Term Premia in Emerging Markets

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  - Term premium

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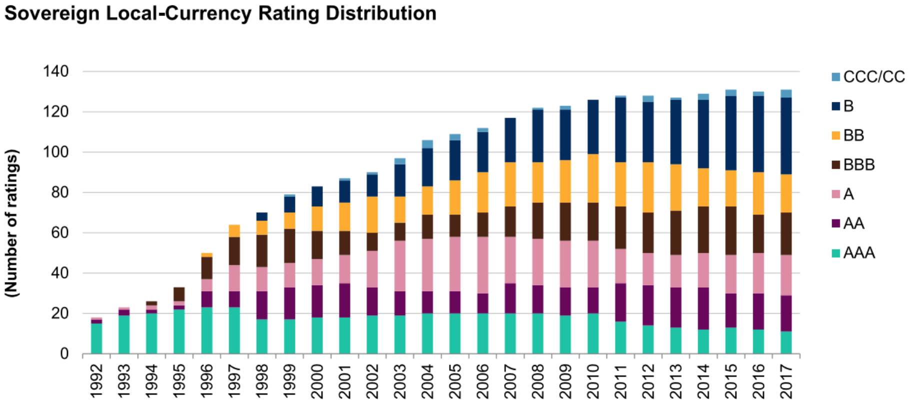
  - ⇀ Term premium
- Sovereign debt of advanced economies is considered risk-free
- **Problem:** Debt of emerging markets (EMs) is *not* risk-free
  - ⇀ Credit risks embedded in local currency (LC) debt

Motivation



Source: S&P Global Fixed Income Research.

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- Decompose LC yields of EMs *without* credit risk
  - ⇀ Analyze components, especially the term premium
- **Main idea:** What if the U.S. issue debt in other currencies?
  - ⇀ Use synthetic zero-coupon yield curves
  - ⇀ Swap U.S. Treasury yields into LC using derivatives
    - — Forward premium

Why Is This Important?

- Determinants of LC yields
  - ⇀ Market expectations about monetary policy
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  - Monetary policy transmission in EMs
- Global financial cycle
  - EMs vs advanced economies
- Testing asset pricing theories in EMs
  - Buraschi, Piatti and Whelan (2018)

What Has Been Done?

- Vast literature on yield curve decomposition for advanced economies (AEs)
- Fewer papers decompose of EM yield curves
  - ⇀ Blake, Rule, and Rummel (2015)

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- Vast literature on yield curve decomposition for advanced economies (AEs)
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  - ⇀ Blake, Rule, and Rummel (2015)
- Synthetic yield curves
  - ⇀ LC credit spread (Du and Schreger, 2016)
  - ⇀ Convenience yield (Du, Im, and Schreger, 2018a)

Roadmap

- Construction of yield curves: synthetic and nominal
- Affine term structure models
- Results
- Proposals

Construction of **Synthetic** Yield Curves

$$\widetilde{y}_{t,n}^{LC} = y_{t,n}^{US} + \rho_{t,n}$$

- $\widetilde{y}_{t,n}^{LC}$ is the n-period zero-coupon yield of a country in LC at time t
- $y_{t,n}^{US}$ is the n-period zero-coupon yield of the U.S. in USD at time t
- $\rho_{t,n}$ is the n-period forward premium from USD to LC at time t

Construction of Synthetic Yield Curves: Forward Premium

$$\rho_{t,n}$$

- < 1 year: FX forwards $\rightarrow (forward_{t,n} - spot_t)/n$
- ≥ 1 year: Fixed-for-fixed cross-currency swaps (CCS)

Construction of Synthetic Yield Curves: Forward Premium

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- < 1 year: FX forwards $\rightarrow (forward_{t,n} - spot_t)/n$
- ≥ 1 year: Fixed-for-fixed cross-currency swaps (CCS)
  - Constructed using cross-currency basis swaps and interest rate swaps
  - Why CCS?
    - Defaults on LC bonds not considered trigger events of credit default swaps (CDS)
    - CCS are collateralized $\rightarrow$ Bilateral counterparty risk in CCS is small

Construction of **Nominal** Yield Curves

- Focus on synthetic yield curve $\widetilde{y}_{t,n}^{LC}$ but nominal yield curve $y_{t,n}^{LC}$ also of interest
  - Assess benefits of 'adjusting' for credit risk
  - Calculate deviations from covered interest rate parity (CIP)
- $y_{t,n}^{LC}$ estimated from:
  - Bloomberg Fair Value (BFV) curves
  - Nelson and Siegel (1987)

Deviations from CIP

$$\phi_{t,n} = y_{t,n}^{LC} - \widetilde{y}_{t,n}^{LC}$$

- $\phi_{t,n}$ measures CIP deviations between government bond yields
- Explanations:
  - Sovereign credit risk (Du and Schreger, 2016)
  - Liquidity and convenience yields (Du, Im, and Schreger, 2018a)
  - Financial market frictions (Du, Tepper, and Verdelhan, 2018b)

Affine Term Structure Model

- ATSMs standard tool to estimate dynamics of *nominal* yield curves for AEs
  - ⇀ A set of stochastic factors drive the dynamics of the term structure
  - ⇀ No-arbitrage restrictions: Consistency in (cross section/time series) bond yields
  - ⇀ Yields are affine functions of the set of pricing factors
- Key assumption: Yields are risk-free

ATSM for EMs

- For EMs,
  - $y_{t,n}^{LC}$ is not risk-free since $\phi_{t,n} \neq 0$ (Du and Schreger, 2016)
  - Focusing on $\widetilde{y}_{t,n}^{LC}$ better aligns with the risk-free assumption
- Estimating an ATSM for the dynamics of $\widetilde{y}_{t,n}^{LC}$ allows to decompose $y_{t,n}^{LC}$ into:
  - Expected future short-term interest rate
  - Term premium
  - LC credit spread

Identification Problem

- Bond yields are persistent $\rightarrow$ Small sample bias (Kim and Orphanides, 2012)
    - ⇀ Overestimates the stability of the expected path of the short-term interest rate
    - ⇀ Most variability in yields will be attributed to fluctuations in the term premium
- Solutions: parameter restrictions, bias-corrected estimators, survey forecasts
- Surveys are an effective solution to obtain robust decompositions of the yield curve (Guimarães, 2014)

Data

- Countries:
  - 15 EMs: BRL, COP, HUF, IDR, ILS, KRW, MYR, MXN, PEN, PHP, PLN, RUB, ZAR, THB, TRY
  - 10 AEs: G-3 (EUR, JPY, GBP), SOE (AUD, CAD, DKK, NOK, NZD, SEK, CHF)

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  - Expected short-term rate: Consensus Economics + BIS policy rate statistics

Results

- Goal: Decompose synthetic yield curves $\widetilde{y}_{t,n}^{LC}$ of EMs
  - ⇀ Byproduct: Decomposition of nominal yield curves $y_{t,n}^{LC}$ of EMs
- To assess the relevance of the results:
  - ⇀ Compare estimated term premia of EMs to those of advanced SOEs
  - ⇀ Compare the term premia obtained from both $y_{t,n}^{LC}$ and $\widetilde{y}_{t,n}^{LC}$
- Results reported for 10-year maturity

Dynamics of EM Term Premia: Stylized Facts

- U.S. benchmark

  1. U.S. term premium (USTP) is time-varying
  2. USTP increases during periods of uncertainty
  3. USTP has declined over time
  4. USTP turned negative in recent years

- Estimates for EMs consistent with 1 and 2, some countries with 3 and 4

EM Term Premium Estimates: 10Y

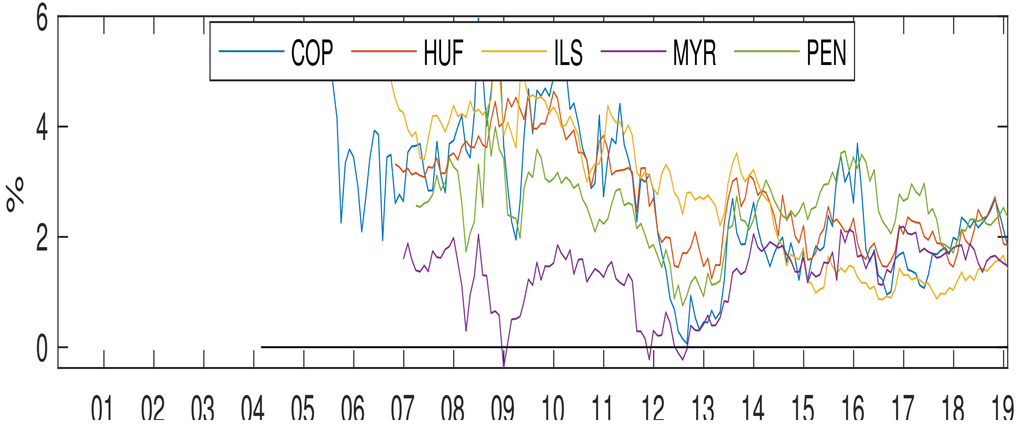

Figure: Estimated 10-Year Term Premia.

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Term Structure of Term Premia

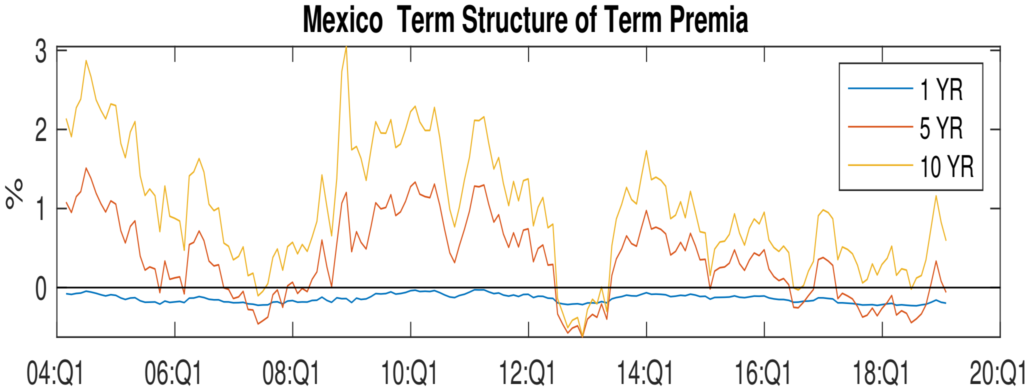


Figure: Estimated 1-, 5- and 10-Year Term Premia.

Nominal Yield Curve Decomposition

	Nominal	Synthetic	Expected	Term Premium	CIP Dev
EM	7.10	6.11	4.29	1.74	0.85
A-SOE	3.48	3.52	1.54	1.97	-0.23
G-3	2.41	2.13	0.52	1.60	0.15

Table: 10-Year Yield Decomposition (%).

- Estimated TP is higher on average than CIP deviations
- Main component of the nominal yield curve:
  - For EMs, the expectation of the future short-term interest rate
  - For AEs, the term premium

Term Premia: Does It Matter Which Curve Is Used?

	Nominal	Synthetic
EM	2.17	1.74
A-SOE	2.03	1.97
G-3	1.70	1.60

Table: 10-Year Term Premium Comparison (%).

- Difference between the two TP estimates is larger for EMs on average
  - ⇀ Null of equal means is rejected at 5% for 13 EMs vs 4 AEs
  - ⇀ For EMs, risk premium $\neq$ term premium

Is There A Global Factor in EM Term Premia?

	Dec-2006	Jun-2005
EM	81.01	94.46
AE	98.07	97.83

Table: Total Variation Explained by First 3 PCs (%): 10-Year Term Premium.

- Global financial cycle: Common factors on capital flows (Rey, 2013)
- For AEs, a global factor seems more relevant for TP
- For EMs, both domestic and global factors appear more relevant for TP

Relationship with Risk and Uncertainty Measures

- Comparison with US term premium
  - TP
  - $\perp$TP
- CIP deviations:
  - LC credit spread (Du and Schreger, 2016)
  - Convenience yield (Du et al., 2018a)
- Uncertainty indexes (Baker et al., 2016)

	TP-USTP	TP-CIP Dev	⊥TP-CIP Dev
EM	0.60	-0.28	-0.13
A-SOE	0.80	-0.01	-0.20
G-3	0.71	-0.29	-0.22

Table: Correlations of 10-Year Term Premia: U.S TP and LCCS.

	BRL	COP	KRW	MXN	RUB
TP-EPU	0.14	0.46	-0.32	0.40	-0.22
⊥TP-EPU	0.11	0.28	-0.31	0.20	-0.09

Table: Correlations of 10-Year Term Premia: EPU Index.

Drivers of EM Term Premia

- Panel regressions per maturity

$$tp_{it} = \alpha_i + \beta' z_{it} + u_{it}$$

  - tp_{it}: model-based n-year term premium of country i in month t
  - z_{it}: vector of regressors
  - α_i: country fixed effects

Drivers of EM Term Premia: Regressors

- Global financial variables
  - (log) VIX, fed funds rate (FFR), S&P, oil price
- Domestic variables
  - Macro: Inflation, unemployment rate, industrial production
  - Financial: exchange rate (LC per USD), stock market

10Y EM TP

	(1)	(2)
FFR	0.11	0.923**
	(0.10)	(0.355)
USTP10	1.22***	0.521**
	(0.16)	(0.237)
INF	0.21***	0.222***
	(0.05)	(0.040)
UNE	0.13**	0.137**
	(0.05)	(0.058)
IP	-0.02*	-0.019**
	(0.01)	(0.008)
RFX	0.01	0.0199*
	(0.01)	(0.0103)
Observations	1,969	1,969
R-squared	0.49	0.547
Country FE	Yes	Yes
Time FE	No	Yes

Robust standard errors in parentheses.

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Work in Progress

- Survey forecasts so far as a robustness check. Next: supplement ATSM
- Controls to include when studying the drivers of TP:
  - ⇀ Measures of inflation uncertainty (Stock and Watson, 2007)
  - ⇀ Measures of political uncertainty (Baker et al., 2016)
- How U.S. monetary policy moves EM yields?
  - ⇀ Event study methodology (Gürkaynak and Wright, 2013)
  - ⇀ Local projections (Jordà, 2005)

Conclusions

- ‘Clean’ EM TP estimates using synthetic LC yield curves
  - ⇀ Gains from ‘adjusting’ for credit risk
  - ⇀ In EMs, risk premium $\neq$ term premium
  - ⇀ More disaggregated decomposition of nominal LC yield curves
- Properties of EM term premia
- Several potential extensions

Internship Proposals

Proposals

- Effects of changes in the yield curve on the banking system
- Effects of monetary policy on the banking system
  - Whose monetary policy?
    - Mexico vs U.S.
  - Effects on what?
    - Prices: bank stock returns, deposit rates
    - Quantities: size of deposits, loans, balance sheet
    - Performance: interest rate risk, NIM, ROA, ROE

Proposal 1

- Challenge of assessing impact of MP: Isolate exogenous policy changes
- Identification of monetary policy shocks
  - ⇀ SVAR for quarterly data and macro variables (e.g. GDP, inflation, policy rate)
  - ⇀ Ordering is not straight forward when using other financial variables
- In such cases, high-frequency event studies allow for identification
  - ⇀ Changes in interest rate futures contracts around MP announcements
  - ⇀ But tool rely on federal funds futures rates → U.S. specific

Proposal 1

- **Proposal**: Are there real effects of HF-identified U.S. MP shocks on local credit conditions?
  - Quantities: size of deposits, loans, bank balance sheets
- Evidence on the international bank-lending channel using Mexican data
  - Morais, Peydró, Roldán-Peña and Ruiz (2019)
  - But they don't identify U.S. MP shocks using HF data

Proposal 2

- Theoretically, effects of expansionary MP on bank performance are ambiguous
  - ⇀ Higher present value of future cash flows → Higher stock price
  - ⇀ Lower net interest margin → Lower ROA
- Mixed evidence on the effects of MP on bank performance
  - ⇀ Negative effect (−): English et al. (2018)
  - ⇀ Positive effect (+): Claessens et al. (2018)
  - ⇀ Reversal effect (−, +): Ampudia and Van den Heuvel (2018), Yuan (2019)
  - ⇀ No effect: Altavilla et al. (2018), Drechsler et al. (2018)

Proposal 2

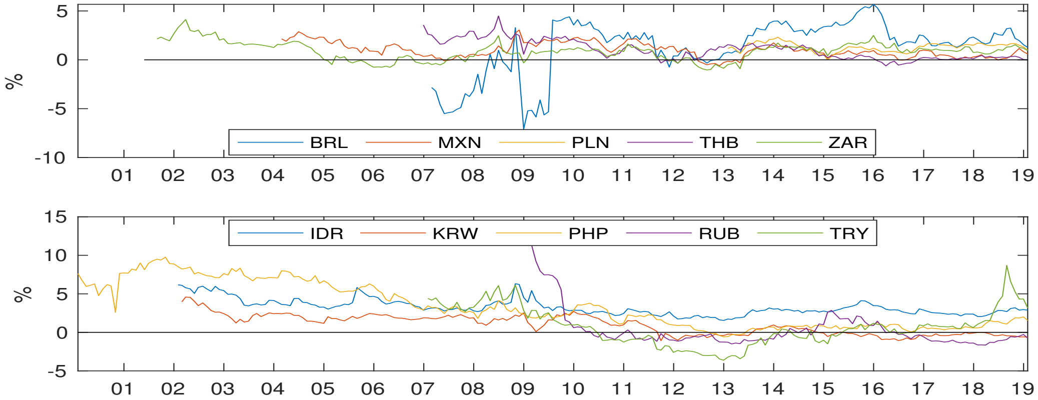
- **Proposal**: Effects of MXN monetary policy changes on banks' performance
  - ⇀ Interest rate risk, NIM, ROA
- Main implication of no effect → Deposits channel of MP not limited to AEs
  - ⇀ Banks unexposed to interest rate risk
    - — Market power over deposits lowers sensitivity of banks' expenses
  - ⇀ Maturity transformation *hedges* banks' interest rate risk
    - — Banks invest in long-term assets to hedge their deposit franchise
- DC might be behind both: bank-lending and risk-taking channels of MP

Data Needed

- EM TP: Surveys from Consensus Economics for Latam countries since 2013
- Proposal 1: Quantities
  - → Size of deposits, loans, bank balance sheets
- Proposal 2: Interest expense and interest income over assets. Plus:
  - → Deposit rates, durations of assets and liabilities
- P1 & P2: NIM, ROA

Appendix

EM Term Premium Estimates: 10Y (cont.)



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Survey-Based Term Premium Estimates

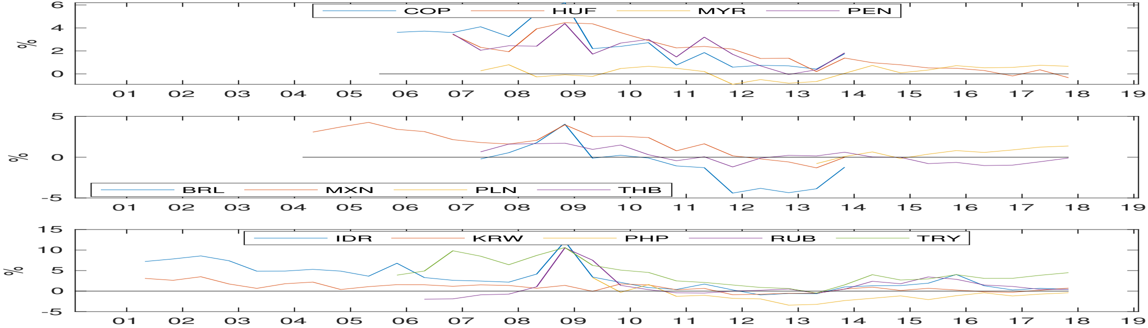

Figure: Survey-Based 10-Year Term Premium Estimates.