terms of regulatory capital.
  - Sovereign bonds are exempted from capital charge from credit risk (and concentration risk, and counterparty risk)
- How is the credit risk managed?
  1. The SCR coverage ratio (= own funds / required capital) can be lower, making insurance companies riskier.
  2. Insurers can operate with more equity (lower leverage), making insurance more capital intensive.
  3. Insurers can adjust the design of insurance products, thereby exposing policyholders to more market risk.
- We find support for all three channels with varying importance.

Decomposition of the SCR Coverage Ratio (ctd.)

- Write the SCR coverage ratio decomposition in logs:

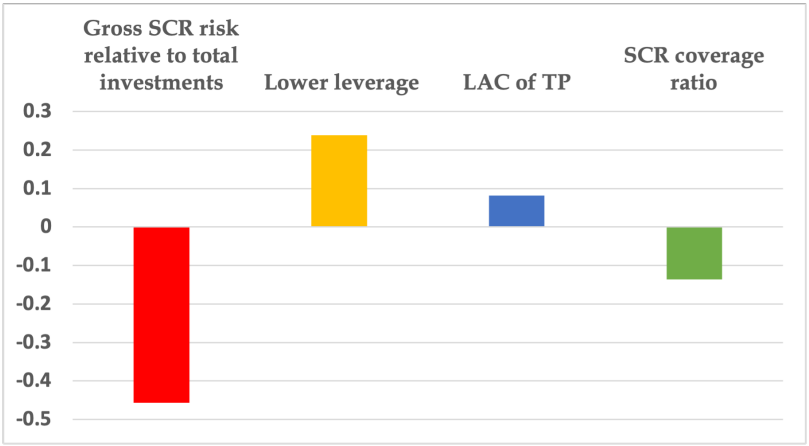
$$\underbrace{\ln\left(\frac{OF_{i,t}}{nSCR^{mkt}_{i,t}}\right)}_{\text{SCR coverage ratio}} = \underbrace{\ln\left(\frac{Inv_{i,t}}{gSCR^{mkt}_{i,t}}\right)}_{\text{investment risk}} + \underbrace{\ln\left(\frac{OF_{i,t}}{Inv_{i,t}}\right)}_{\text{leverage}} + \underbrace{\ln\left(\frac{1}{1-\phi_{i,t}}\right)}_{\text{loss absorbing capacity}}.$$

- Regress on the corporate bond share in a panel regression with time FEs:

$$\begin{aligned}
\ln\left(\frac{OF_{i,t}}{nSCR^{mkt}_{i,t}}\right) &= \alpha_t + \beta_{cr}\, CorpShare_{i,t} + \varepsilon^{cr}_{i,t}, \\
\ln\left(\frac{Inv_{i,t}}{gSCR^{mkt}_{i,t}}\right) &= \alpha_t + \beta_{gscr}\, CorpShare_{i,t} + \varepsilon^{gcsr}_{i,t}, \\
\ln\left(\frac{OF_{i,t}}{Inv_{i,t}}\right) &= \alpha_t + \beta_{lev}\, CorpShare_{i,t} + \varepsilon^{lev}_{i,t}, \\
\ln\left(\frac{1}{1-\phi_{i,t}}\right) &= \alpha_t + \beta_{lac}\, CorpShare_{i,t} + \varepsilon^{lac}_{i,t}.
\end{aligned}$$

How Are Differences in Credit Risk Managed?

Figure 14: Effects of 1 std. dev. increase in the corporate bond share



4. Explaining Global Asset Allocations

Potential Reasons for Portfolio Biases

- Domestic projection bias:
  - Insurers and banks in safe countries may not want to invest in risky countries due to internal risk constraints
  - Insurers in risky countries face "right-way risk" when their sovereign defaults, and if sovereign defaults are correlated
- Going native bias:
  - Local supervision, local product market regulation and potentially financial repression
  - Sluggish adjustment
    - Global insurers typically enter markets by acquiring local insurers. Centralization and integration may be a slow process
    - Legacy effect from Solvency I (Solvency II introduced in 2016)
- We refer to these portfolio frictions as "biases," but the root causes may be either rational or behavioral.

ICPF Size and Demand for Corp Bonds

- Why do countries with larger ICPF sector invest more in corporate bonds?
  - Government bond yields would be strongly negative if the ICPF sector and banks all invested in govt bonds, a negative alpha (convenience yield) on government bonds.
  - Other investors would want to short government bonds, but face short-selling constraints.
  - Banks and insurance companies can create value by reducing the allocation to govt bonds and tilt to close substitutes (corp bonds) that are not too capital intensive.
- Alternative hypothesis: A positive alpha on safe corporate bonds?
  - A larger ICPF sector competes the alpha away, seemingly at odds with our finding that insurers in countries with a larger ICPF sector invest more in corporate bonds.
- Supply of corporate bonds can endogenously respond to demand.

Conclusion

- Portfolio allocation is predominately driven by characteristics of the domestic financial market due to new portfolio frictions.
  - Domestic projection bias
  - Going native bias
- These portfolio frictions are difficult to overcome and have important policy implications.
  - European capital market deepening and integration
  - Monetary policy transmission and financial stability
  - Multi-sectoral approach to regulatory design