

Monetary Policy Implications of Capital Flows in Asia

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Note: the views expressed in this presentation is the personal views of the presenter and do not reflect the views of the ADB.



Outline

1. Pattern of International Capital Flows (ICF)
2. Transmission Mechanism of ICF
3. Policy Response to ICF
4. Challenge Presented by ICF to Monetary Policy
5. How Do We Insulate Economies from External Monetary Policy Shocks?

History of International Capital Flows

- Petro-dollar crisis:
- Financial liberalization



- Great Moderation:

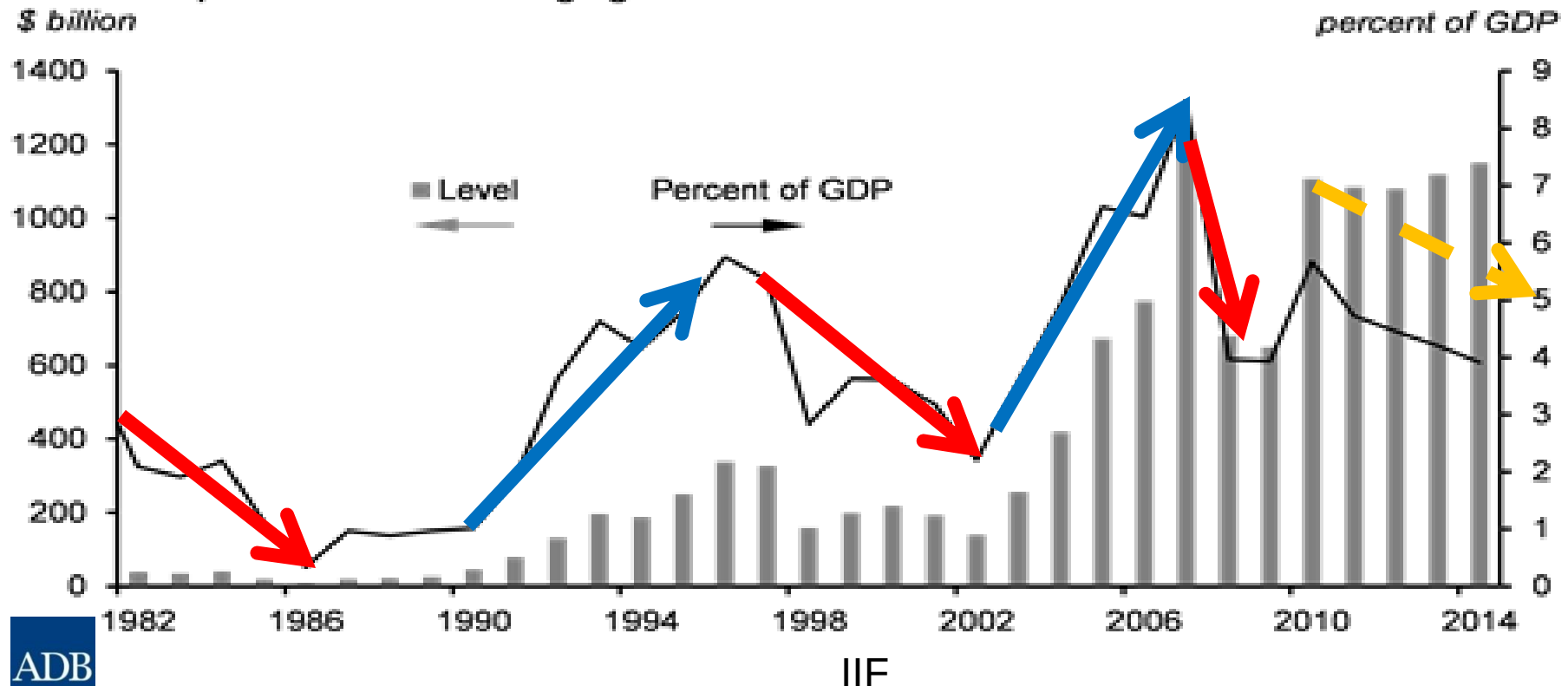
- QE, Tapering Fears



Surge in Capital Flow Ends in Crisis

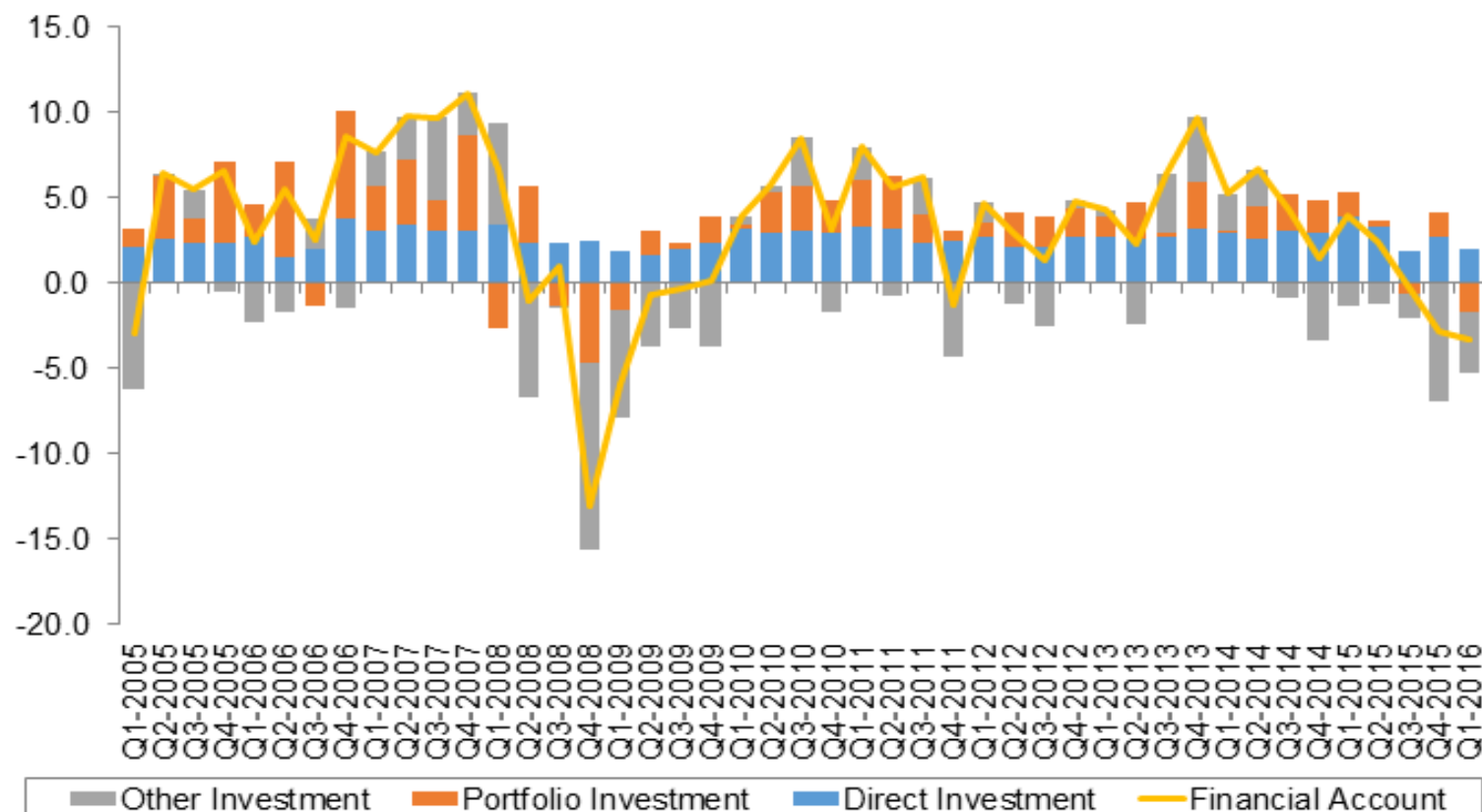
- Petro-dollar led to 1982-89 debt crisis in Latin America;
- Financial liberalization led to 1994 Tequila crisis and the 1997 Asian financial crisis;
- The great moderation led to the 2008 global financial crisis
- Will the QE and eventual QE taper lead to another crisis?

Private Capital Inflows to Emerging Market Economies
\$ billion



Non-Resident Capital Flows— ASEAN+3 (% of GDP)

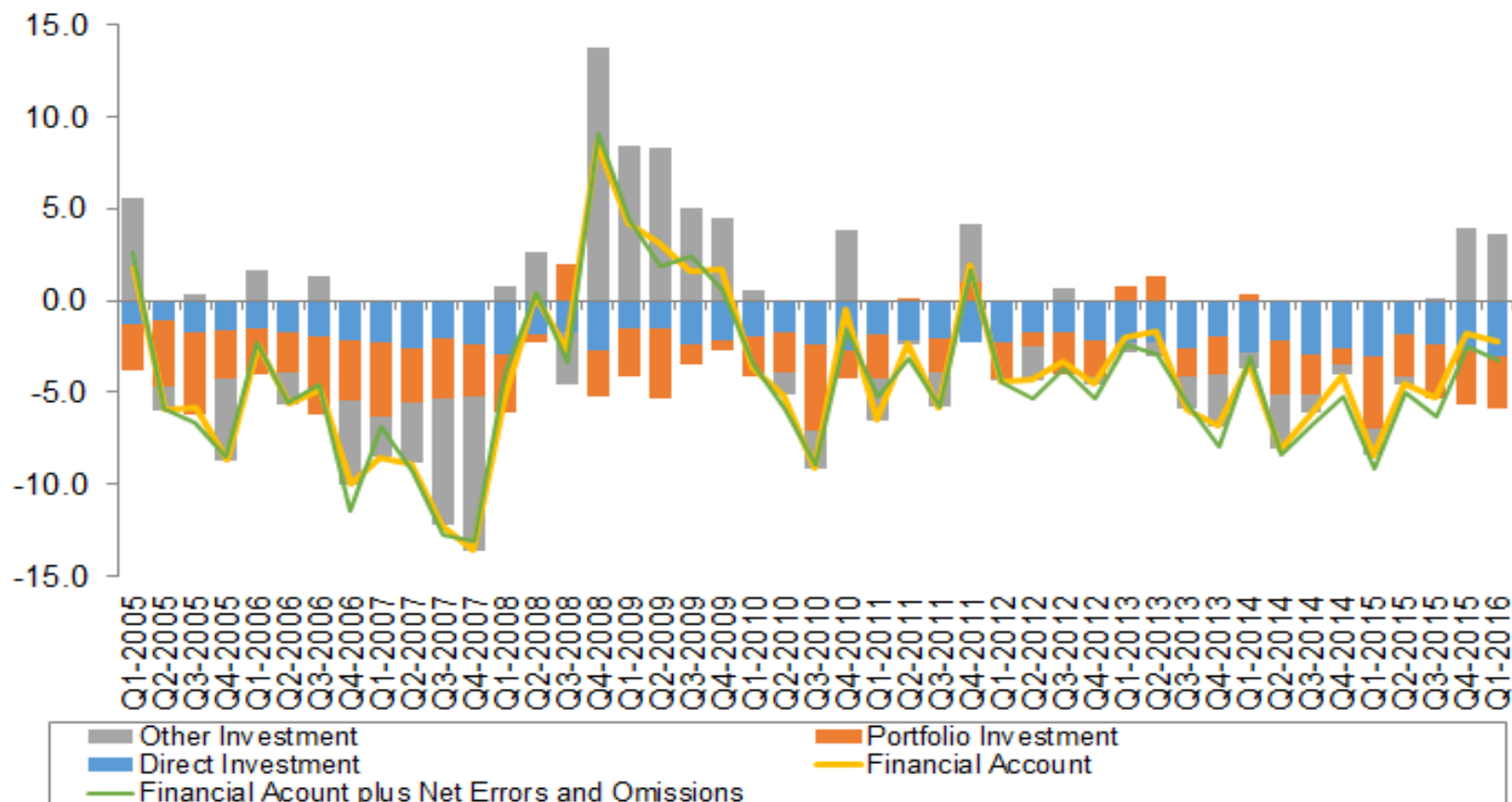
Fig. 1.1: Non-Resident Flows—ASEAN+3 (% of GDP)



Note: Break in comparability of data for PHI (2005), BRIU (2010) and MAL (2010). For Malaysia, this effectively discounted "other investments" in its assets and liabilities breakdown.
 1. For consistency of charts, net of "other investment" corresponds to resident inflow for Malaysia starting 2010.
 2. In the case of Lao PDR, net of direct, portfolio and other investments corresponds to "non-resident inflows" direct, portfolio and other investments starting 2014.
 3. ASEAN+3 excludes CAM starting Q12015; BRIU, MYA, and VIE for Q12016.

Source: International Financial Statistics, International Monetary Fund

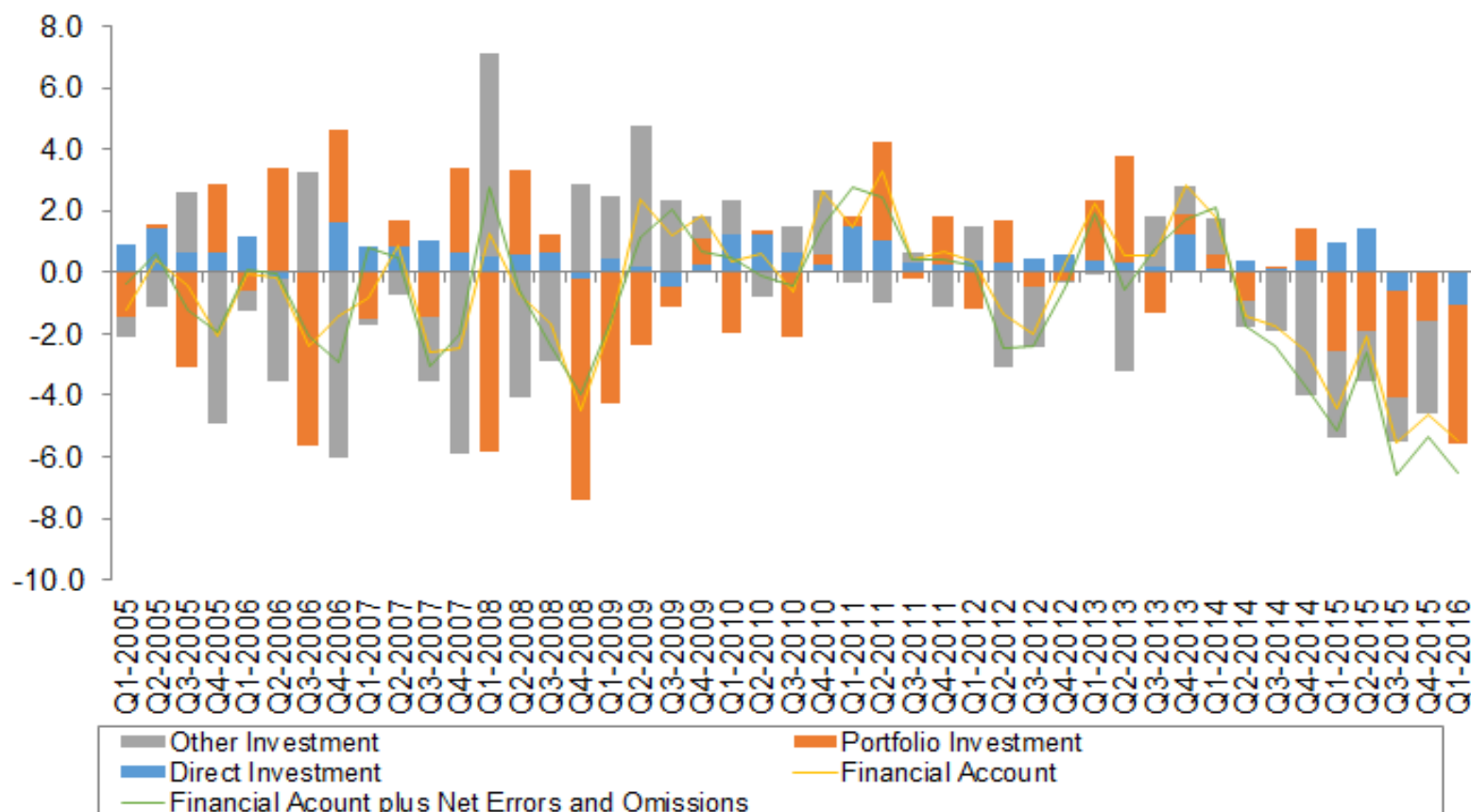
Resident Capital Flows—ASEAN+3 (% of GDP)



Note: Break in comparability of data for PHI (2005), BRU (2010) and MAL (2010). For Malaysia, this effectively discounted 'other investments' in its assets and liabilities breakdown.
 1. For consistency of charts, net of 'other investment' corresponds to resident inflow for Malaysia starting 2010.
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 3. ASEAN+3 excludes CAM starting Q12015; BRU, MYA, and VIE for Q12016.

Source: International Financial Statistics, International Monetary Fund

Net Financial Capital Flows— ASEAN+3 (% of GDP)

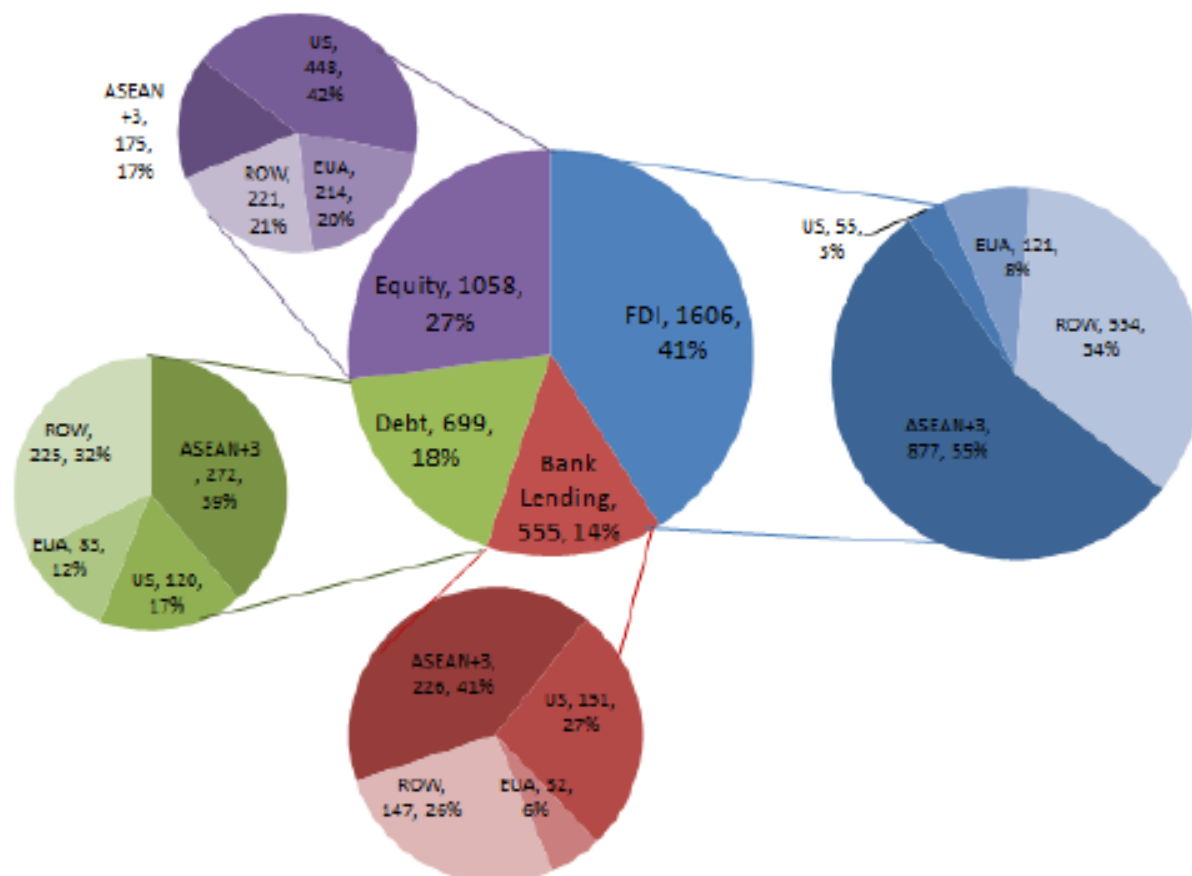


Note: Break in comparability of data for PHI (2005), BRU (2010) and MAL (2010). For Malaysia, this effectively discounted "other investments" in its assets and liabilities breakdown.
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Source: International Financial Statistics, International Monetary Fund

Structure of Capital Inflows to ASEAN+3 (cumulative, 2010–2014, \$bn)

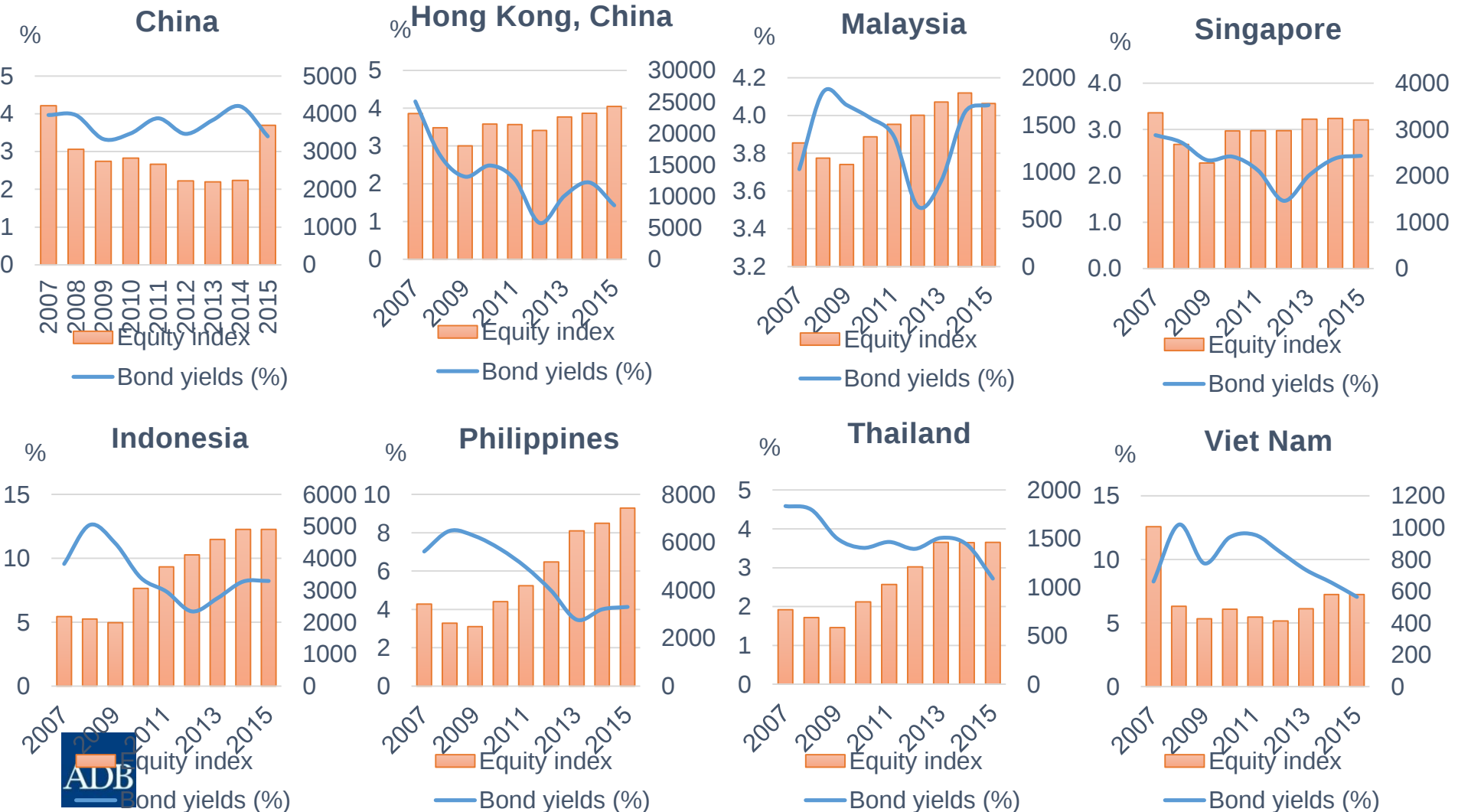
Inward flows to ASEAN+3



Transmission and Impact: ASEAN+3 Experience

- **Periods of capital inflow:** the transmission mechanisms invariably involve the tendency towards currency appreciation, high increase in monetary aggregates and domestic credit, and increasing asset prices of debts, equities and properties. But the link to growth is less clear.
- **Periods of capital outflow:** entails massive (competitive) currency depreciation leading to losses in confidence or depletion of international reserves, sudden curtailment of foreign lending facilities, particularly in the period when one most needs it (as in a global recession), and bursting of asset and property bubbles created, in the first place, by previous large financial inflows.

Capital Inflows Fueled Growths in Equity and Bond Markets



Growth in Stock Price Index

2005-2007 2008-2009 2010-2013				Taper Tantrum	2014-2015
ASEAN4					
INO	57.4	20.2	17.2	-17.1	3.7
MAL	18.3	8.1	11.7	0.6	-4.7
PHI	33	1.2	23.2	-14.1	9
THA	7.8	4	19.2	-19	-0.4
VIE	98.3	-17.1	0.5	-0.4	7.4
NIE-3					
HKG	35	4.8	1.6	-4.4	-3
KOR	38.5	8.7	4.9	-1.9	-1.2
SIN	24.6	-0.4	2.3	-10.1	-4.5
PRC	106.2	11.2	-8.9	-3.7	33.6
JPN	11.2	-19.4	13.6	-3	8.4

Growth in Claims to Private Sector

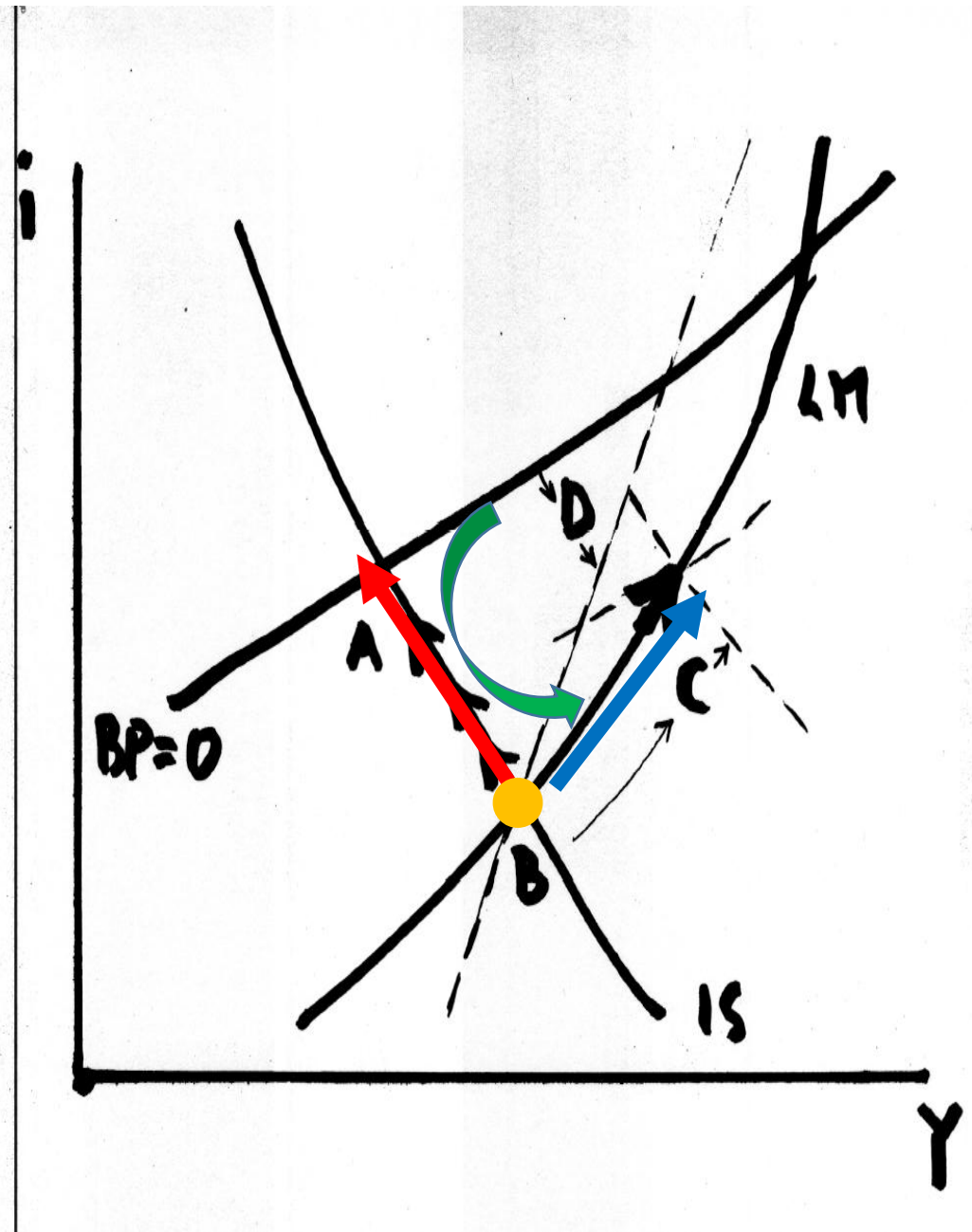
	2006-2007	2008-2009	2010-2013	2014-2015
VIE	39.7	32.5	17.1	15.8
ASEAN-4				
INO	18.6	19.9	22.7	11.1
MAL	6.9	9.6	11.2	8.6
PHI	16.7	8.2	15.1	16.8
THA	4.3	5.8	13.3	4.9
NIE-3				
HKG	5.7	6.9	16.3	3.8
KOR	15.2	9.3	4.7	7.5
SIN	10.9	8.6	15	4.6
PRC	16.5	23.3	17.9	17.5
JPN	-3	-3	0	1.5

Growth in Short-Term Debt (% of International Reserves)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
VIE	28.4	18.1	19.7	17.9	31.5	55.7	73.6	38.7	47.1	38.2	
ASEAN-4											
INO	33.3	29.7	33.9	41.3	37.8	35.6	35.8	40.7	44.4	42.0	44.3
MAL					50.9	59.0	61.3	67.3	77.4	90.7	87.2
PHI								22.4	22.3	22.5	20.4
THA							29.5	35.0	38.4	37.1	33.9
NIE-3											
HKG	251.1	278.9	357.5	266.1	194.3	241.7	251.7	237.1	277.0	282.6	265.9
KOR	31.8	49.5	63.3	74.1	55.1	46.8	45.9	39.6	32.7	32.4	29.9
SIN	467.7	442.8	491.4	436.1	392.3	382.8	380.5	379.2	386.4	406.0	388.2
PRC	20.9	18.6	15.4	11.6	10.7	13.1	15.6	16.2	17.6	17.7	27.5
JPN	122.0	105.8	110.4	140.2	133.4	170.1	180.6	182.9	175.6	166.5	180.4

Ways to Manage Capital Outflows

- A. Allow money to flow out (can cause crisis)
- B. Sterilized intervention (difficult; only prolongs the problem)
- C. Allow currency to depreciate (inflationary)
- D. Capital controls



Policy Response in ASEAN+3

Exchange rate response:

- flexible exchange is best way to cope with massive capital outflow
- But during periods of strong capital inflows, countries are keen to guard against currency appreciation -- contradicts the policy towards sterilization of inflows

domestic credit and asset bubble creation:

- countries tend to sterilize the inflows and create limits and prudential measures for credit expansion – especially to the property sector –to prevent a potential financial default crisis

Policy Response in ASEAN+3

On capital controls and taming capital inflows:

- **Textbook:** i) give up on stemming currency appreciation, or ii) give up on stemming exaggerated monetary and credit expansion, or iii) institute capital controls.
- **Experience:** indeed, some economies have instituted correct macro-prudential measures to tame exaggerated inflows. For instance, capital inflows in 2009-2015 into ASEAN+3 were not as large in terms of percent of GDP compared to 2004-2007

Use of Macroprudential Policy (2010-13)

MPP type	Economy										Total	%
	SIN	HKG	INO	MAL	KOR	IND	TAP	THA	PHI	PRC		
<i>Credit-related^a</i>	13	5	11	6	23	6	3	15	1	9	92	49.2
<i>Liquidity-related^b</i>	0	0	7	3	3	18	6	1	10	31	79	42.2
<i>Capital-related^c</i>	1	1	1	0	2	4	0	0	6	1	16	8.6
Total	14	6	19	9	28	28	9	16	17	41	187	100.0

PRC = People's Republic of China; HKG = Hong Kong, China; IND = India; INO = Indonesia; KOR = Republic of Korea; MAL = Malaysia; MPP = macroprudential policy; PHI = Philippines; SIN = Singapore; TAP = Taipei China; THA = Thailand.

Notes:

^a Caps on loan-to-value ratio, caps on debt-to-income ratio, caps on foreign currency lending, and ceiling on credit/credit growth

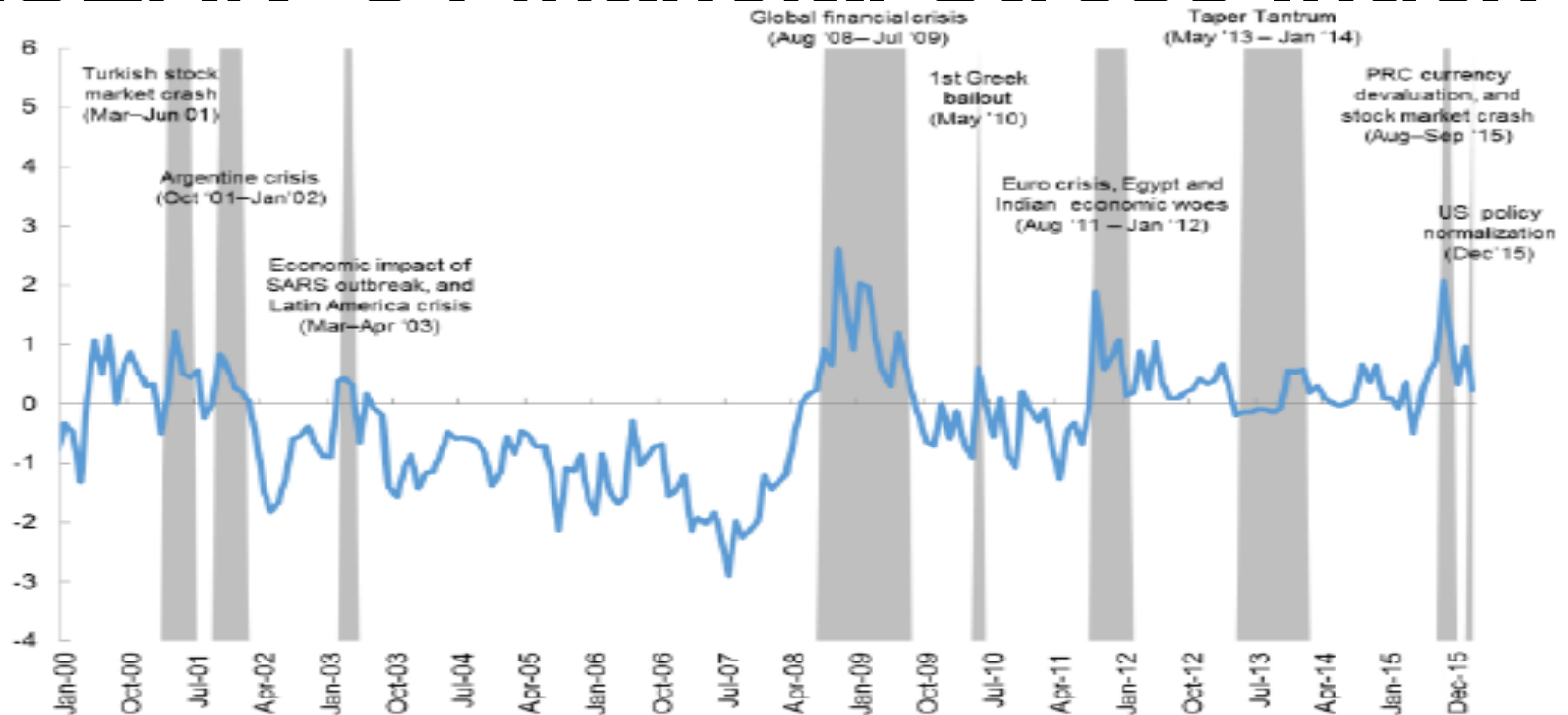
^b Limits on net open currency positions/currency mismatch (NOP), limits on maturity mismatch, and reserve requirements

^c Countercyclical/time-varying capital requirements, time-varying/dynamic provisioning, and restrictions on profit distribution Source: M. Lee, R.C. Asuncion, and J. Kim. 2015. Effectiveness of Macroprudential Policies in Developing Asia: An Empirical Analysis. ADB Economics Working Paper Series No. 439.

ASEAN+3 Builds Forex Reserves

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BCLMV											
BRU	3.7	3.3	3.3	3.6	4.7	6.2	4.4	5.1	5.3	5.4	5.6
CAM	5.0	4.5	5.2	6.4	7.8	8.6	7.5	6.9	6.2	4.7	4.1
LAO	2.3	2.2	2.9	3.0	2.6	2.1	2.3	1.5	1.2	1.2	
MYA	4.5	5.8	9.4	11.7	11.6	14.4	10.7	9.0	9.2		
VIE	3.0	3.5	4.8	4.0	3.6	2.2	1.7	2.2	2.6	3.0	2.7
ASEAN-4											
INO	5.9	6.1	6.8	5.7	6.5	7.8	8.3	6.8	6.1	6.9	7.9
MAL	8.1	7.5	8.2	8.7	8.4	7.9	8.4	8.3	8.1	7.4	6.2
PHI	3.9	4.5	5.6	6.7	9.2	10.8	12.8	13.7	14.5	13.4	13.4
THA	5.4	5.6	6.6	7.5	10.1	11.0	10.1	8.5	7.8	8.1	8.4
NIE-3											
HKG	5.2	4.9	4.8	5.0	7.3	7.9	7.2	7.3	7.1	7.2	7.6
KOR	10.2	9.4	9.1	7.1	8.0	8.9	7.6	7.2	7.7	8.2	9.1
SIN	7.4	6.9	7.0	6.8	8.0	8.7	8.4	7.9	8.5	8.6	9.2
PRC	14.3	15.5	18.4	19.9	25.9	25.2	24.0	22.1	22.8	24.1	24.3
JPN	20.4	18.6	18.4	16.7	19.2	19.9	17.5	16.7	17.3	17.9	20.4

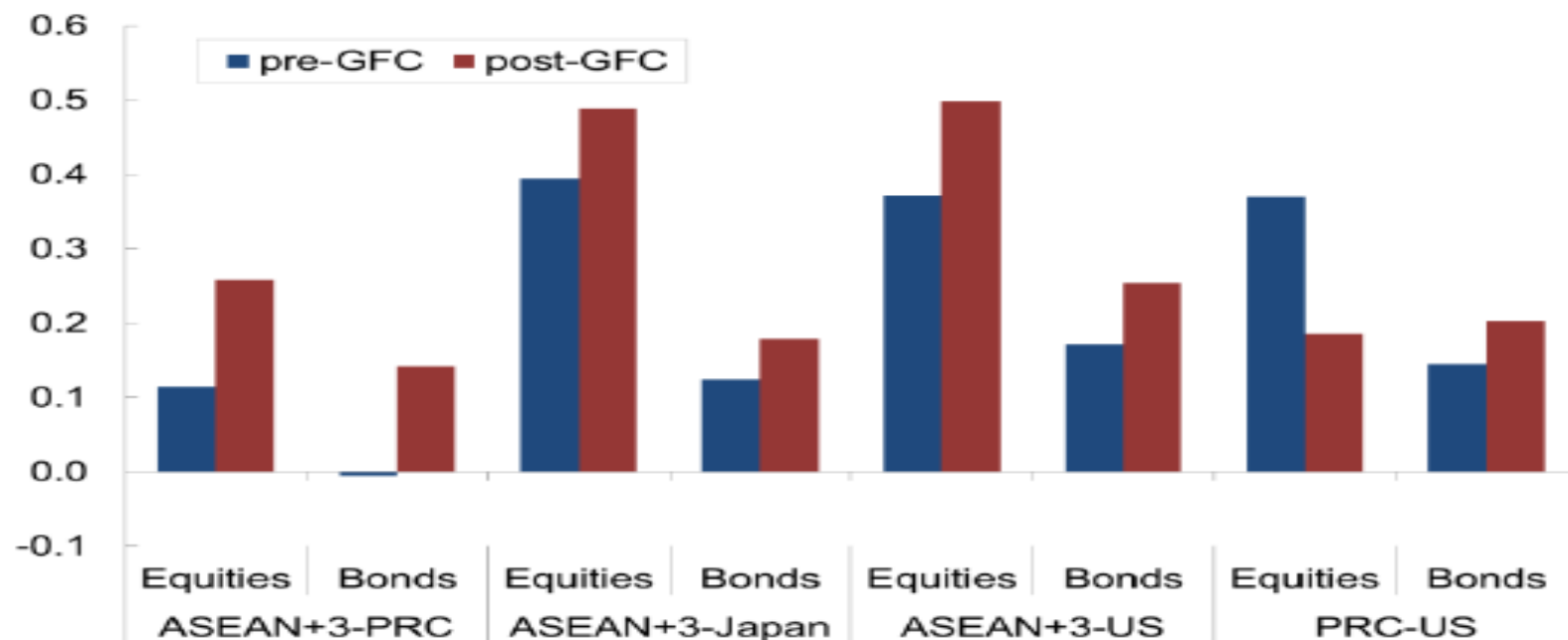
Impact of Global Shocks on ASEAN+3 Financial Stress Index



Note: Includes the People's Republic of China; Hong Kong, China; Indonesia; Japan; Republic of Korea; Malaysia; the Philippines; Singapore; Thailand; Viet Nam. Based on principal components analysis using the methodology in C.Y. Park and R.V. Mercado Jr. 2014. Determinants of Financial Stress in Emerging Market Economies. *Journal of Banking and Finance*. Vol. 45. pp 199-224.

Source: ADB staff calculations using data from Bloomberg, Yahoo! Finance, and CEIC.

Impact of US monetary policy on asset returns

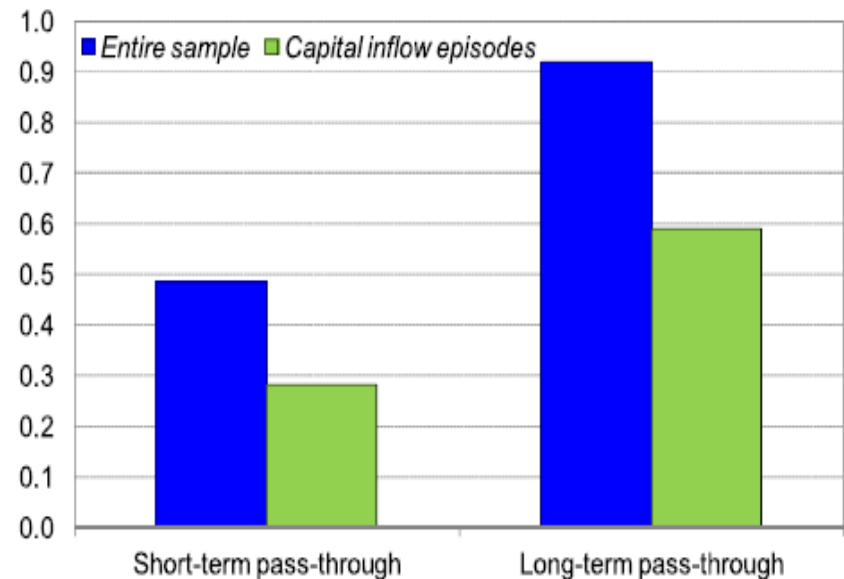
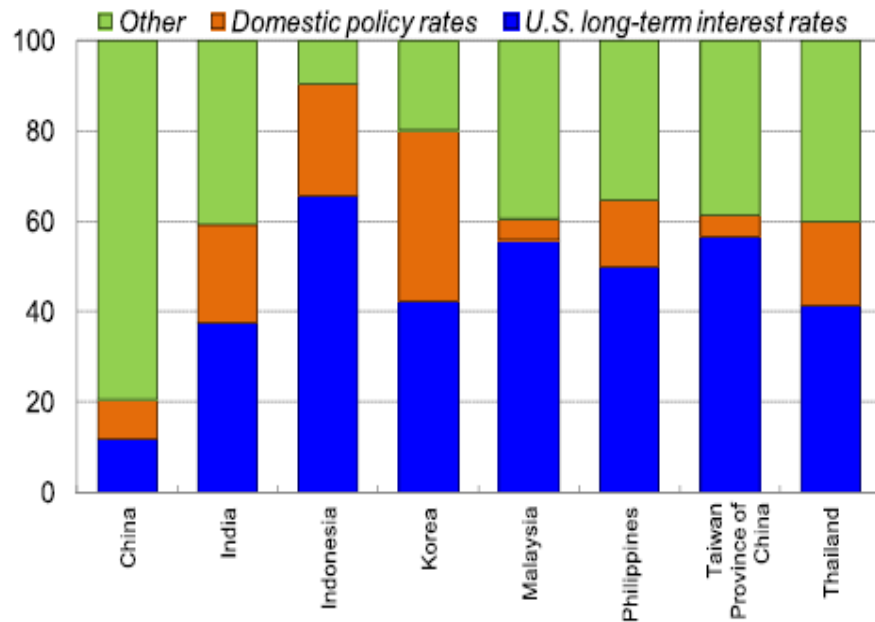


GFC = global financial crisis, PRC = People's Republic of China, US = United States.

Note: ASEAN+3 refers to Brunei Darussalam, Indonesia, the Republic of Korea, Malaysia, the Philippines, Singapore, Thailand, and Viet Nam. No Brunei Darussalam data on equities and bonds, and no Viet Nam data on equities. Pre-GFC period covers January 2000 to August 2008, post-GFC covers July 2009 to February 2016. Methodology based on M. Hinojales and C.Y. Park. 2011. *Stock Market Integration: Emerging East Asia's Experience*. In M. Devereux, et al., eds. *The Dynamics of Asian Financial Integration*. New York: Routledge. Source: ADB calculations using data from Bloomberg.

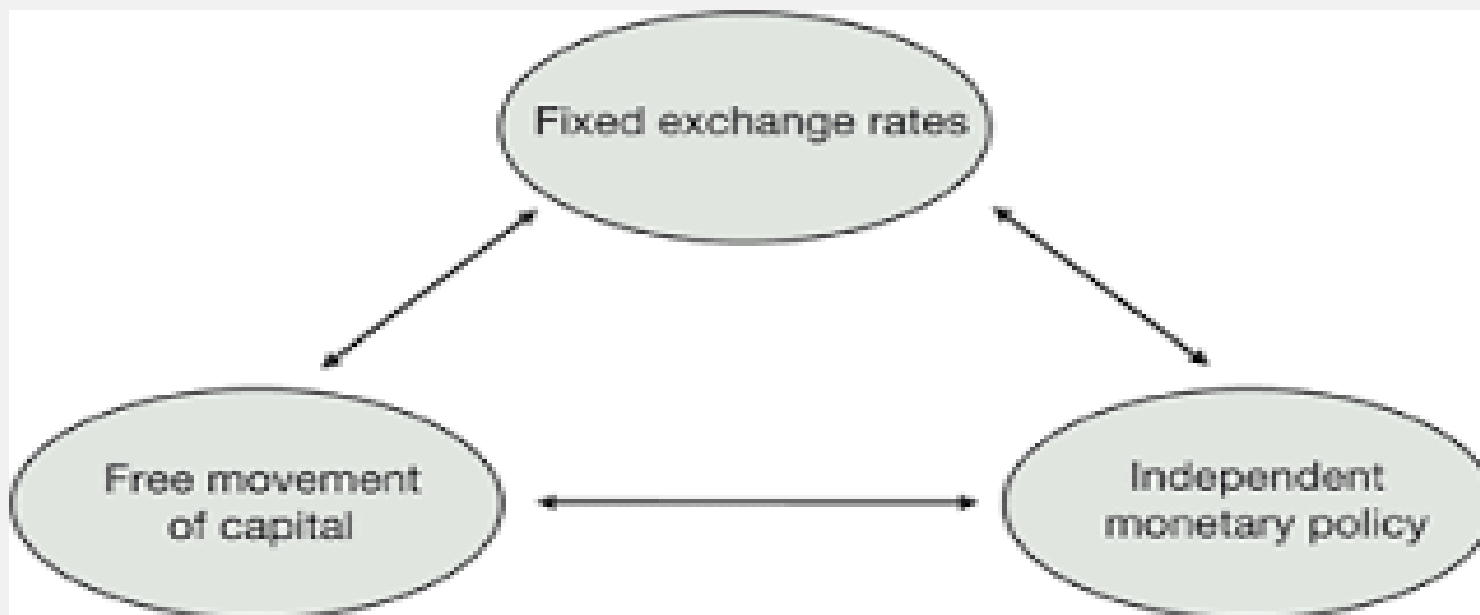
Impact of US monetary policy on monetary transmission mechanism

- Asia: variance decomposition of domestic 10-year yield by sources during 2005-10
- Effect of capital flows on monetary transmission mechanism (pass through from policy rates to lending rates)



Source: Sonali Jain-Chandra and D. Filiz Unsal, *The effectiveness of monetary policy transmission under capital inflows: Evidence from Asia*, 2014.

How do we insulate ourselves from US monetary policies?



Based on the papers by Han and Wei (2015), Han and Wei (2014).
"International Transmission of Monetary Shocks", CEPR working paper series no. DP11070 2015

"Policy Choices and Resilience to International Monetary Shocks",
Global Economic Review, Volume: 43, Issue: 04, pages 319 – 337,
2014.

Alternative Views

- Calvo and Reinhart, QJE, 2002
 - “Fear of floating”
- H. Tong and S.J. Wei, RFS, 2011
 - The nominal exchange rate regime does not make a difference to the transmission of global financial crisis to developing countries
- H. Rey, Jackson Hole presentation, 2013
 - Capital flows are highly correlated regardless of nominal exchange rate regime.

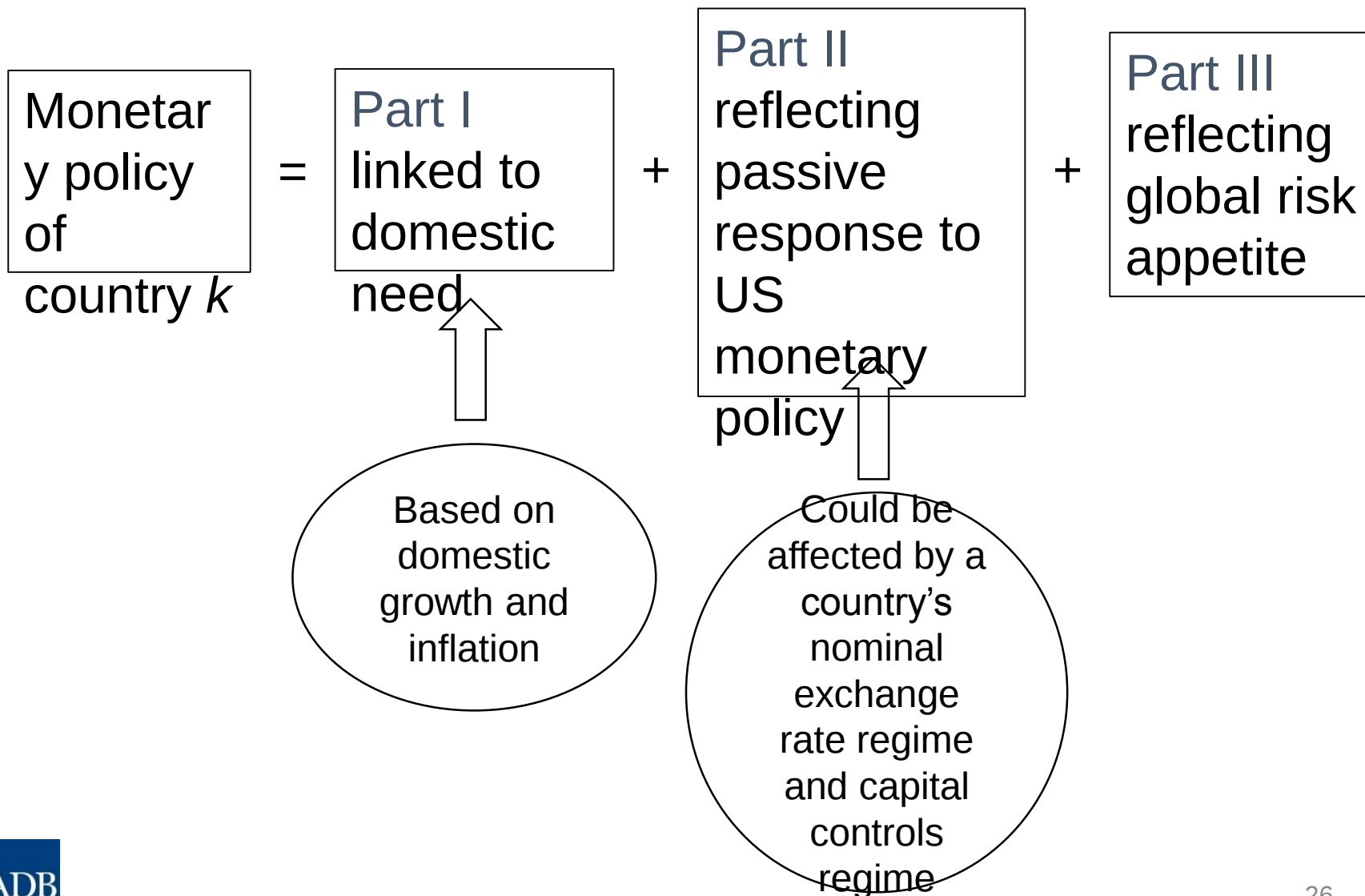
Competing Recommendations:

- For emerging markets: prioritize **exchange rate flexibility** (e.g., IMF's Article IV reports on the People's Republic of China, 2014) since capital controls are leaky (Edwards, 2012) and costly (e.g., Wei and Zhang, 2007)
- Only **capital controls** confer real monetary autonomy (Tong and Wei (2011), Chinn and Wei (2013), and Rey (2013))

Empirical Investigation

- Does a flexible exchange rate regime really confer monetary policy autonomy?
- Capital control or flexible exchange rate regime, which one is more effective?

The Methodology for Investigation



The Baseline Model

$$(1) \Delta i_{i,t}^p = \lambda i_{i,t-1}^p + \gamma_1 \Delta r_{i,t}^{P*} + \gamma_2 \Delta r_t^{US} + \delta VIX_t + \varepsilon_{i,t}.$$

- $\gamma_1 \Delta r_{i,t}^{P*}$: a desired change based on purely domestic factors;
- $\gamma_2 \Delta r_t^{US}$: an “involuntary” change, responding to a US rate change;
- VIX_t : an indicator of the state of the financial cycle (Chicago Board Options Exchange Equity Option Volatility Index)

$$(2) \Delta r_{i,t}^{P*} = \tilde{c} + \widetilde{\phi}_1 * \Delta GDP \text{ growth}_{i,t} + \widetilde{\phi}_2 * \Delta Inflation_{i,t} + \widetilde{e}_{i,t}$$

$$(3) \textcolor{red}{\gamma}_2 = \beta_1 D_{fixed.NC} + \beta_2 D_{fixed.C} + \beta_3 D_{flex.C} + \beta_4 D_{flex.NC},$$

The Model Used for Estimations

$$\begin{aligned} \Delta i_{i,t}^p = & c + \lambda i_{i,t-1}^p + \phi_1 * \Delta GDP \text{ growth}_{i,t} + \phi_2 * \Delta Inflation_{i,t} \\ & + \beta_1 D_{fixed.NC} \Delta r_{i,t}^{US} + \beta_2 D_{fixed.C} \Delta r_{i,t}^{US} + \beta_3 D_{flex.C} \Delta r_{i,t}^{US} \\ & + \beta_4 D_{flex.NC} \Delta r_{i,t}^{US} + \delta VIX_t + e_{i,t} \end{aligned}$$

Hypothesis and Analysis

Table 1 Combinations of exchange rate regimes and capital control scenarios and the coefficients on foreign policy influence

	No Capital Controls	Capital Controls
Fixed Exchange Rate Regime	β_1	β_2
Flexible Exchange Rate Regime	β_4	β_3

Main Findings

- With a fixed exchange rate and no capital controls: An increase in the US interest rate by 100 basis points is followed by an increase in the interest rate by 65 basis points on average;
- Flex rate and no capital controls: an increase in interest rate by 45 bps. (still no monetary policy autonomy)
- With capital controls: domestic interest rate is uncorrelated with the US rate -> autonomy

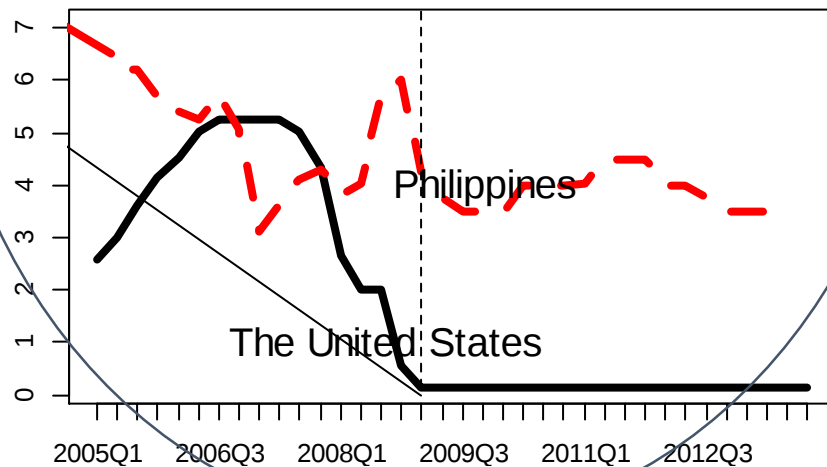
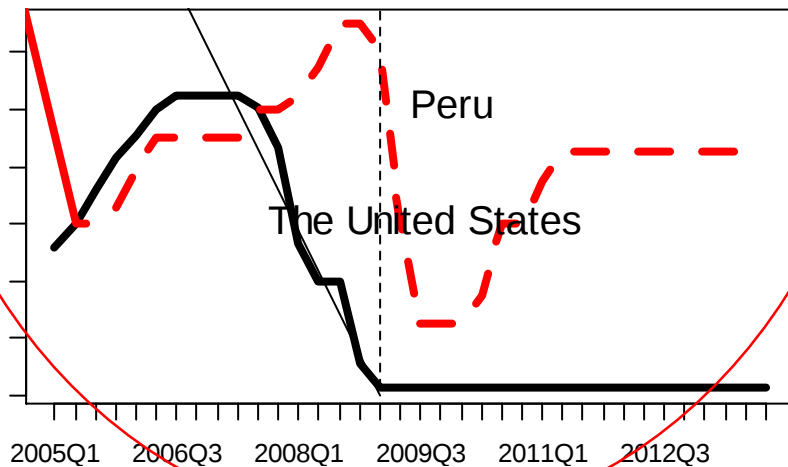
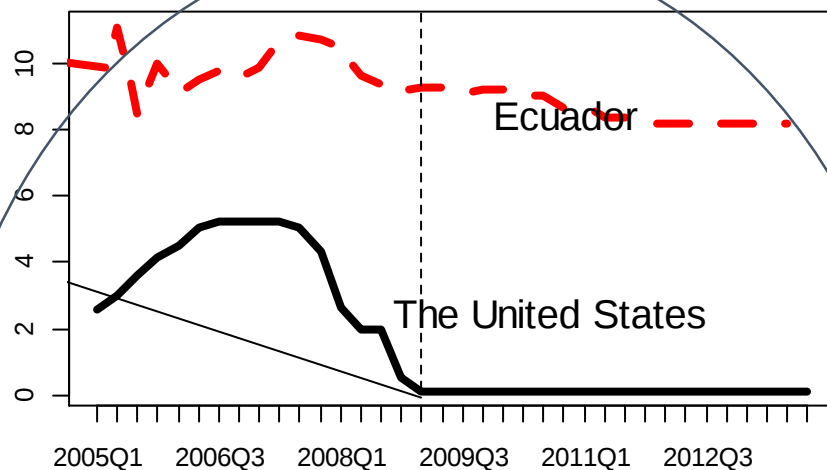
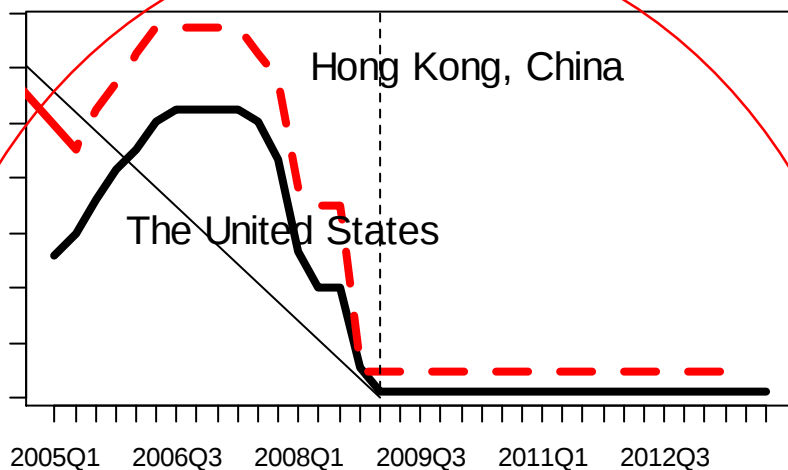


Fixed Exchange Rate

Flexible Exchange Rate

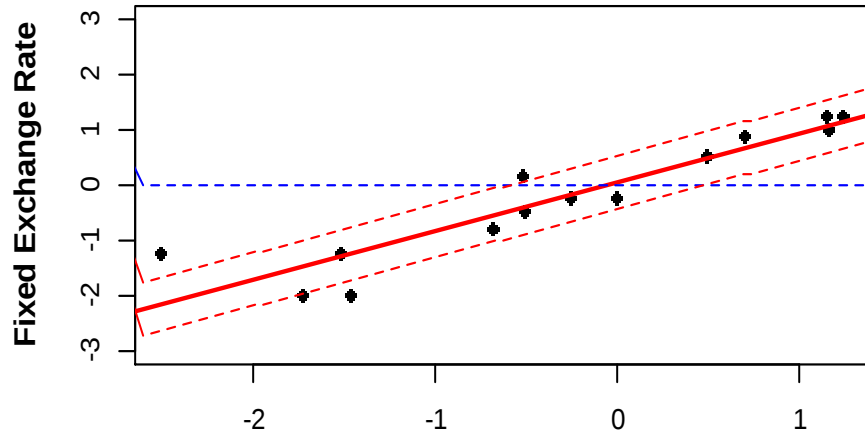
No Capital Controls

Capital Controls



Unconditional Plotting

No Capital Control



Capital Control

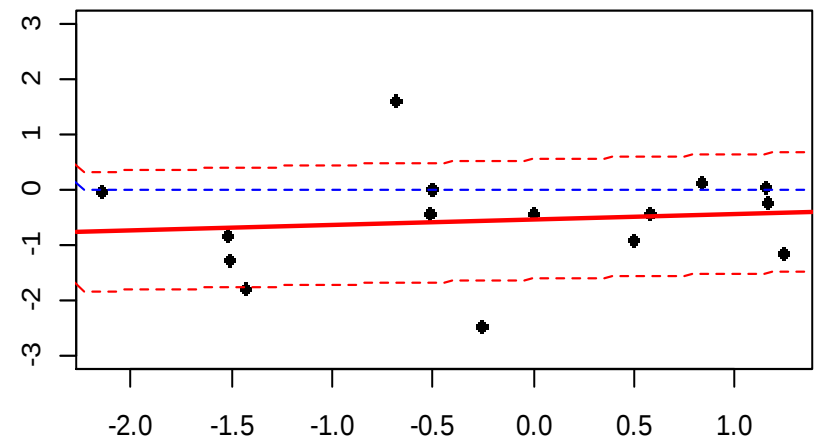
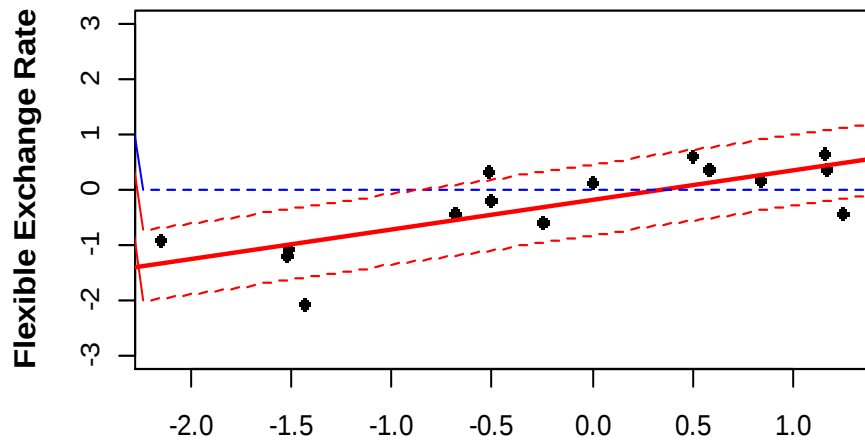
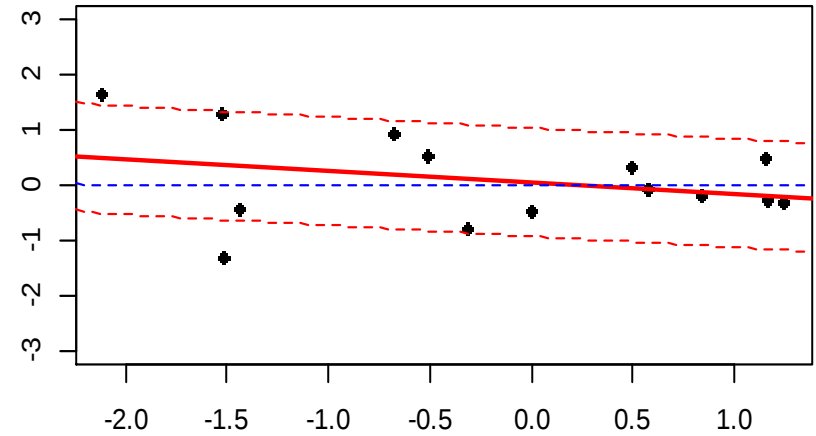


Table 3 Coefficient estimates for baseline model for different periods

		Short-term 1990–2009 (1)	Short-term 1990–1998 (2)	Short-term 1999–2009 (3)	Long-term 1999–2009 (4)
$i_{i,t-1}^p$	λ	−0.048*	−0.007	−0.110*	−0.068*
$\Delta GDP\ growth_{i,t}$	ϕ_1	0.096	0.237	0.041	0.064*
$\Delta Inflation_{i,t}$	ϕ_2	0.329*	0.134	0.413*	0.162*
$D_{fixed.NC} \Delta r_{i,t}^{US}$	β_1	0.649*	0.402	0.654*	0.680*
$D_{fixed.C} \Delta r_{i,t}^{US}$	β_2	0.034	1.998	−0.249	0.34
$D_{flex.NC} \Delta r_{i,t}^{US}$	β_3	0.450*	0.492	0.497*	0.407*
$D_{flex.C} \Delta r_{i,t}^{US}$	β_4	0.029	0.008	0.063	0.12
ΔVIX_t	δ	0.23	0.086	0.176	0.14
F test: $\beta_2 = \beta_4$		1.33	1.26	6.48*	0.00
F test: $\beta_4 = \beta_3$		4.07*	0.82	5.79*	2.62
Adj. R-squared		0.09	0.000	0.30	0.20
No. of Obs.		827	295	532	301

* Significant at 10%.

Key Messages

- Historically, surges in capital flows end in a crisis.
- ASEAN+3 has experienced cyclical movement in non-resident and resident flows.
- These flows have contributed to high volatility in asset prices, increases in credit growth and an increase in short-term external debt.
- To mitigate the impact of cyclical capital flow, the region has adopted capital constraining macro-prudential policies.
- Financial volatility in the region has increased in frequency and intensity, partly due to US monetary policy shock.
- In open economies, a flexible exchange rate regime can help in keeping short-term policy rates less affected by US monetary policy changes, compared to those on a fixed exchange regime
- **Pre-QE:** a flexible exchange rate does not reliably deliver monetary policy independence, but **capital controls** do
- **QE episode:** the response of peripheral countries' policy rates to the money-supply-approximated monetary policy of the US are much lower