The Insurer Channel of Monetary Policy

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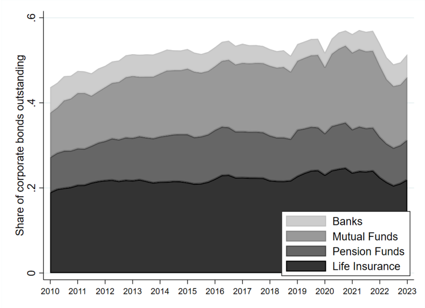
How do NBFIs shape transmission of monetary policy?

- NBFIs are important drivers of US credit supply



- Life insurers: Largest lenders, granular investment data

Insurers face tradeoff between asset duration and returns

- Insurers are short duration
  - Very long-term liabilities, scarce long-term corporate bonds
- Tradeoff between LT Treasuries and MT corporate bonds
- Use transaction-level data to establish tradeoff

Insurers transmit MP to credit risk premia through LT risk-free rates

- Insurer channel of MP:
  - MP $\Rightarrow \uparrow$ LT treasury yield $\Rightarrow \downarrow$ corp bond demand $\Rightarrow \uparrow$ credit risk premia
- Identify channel using insurance specific regulatory reform

Selected literature

1. Life insurance investments: Becker Ivashina (2015), Ozdagli Wang (2019)
   - This paper: Cross asset class tradeoff between corporate bonds and LT treasuries
2. MP affects the entire yield curve: Hanson Stein (2015), Hanson Lucca Wright (2021), Domanski Sushko Shin (2017), Greenwood Vayanos (2014)
   - This paper: Relate to variations in corporate bond demand and credit risk premia
3. Monetary policy and credit risk premia: Palazzo Yamarthy (2022), Anderson Cesa-Bianchi (2023), Dreschler Savov Schnabl (2018), Bekaert Hoerova Duca (2013), Chava Hsu (2019), Foley-Fisher Ramcharan Yu (2016)
   - This paper: Non-bank transmission to credit risk premia

Overview

1. Data
2. Context: Insurers' duration mismatch
3. Tradeoff: Corporate bonds vs. long-term treasuries
4. MP transmission via life insurers
5. Conclusion

Data

- Bond-level daily transactions and quarterly holdings for US insurers: Regulatory data via S&P Capital IQ Pro
- Corporate bond characteristics, bond ratings: Mergent FISD
- Treasury bond characteristics: TreasuryDirect
- Daily corporate bond yields, prices: TRACE
- Stock price information: CRSP
- Corporate balance sheet information: Compustat

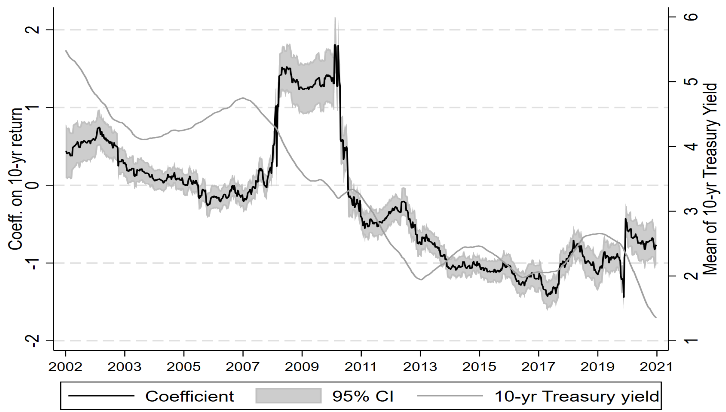
Insurers' duration mismatch

Life insurers are short duration

Two Factor Model Specification (Hartley Paulson Rosen 2016, Koijen Yogo 2023):

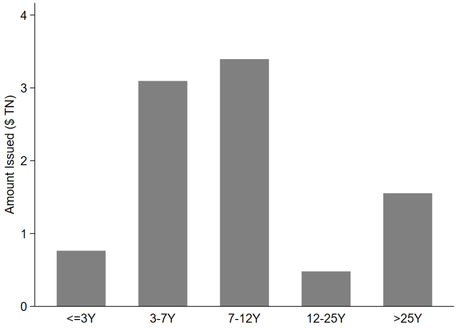
$$R_{i,t} = \alpha + \beta R_{m,t} + \gamma R_{10,t} + \epsilon_{i,t}$$

$R_{i,t}$: return on insurance portfolio in week t, $R_{m,t}$: return on value-weighted stock market portfolio in week t, $R_{10,t}$: the return on 10 yr treasury bond in week t

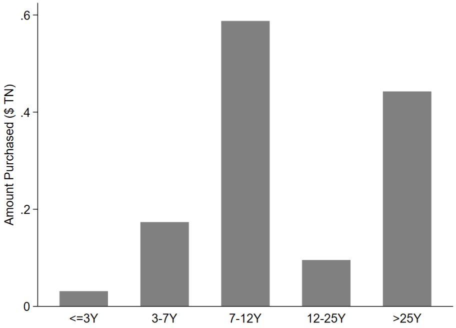


Insurers attempt to extend asset duration

- Sample of all corporate bonds issued from 2015-2023:



(a) Bond maturity of issuances

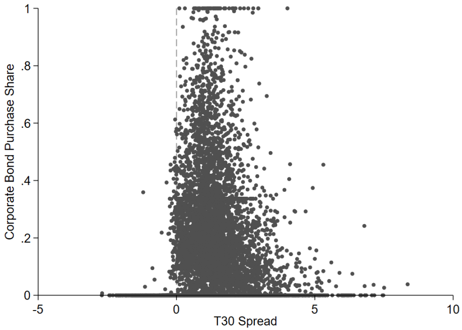


(b) Bond maturity of insurer purchases

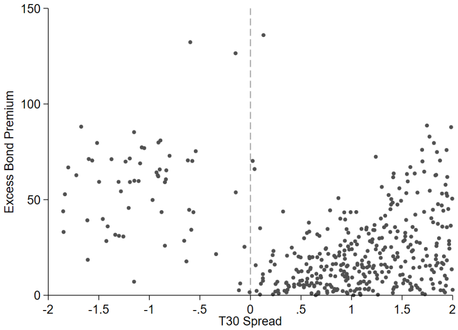
Tradeoff: Corporate bonds vs. long-term Treasuries

Relative demand sharply drops below LT Treasury yields

- Isolate demand by focusing on insurer purchase shares *within* individual bonds



(a) Relative demand



(b) Credit risk premia

T10 Spread EBP Derivation

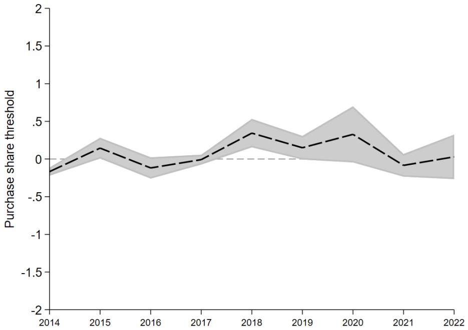
Formal threshold analysis

- Employ a search technique (Hansen 2000, Card Mas Rothstein 2008):

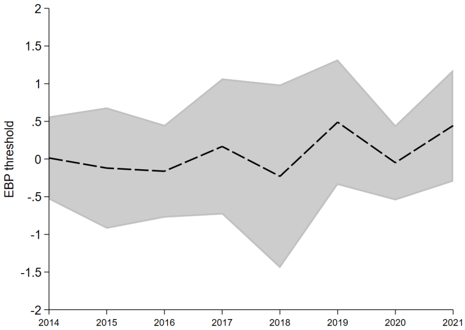
$$\text{Purchase Share}_{c,y} = \alpha_y + \delta_y \mathbb{1}[s_y > s_y^*] + \epsilon_{c,y}$$

  for 0$\leq s_y \leq$S, where y: issuance year, c: CUSIP, s: T30 spread, s*: threshold spread
- We select s_y^* to maximize R^2, separately for each year

LT Treasury yield is consistently a floor



(a) T30 spread threshold for relative demand



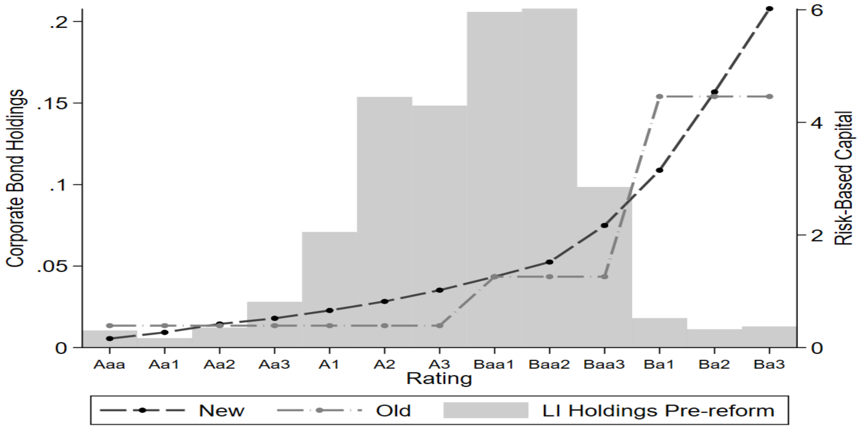
(b) T30 spread threshold for credit risk premia

Insurer relative demand driven by LT Treasury yield comparison

$$\text{Purchase Share}_{c,m} = \alpha_i + \delta_m + \beta_1 \text{T30 Spread}_{c,m} + \text{X}_{c,m} + e_{c,m}$$

	(1)	(2)	(3)	(4)
T30 Spread	1.32**	6.66***	2.49***	2.42***
	(0.53)	(0.73)	(0.64)	(0.59)
Duration			1.05***	1.11***
			(0.11)	(0.10)
Distance to Default			3.67**	1.80
			(1.45)	(1.53)
Log(Offering Amount)				-7.20***
				(1.47)
1{Callable}				-1.04
				(2.26)
Observations	3932	3932	3932	3932
R^2	0.006	0.531	0.565	0.593
Issuer FE	no	yes	yes	yes
Time FE	no	yes	yes	yes
SE Clustering		Issue + Time		

Use insurance-specific regulatory reform to identify tradeoff

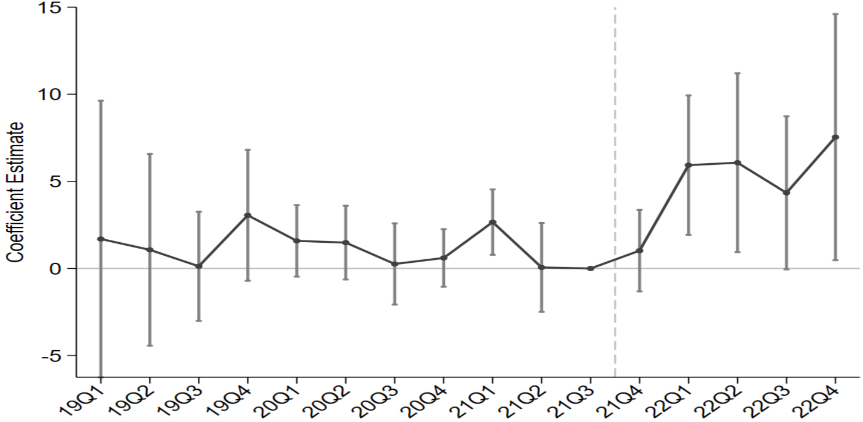


$\uparrow$ RBC $\Rightarrow$ $\downarrow$ attractiveness of corporate bonds $\Rightarrow$ $\uparrow$ binding tradeoff

Capital-adjusted spread

Tradeoff more binding post insurance regulatory reform

$$\text{Purchase Share}_c = \alpha_i + \delta_q + \sum_{q=2015Q1}^{2023Q1} \beta_q \times (\Delta\text{RBC}_r \times \text{T30 Spread}_c \times 1_q) + \text{X}_{c,t} + \epsilon_c$$



LT Treasury yield shapes demand at asset-class level

$$\text{Purchase Share}_{r,m} = \delta_m + \beta \times (\Delta\text{RBC}_r \times \text{T30 Yield}_m \times \mathbb{1}\{\text{Post}\}) + \text{X}_{r,m} + \epsilon_{r,m}$$

	(1)	(2)
T30 yield	1.32*	
	(0.74)	
$1\{\text{Post}\} \times$ T30 yield	-2.76	
	(1.71)	
$\Delta\text{RBC}_r \times$ T30 yield	0.13	0.18
	(0.12)	(0.10)
$1\{\text{Post}\} \times \Delta\text{RBC}_r \times$ T30 yield	-0.77**	-0.98***
	(0.28)	(0.29)
Observations	1348	1348
R^2	0.018	0.119
Time FE	no	yes
SE Clustering	Rating + Time	

30Y Treasury

Monetary policy transmission via life insurers

Role of insurers in MP transmission

- Identifying MP induced changes in LT treasury yields:
  - Use changes in T30 yields on FOMC announcement days
  - To ensure MP component $>$ Fed information effect: only include days when bond yields and S&P 500 move in opposite directions (Jarociński Karadi 2021)
- Identifying role of insurers using insurer regulatory reform:
  - Differential impact of MP-induced changes in LT rates to credit risk premia

Insurers transmit MP-induced changes in T30 yield to risk premia

$$\Delta \text{EBP}_{c,m} = \alpha_c + \delta_m + \beta \times (\Delta \text{RBC}_r \times \Delta \text{T30 Yield}_{\text{MP}} \times \mathbb{1}\{\text{Post}\}) + \text{X}_{c,m} + \epsilon_{c,m}$$

	(1)	(2)	(3)
ΔT30 Yield_{MP}	15.56		
	(18.31)		
1{Post} $\times$ ΔT30 Yield_{MP}	-125.99***		
	(34.04)		
$\Delta \text{RBC}_r \times$ ΔT30 Yield_{MP}	-2.25	-1.94	-2.20*
	(1.55)	(1.53)	(1.28)
1{Post} $\times$ $\Delta \text{RBC}_r \times$ ΔT30 Yield_{MP}	22.23***	15.12**	14.74***
	(6.41)	(6.17)	(4.89)
Observations	365703	365703	365703
R^2	0.103	0.395	0.412
Issue FE	no	no	yes
Time FE	no	yes	yes
Aggregate Controls	yes	no	no
SE Clustering		Issue + Time	

T30 change Time series

Conclusion

Insurer asset allocation tradeoff shapes MP transmission

- Tradeoff between long-term treasuries and medium-term corporate bonds
- New insurer channel of monetary policy
  - Transmit MP-induced changes in LT risk-free rates to credit risk premia
  - Impact in cross section of bonds quantitatively relevant
- Policy implications: Role of NBFIs in MP transmission
- Next steps: Theory, cross-section of insurers, international spillovers

Appendix

Transmission of short rates to long rates

- Hanson Lucca Wright 2021 propose three channels:

  1. Mortgage refinancing: Negative shocks to short-term rates trigger mortgage refinancing waves that lead to temporary reductions in the effective gross supply of long-term bonds.
  2. Investor extrapolation: Some bond investors make biased forecasts of future interest rates. Positive shocks to short rates lead extrapolative investors to overestimate the future path of short rates and demand fewer long-term bonds.
  3. Reach for yield: Negative shocks to short rates boost the demand for long-term bonds from "yield-seeking investors".

Return

Excess Bond Premium

- Derived as in Gilchrist Zakrajšek (2012)
- Component of credit spreads not directly attributable to expected default risk

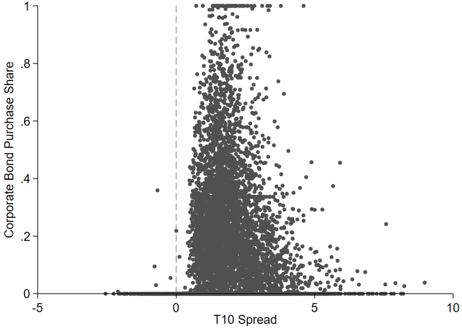
$$\ln S_{i,t}[k] = \beta DTD_{i,t} + \gamma' Z_{i,t}[k] + \epsilon_{i,t}[k]$$

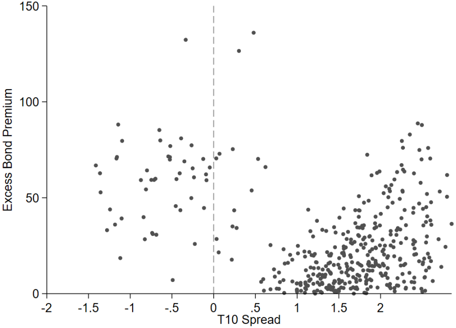
$$\hat{S}_{i,t}[k] = exp\left[\hat{\beta} DTD_{i,t} + \hat{\gamma}' Z_{i,t}[k] + \frac{\hat{\sigma}^2}{2}\right]$$

$$EBP_{i,t}[k] = S_{i,t}[k] - \hat{S}_{i,t}[k]$$

Return

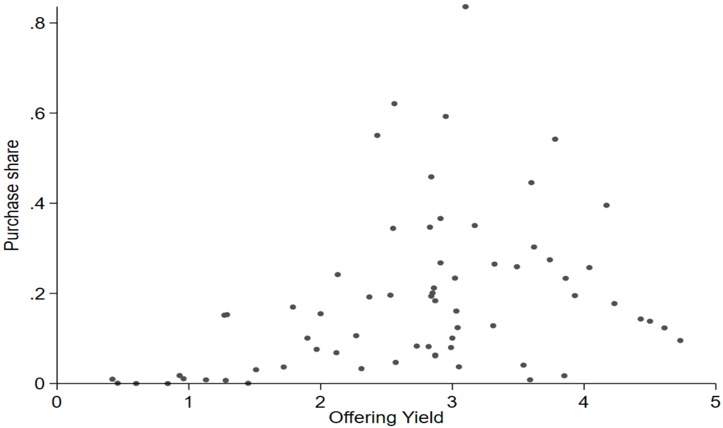
Relative demand and 10 Year Treasury yields





Return

Relative demand of LT Treasury bonds increases with LT yields



Return

Tradeoff

- 30 year Treasury bond:

$$y_t^{30} = \underbrace{\frac{1}{30}\mathbb{E}_t\left\{\sum_{k=0}^{30-1} y_k\right\}}_{Expected\ Rates} + \underbrace{\tau^{30}}_{Term\ Premium}$$

- 10 year Corporate bond:

$$y_c^{10} = \underbrace{\frac{1}{10}\mathbb{E}_t\left\{\sum_{k=0}^{10-1} y_k\right\}}_{Expected\ Rates} + \underbrace{\tau^{10}}_{Term\ Premium} + \underbrace{\delta_c}_{Credit\ Risk\ Premium}$$

- Capital-adjusted T30 spread:

$$\{y_c^{10} - y_t^{30}\}_{Cap.\ Adj} = \underbrace{\delta_c}_{Credit\ Risk\ Premium} - \underbrace{\tau^{10,30}}_{Term\ Premium} - \underbrace{\eta_c}_{RBC}$$

Return

Differential effects of LT Treasury Yield on risk premia

$$\Delta \text{EBP}_{c,m} = \alpha_c + \delta_m + \beta \times (\Delta \text{RBC}_{\text{rat}} \times \Delta \text{T30 Yield}_m \times \mathbb{1}\{\text{Post}\}) + \text{X}_{c,m} + \epsilon_{c,m}$$

	(1)	(2)	(3)
ΔT30 Yield	-9.53***		
	(3.34)		
$1\{\text{Post}\} \times \Delta$T30 Yield	15.62***		
	(4.15)		
$\Delta \text{RBC}_{\text{rat}} \times \Delta$T30 Yield	-0.46**	-0.65**	-0.64***
	(0.22)	(0.25)	(0.24)
$1\{\text{Post}\} \times \Delta \text{RBC}_{\text{rat}} \times \Delta$T30 Yield	0.77**	0.77**	0.68**
	(0.34)	(0.33)	(0.31)
Observations	547262	547262	547262
R^2	0.100	0.363	0.376
CUSIP FE	no	no	yes
Time FE	no	yes	yes
Aggregate Controls	yes	no	no

Return

MP-induced changes in T30 yield increase risk premia

$$\Delta \text{EBP}_{c,m} = \alpha_c + \beta \times \Delta \text{T30 Yield}_{\text{MP}} + \text{X}_m + \epsilon_{c,m}$$

	(1)	(2)	(3)	(4)
ΔT30 Yield$_{\text{MP}}$	5.55	4.04		
	(16.39)	(17.10)		
ΔT30 Yield			-10.27*	-8.33*
			(6.01)	(4.59)
Observations	372177	372177	372177	372177
R^2	0.024	0.082	0.054	0.100
CUSIP FE	yes	yes	yes	yes
Aggregate Controls	no	yes	no	yes

Return