Local Currency Bond Returns, Foreign Investors and Portfolio Flows in Emerging Markets

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Some stylized facts

- Emerging economies (EMEs) have been **issuing substantial local currency sovereign debt** over the past decade (Bloomberg; World Bank, 2013)
- Local currrency bonds are mostly held in **portfolios of foreign (institutional) investors** (Arslanalp and Tsuda, 2014; JP Morgan, 2014; G20 IFA WG, 2018)
- Portfolio flows to and from EMEs **exert important effects on local currency bond prices** (Ananchotikul and Zhang, 2014)

Our contribution

- We adopt an asset pricing perspective
- We propose the empirical investigation of a model that ties together
  1. Local currency bond returns
  2. Foreign investors' portfolio returns
  3. Portfolio flows to and from EMEs

Main questions

1. Does the performance of foreign investor portfolios affect local currency bond returns?
2. Do portfolio flows to and from EMEs affect local currency bond returns?
3. Are there any risk premia associated with 1) and 2) and, if so, how/why do they change over time?

Our results

1. We find that bonds whose returns **positively** (negatively) covary with the returns of foreign investors' portfolios exhibit **higher** (lower) average excess returns, adjusted for market risk

   $\rightarrow$ Risk premia are **compensation for active fund risk**

2. **Portfolio outflows** from EMEs **positively impact** the price of active fund risk and bonds with high average excess returns exhibit **high exposure** to active fund risk when the price of this risk is **high**

Theoretical framework

- We build upon Vayanos and Woolley (2013) and obtain an **expected return-beta representation** of excess returns as

$$E_t\left[e^{(n)}_{h,t+1}\right] = \lambda_t \beta^{A,(n)}_{h,t}, \tag{1}$$

where

- $e^{(n)}_{h,t+1}$ is the US dollar excess return on a $n-$period local currency bond for country h at time $t+1$, **adjusted for market risk**
- λ_t is the **price of active fund risk**. It varies with the aggregate net portfolio outflows from EM
- $\beta^{A,(n)}_{h,t}$ is the **quantity of active fund risk** (risk exposure)

Interpretation

- As in Jagannathan and Wang (1996):

$$E\left[e_{h,t+1}^{(n)}\right] = \overline{\lambda}_t \overline{\beta}_{h,t}^{A,(n)} + \phi_h^{(n)} var\left(\lambda_t\right), \qquad (2)$$

$$\overline{\lambda}_t = E\left(\lambda_t\right),\ \overline{\beta}_{h,t}^{A,(n)} = E\left[\beta_{h,t}^{A,(n)}\right],\ \phi_h^{(n)} = cov\left[\lambda_t, \beta_{h,t}^{A,(n)}\right] / var\left(\lambda_t\right)$$

  With expected excess returns due:
  - The **average exposure** against active portfolio returns and the **average price of risk**, $\overline{\lambda}_t \overline{\beta}_{h,t}^{A,(n)}$
  - The **beta-premium sensitivity** against the active portfolio $\phi_h^{(n)}$
  - The **variance of the price of active fund risk** $var(\lambda_t)$

- If $\phi_h^{(n)}>0$, the **larger** $var(\lambda_t)$ the **higher** bond expected returns.

Estimation strategy

- **Time-varying betas and lambda:** We estimate time-varying betas and lambda using the procedure adopted in Pektova and Zhang (2005)
- **Portfolio formation:** for each month we use the cross-section of time-varying betas to construct (equal-weighted) bond portfolios
  - *Portfolio H:* bonds in the **top tercile** of beta estimates
  - *Portfolio L:* bonds in the **bottom tercile** of beta estimates
  - Keep the composition constant for one-month and compute portfolio returns. Repeat over the next month, etc.

Data

- **Data sources:**
  - **Zero coupon yield curves:** Nelson-Siegel applied to Bloomberg Fair Value (BFV) yield curves 1-5 years (source: Bloomberg)
    $\rightarrow$ compute *excess holding period returns in US dollar*
  - **World market portfolio:** Total returns on a global Treasury fund in US dollar (source: JP Morgan)
  - **Active portfolio:** Total returns on EM Treasury bond fund index in US dollar (source: JP Morgan)
  - **Portfolio net outflows:** Net portfolio outflows from EM sovereign bond portfolios (source: EPFR)
  - **US dollar exchange rates:** Bilateral US dollar spot exchange rates (source: Bloomberg)
- **Countries:** China, Colombia, Czech Republic, Hong Kong SAR, Hungary, Indonesia, Malaysia, Mexico, Peru, Poland, Russia, Singapore, South Africa, South Korea, Thailand and Turkey [16]
- **Sample period:** June 2007 - March 2018 [>10,000 bond-months]

Portfolio betas and returns

n=	**12**	**24**	**36**	**48**	**60**
$\widehat{\beta}_{H,t}^{(n)}$	2.056***	2.816***	3.745***	3.515***	3.061***
	(0.18)	(0.26)	(0.34)	(0.29)	(0.23)
$\widehat{\beta}_{L,t}^{(n)}$	0.268***	0.323***	0.603***	0.728***	1.007***
	(0.06)	(0.10)	(0.14)	(0.11)	(0.08)
$\widehat{\beta}_{H,t}^{(n)} - \widehat{\beta}_{L,t}^{(n)}$	1.778***	2.493***	3.141***	2.786***	2.053***
	(0.14)	(0.19)	(0.24)	(0.21)	(0.20)

n=	**12**	**24**	**36**	**48**	**60**
$e_{H,t}^{(n)}$	1.008***	1.181***	1.406***	1.256***	0.951***
	(0.29)	(0.28)	(0.26)	(0.26)	(0.21)
$e_{L,t}^{(n)}$	0.112	0.148	0.218	0.297*	0.225
	(0.16)	(0.15)	(0.14)	(0.16)	(0.19)
$e_{H,t}^{(n)} - e_{L,t}^{(n)}$	0.895***	1.032***	1.187***	0.959***	0.725***
	(0.19)	(0.15)	(0.15)	(0.11)	(0.09)

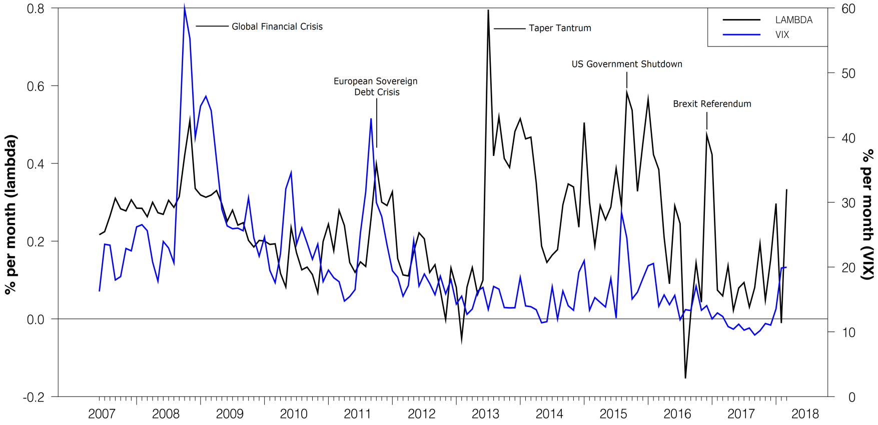
Portfolio features (issuers)

	Current Account	Foreign Reserve	FX rate
Portfolio H	-1.98***	2.69***	140.29***
	(0.28)	(0.11)	(3.45)
Portfolio L	7.07***	7.59***	98.67***
	(0.52)	(0.22)	(0.96)
Portfolio H - Portfolio L	-9.04***	-4.90***	41.63***
	(0.45)	(0.23)	(6.80)

The price of active fund risk and portfolio flows

- EMEs portfolio new outflows significantly affect the price of active fund risk: outflows from EMEs $\uparrow$, $\lambda_t \uparrow$
- **US dollar 1 billion** new outflows from EMEs increase the price of active fund risk by **25 basis points (per month)**

The price of active fund risk and the VIX



Beta-premium sensitivities

n=	12	24	36	48	60
$\widehat{\phi}_H^{(n)}$	1.170*	1.708**	2.156**	1.905**	1.033
	(0.62)	(0.87)	(1.11)	(0.97)	(0.87)
$\widehat{\phi}_L^{(n)}$	0.164	0.253	0.340	0.278	0.045
	(0.20)	(0.32)	(0.42)	(0.35)	(0.29)
$\widehat{\phi}_H^{(n)} - \widehat{\phi}_L^{(n)}$	1.007*	1.454**	1.816**	1.627**	0.988
	(0.55)	(0.73)	(0.91)	(0.82)	(0.79)

Takeaway summary

- We find that bonds whose returns **positively** (negatively) covary with the returns of foreign investors' portfolios exhibit **higher** (lower) average USD excess returns, adjusted for market risk

  $\rightarrow$ Risk premia are **compensation for active fund risk**

- Bond with **higher average excess** returns are issued by countries with relatively **weaker fundamentals** (fragility)

- **Portfolio outflows** from EMEs **positively impact** the price of active fund risk

- Bonds with high average excess returns exhibit **high exposure** to active fund risk when the price of this risk is **high**

Appendix: Vayanos and Wolley (2013)

$$E_t\left(r_{t+1}\right) = \underbrace{\lambda_1 cov_t\left(r_{t+1}, r^M_{t+1}\right)}_{\text{market risk premium}} + \underbrace{\lambda_{2,t} cov_t\left(r_{t+1}, r^A_{t+1}\right)}_{\text{active fund risk premium}}, \qquad (3)$$

where

- r_{t+1} is the excess return on a risky asset at time $t+1$,
- r^M_{t+1} is the excess return on the market portfolio,
- r^A_{t+1} is the excess return on the active portfolio,
- λ_1 is constant while $\lambda_{2,t}$ is time-varying and depends on fund flows.

Caveat: equation (1) can be obtained from alternative starting points (see Adrian et al., 2017)

Appendix: Assumptions to equation (2)

- Risky assets are **local currency bonds**
- The market portfolio is a global broad fund comprised of international sovereign bonds (world bond market portfolio)
- The active portfolio is a global focused fund buying and selling EMEs local currency sovereign bonds
- **Aggregate net portfolio outflows from EMEs** generate proportional time variation in the active portfolio's price of risk (Feroli et al., 2014)
- All returns are **expressed in US dollar** (Chan et al., 2012; Adrian et al., 2017; Hofmann et al., 2017)

Appendix: Pektova and Zhang's strategy (2005)

- **Time-varying betas**:

$$e_{h,t+1}^{(n)} = \psi_{h,0}^{(n)} + \psi_{h,1}^{(n)} r_{t+1}^{A} + \boldsymbol{\psi}_{h,2}^{(n)} \mathbf{Z}_{h,t} r_{t+1}^{A} + \upsilon_{h,t+1}^{(n)}, \quad (4)$$

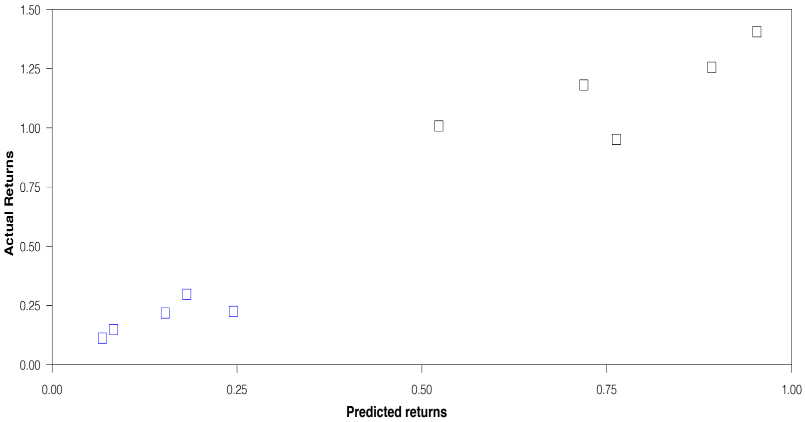
where $\boldsymbol{Z}_{h,t}$ denotes a vector of bond-specific characteristics (level and slope of the yield curve in LC). We compute $\widehat{\beta}_{h,t}^{A,(n)} = \widehat{\psi}_{1}^{(n)} + \widehat{\boldsymbol{\psi}}_{2}^{(n)} \mathbf{Z}_{h,t}$

- **Time-varying lambda**:

$$r_{t+1}^{A} = \delta_0 + \delta_1 \overline{FL}_t + \delta_2 \mathbf{X}_t + \varepsilon_{t+1}, \quad (5)$$

where $\overline{FL}_t$ is the aggregate EMEs net outflow for bond investments, $\mathbf{X}_t$ denotes a set of control variables (changes in VIX and FFR). We compute $\widehat{\lambda}_t = \widehat{\delta}_0 + \widehat{\delta}_1 \overline{FL}_t$.

Appendix: Model fit



Appendix: Robustness (ongoing)

- We carry out the following checks:
  1. Update sample period (to 2021) and assess the importance of data frequency (weekly vs monthly)
  2. Assess the estimation results including a direct proxy for active portfolio outflows and returns from mutual fund data (lambda and betas)
  3. Assess the estimation results including alternative control variables (lambda) and the effect of the parameter restrictions (betas)
  4. Expand the implications of the asset pricing model for important macro issues (e.g. bond-based UIP deviations, a la Lustig et al., 2019)