Exchange Rates in Emerging Markets: Shock Absorber or Source of Shock?

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Motivation

▶ A longstanding debate: whether flexible exchange rates are beneficial for macroeconomic stability

- Exchange rates act as shock absorbers which help dampen the impact of real and external shocks (Obstfeld et al., 1985; Mundell, 1963; Fleming, 1962)
- Exchange rate movements may stem from shocks that originate in the FX market and become a source of macro volatility (Buiter, 2000)

▶ For EMs, this debate has been more controversial

- Large and volatile capital flows
- Exchange rates can induce procyclicality due to high external debt and high foreign participation in domestic financial markets (Kohler and Stockhammer, 2023)

Motivation and Background

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▶ Empirically, the shock-absorbing role of E/R remains inconclusive.

- Studies that focus on drivers of exchange rates: (De and Sun, 2020; An and Kim, 2010; Artis and Ehrmann, 2006; Farrant and Peersman, 2006; Buiter, 2000; Clarida and Gali, 1994).
- Studies that focus on economic responses to shocks across E/R regimes: (Dabrowski et al., 2024; Corsetti et al., 2021; Eichengreen et al., 2020; Obstfeld et al., 2019).
- Empirical evidence limited in EMs despite being exposed to large E/R shocks: (Eichengreen et al., 2020; Obstfeld et al., 2019; Edwards, S., 2011).

▶ Recent work highlight that the shock-absorbing role of E/R may be shock-dependent. (Beckman et al., 2024; Dabrowski et al., 2020).

▶ Explores the shock-insulation property of E/R in the context of EM Asia and Latin America

▶ Estimates country-by-country structural VAR models with zero, sign and ERPT restrictions to identify shocks.

⇒ ERPT restriction is novel and helps address the issue of unrealistic ERPT estimates.

▶ Aims to uncover underlying drivers of E/R movements, as well as:

⇒ Quantify the extent of the E/R being a shock absorber across different shocks.
⇒ Quantify whether E/R flexibility helps reduce or raise economic volatility based on counterfactual analyses.

▶ Examines factors influencing the shock-absorbing roles of E/R. Do structural characteristics of a country matter?

▶ 10 small open emerging economies in the LATAM and Asia Pacific regions during the period 2000Q1 to 2022Q3

- Latam: Brazil, Chile, Colombia, Mexico, Peru
- Asia: South Korea, Indonesia, Malaysia, the Philippines and Thailand
- Most countries operate under a managed-float exchange rate regime over the entire sample period (Ilzetzki et al., 2019, 2022).

Table: Summary Statistics (%)

	Brazil	Chile	Colombia	Mexico	Peru	South Korea	Indonesia	Malaysia	Philippines	Thailand
E/R Volatility	15.09	9.94	10.80	9.38	4.62	8.50	8.64	6.29	5.44	5.45
Growth Volatility	3.46	4.10	5.02	5.34	8.90	1.90	2.02	6.34	4.38	4.10
Inflation Volatility	1.73	1.59	1.76	0.92	1.44	0.95	2.43	1.76	1.32	1.66
Inflation	1.54	0.91	1.21	1.14	0.72	0.61	1.49	0.56	0.98	0.52

Note: volatility is calculated as an annualized standard deviation

▶ 8-variable structural VAR (2 lags), country-by-country

  ■ <u>Domestic</u>: Real GDP growth, inflation, policy rate
  ■ <u>Global (US)</u>: Real GDP growth, inflation, policy rate, oil price changes
  ■ Bilateral exchange rate between domestic currency and USD

▶ Three types of restrictions to identify shocks

  1. Zero restrictions (short-run & long run)
  2. Sign restrictions (contemporaneous)
  3. Exchange rate pass-through restrictions

▶ Bayesian estimation with Minnesota priors

Zero and Sign Restrictions

▶ Close to Forbes et al. (2018), Forbes et al. (2020) and Ha et al. (2020)

Table: Zero and Sign Restrictions for VAR Shock Identification

	Domestic supply shock (S)	Domestic demand shock (D)	Domestic monetary policy shock (MP)	Exchange rate shock (ER)	Global supply shock (S^*)	Global demand shock (D^*)	Global monetary policy shock (MP^*)
Dom. RGDP Growth	+	+	-/ 0^L	-/ 0^L			
Dom. Inflation	-	+	-	-			
Dom. Interest Rate		+	+	-			
Exchange Rate			+	+			-
Global RGDP Growth	0	0	0	0	+	+	-/ 0^L
Global Inflation	0	0	0	0	-	+	-
Global Interest Rate	0	0	0	0		+	+
Oil price	0	0	0	0	-	+	

▶ SVAR with only zero and sign restrictions $\Rightarrow$ implausible ERPT estimates & underestimate roles of E/R shocks

$\Rightarrow$ An et al. (2021): narrative sign restriction

$\Rightarrow$ This paper: directly impose ERPT restrictions based on estimates from standard pass-through regressions.

$$\Delta p_{i,t} = \sum_{n=0}^{4} \beta_{1,n}^{i} \Delta s_{i,t-n} + \sum_{n=0}^{4} \beta_{2,n}^{i} \Delta wpx_{i,t-n} + \sum_{n=0}^{4} \beta_{3,n}^{i} \Delta oil_{t-n} + \sum_{n=0}^{4} \beta_{4,n}^{i} GSCPI_{t-n}$$

$$+ \sum_{n=0}^{4} \beta_{5,n}^{i} \Delta GDP_{i,t-n} + \epsilon_{i,t},$$

(1)

$\Delta p_{i,t}$ is the CPI inflation

$\Delta s_{i,t}$ represents changes in the bilateral E/R against USD ($+$ = USD depreciation)

Control: Δwpx_i is changes in export prices of country i's major exporting countries. Δoil is changes in world oil prices. $GSCPI$ is the global supply chain pressure index. ΔGDP is the real GDP growth.

ERPT restrictions help limit unrealistic ERPT estimates

▶ OLS estimates suggest low, and possibly insignificant, ERPT
▶ Without ERPT restrictions, ERPT estimates from SVAR become unrealistic

Figure: Exchange Rate Pass-through Estimates

(a) OLS Regression

(b) SVAR Model

W/O ERPT Restriction (5,95pct)   W/ ERPT Restriction (5,95pct)
—○— W/O ERPT Restriction (50pct)   —●— W/ ERPT Restriction (50pct)
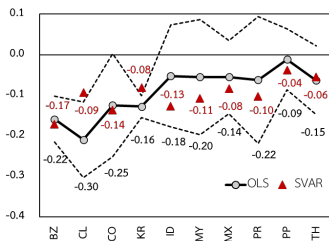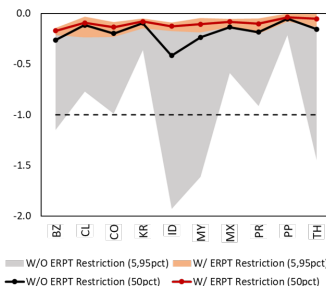
▶ Exogenous exchange rate shocks drive a sizable portion of overall fluctuations in exchange rates, more so for Asia

Table: Forecast Error Variance Decomposition (FEVD) for Exchange Rates

	S	D	MP	ER	S*	D*	MP*	Other*	Demand	Supply	Domestic	Global
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(2)+(6)+(7)	(1)+(5)	(1)-(3)	(5)-(8)
EM LatAm	4%	7%	7%	48%	5%	13%	8%	7%	28%	10%	19%	33%
EM Asia	4%	10%	6%	58%	5%	8%	5%	5%	24%	9%	20%	22%

Note: average over 8-quarter horizon.

Exchange Rates as a Source of Shock?

▶ Negligible contribution of exchange rate shocks toward explaining output fluctuations, but larger roles for inflation variance.

Table: FEVD for Output Growth & Inflation

	S (1)	D (2)	MP (3)	ER (4)	S* (5)	D* (6)	MP* (7)	Other* (8)	Demand (2)+(6)+(7)	Supply (1)+(5)	Domestic (1)-(3)	Global (5)-(8)
For Output Growth												
EM LatAm	14%	11%	1%	2%	10%	46%	4%	13%	61%	24%	26%	72%
EM Asia	18%	14%	3%	2%	6%	42%	5%	11%	61%	24%	35%	63%
For Inflation												
EM LatAm	22%	22%	18%	12%	6%	8%	7%	5%	37%	28%	62%	26%
EM Asia	13%	17%	18%	4%	9%	18%	12%	8%	48%	22%	49%	47%

Note: average over 8-quarter horizon.

Exchange Rates as a Source of Shock? (Cont.)

▶ Small sensitivity of output and inflation to an exchange rate shock

Figure: Impulse Responses to an Exogenous Exchange Rate Shock

(a) Output Growth

(b) Inflation
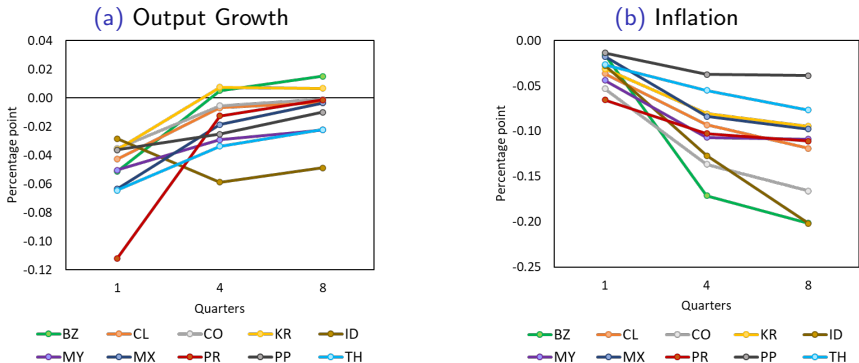
# How well does the exchange rate act as a shock absorber?

▶ <u>Conditional IRFs</u>: Examine IRFs to each fundamental shock x conditional on exchange rates held fixed ($IRF_{i,t}^{x,conditional}$)

   ■ Generate a series of exchange rate shocks to offset the exchange rate movements
   ■ Then, measure the degree of shock absorption by comparing with the unconditional IRFs:

$$\%Shock\ Absorption_{i,t}^{x} = (\frac{IRF_{i,t}^{x,unconditional} - IRF_{i,t}^{x,conditional}}{IRF_{i,t}^{x,conditional}}) * 100 \qquad (2)$$

Do Exchange Rates Absorb the Shock Impact on Growth?

▶ To some extent but highly shock-dependent: E/R absorbs *demand shocks* well, but limited role in the face of *supply shocks*
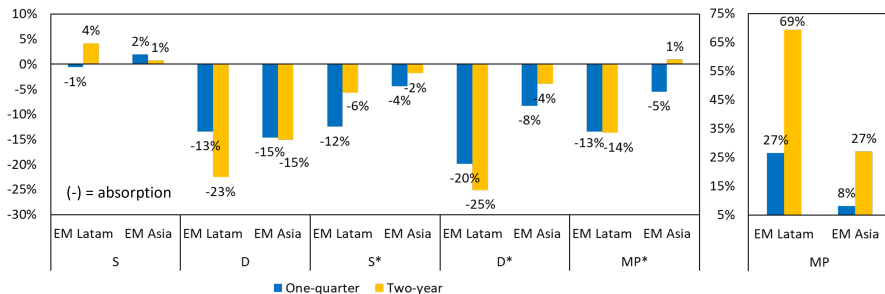
Figure: Degree of Shock Absorption for Fundamental Shocks on Output Growth
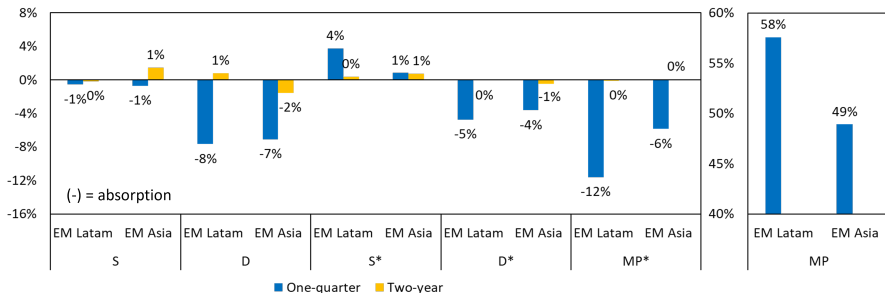
► The shock-absorption roles for demand shocks become much more prominent
► E/R also absorbs foreign supply shocks ⇒ tradeoffs between stabilizing output and inflation

Figure: Degree of Shock Absorption for Fundamental Shocks on Inflation

Measuring Net Benefits of Flexible Exchange Rates

▶ Counterfactual analyses: keeping E/R fixed in response to shocks

▶ $Net\ Benefit_i^Y = Vol_i^{Y,counterfactual} - Vol_i^{Y,actual}$, where $Y \in \{growth, inflation\}$

▶ Positive values signify that benefits in terms of reduced macro volatility outweigh costs.

Figure: Net Benefits of Flexible Exchange Rates

(a) Output Growth Stabilization

(b) Inflation Stabilization
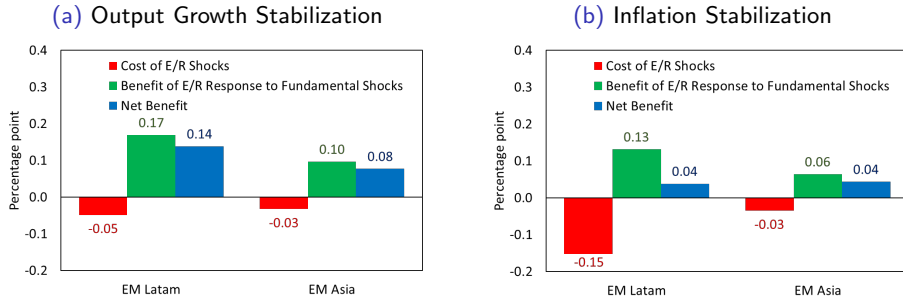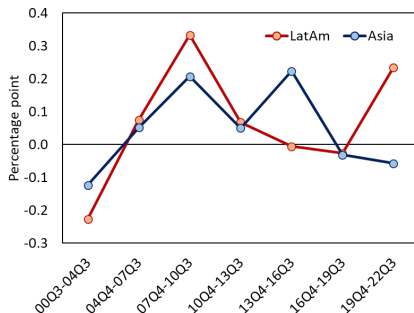

Shock Absorber?: Counterfactual Analysis

▶ Benefits of flexible exchange rates appear large for EMs in Latin America, particularly during crises periods.

Figure: Net Benefits of Flexible Exchange Rates across Time and Regions

(a) Output Growth Stabilization
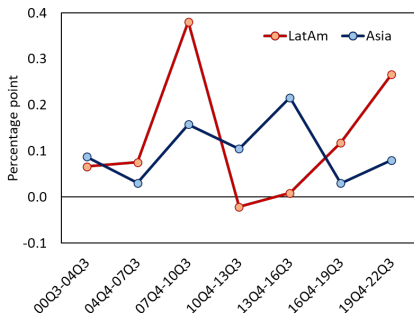
(b) Inflation Stabilization

Determinants of Shock Insulation Properties

- Shocks vs. Structural Characteristics
- Panel regression of 10 countries over 7 sub-periods
- Regression specification:

$$Net\ Benefit_{i,t} = \gamma_0 + \gamma_1 Shock_{i,t} + \gamma_2 Structural_i + \epsilon_{i,t} \qquad (3)$$

–$NetBenefit_{i,t} = Vol_{i,t}^{counterfactual} - Vol_{i,t}^{actual}$; t=sub-period
–$Shock_{i,t}$ is the share of country i's exchange rate movements attributed to each structural shock.
–$Structural_i$ is a vector of time-invariant structural variables including E/R volatility, trade openness, inflation volatility, extent of external debt, FX market depth.

Table: Determinants of the Net Benefits of Flexible Exchange Rates

	Output Growth Stabilization			Inflation Stabilization		
	(1)	(2)	(3)	(4)	(5)	(6)
Exchange Rate Shocks	-0.004***			-0.006**		
Domestic Shocks		0.001			0.002	
Global Shocks		0.007***			0.008**	
Demand Shocks			0.005***			0.007***
Supply Shocks			0.006			0.000
Exchange Rate Volatility	0.022*	0.024**	0.019	0.009	0.011	0.000
Trade Openness	0.002*	0.003**	0.002	0.002	0.003	0.001
Observations	69	69	69	69	69	69
R-squared	0.150	0.198	0.178	0.078	0.091	0.089

- Exchange rates in general play a stabilizing role for the macroeconomy in LATAM and Asian emerging countries.
- The benefits of flexible exchange rates are highly shock-dependent, while also hinge upon structural characteristics of a country.
- Policy Recommendations
  - Flexible exchange rates can help provide an insulation against domestic and global shocks.
  - Optimal FX market intervention and monetary policy could follow from tailored responses to shocks
  - Consider other factors so as to not underevaluate the costs of exchange rate shocks or overestimate the benefits of fundamental exchange rate movements.