Balance Sheet Effects on Monetary and Financial Spillovers: The Global Economy 20 years past the East Asian Crisis

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Vulnerable to "*Global Financial Cycles*"?

Countries around the globe have been nervous about the state of the major economies (the U.S., Euro Area, Japan, China)

In the highly globalized world, the fate of economies, especially open and small ones, can be subject to policy changes in the economic centers (CEs)
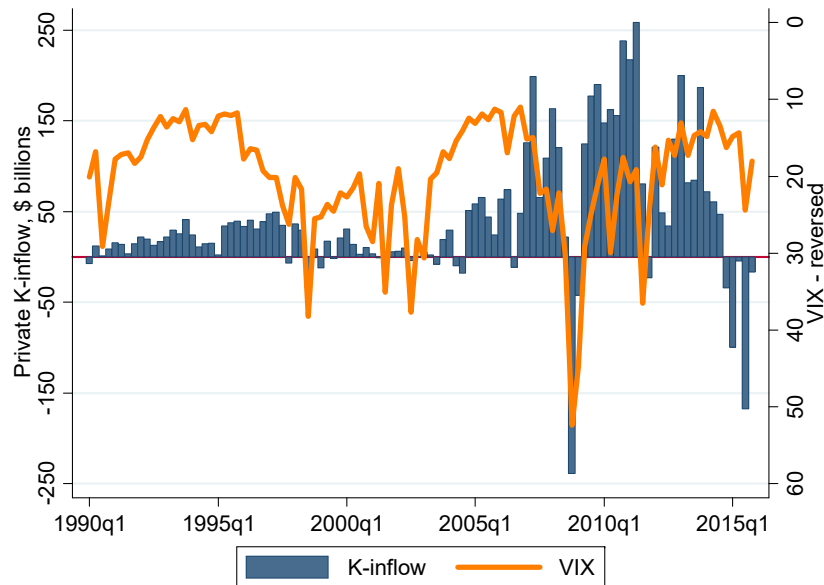
➢ "Fragile five" / "Taper tantrum"

➢ Lifting of ZIRP by the U.S.

➢ China's slow down

➢ NIRP in Japan & Europe

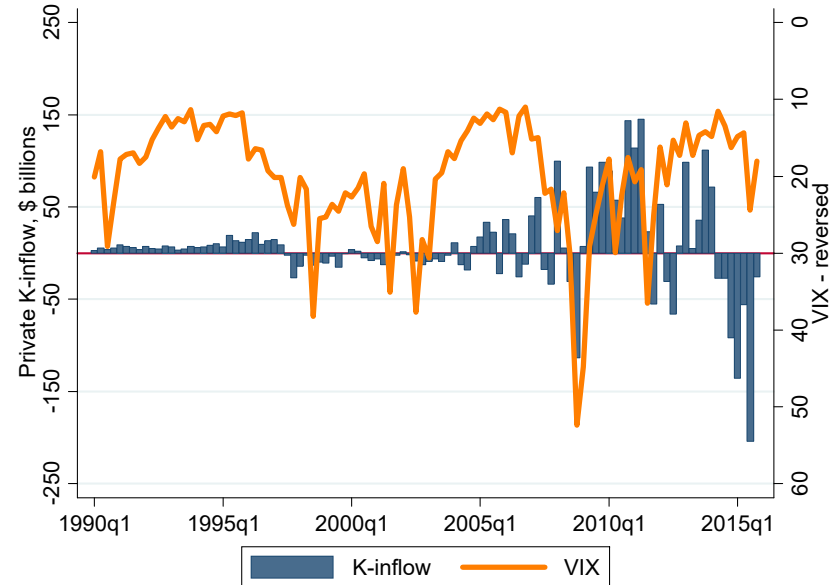➢ Continuing U.S. contractionary MP

EMEs are vulnerable

VIX and Net Capital Flows to EMEs

(a) EME Total

(b) Asian EMEs
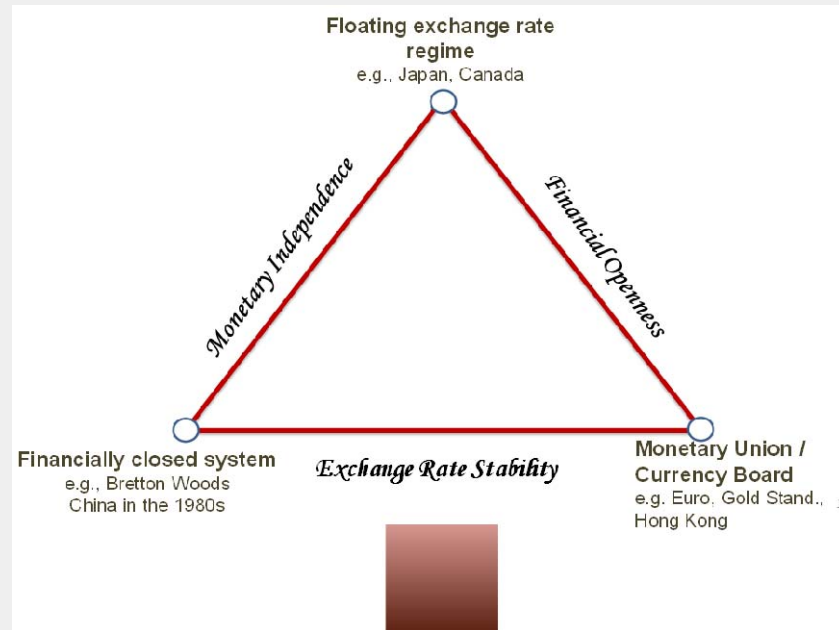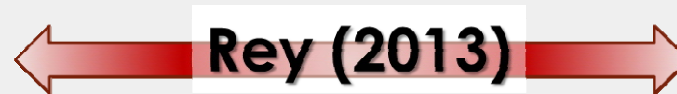
The debate begins

Hélène Rey @ Jackson Hole, 2013: *"Dilemma not Trilemma"*

➤ "Whenever capital is freely mobile, the global financial cycle constrains national monetary policies <u>regardless of the exchange rate regime</u>."

➤ It is a dilemma b/w capital mobility and monetary policy independence, not trilemma

➤ Restricting K-mobility is the only way for non-CE to retain monetary autonomy

Aizenman, Chinn, and Ito (JIMF, 2016)

The center economies (CE's) are influential

> For both policy interest rates and the REER, the link with the CE's has been dominant for developing and emerging market economies in the last two decades

The type of exchange rate regime does matter; the trilemma still dictates open macro policy choice

> An economy that pursues greater exchange rate stability and financial openness faces a stronger link with the center economies through policy interest rates and real effective exchange rate (REER) movements

In this paper, we

- Investigate how the financial conditions in the Center Economies [CEs: the U.S., Japan, and the Euro area] impact other non-CEs

- Especially, focus on the impact of balance sheet-related factors on the sensitivities of the sample countries to shocks emanating from the CEs such as:

  - ➢ debt exposures
  - ➢ weights in the currency basket
  - ➢ currency choices in debt denomination

Take-home messages

- The extent of belonging to a currency zone (i.e., USD- or euro-zone) matters
- We find evidence that exposure to external debt also matters
- Also, that currency composition in int'l debt securities matter. Generally, those economies more reliant on the dollar for debt issuance tend to be more vulnerable to shocks occurring in the U.S. (or other CEs)

Five paths of linkages
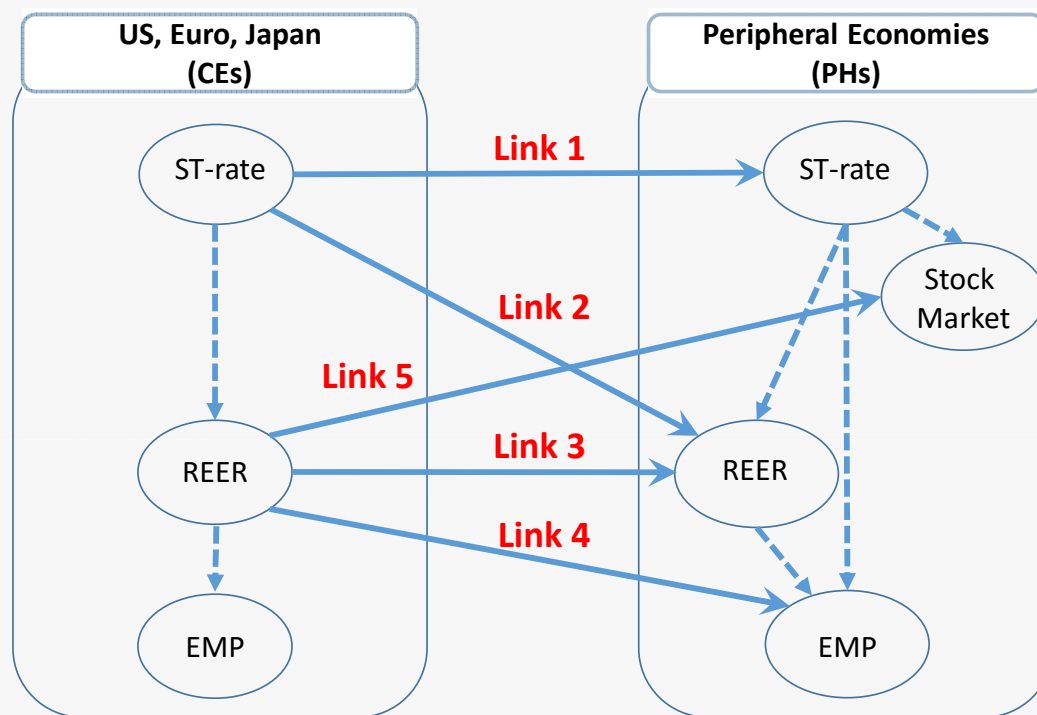
Two step approach

Step 1:

☐ investigate the extent of sensitivity of policy interest rate, the REER and EMPs to those of the center economies while controlling for global factors for the sample period is 1986 through 2015

Step 2:

☐ examine the association of these sensitivity coefficients with country's trilemma choices, the real and financial linkages with the CEs, the levels of institutional development, macroeconomic conditions, and the like

☐ look into the impacts of external debt exposure; the weights in the currency basket of the PHs; currency shares in int'l debt denomination on the transmission of shocks from the ECs

Step 1 – estimate γ's

$$R_{it}^{F} = \alpha_{Fit} + \sum_{g=1}^{G} \beta_{Fit}^{G} Z_{it}^{G} + \sum_{c=1}^{C} \gamma_{Fit}^{C} X_{it}^{C} + \phi_{Fit} Y_{it} + \varepsilon_{it}. \qquad (1)$$

R^F : a financial variable in local country (PH) for link F

X^c : a vector of financial variables of the center economies (CE) for Link F -- CE = U.S., Euro area, and Japan

Z^G : global factors

  – **Real**: PC of the U.S., ECB, and BOJ policy rates, oil, commodity prices

  – **Financial**: VIX, Ted-spread

Rolling est. w/ 36-mos windows for <u>each</u> of about 100 countries, 1986-2015

Proportion of Significant F-Tests:
1. ST rate in CE → ST rate in PH
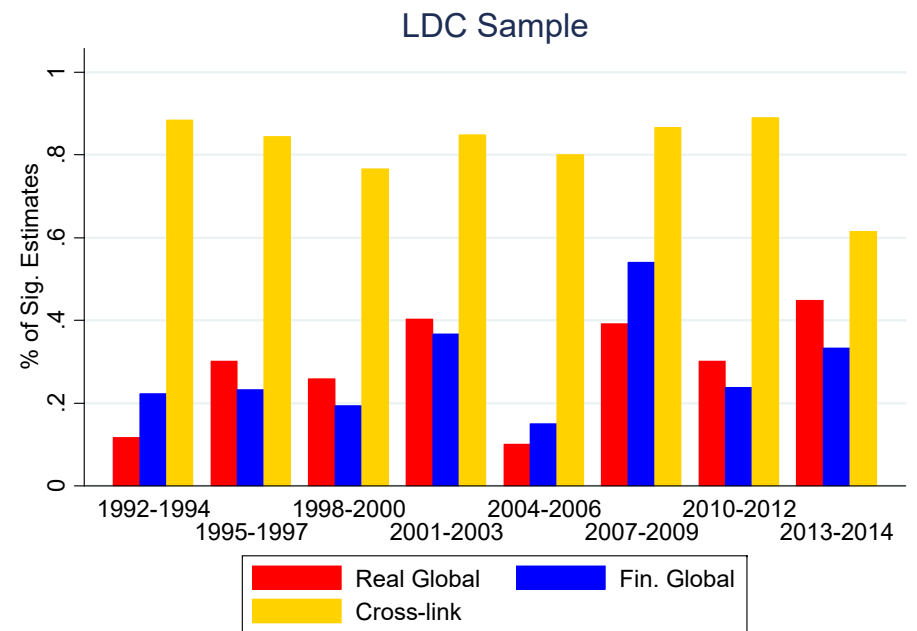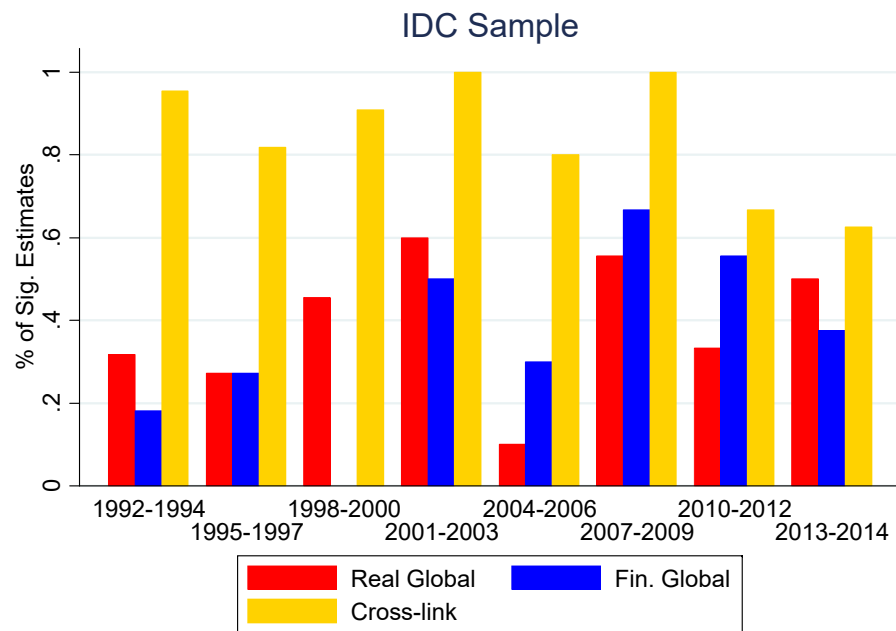
Proportion of Significant F-Tests:
2. Change in REER in CE → Change in REER in PH
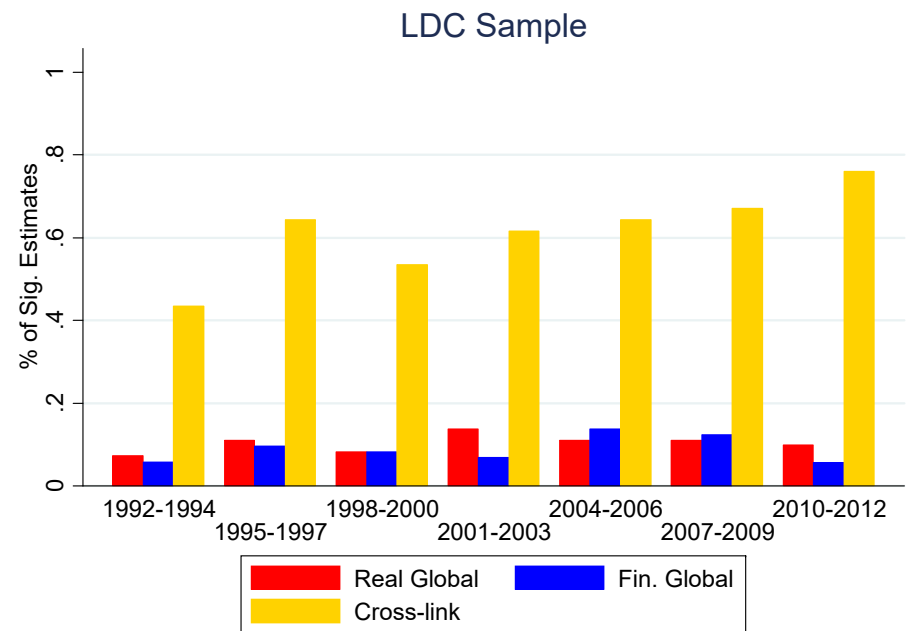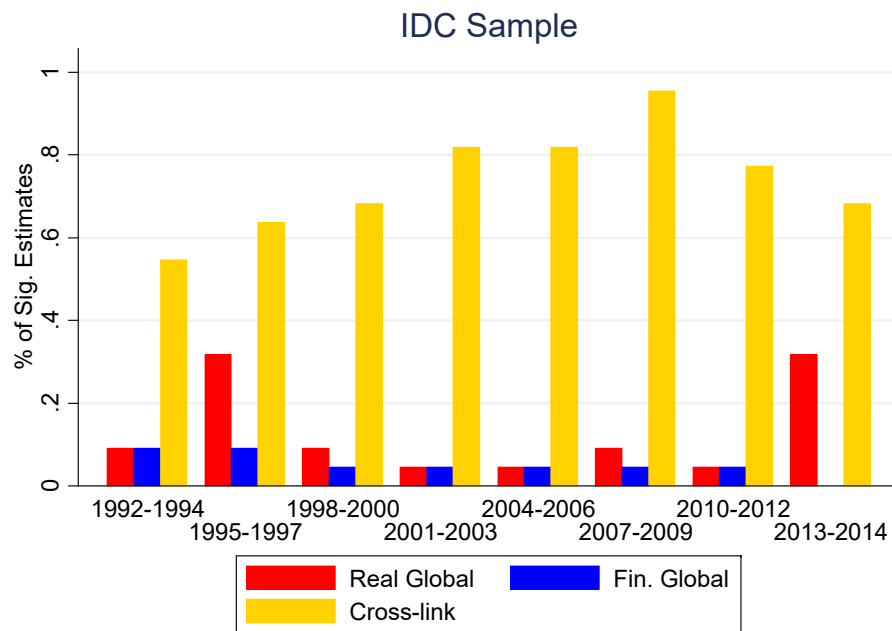
Step 2 – Basic Exercise:
Relate γ's to Policies, Conditions, and Institutions

$$\hat{\gamma}_{Fit}^{C} = \theta_0 + \theta_1 \, OMP_{Fit} + \theta_2 \, MC_{Fit} + \theta_3 \, LINK_{Fit}$$
$$+ \, \theta_4 \, INST_{Fit} + \theta_5 \, CRISIS_{Fit} + u_{Fit}. \qquad (1)$$

OMP: Open Macro Policies – Exchange rate stability, financial openness (Chinn-Ito), Int'l reserve accumulation

MC: Macro conditions – infl. volatility, CA balances, gov't gross debt

LINK: Import Demand by CEs, bank lending by CEs, FDI provided by CEs, degree of trade competition w/r/t CEs

INST: LEGAL (PC of BQ, LAO, Anti-corrupt), Fin. Dev.

CRISIS: currency and banking

1986-2014, 3-yr panels, about 60 countries (i x 3 x t) γ's

With time (panel) fixed effects

Findings from the basic analysis

- PHs with more open financial markets tend to follow the monetary policy of the CEs

- The more stable a PH country's exchange rate movements are, the more sensitive its REER to the CEs' policy interest rates or REER

- Higher levels of IR holding or greater financial openness would lead both developing and emerging market countries to follow the real exchange rate movement of the CEs

- When the CEs experience real appreciation, PHs with more exchange rate stability or greater financial openness are less likely to experience a rise in their EMPs

Extended Analysis:
the impact of Currency Weights

$$\hat{\gamma}_{Fit}^{C} = \theta_0 + \theta_1 OMP_{Fit} + \theta_2 MC_{Fit} + \theta_3 LINK_{Fit} + \theta_4 INST_{Fit} + \theta_5 CRISIS_{Fit}$$
$$+ \theta_6 CZW_{Fit}^{US,Euro} + \theta_7 \left(D\Gamma_{Fit}^{US,Euro} \times CZW_{Fit}^{US,Euro} \right) + u_{Fit}, \quad (3)$$

➢ We first estimate the currency zone weights (CZW) for the dollar, euro, yen, and pound, using the oft-used Frankel-Wei method.

➢ $D\Gamma$ includes the (level) dummies for γ^{US} and γ^{EA} (where EA means euro area)

Extended Analysis:
the impact of Currency Weights

$$\hat{\gamma}_{Fit}^{C} = \theta_0 + \theta_1 OMP_{Fit} + \theta_2 MC_{Fit} + \theta_3 LINK_{Fit} + \theta_4 INST_{Fit} + \theta_5 CRISIS_{Fit}$$
$$+ \theta_6 CZW_{Fit}^{US,Euro} + \theta_7 \left(D\Gamma_{Fit}^{US,Euro} \times CZW_{Fit}^{US,Euro} \right) + u_{Fit}, \qquad (3)$$

By construction, θ_7 should be significant if the extent of belonging to a currency zone matters

For example, if Korea has a high dollar zone weight, it can be more sensitive to a financial shock occurring in the U.S. (γ^{US}) and the degree of sensitivity should be higher if the dollar zone weight (CZW^{US}) is higher. Also, the dollar zone weight (CZW^{US}) should matter less to the shocks occurring in either the euro area or Japan (θ_6).

If the extent of belonging to a currency zone matters, θ_7 should be significant and θ_6 should have a sign opposite to θ_7 or be insignificant

Estimations with the Currency Zone Weight (1)

Link 1 – CEs: ST rate in the CEs → PHs: ST rate

	FULL (1)	FULL (2)	FULL (3)	LDC (4)	LDC (5)	LDC (6)	EMG (7)	EMG (8)	EMG (9)
Exch. Rate Stability	0.098	0.094	0.083	0.103	0.089	0.054	0.144	0.156	0.185
	(0.202)	(0.202)	(0.205)	(0.256)	(0.259)	(0.262)	(0.277)	(0.283)	(0.287)
$ zone weight (θ_6^{US})	0.109		0.171	0.191		0.766	0.109		-0.268
	(0.161)		(0.348)	(0.243)		(0.820)	(0.257)		(1.002)
US gamma x dollar zone weight (θ_7^{US})	-0.364		-0.353	-0.439		-0.443	-0.488		-0.502
	(0.201)*		(0.204)*	(0.263)*		(0.266)*	(0.264)*		(0.267)*
Euro zone weight (θ_6^{Euro})		-0.035	-0.015		0.159	0.677		0.189	-0.298
		(0.194)	(0.386)		(0.282)	(0.843)		(0.302)	(1.029)
Euro area gamma x euro zone Weight (θ_7^{Euro})		0.274	0.257		-0.300	-0.281		-0.296	-0.319
		(0.344)	(0.348)		(0.560)	(0.562)		(0.580)	(0.576)
Financial Openness	0.350	0.338	0.362	0.437	0.473	0.422	0.531	0.541	0.532
	(0.162)**	(0.161)**	(0.163)**	(0.218)**	(0.220)**	(0.222)**	(0.242)**	(0.245)**	(0.245)**
IR Holding	-0.572	-0.587	-0.590	-0.921	-1.047	-0.908	-0.779	-0.972	-0.782
	(0.481)	(0.476)	(0.482)	(0.656)	(0.657)	(0.666)	(0.768)	(0.774)	(0.778)

Link 2 – CEs: Change in ST-rate → PH: REER changes

	FULL (1)	FULL (2)	FULL (3)	LDC (4)	LDC (5)	LDC (6)	EMG (7)	EMG (8)	EMG (9)
Exch. Rate Stability	1.468	1.395	1.476	1.971	1.978	2.150	2.081	1.957	2.105
	(0.513)***	(0.523)***	(0.528)***	(0.763)**	(0.765)**	(0.770)***	(0.835)**	(0.841)**	(0.859)**
$ zone weight (θ_6^{US})	-0.829		-0.810	-0.793		-3.076	-1.211		-2.180
	(0.406)**		(0.784)	(0.695)		(1.951)	(0.822)		(2.596)
US gamma x dollar zone weight (θ_7^{US})	0.122		0.102	0.050		-0.033	-0.332		-0.341
	(0.549)		(0.561)	(0.757)		(0.760)	(0.844)		(0.856)
Euro zone weight (θ_6^{Euro})		0.631	-0.068		0.243	-2.666		1.489	-0.803
		(0.456)	(0.854)		(0.740)	(1.977)		(0.894)*	(2.660)
Euro area gamma x euro zone Weight (θ_7^{Euro})		0.139	0.227		0.959	0.743		-0.548	-0.624
		(0.770)	(0.781)		(1.415)	(1.414)		(1.551)	(1.564)
Financial Openness	-0.169	-0.078	-0.151	0.282	0.259	0.280	0.280	0.171	0.250
	(0.424)	(0.423)	(0.428)	(0.682)	(0.682)	(0.683)	(0.815)	(0.818)	(0.820)
IR Holding	2.819	2.623	2.777	1.347	1.553	1.366	1.233	1.313	1.156
	(1.415)**	(1.416)*	(1.431)*	(2.141)	(2.143)	(2.143)	(2.342)	(2.347)	(2.355)

Link 3 – CEs: Change in REER → PHs: Change in REER

	FULL (1)	FULL (2)	FULL (3)	LDC (4)	LDC (5)	LDC (6)	EMG (7)	EMG (8)	EMG (9)
Exch. Rate Stability	0.567	0.571	0.566	0.619	0.691	0.630	0.722	0.764	0.715
	(0.060)***	(0.062)***	(0.061)***	(0.082)***	(0.084)***	(0.082)***	(0.096)***	(0.099)***	(0.098)***
$ zone weight (θ_6^{US})	-0.131		-0.110	-0.080		-0.039	-0.167		0.049
	(0.048)***		(0.091)	(0.075)		(0.208)	(0.094)*		(0.296)
US gamma x dollar zone weight (θ_7^{US})	0.370		0.391	0.436		0.457	0.364		0.403
	(0.065)***		(0.065)***	(0.081)***		(0.081)***	(0.097)***		(0.098)***
Euro zone weight (θ_6^{Euro})		-0.052	-0.082		-0.181	-0.069		-0.024	0.131
		(0.054)	(0.099)		(0.081)**	(0.211)		(0.105)	(0.303)
Euro area gamma x euro zone Weight (θ_7^{Euro})		0.375	0.411		0.430	0.465		0.277	0.362
		(0.091)***	(0.091)***		(0.156)***	(0.151)***		(0.183)	(0.178)**
Financial Openness	0.100	0.137	0.103	0.116	0.132	0.124	-0.073	-0.046	-0.069
	(0.050)**	(0.050)***	(0.050)**	(0.073)	(0.075)*	(0.073)*	(0.094)	(0.096)	(0.093)
IR Holding	0.631	0.626	0.622	0.579	0.744	0.578	0.255	0.385	0.261
	(0.166)***	(0.168)***	(0.166)***	(0.230)**	(0.236)***	(0.229)**	(0.269)	(0.277)	(0.268)

Notes: The estimates of the other explanatory variables are omitted from presentation.
Their signs and statistical significance are not much affected except overall.
The weights of the US$ and the euro are highly correlated

Estimations with the Currency Zone Weight (2)

Link 4 – CEs: REER changes → PHs: EMP

	FULL (1)	FULL (2)	FULL (3)	LDC (4)	LDC (5)	LDC (6)	EMG (7)	EMG (8)	EMG (9)
Exch. Rate Stability	-7.891	-6.970	-6.722	-7.551	-7.194	-7.247	-6.989	-6.663	-7.575
	(2.118)***	(2.127)***	(2.145)***	(2.182)***	(2.162)***	(2.176)***	(2.622)***	(2.644)**	(2.708)***
$ zone weight (θ_6^{US})	0.799		-7.472	-0.210		-4.165	0.302		5.145
	(1.704)		(3.562)**	(2.031)		(6.331)	(2.377)		(8.817)
US gamma x dollar zone weight (θ_7^{US})	4.677		3.853	3.590		3.563	5.633		5.574
	(2.117)**		(2.133)*	(2.179)*		(2.159)*	(2.416)**		(2.435)**
Euro zone weight (θ_6^{Euro})		-0.664	-6.715		1.178	-1.653		0.578	7.445
		(1.960)	(3.907)*		(2.224)	(6.473)		(2.676)	(9.079)
Euro area gamma x euro zone Weight (θ_7^{Euro})		-10.329	-9.768		-9.112	-9.171		-8.532	-8.180
		(3.432)***	(3.468)***		(4.368)**	(4.373)**		(5.023)*	(5.039)
Financial Openness	-2.659	-2.124	-2.654	-4.067	-3.931	-3.940	-4.772	-4.357	-4.856
	(1.693)	(1.667)	(1.688)	(1.788)**	(1.767)**	(1.774)**	(2.194)**	(2.195)**	(2.216)**
IR Holding	-12.898	-14.236	-12.993	-1.990	-1.886	-2.560	-2.301	-2.519	-2.426
	(5.503)**	(5.410)***	(5.481)**	(5.815)	(5.741)	(5.765)	(7.322)	(7.348)	(7.395)

Link 5 – CEs: REER changes → PH: Stock market price changes

	FULL (1)	FULL (2)	FULL (3)	LDC (4)	LDC (5)	LDC (6)	EMG (7)	EMG (8)	EMG (9)
Exch. Rate Stability	-0.089	-0.067	-0.127	0.143	0.099	0.105	0.234	0.112	0.203
	(0.164)	(0.172)	(0.168)	(0.229)	(0.239)	(0.229)	(0.277)	(0.293)	(0.283)
$ zone weight (θ_6^{US})	0.371		0.538	0.538		1.506	0.289		0.676
	(0.132)***		(0.249)**	(0.201)***		(0.602)**	(0.237)		(0.856)
US gamma x dollar zone weight (θ_7^{US})	-1.149		-1.126	-1.521		-1.475	-1.772		-1.705
	(0.160)***		(0.162)***	(0.208)***		(0.208)***	(0.228)***		(0.229)***
Euro zone weight (θ_6^{Euro})		-0.079	0.203		-0.193	0.849		-0.021	0.199
		(0.155)	(0.268)		(0.232)	(0.604)		(0.286)	(0.872)
Euro area gamma x euro zone Weight (θ_7^{Euro})		0.193	-0.009		0.746	0.540		1.157	0.683
		(0.259)	(0.253)		(0.451)*	(0.433)		(0.530)**	(0.504)
Financial Openness	0.211	0.097	0.212	0.027	0.010	-0.002	-0.003	0.019	-0.019
	(0.135)	(0.138)	(0.136)	(0.179)	(0.187)	(0.179)	(0.215)	(0.228)	(0.216)
IR Holding	-0.610	-0.453	-0.608	-0.530	-0.653	-0.464	-0.427	-0.840	-0.434
	(0.388)	(0.397)	(0.388)	(0.531)	(0.554)	(0.531)	(0.703)	(0.745)	(0.709)

Notes: The estimations are conducted with the robust regression method due to the existence of outliers. * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Notes: The estimates of the other explanatory variables are omitted from presentation.
Their signs and statistical significance are not much affected except overall. The weights of the US$ and the euro are highly correlated.

Findings

Link 1 (i-i):

A country with more dollar zone weight tends to have weaker (or negative) correlation between its policy rate with the policy rate of the CEs.

- Investors in more dollar-oriented economies tend to respond to changes in the policy interest rates in the CEs, so they would reallocate their investment. For example, if the U.S. raises FFR, investors in more dollar-oriented economies would reallocate their investment from their home countries to the U.S., making the correlation of the policy rates weaker or more negative

Findings, continued

Link 2 (i-REER):
The extent of belonging to the dollar zone does not matter

– Exchange rate stability would matter

Findings, continued

Link 3 (REER-REER):
If the U.S. or the euro area experiences a positive (i.e., appreciation) shock to its REER, developing countries and EMGs with higher USD or Euro weights tend to experience REER appreciation as well

– ERS continues to be a significantly positive factor for both groups,

→ **LDCs and EMGs tend to have the "fear of floating"**

Findings, continued

Link 4 (REER-EMP):

U.S. REER appreciation would lead to an increase in EMP of both LDCs and EMGs with higher USD zone weights

When we estimate the *Trade Share* of the dollar and/or euro zone

$$\hat{\gamma}_{Fit}^{C} = \theta_0 + \theta_1 OMP_{Fit} + \theta_2 MC_{Fit} + \theta_3 LINK_{Fit} + \theta_4 INST_{Fit} + \theta_5 CRISIS_{Fit}$$
$$+ \theta_6 TH\_CZ_{Fit}^{US,Euro} + \theta_7 \left(D\Gamma_{Fit}^{US,Euro} \times TH\_CZ_{Fit}^{US,Euro} \right) + u_{Fit}. \quad (4)$$

Generally, the estimation results for the variables of our concern remain intact qualitatively, but usually with stronger statistical significance

Both currency weights and the share of trade with the dollar and euro zones matter for the extent of spillover linkages to the CEs

Impacts of External Debt

Are countries with more external debt exposure more susceptible to shocks occurring in the CEs?

We examine the impacts of

- ❑ External debt as a share of exports
- ❑ External debt as a share of gross national income
- ❑ Short-term debt as a share of exports
- ❑ Short-term debt as a share of total external debt
- ❑ Short-term debt as a share of int'l reserves

We find …

- Link 1 (i-$\check{\imath}$) is not affected by how much PHs owe externally

- **Link 2 (i-REER):** A rise in the U.S. policy interest rate would lead more toward currency real *de*preciation of a PH if its total external debt is larger

We find …

- **Link 3 (REER-REER):** The estimate on the variable for external debt (as a share of GNI) is significantly negative among the EMGs. However, the estimate on short term debt as a share of IR holding is significantly *positive*

  ➢ Because of the need to roll-over the debt?

- **Link 4 (REER-EMP):** Greater levels of external debt or short-term debt would also make PHs' EMP more positively correlated with CE's REER especially among emerging market countries

The bottom line is …

Countries with more external debt exposure are vulnerable to financial shocks emanating from the CEs

- **i-REER**
- **REER-REER**
- **REER-EMP**

Looking into the impact of currency compositions in int'l debt denomination

$$\hat{\gamma}_{Fit}^{C} = \theta_0 + \theta_1 OMP_{Fit} + \theta_2 MC_{Fit} + \theta_3 LINK_{Fit} + \theta_4 INST_{Fit} + \theta_5 CRISIS_{Fit}$$
$$+ \theta_6 CSH_{Fit}^{US} + \theta_7 \left(D\Gamma_{Fit}^{US} \times CSH_{Fit}^{US} \right) + u_{Fit}, \qquad (5)$$

If a PH has more dollar-denominated debt, such an economy should be more vulnerable to spillover effects from the U.S., more so than to spillovers from other CEs

Is this true?

We test these variables

Dollar-denominated International debt (%) = share of the dollar-denomination in total international debt securities, BIS
  – Total
  – Financial institutions
  – Non-financial institutions
  – Gov't

Public debt denominated in the dollar (%) = share of external long-term public and publicly-guaranteed debt contracted in the dollar. Extracted from the World Bank's Global Development Indicators.

We include these variables as both individually and interactively with the dummy for the U.S. (γ^{US})

The higher dollar share in int'l public debt securities a PH has, the more positively correlated its REER to a policy interest rate change in the U.S.

Link 2 – CEs: Change in ST-rate → PH: REER changes

	Developing Countries (LDC)						Emerging Market Countries (EMG)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Exch. Rate Stability	2.135	3.310	1.977	2.977	3.344	4.196	2.519	3.308	3.349	3.365	4.058	4.635
	(0.782)***	(0.975)***	(1.055)*	(1.312)**	(1.564)**	(1.043)***	(0.860)***	(1.094)***	(1.156)***	(1.751)*	(1.949)**	(1.133)***
Financial Openness	-0.011	-0.059	-0.553	0.113	-0.005	-1.209	-0.088	-0.577	0.345	0.081	0.409	-1.209
	(0.692)	(0.847)	(1.026)	(0.961)	(1.160)	(0.910)	(0.845)	(1.023)	(1.526)	(1.300)	(1.300)	(1.032)
IR Holding	0.969	1.323	-2.320	3.165	2.948	-2.307	1.742	3.148	1.324	4.424	5.466	-1.031
	(2.265)	(2.620)	(3.910)	(3.027)	(3.253)	(3.105)	(2.489)	(2.873)	(4.303)	(3.566)	(3.751)	(3.376)
Dollar-denom. Int'l debt(%)		-2.440						-2.806				
		(0.923)***						(1.218)**				
Dollar share x US gamma		0.381						-0.337				
		(0.853)						(0.934)				
Public debt denominated in USD (%)			-0.760						-1.183			
			(1.447)						(1.659)			
Dollar share (PPG) x US gamma			0.844						1.018			
			(1.545)						(1.531)			
Dollar-denom. Int'l debt(%) Financial Inst.				-0.785						-0.282		
				(0.849)						(1.232)		
Dollar share x US gamma Financial Inst.				0.168						-0.879		
				(0.885)						(1.033)		
Dollar-denom. Int'l debt(%) Non-Financial Inst.					-2.410						-4.364	
					(0.991)**						(1.285)***	
Dollar share x US gamma Non-Financial Inst.					0.109						-0.087	
					(0.944)						(1.016)	
Dollar-denom. Int'l debt(%)¥ Gov't sector						-4.175						-4.846
						(1.179)***						(1.387)***
Dollar share x US gamma Gov't Sector						1.821						1.392
						(0.989)*						(1.048)
N	494	375	290	344	281	354	367	300	202	275	245	303
Adj. R2	0.03	0.09	-0.01	0.06	0.09	0.09	0.07	0.16	0.03	0.12	0.15	0.11
# of countries	37	26	23	27	23	28	24	20	13	20	18	23
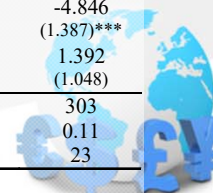
If PH's international debt is more denominated in the dollar, the PH would try to align its REER with that of the U.S.

Link 3 – CEs: Change in REER → PHs: Change in REER

	Developing Countries (LDC)						Emerging Market Countries (EMG)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Exch. Rate Stability	0.765	0.775	0.623	0.823	0.778	0.824	0.816	0.775	0.881	0.881	0.679	0.942
	(0.084)***	(0.106)***	(0.106)***	(0.135)***	(0.165)***	(0.115)***	(0.099)***	(0.125)***	(0.132)***	(0.180)***	(0.209)***	(0.125)***
Financial Openness	0.155	0.211	-0.001	0.256	0.185	0.076	-0.063	0.032	-0.445	0.154	0.145	-0.048
	(0.074)**	(0.092)**	(0.103)	(0.099)***	(0.122)	(0.100)	(0.097)	(0.117)	(0.174)**	(0.134)	(0.139)	(0.113)
IR Holding	0.799	0.799	0.575	1.193	1.062	0.172	0.518	0.733	0.025	1.293	1.062	-0.187
	(0.243)***	(0.285)***	(0.394)	(0.312)***	(0.342)***	(0.343)	(0.286)*	(0.329)**	(0.491)	(0.368)***	(0.402)***	(0.371)
Dollar-denom. Int'l debt(%)		-0.083						0.049				
		(0.100)						(0.140)				
Dollar share x US gamma		0.082						0.018				
		(0.093)						(0.107)				
Public debt denominated in USD (%)			-0.231						-0.171			
			(0.146)						(0.189)			
Dollar share (PPG) x US gamma			0.457						0.198			
			(0.156)***						(0.175)			
Dollar-denom. Int'l debt(%) Financial Inst.				0.039						0.172		
				(0.087)						(0.127)		
Dollar share x US gamma Financial Inst.				0.247						0.173		
				(0.091)***						(0.106)		
Dollar-denom. Int'l debt(%) Non-Financial Inst.					-0.065						-0.132	
					(0.104)						(0.138)	
Dollar share x US gamma Non-Financial Inst.					0.218						0.137	
					(0.099)**						(0.109)	
Dollar-denom. Int'l debt(%)¥ Gov't sector						0.010						-0.082
						(0.130)						(0.152)
Dollar share x US gamma Gov't Sector						0.391						0.355
						(0.109)***						(0.115)***
N	494	375	290	344	281	354	367	300	202	275	245	303
Adj. R2	0.26	0.23	0.32	0.28	0.29	0.27	0.26	0.23	0.34	0.25	0.23	0.29
# of countries	37	26	23	27	23	28	24	20	13	20	18	23

If the U.S. experiences currency real appreciation, the PHs' EMP would be more responsive if the dollar share is higher in the denomination for int'l debt

Link 4 – CEs: REER changes → PHs: EMP

	Developing Countries (LDC)						Emerging Market Countries (EMG)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Exch. Rate Stability	-8.347	-12.528	-8.209	-10.216	-7.208	-11.561	-7.367	-10.027	-5.480	-9.224	-6.663	-10.215
	(2.265)***	(2.697)***	(3.200)**	(3.191)***	(3.332)**	(2.828)***	(2.741)***	(3.049)***	(4.588)	(3.988)**	(3.747)*	(3.119)***
Financial Openness	-3.976	-8.195	-4.175	-7.780	-5.295	-2.498	-4.608	-7.707	-8.731	-8.596	-5.339	-1.994
	(1.812)**	(2.216)***	(2.582)	(2.427)***	(2.660)**	(2.261)	(2.253)**	(2.517)***	(3.671)**	(2.878)***	(2.837)*	(2.454)
IR Holding	0.502	-4.443	4.874	-6.133	-8.708	9.357	1.913	-9.704	10.046	-10.066	-3.191	9.671
	(5.914)	(6.829)	(8.862)	(7.182)	(8.544)	(7.230)	(7.793)	(8.825)	(14.228)	(9.749)	(9.261)	(9.196)
Dollar-denom. Int'l debt(%)		-4.504						-4.748				
		(2.646)*						(3.315)				
Dollar share x US gamma		8.029						10.819				
		(2.562)***						(2.694)***				
Public debt denominated in USD (%)			8.605						13.941			
			(4.275)**						(5.545)**			
Dollar share (PPG) x US gamma			9.801						15.993			
			(4.780)**						(5.869)***			
Dollar-denom. Int'l debt(%) Financial Inst.				-2.715						-3.444		
				(2.431)						(3.151)		
Dollar share x US gamma Financial Inst.				6.085						8.412		
				(2.520)**						(2.687)***		
Dollar-denom. Int'l debt(%) Non-Financial Inst.					-0.895						-2.899	
					(2.642)						(3.117)	
Dollar share x US gamma Non-Financial Inst.					8.736						9.630	
					(2.455)***						(2.601)***	
Dollar-denom. Int'l debt(%)¥ Gov't sector						-5.349						-4.146
						(2.803)*						(2.958)
Dollar share x US gamma Gov't Sector						3.514						3.959
						(2.687)						(2.765)
N	782	550	502	530	415	526	580	445	365	426	373	459
Adj. R2	0.06	0.14	0.09	0.11	0.13	0.09	0.04	0.12	0.11	0.10	0.12	0.05
# of countries	61	39	42	44	33	42	38	29	24	32	27	33
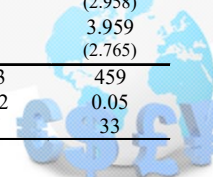
We also repeated the exercise for the euro

Generally, the results are weaker

The euro share in int'l debt securities is found to affect the REER-REER link

Take-home messages, again

➢ For both policy interest rates and the REER, the link with the CEs has been dominant for LDCs and EMGs in the last two decades

➢ The extent of belonging to a currency zone (i.e., USD- or euro-zone) affects the degree of connectivity

➢ We find evidence that exposure to external debt also matters

➢ Also, that currency composition in int'l debt securities matter. Generally, those economies more reliant on the dollar for debt issuance tend to be more vulnerable to shocks occurring in the U.S. (or other CEs)

Thank you!!