

U.S. Monetary Policy and Foreign Bond Yields

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INTRODUCTION

- U.S. monetary policy affects global asset prices: sovereign bond yields, exchange rates, equity prices, commodity prices,...
- Conventional monetary policy (pre-ZLB):
 - ▶ Alters **level** and expected **path** of target federal funds rate.
- Unconventional policy (post-ZLB):
 - ▶ Influences expected path of short-term rates via **forward guidance**.
 - ▶ Induces asset substitution to affect term premia via **LSAPs**.
(i.e., preferred habitat, safe asset demand, searching for yield)

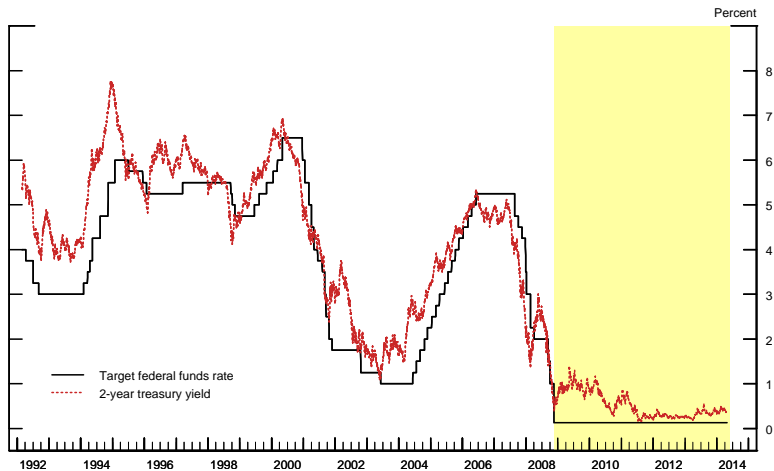
OUR PAPER

- Compare spillovers of U.S. monetary policy to international bond markets between **conventional** and **unconventional** policy regimes.
- Use U.S. monetary policy **surprises** to examine:
 - ▶ Reaction of yields on foreign government bonds denominated in **local** currencies (AFEs and EMEs).
 - ▶ Reaction of credit spreads on **\$**-denominated sovereign bonds for a panel of almost 80 countries.

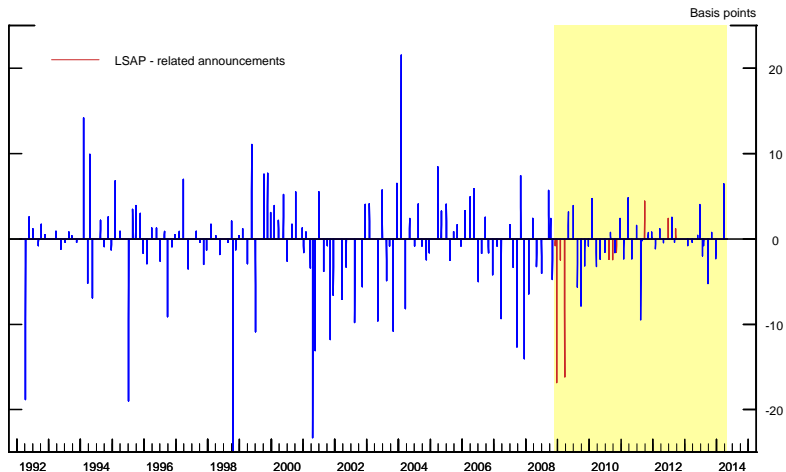
U.S. MONETARY POLICY REGIMES

- Three U.S. monetary policy regimes:
 - ▶ Conventional: Feb-06-1992 to Nov-24-2008
143 FOMC announcements
 - ▶ Unconventional: Nov-25-2008 to Apr-30-2014
52 FOMC announcements
 - ▶ Unconventional, excl. LSAPs: Nov-25-2008 to Apr-30-2014
40 FOMC announcements
- Measure policy surprises using changes in the 2-year Treasury yield within **narrow** windows bracketing FOMC announcements:
[Hanson & Stein \(2012\)](#); [Gertler & Karadi \(2014\)](#); [Gilchrist, López-Salido & Zakrajšek \(2014\)](#)
 - ▶ Conventional: 30-minute window $[t - 10, t + 20]$
 - ▶ Unconventional: 60-minute window $[t - 10, t + 50]$

STANCE OF U.S. MONETARY POLICY



U.S. MONETARY POLICY SURPRISES



LOCAL CURRENCY FOREIGN BOND YIELDS

- Analyze responses of 2- and 10-year nominal government bond yields denominated in **local** currencies:
 - ▶ AFEs: AU, CA, CH, DE, ES, FR, IT, JP, SE, UK
 - ▶ EMEs: BR, IN, KR, MX, SG, TH
- Summary:
 - ▶ Unanticipated **easing** of U.S. monetary policy:
 - **steepens** the foreign yield curve during **conventional** period
 - **flattens** the foreign yield curve during **unconventional** period
 - responses are country-specific, especially among EMEs
 - ▶ Passthrough of unconventional U.S. monetary policy to international bond markets is similar to that conventional policy.

SOVEREIGN BOND DATA

- **T/R Datastream:** \$-denominated sovereign bonds traded in the secondary market:
 - ▶ 1,278 bond issues
 - ▶ 78 countries
 - ▶ 1,474,612 daily price quotes
- **Information:** price, issue date, maturity, coupon, issue size

MEASURING SOVEREIGN CREDIT SPREADS

- Construct synthetic U.S. Treasuries that replicate cash-flows of \$-denominated sovereign debt instruments.
- Price of a bond with cash-flows: $\{c(s): s = 1, 2, \dots, S\}$

$$P_t = \sum_{s=1}^S c(s)D(t_s), \quad D(t) = e^{-rt}$$

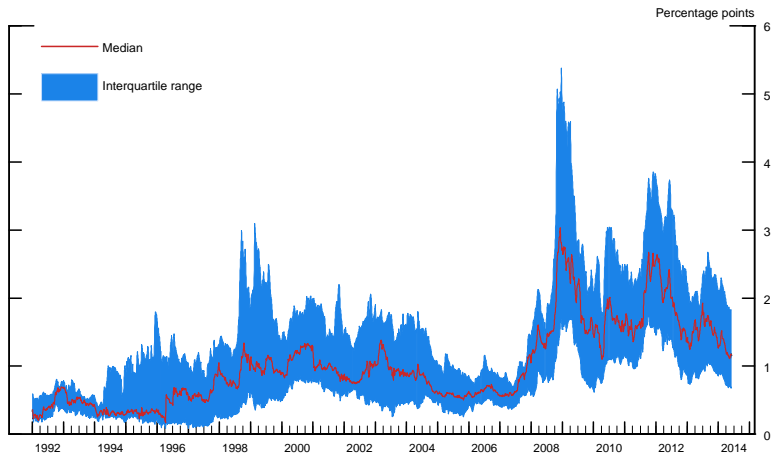
- P_t^{US} = price of a corresponding synthetic U.S. Treasury
 - ▶ Cash-flows discounted using (c-c, z-c) U.S. Treasury yields
- Sovereign credit spread: $s_{it}[k] = y_{it}[k] - y_t^{US}[k]$
 - ▶ $y_{it}[k]$ = yield on sovereign bond k (issued by country i)
 - ▶ $y_t^{US}[k]$ = yield on corresponding synthetic U.S. Treasury

SOVEREIGN BOND CHARACTERISTICS

Bond Characteristic	Mean	StdDev	Min	Median	Max
No. of bonds per country	16.50	51.44	1	6	450
Maturity at issue (years)	12.64	7.76	2	10	30
Term to maturity (years)	7.01	4.95	1.00	5.85	30.00
Duration (years)	5.63	3.32	0.91	5.06	18.87
Par amount (\$millions)	766.62	946.96	1.06	429.85	11,209
Sovereign credit rating (Moody's)	.	.	Ca	A1	Aaa
Coupon rate (pct.)	4.20	3.51	0.00	4.50	13.63
Nominal yield to maturity (pct.)	4.93	3.22	0.11	4.31	36.57
Credit spread (bps.)	205	269	-50	107	3,000

SOVEREIGN CREDIT SPREADS

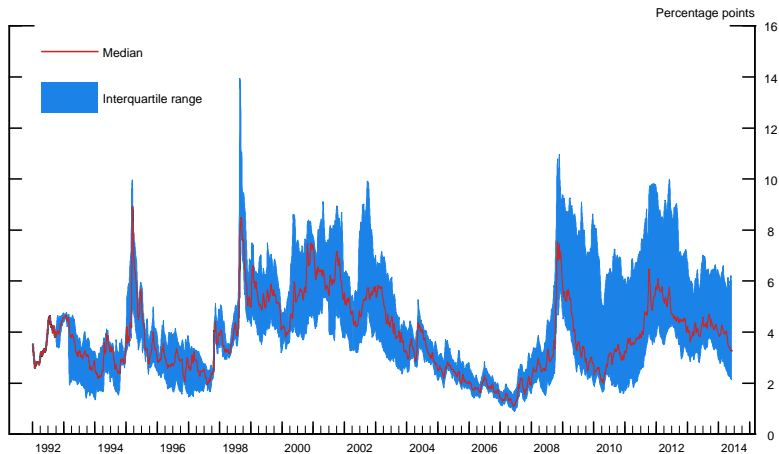
Countries with an Investment-Grade Sovereign Rating



NOTE: Weekly averages of daily data.

SOVEREIGN CREDIT SPREADS

Countries with a Speculative-Grade Sovereign Rating



NOTE: Weekly averages of daily data.

SOVEREIGN BOND PORTFOLIOS

Speculative- vs. Investment-Grade Portfolios

- Sort countries into **SG** and **IG** credit categories based on country's sovereign credit rating at $t - 1$.
- Compute weighted-average of $y_{i,t}[k]$ for each portfolio.
- Compute weighted-average of $y_t^{LS}[k]$ for each portfolio.
- Weights = $MV_{i,t-1}[k]$

METHODOLOGY

- Empirical framework:

$$\begin{aligned}\Delta_h y_{p,t+h-1} &= \beta_p m_t^{US} + \epsilon_{p,t+h-1}; \\ \Delta_h y_{p,t+h-1}^{US} &= \gamma_p m_t^{US} + \nu_{p,t+h-1},\end{aligned}$$

- ▶ m_t^{US} = U.S. monetary policy surprise
 - ▶ $\Delta_h y_{p,t+h-1}$ = h -day change in sovereign bond portfolio yield
 - ▶ $\Delta_h y_{p,t+h-1}^{US}$ = h -day change in yield on portfolio of U.S. Treasuries.
- Credit spread response: $\beta_p - \gamma_p$
 - Passthrough coefficient: β_p / γ_p

U.S. MONETARY POLICY AND SOVEREIGN YIELDS

Investment- vs. Speculative-Grade Portfolio Yields (2-day changes)

Dependent Variable	Conventional	Unconventional	Non-LSAP
Sovereign yield (SG)	0.977*** (0.196)	1.254** (0.521)	0.335 (0.885)
Sovereign yield (IG)	0.727*** (0.100)	1.374*** (0.241)	0.976** (0.402)
Treasury yield (SG)	0.506*** (0.116)	1.597*** (0.343)	1.246*** (0.417)
Treasury yield (IG)	0.693*** (0.111)	1.375*** (0.306)	1.183*** (0.368)
<i>Implied credit spread response</i>			
Credit spread (SG)	0.471** (0.193)	-0.343 (0.605)	-0.911 (0.950)
Credit spread (IG)	0.035 (0.091)	-0.001 (0.333)	-0.207 (0.358)

NOTE: * $p < 0.10$; ** $p < 0.05$; and *** $p < 0.01$.

U.S. MONETARY POLICY AND SOVEREIGN YIELDS

Investment- vs. Speculative-Grade Portfolio Yields (6-day changes)

Dependent Variable	Conventional	Unconventional	Non-LSAP
Sovereign yield (SG)	1.746*** (0.515)	1.358 (1.097)	-1.114 (1.489)
Sovereign yield (IG)	0.725*** (0.138)	1.617*** (0.409)	1.374** (0.692)
Treasury yield (SG)	0.316** (0.144)	1.852*** (0.234)	2.092*** (0.479)
Treasury yield (IG)	0.455*** (0.136)	1.479*** (0.258)	1.903*** (0.456)
<i>Implied credit spread response</i>			
Credit spread (SG)	1.430*** (0.494)	-0.493 (1.061)	-3.206** (1.300)
Credit spread (IG)	0.270*** (0.091)	0.138 (0.393)	-0.529 (0.440)

NOTE: * $p < 0.10$; ** $p < 0.05$; and *** $p < 0.01$.

MICRO-LEVEL ANALYSIS

- Control directly for observable bond characteristics that could influence liquidity or term premia.
- Empirical specification:

$$\Delta_h s_{i,t+h-1}[k] = \beta_S m_t^{US} \times \mathbf{1}[\text{RTG}_{i,t-1} \in \text{SG}] + \beta_G m_t^{US} \times \mathbf{1}[\text{RTG}_{i,t-1} \in \text{IG}] \\ + \boldsymbol{\theta}' \mathbf{x}_{i,t}[k] \times m_t^{US} + \epsilon_{i,t+h-1}[k]$$

- ▶ m_t^{US} = U.S. monetary policy surprise
- ▶ $\Delta_h s_{i,t+h-1}[k]$ = h -day change in sovereign credit spread
- ▶ $\mathbf{x}_{i,t}[k]$ = vector of (pre-determined) observable bond characteristics (issue size, age of the issue, coupon rate, duration)

U.S. MONETARY POLICY AND CREDIT SPREADS

Investment- vs. Speculative-Grade Sovereign Countries

Dependent Variable	Conventional	Unconventional	Non-LSAP
<i>2-day changes (h = 2)</i>			
Credit spread (SG)	0.222 (0.170)	-0.372 (0.302)	-0.403 (0.409)
Credit spread (IG)	-0.056 (0.066)	0.183 (0.298)	-0.109 (0.267)
<i>6-day changes (h = 6)</i>			
Credit spread (SG)	0.757*** (0.255)	-0.292 (0.284)	-1.052** (0.428)
Credit spread (IG)	0.141 (0.095)	-0.074 (0.169)	-0.096 (0.208)

NOTE: * $p < 0.10$; ** $p < 0.05$; and *** $p < 0.01$.

THE PASSTHROUGH OF U.S. MONETARY POLICY

Investment- vs. Speculative-Grade Portfolio Yields

Dependent Variable	Conventional	Unconventional	Non-LSAP
<i>2-day changes (h = 2)</i>			
Sovereign yield (SG)	1.931*** (0.486)	0.785** (0.357)	0.269 (0.709)
Pr > CLR	0.000	0.011	0.652
Sovereign yield (IG)	1.050*** (0.136)	0.999*** (0.242)	0.825*** (0.286)
Pr > CLR	0.000	0.000	0.004
<i>6-day changes (h = 6)</i>			
Sovereign yield (SG)	5.532*** (2.592)	0.734 (0.576)	-0.533 (0.783)
Pr > CLR	0.001	0.133	0.407
Sovereign yield (IG)	1.593*** (0.305)	1.093*** (0.271)	0.722*** (0.253)
Pr > CLR	0.002	0.000	0.024

NOTE: * $p < 0.10$; ** $p < 0.05$; and *** $p < 0.01$.

SUMMARY

- Conventional U.S. monetary policy easing \Rightarrow
 - ▶ **Narrowing** of credit spreads on speculative-grade \$-denominated sovereign debt.
 - ▶ No change in credit spreads on investment-grade \$-denominated sovereign debt.
- Unconventional U.S. monetary policy easing \Rightarrow
 - ▶ No change in credit spreads on speculative- and investment-grade \$-denominated sovereign debt.
 - ▶ Yields on \$-denominated sovereign debt move **one-to-one** with yields on comparable U.S. Treasuries.