Fuller capital account opening in China and India: mind the gap

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Roadmap

I. Two emerging giants
- One direction, two paths

II. Quantity evidence
- International investment position, balance of payments and BIS banking statistics

III. Onshore-offshore price gap: a framework
- Foreign exchange forward market, money market, bond market and stock market

IV. Price evidence from the four financial markets

V. Combined evidence and implications

VI. Summary

Key findings

- Quantity evidence gives a mixed picture
  - China: greater quantity integration on aggregate data
  - India: more open in banking market and to portfolio flows
- Price evidence on four financial markets
  - Both economies face considerable impediments to cross-border arbitrage
  - India is consistently more financial integrated than China
  - Overall inflows pressure on the two economies, but pressure on equity portfolio outflows for China
- When opening capital account, Indian policymakers may be better prepared for 2-way capital flow volatility

I. Two giants, one goal

- Two fast-growing emerging markets both aim for more open capital account
- Similarities
  - Dominant bank state-ownership
  - Discrimination against short-term debt flows
  - Incremental and non-linear approach to opening
- Differences
  - China is better endowed in terms of creditor position, fiscal position, current account balance, and trend inflation
  - India is better endowed in terms of market development, price convergence and experience of coping with volatility

II. Quantity measures of financial integration

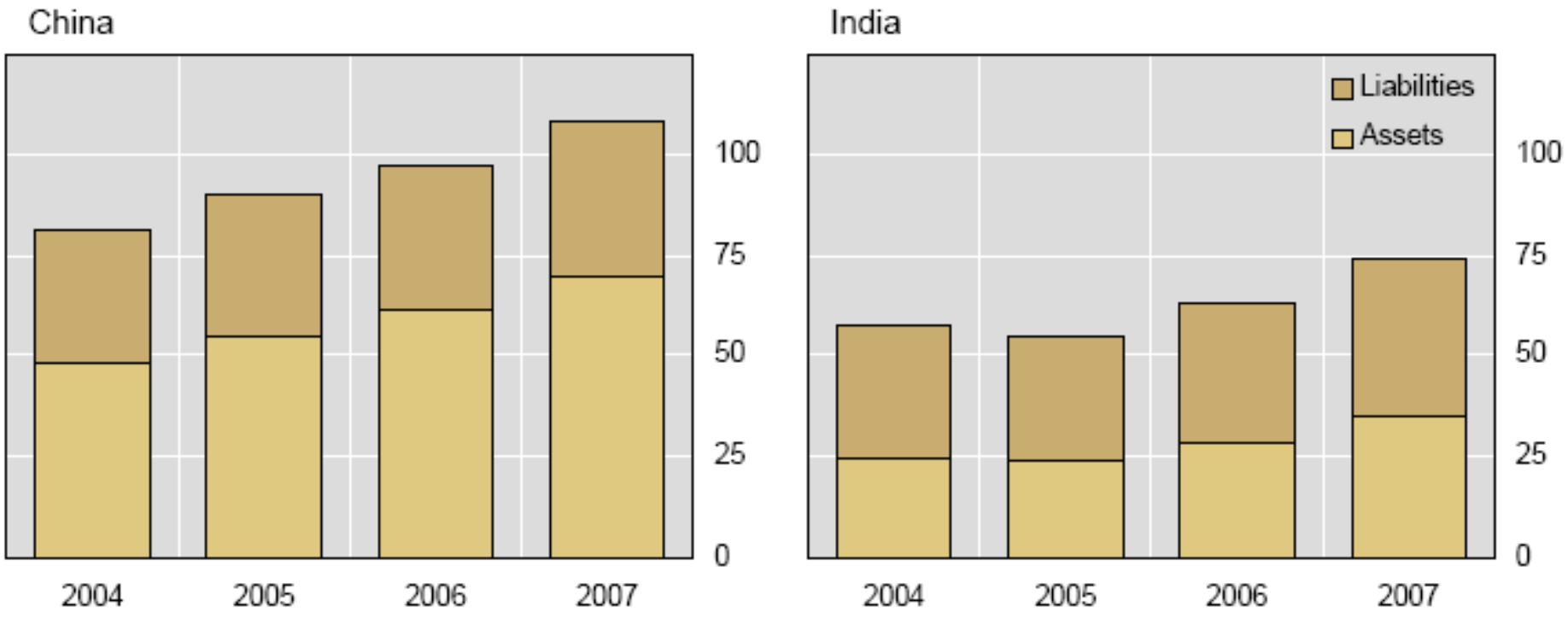
- Three sets of quantity measures
  - IIP, BoP and BIS banking statistics
- China appears more financially integrated in aggregate terms …
- … but India is more experienced in coping with portfolio flows
- Upon further opening, both see large potential for bigger external balance sheets and cross-border flows

Quantity evidence (1): IIP stock measure

- Shared similarities
  - Less integrated than other key emerging markets
  - "Long debt and short equity"
  - Public sector a big holder of international assets
- The size of China's international balance sheet is larger than that of India's
  - In absolute terms as well as % of GDP
- China is a net creditor while India a net debtor …
- … but India's equity portfolio position is larger

Graph 1: International investment positions

As per cent of GDP



Sources: IMF, *International Finance Statistics*; authors' calculations.

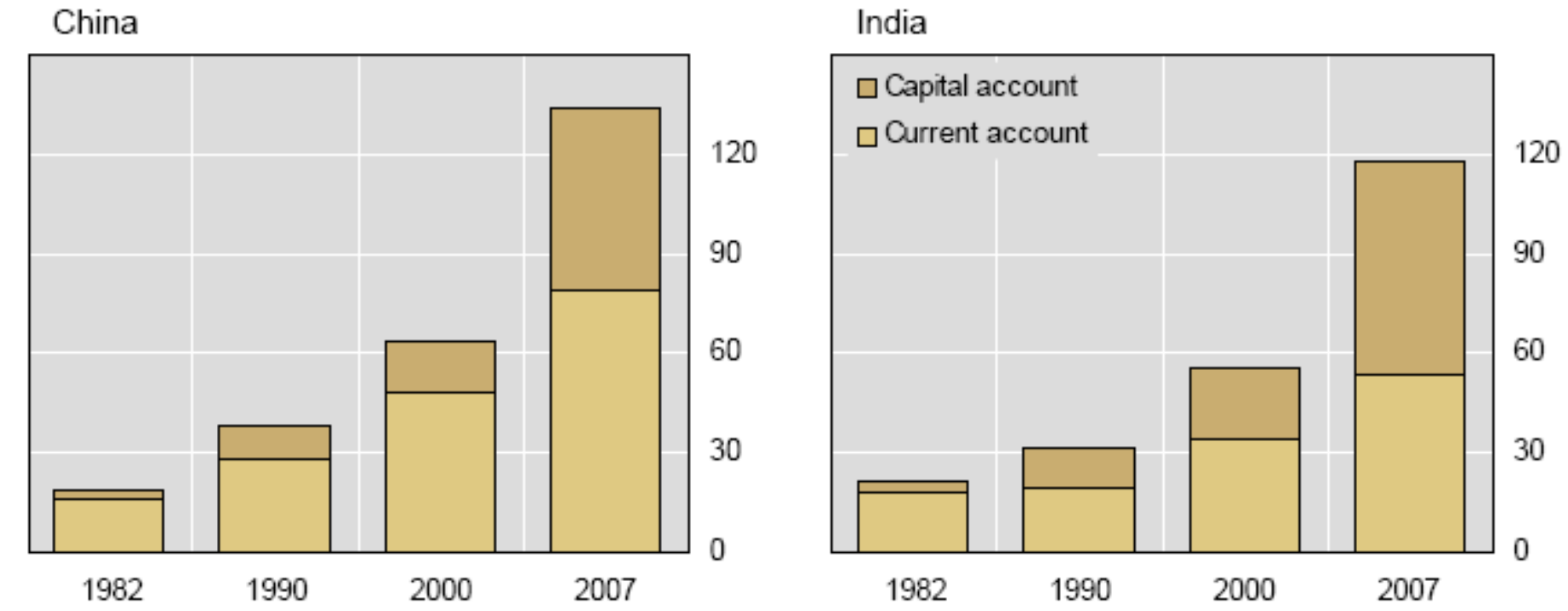
Table 1: Net international investment positions of China and India in 2007				
	China		**India**	
	USD billions	*% of GDP*	USD billions	*% of GDP*
Net equity	-740.9	*-22.8*	-167.0	*-15.2*
Net FDI	-634.8	*-19.5*	-69.3	*-6.3*
Net portfolio equity	-106.1	*-3.3*	-97.6	*-8.9*
Net debt	1,763.0	*54.2*	114.0	*10.4*
Net private debt	228.1	*7.0*	-195.8	*-17.8*
Reserves	1,534.9	*47.2*	309.7	*28.2*
Net overall position	1,022.1	*31.4*	-53.0	*-4.8*
Sources: IMF; authors' calculations.				Table number

Quantity evidence (2): BoP flows

- China and India neck-to-neck in BoP flows scaled by GDP
  - From 30% in 1982 to 120% in 2007
- China's gross current account flows far exceed gross capital flows, while India is more evenly split
- China finds greater comfort in illiquid direct investment
- But India's portfolio flows command greater role under a more open regime
  - often tested by abrupt swings

Graph 2: Gross balance of payments flows

As per cent of GDP

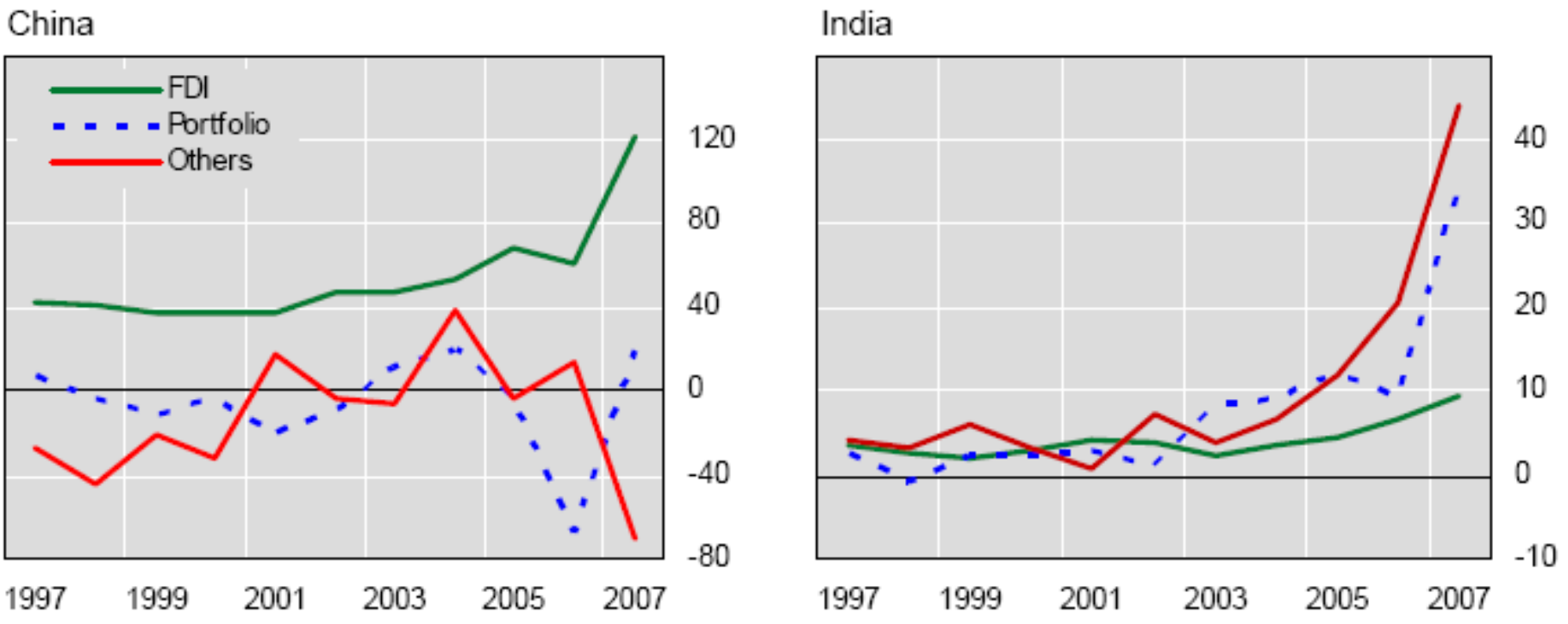


Note: Sum of credit and debit flows.

Sources: CEIC; authors' calculations.

Graph 3: Net FDI, portfolio and other investment flows

In billions of US dollars



Source: CEIC.

Graph number

Windows for portfolio flows

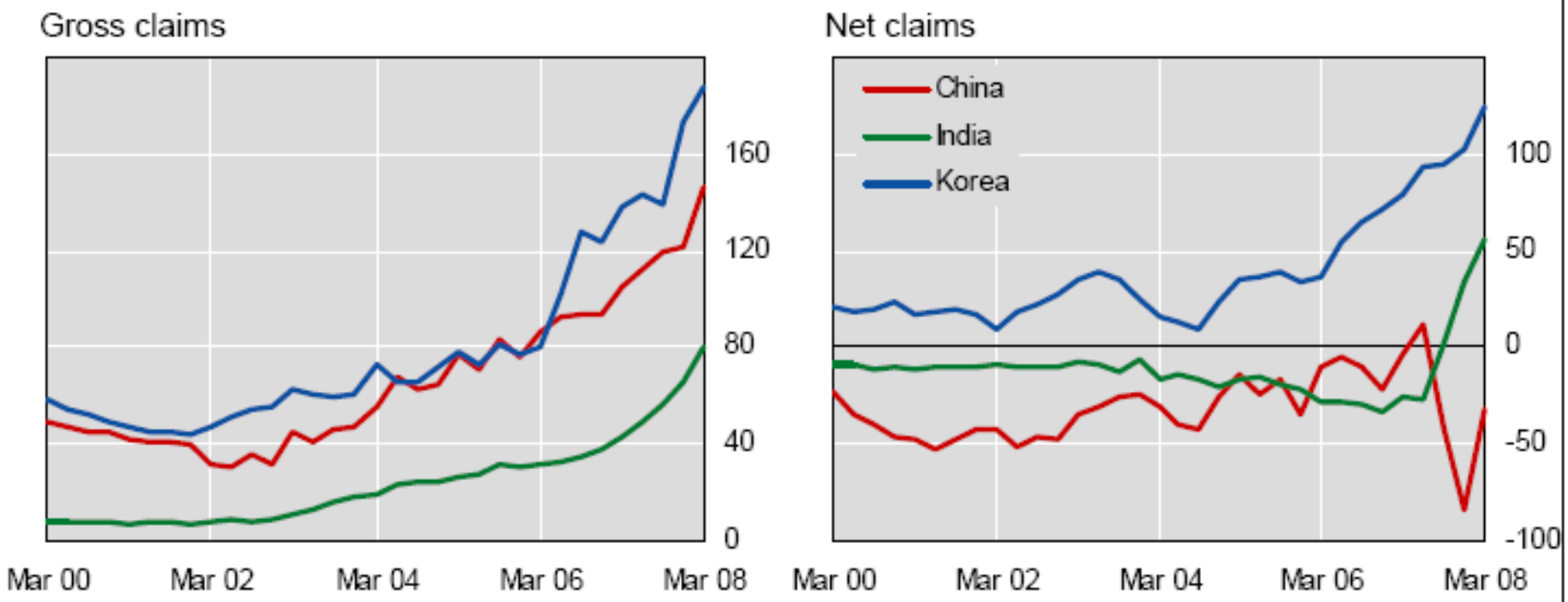
- China manages portfolio flows principally through the QFII and QDII schemes
  - Small size relative to local market cap and deposit base
  - QFII quota and managed repatriation of proceeds from overseas listing
  - An individual resident can convert $50K each year
- India monitors portfolio inflows through FII and portfolio outflows through quota for mutual funds
  - Foreign ownership ceiling and cap on bond investment
  - An individual resident can convert $200K annually
  - Mutual fund overseas investment quota

Quantity evidence (3): Banking flows

- Cross-border banking flows are heavily regulated in both markets but managed differently
- India keeps commercial banks mostly out of external borrowing
  - Smaller of $10mn or 25% of unimpaired tier one capital,
  - Setting official rates on NRI deposits --- used to be an important source of dollar funding for onshore banks
- Chinese banks are allowed to take resident dollar deposits onshore --- banned in India --- but subject to tight(er) ceiling on offshore borrowing

Graph 4: Interbank claims vis-à-vis selected Asian economies

In billions of US dollars



Sources: BIS; authors' calculations.

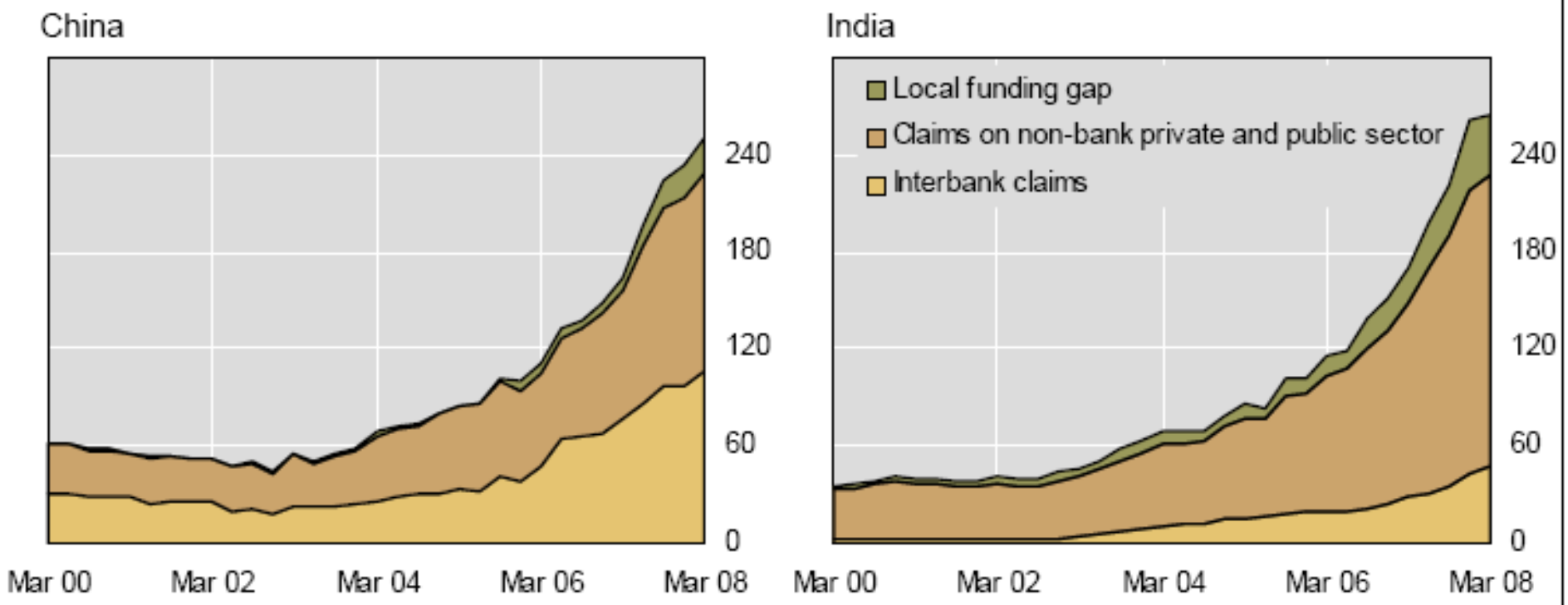
Graph number

Cross-border bank flows

- Both experienced fast growth in cross-border bank claims outstanding to the tune of $250 billion in 2007
- A much bigger role of local and cross-border claims by foreign banks in India's local banking system
  - China's GDP and banking sector are 3 and 6 times of those of India, respectively
- Tight controls kept net cross-border claims on banks small and mostly negative in both markets --- in contrast to Korea
  - In India, most the cross-border claims went to non-banks (ECB)
  - Claims on Chinese banks and non-banks more evenly split

Graph 5: Consolidated claims vis-à-vis China and India

In billions of US dollars

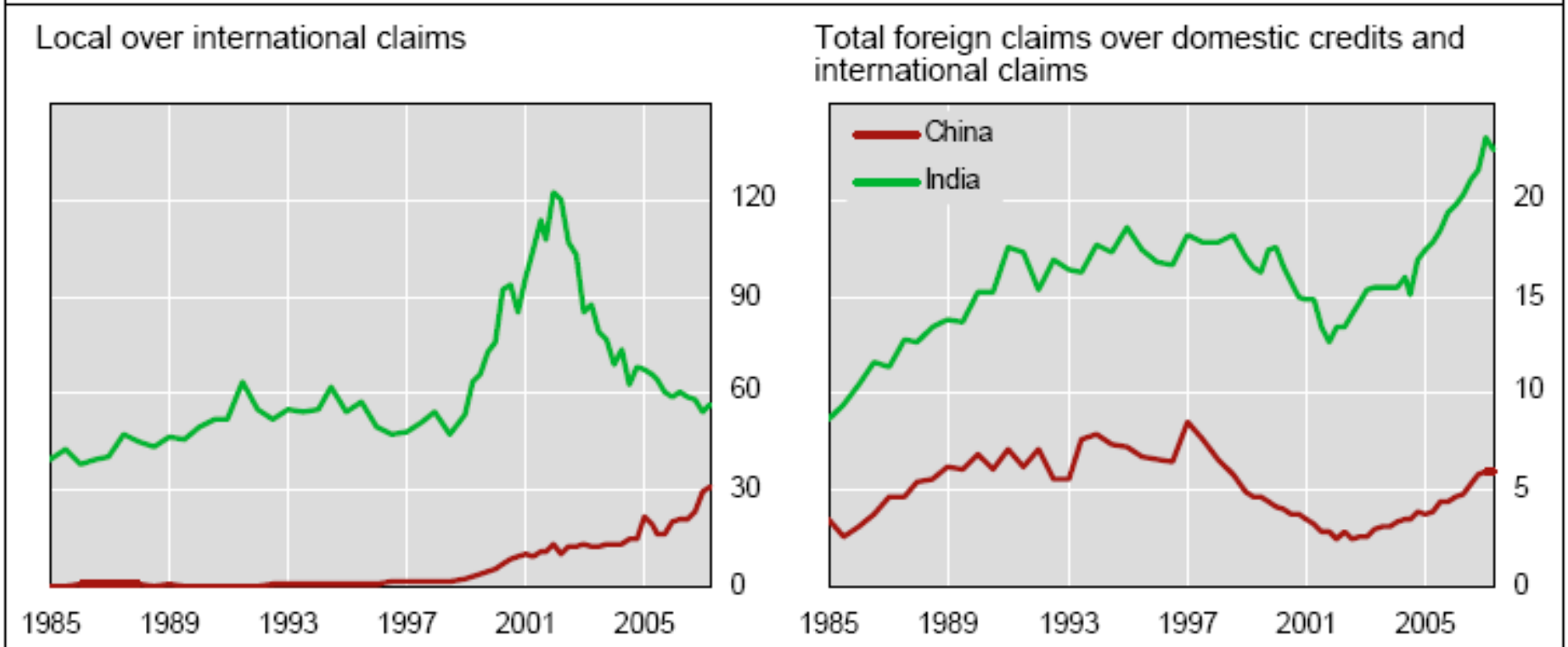


Sources: BIS; authors' calculations.

Graph number

Graph 6: Foreign bank presence and cross-border bank flows

In per cent



Sources: IMF *IFS*; BIS.

Graph number

Cross-border bank flows and foreign banks

- The size of international banks' local funding gaps in India are bigger than in China
- Foreign presence in local banking market is also much larger in India than in China
- Recent big jumps in India's local over international claims ratio reflect increased entry of foreign banks …
- … while its subsequent sharp fall is caused by rapid growth in external commercial borrowings (ECB)
- Overall, a more open Indian domestic banking market

III. Onshore-offshore price gaps: a framework

- The gap between the prices of the same financial asset traded onshore and offshore
- Onshore-offshore price gap is defined consistently across four financial markets
  - Foreign exchange forward, money, bond and stock markets
  - Each market may have one or two instruments
  - A positive gap indicates inflow pressure on that market
- Hypothesis: efficient cross-border arbitrage ensures fast convergence of the price gap towards zero
- Persistently large gaps point to market segmentation and tensions, and signs indicate direction of pressure

(1) Price gap for the forward market

- Onshore forward markets and offshore non-deliverables (NDF) operate side by side
- Both restrict access to onshore FX derivatives to hedging underlyings
  - India's FX derivatives market is deeper and more sophisticated
- Forward premium gap = (onshore forward - offshore NDF)/spot rate
  - Three-month and 12-month tenors
- Controls lead to onshore dollar yields different from offshore dollar LIBOR
- Positive premium gaps indicate greater appreciation pressure offshore than onshore

(2) Price gap for the money market

- Yields on the same currency can differ onshore & offshore
  - Control reduces capital mobility and segments market
  - Yield gap = onshore yield (i) – offshore yield (r)
- How to get offshore yields for the CNY and INR?
- Covered interest parity: $F = S (1+r)/(1+r^{\$})$, where

  F = Offshore CNY or INR forward rate (measured by NDF)

  S = Spot CNY/USD or INR/USD exchange rate

  $r^{\$}$ = USD Libor

  r = NDF implied CNY or INR interest rate offshore
- 3-month and 12-month tenors and credit risk mismatch

(3) Price gap for the bond market

- Chinese and Indian local currency bond markets highly restricted to foreign investors
  - Foreign holdings are under 2% of the total domestic outstanding for both markets
- The bond yield gap = onshore bond yield less offshore bond yield
  - Onshore bond yield = 3Y government bond yield
  - Offshore bond yield = 3Y cross-currency swap rate
- Possible credit risk mismatch
  - Work against our findings

(4) Price gap for the stock market

- Previous three markets are fixed-income markets
  - Equity flows drive FX generally in Asia (Chai-Ant and Ho (2008))
- Two routes to manage equity portfolio inflows
  - QFII for China and FII for India
  - Overseas listing --- shares of multiple-listed Chinese and Indian firms traded onshore and offshore
- Stock price gap = logarithm of ratio of overseas to local market prices
  - Positive price gap indicates a New York premium over Mumbai or Shanghai and thus inflow pressure
- Speed of convergence to be estimated as well

IV. Price evidence from the four markets

- Prices gaps from all four markets point to considerable impediments to cross-border arbitrage
  - Thus possible market tensions when opening up
- India is more price integrated for each of the four markets
- All four markets face inflow pressure for India, but China's stock market under outflow pressure
- On balance, composite indicators suggest greater challenges for Chinese policymakers in capital opening
  - Puzzling high correlation between Chinese and Indian composite indicators

Equality of Chinese and Indian price gaps rejected

Table 2: Test on equality of means between China and India, by instrument

	t-test	Anova F-test
Forward premium gap, 3-month	12.485	155.881
Forward premium gap, 12-month	18.455	340.581
NDF Yield gap, 3-month	16.209	262.736
NDF Yield gap, 12-month	13.842	191.606
Bond yield gap, 3-year	8.054	64.872
Stock price gap, ADR-A vs ADR-M	-33.234	1104.499
Stock price gap, H-A vs ADR-M	-33.686	1134.745

Note: Weekly data. Sample period is from 9 April 2004 to 27 June 2008. Results of the Satterthwaite-Welch t-test and the Welch F-test that allow for different variances between subgroups are equivalent to those of the standard t-test and ANOVA F-test and are therefore not reported in the table.

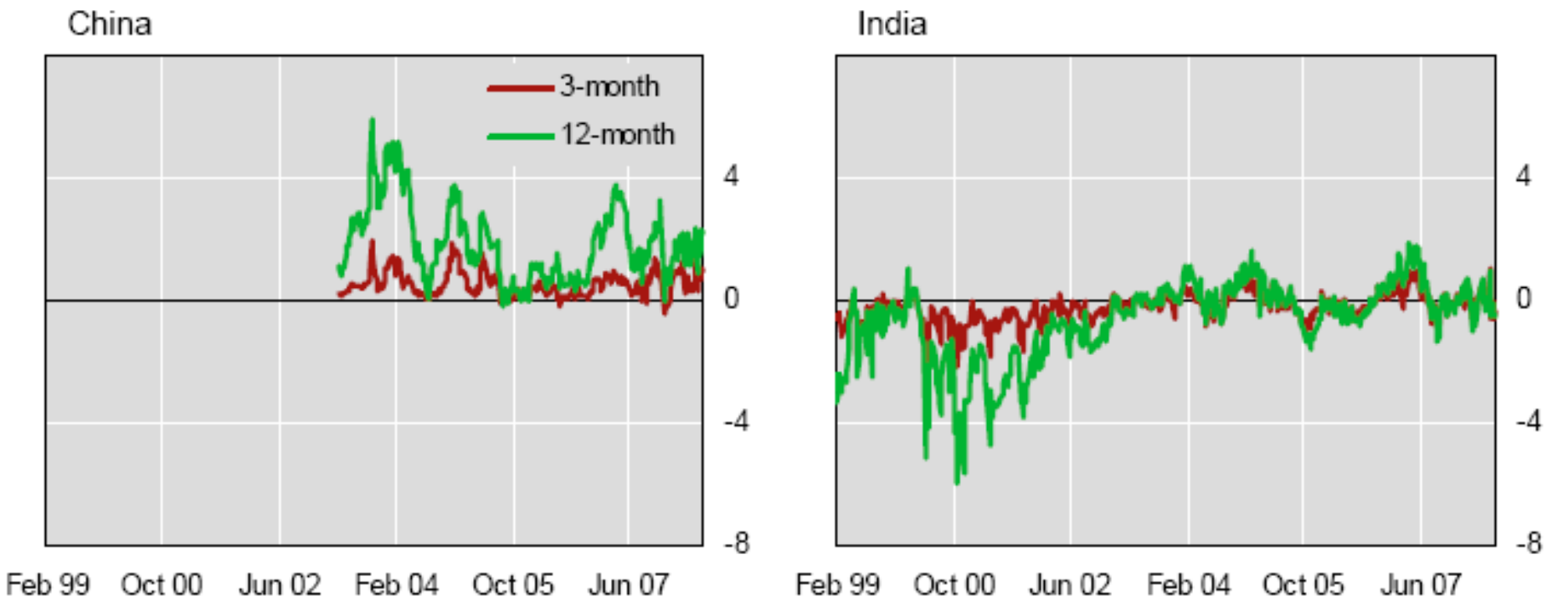
Sources: HKMA; Bloomberg; CEIC; authors' estimations.

(1) Price evidence on the FX forward market

- On average, appreciation/inflow pressure on both the CNY and INR
- The CNY forward premium gap averages ten times that of the INR
- The INR forward premium converged to zero after 2002
- But the CNY premium widened sharply again after 2006
- The CNY and INR premium gaps are highly correlated at 64%

Graph 8: Onshore foreign exchange forward less offshore NDF

As a percent of spot price



Sources: Bloomberg; CEIC; BIS calculations.

Graph number

Table 3: Onshore less offshore foreign exchange forward premiums

As a percent of the spot

	CNY		INR	
	3-month	12-month	3-month	12-month
Maximum	3.44	6.40	1.85	2.83
Minimum	-0.75	-0.47	-5.43	-6.00
Average	0.50	1.55	0.02	0.10
Average of absolute value	55	188	40	100
Annualised volatility	690	2024	812	2080
Onshore/offshore correlation	1.00	0.98	1.00	0.99

Note: Daily data. Forward premium gap is calculated as the difference between onshore forward and offshore non-deliverable forward scaled by the spot rate. For the CNY, sample period is between April 7, 2003 and June 30, 2008. For the INR, sample period is between February 1, 1999 and June 30, 2008.

Sources: Bloomberg; CEIC; authors' calculations. Table number

Table 4: 12-month forward premium gap for the CNY

Y = The absolute value of the 12-month forward premium gap

(1)	$Y = 1.896$ $(0.174)^{***}$	$Adj\text{-}R^2 = 0.00$ $DW = 0.132$
(2)	$Y = 2.582D_1 + 0.631D_2 + 1.947D_3$ $(0.266)^{***}\ (0.081)^{***}\ (0.177)^{***}$	$Adj\text{-}R^2 = 0.387$; $DW = 0.217$ Wald Test: $F(2,270) = 42.269$
(3)	$Y = 2.630 - 0.005T$ $(0.364)^{***}\ (0.002)^{***}$	$Adj\text{-}R^2 = 0.112$ $DW = 0.149$
(4)	$Y = 3.072D_1 + 1.884D_2 + 3.828D_3 - 0.008T$ $(0.430)^{***}\ (0.663)^{***}\ (1.005)^{***}\ (0.004)^{*}$	$Adj\text{-}R^2 = 0.420$; $DW = 0.231$ Wald Test: $F(2,269) = 39.144$

Note: (1) Weekly data. The sample period is between 11 April, 2003 and 27 June, 2008. D_1 represents period between 11 April, 2003 and 15 July, 2005; D_2 represents period between 22 July, 2005 and 3 November, 2006; D_3 represents period between 10 November, 2006 and 27 June, 2008. (2) The Wald Test statistics are for the joint null hypothesis that dummies for all three sub-periods are equal. (3) Standard errors in the parentheses. *** indicates 1% significance; ** indicates 5% significance; * indicates 10% significance.

Sources: Bloomberg; CEIC; authors' calculations. Table number

Table 5: 12-month forward premium gap for the INR

Y = The absolute value of the 12-month forward premium gap

(1)	$Y = 1.004$ $(0.104)^{***}$	$Adj\text{-}R^2 = 0.000$ $DW = 0.252$
(2)	$Y = 1.737D_1 + 0.412D_2 + 0.562D_3$ $(0.182)^{***}$ $(0.054)^{***}$ $(0.074)^{***}$	$Adj\text{-}R^2 = 0.353$; $DW = 0.391$ Wald Test: $F(2,488) = 24.483$
(3)	$Y = 1.851 - 0.003T$ $(0.239)^{***}$ $(0.001)^{***}$	$Adj\text{-}R^2 = 0.223$ $DW = 0.325$
(4)	$Y = 1.669D_1 + 0.231D_2 + 0.284D_3 + 0.001T$ $(0.260)^{***}$ (0.404) (0.623) (0.001)	$Adj\text{-}R^2 = 0.353$; $DW = 0.392$ Wald Test: $F(2,487) = 24.375$

Note: (1) Weekly data. The sample period is between 5 February, 1999 and 27 June, 2008. D_1 represents period between 5 February, 1999 and 13 December, 2002; D_2 represents period between 20 December, 2002 and 15 July, 2005; D_3 represents period between 22 July, 2005 and 27 June, 2008. (2) The Wald Test statistics are for the joint null hypothesis that dummies for all three sub-periods are equal. (3) Standard errors in the parentheses. *** indicates 1% significance; ** indicates 5% significance; * indicates 10% significance.

Sources: Bloomberg; CEIC; authors' calculations.

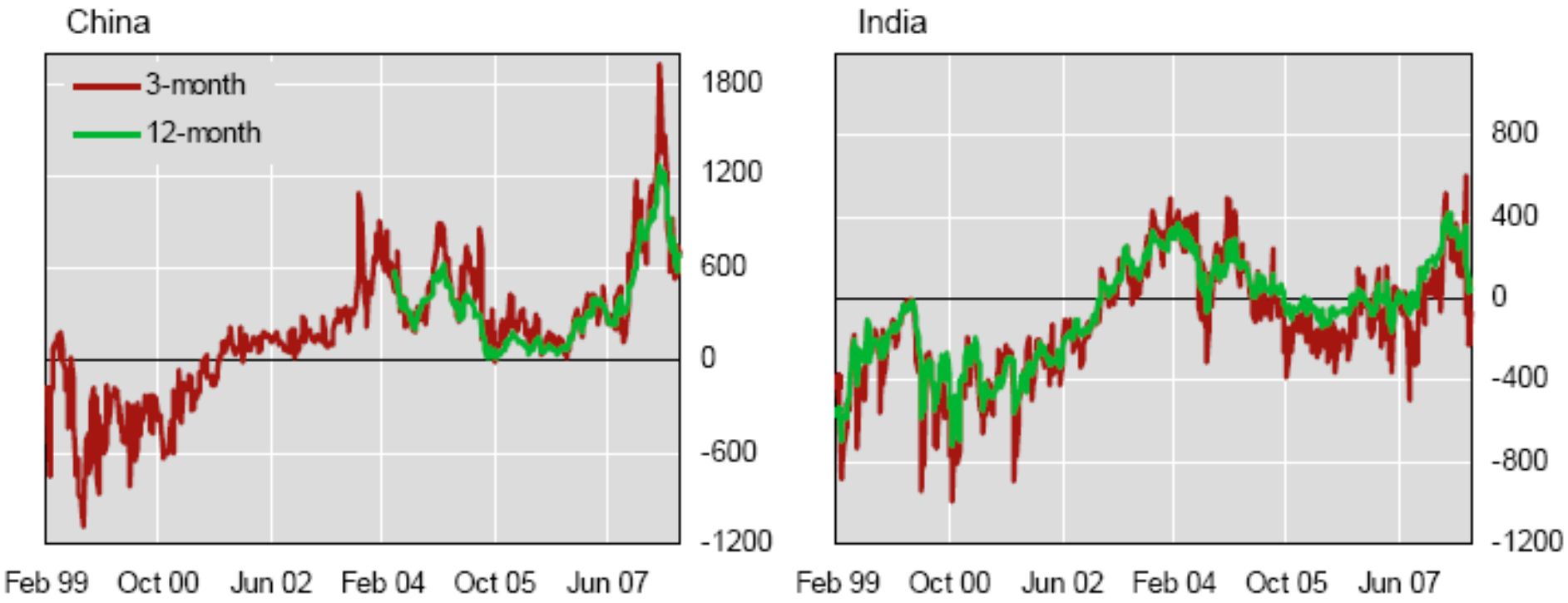
Table number

(2) Price evidence on the money market

- On average, significant onshore-offshore yield gaps for both the CNY and INR
- Mostly inflow and appreciation pressure on both currencies
- The CNY yield gap averages five time that of the INR
- Both CNY & INR under depreciation pressure in 1999-2001 and mostly under appreciation pressure since 2002
- The INR yield gap shows more consistent convergence
- 83% correlation between the CNY and INR yield gaps!

Graph 9: Onshore money market yield less offshore NDF-implied yield

In basis points



Note: Weekly data. For China: 3-month (12-month) NDF, three-month Chibor (one-year PBOC bill auction yield), and 3-month (12-month) Libor. For India: 3-month (12-month) NDF, 91-day (364-day) treasury bill implicit yield, and 3-month (12-month) Libor.

Sources: Bloomberg; CEIC; BIS calculations.

Graph number

Table 6: Onshore less offshore money market yields

In basis points

	CNY		INR	
	3-month	12-month	3-month	12-month
Maximum	1928.11	1273.06	610.04	425.90
Minimum	-1091.98	14.77	-983.63	-714.81
Average	434.91	362.25	8.03	70.95
Average of absolute value	360.60	363.22	244.83	200.72
Annualised volatility	6954.10	4569.00	4521.05	3920.61
Onshore/offshore correlation	0.42	-0.60	0.83	0.88

Note: (1) Yield gap is calculated as the difference between onshore home currency interest rate and yield implied by the offshore non-deliverable forward. The onshore CNY rates are 3-month CHIBOR and 12-month PBC bill auction yield. The onshore INR rates are 91-day T-bill rate and 364-day government bond yield. (2) Weekly data. For the 12-month CNY yield gap, the sample period is between April 2, 2004 and June 27, 2008. For the 3-month CNY and both 3-month and 12-month INR yield gaps, the sample period is between February 5, 1999 and June 27, 2008.

Sources: Bloomberg; CEIC; authors' calculations. Table number

Table 7: The 12-month onshore/offshore yield gap for the CNY

Y = The absolute value of the 12-month onshore/offshore yield gap

(1)	$Y = 363.217$ $(41.884)^{***}$	$Adj\text{-}R^2 = 0.000$ $DW = 0.026$
(2)	$Y = 397.936D_1 + 88.566D_2 + 552.932D_3$ $(24.821)^{***}\quad (9.360)^{***}\quad (75.020)^{***}$	$Adj\text{-}R^2 = 0.463$; $DW = 0.069$ Wald Test: $F(2,219) = 82.293$
(3)	$Y = 162.507 + 1.800T$ $(71.201)^{**}\quad (0.669)^{***}$	$Adj\text{-}R^2 = 0.163$ $DW = 0.031$
(4)	$Y = 219.381D_1 - 441.923D_2 - 376.071D_3 + 5.175T$ $(54.979)^{***}\quad (136.377)^{***}\quad (214.552)^{*}\quad (1.296)^{***}$	$Adj\text{-}R^2 = 0.622$; $DW = 0.116$ Wald Test: $F(2,218) = 39.610$

Note: (1) Weekly data. The sample period is between 2 April, 2004 and 27 June, 2008. D_1 is the dummy for the period between 2 April, 2004 and 15 July, 2005; D_2 is the dummy for the period between 22 July, 2005 and 3 November, 2006; D_3 is the dummy for the period between 10 November, 2006 and 27 June, 2008. (2) The Wald Test statistics are for the joint null hypothesis that the dummies for all the three sub-periods are equal. (3) Standard errors in parenthesis. *** indicates 1% significance; ** indicates 5% significance; * indicates 10% significance.

Sources: Bloomberg; CEIC; authors' calculations.

Table number

Table 8: The 12-month onshore/offshore yield gap for the INR

Y = The absolute value of the 12-month onshore/offshore yield gap

(1)	$Y = 200.716$ $(15.805)^{***}$	$Adj\text{-}R^2 = 0.000$ $DW = 0.136$
(2)	$Y = 301.063D_1 + 166.247D_2 + 99.308D_3$ $(23.292)^{***}$ $(19.104)^{***}$ $(19.380)^{***}$	$Adj\text{-}R^2 = 0.332$; $DW = 0.206$ Wald Test: $F(2,488) = 22.415$
(3)	$Y = 338.632 - 0.561T$ $(32.395)^{***}$ $(0.112)^{***}$	$Adj\text{-}R^2 = 0.273$ $DW = 0.187$
(4)	$Y = 289.018D_1 + 134.206D_2 + 50.119D_3 + 0.119T$ $(41.295)^{***}$ $(81.241)^{*}$ (115.930) (0.293)	$Adj\text{-}R^2 = 0.332$; $DW = 0.207$ Wald Test: $F(2,487) = 4.292$

Note: (1) Weekly data. The sample period is between 5 February, 1999 and 27 June, 2008. D_1 is the dummy for the period between 5 February, 1999 and 13 December, 2002; D_2 is the dummy for the period between 20 December, 2002 and 15 July, 2005; D_3 is the dummy for the period between 22 July, 2005 and 27 June, 2008. (2) The Wald Test statistics are for the joint null hypothesis that the dummies for all three sub-periods are equal. (3) Standard errors in parenthesis. *** indicates 1% significance; ** indicates 5% significance; * indicates 10% significance.

Sources: Bloomberg; CEIC; authors' calculations.

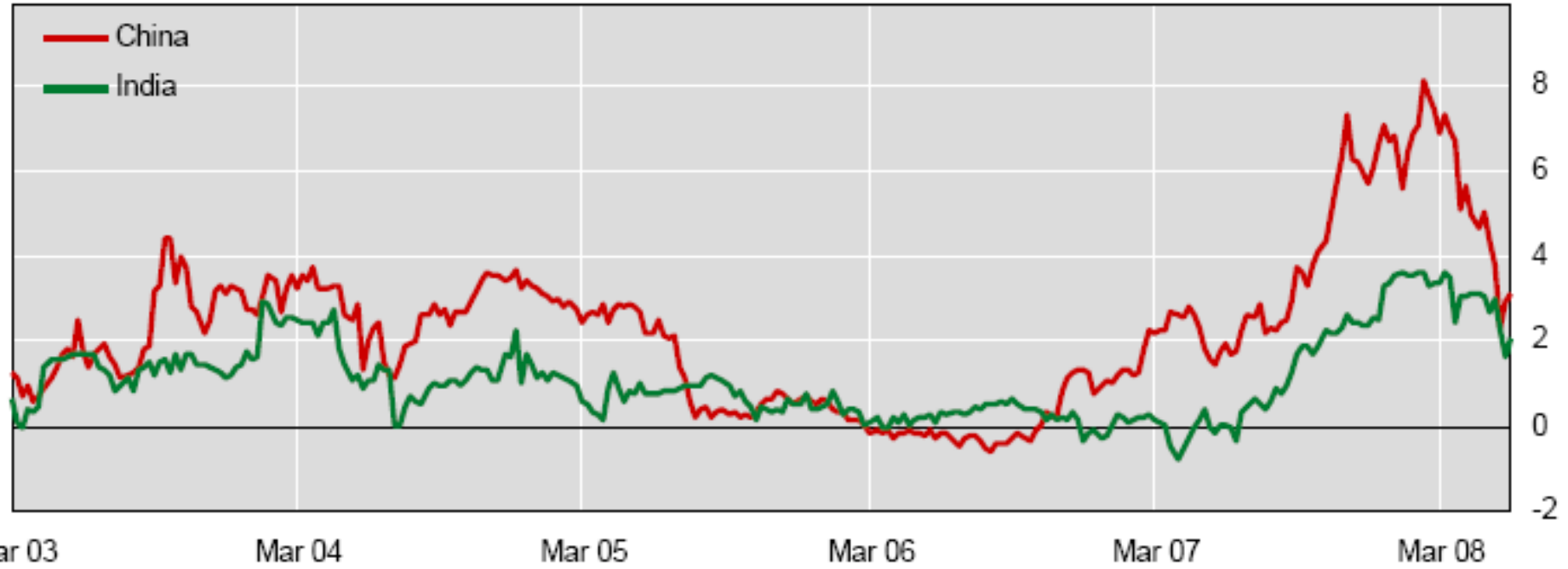
Table number

(3) Price evdience on the bond market

- Onshore-offshore bond yield gaps point to strong inflow pressure on both the Chinese and Indian bond markets
- China's bond yield gap averages twice its Indian counterpart
- High correlations between the money and bond yield gaps:
  - 97% for China
  - 88% for India
- One key difference: money yield gap suggests alternating inflow and outflow pressure, while bond yield gaps point to persistent inflow pressure throughout
- Again 83% correlation between the Chinese and Indian bond yield gaps

Graph 10: Domestic government bonds less non-deliverable cross-currency swaps

In per cent



Note: three-year maturity.

Sources: Bloomberg.

Graph number

Table 9: Onshore less offshore bond yields for the CNY and INR

In basis points

	CNY	INR
Maximum	809.0	363.1
Minimum	-60.0	-74.3
Average	228.0	111.5
Average of absolute value	233.4	114.2
Onshore/offshore correlation	-46.7	79.5

Note: Weekly data. Bond premium is calculated as the difference between three-year onshore government bond yield and three-year offshore non-deliverable swaps rate. Sample period is between March 28, 2003 and June 27, 2008.

Sources: Bloomberg; authors' calculations. Table number

(4) Price evidence on the stock market

- Onshore-offshore stock price premiums point to large but opposite market pressure
- New York discount (40%) over Shanghai => outflow pressure on China
- New York premium (15%) over Mumbai => inflow pressure on India
- Half-life convergence is 30 days for Mumbai and 110 days for Shanghai, compared to 1 day for Hong Kong
- China's stock market under outflow pressure, in contrast to its three fixed-income markets

Graph 11: Ratios of overseas share prices to equivalent local share prices

In per cent

Note: Weekly average; weighted by market capitalisation.

Sources: HKMA; Bloomberg; authors' calculations.

Graph number

Table 10: Premium of overseas shares prices to local share prices

In per cent

	Simple average	Weighted average
H-A, 40 dual-listed companies	–54.0	–43.8
H-A, 9 triple-listed companies	–48.7	–43.9
ADR-A. 9 triple-listed companies	–48.5	–43.9
ADR-H, 9 triple-listed companies	–0.1	–0.1
ADR-Indian, 11 dual-listed companies	12.5	16.9

Note: Daily average. Price gap is calculated as the log difference between overseas share price and local share price. The sample period is between 19 April 2000 and 30 June 2008. For ADR-Indian the sample starts on 30 May 2000.

Sources: HKMA; Bloomberg; authors' calculations. Table number

Table 11: Stock share price premium and convergence of cross-listed companies

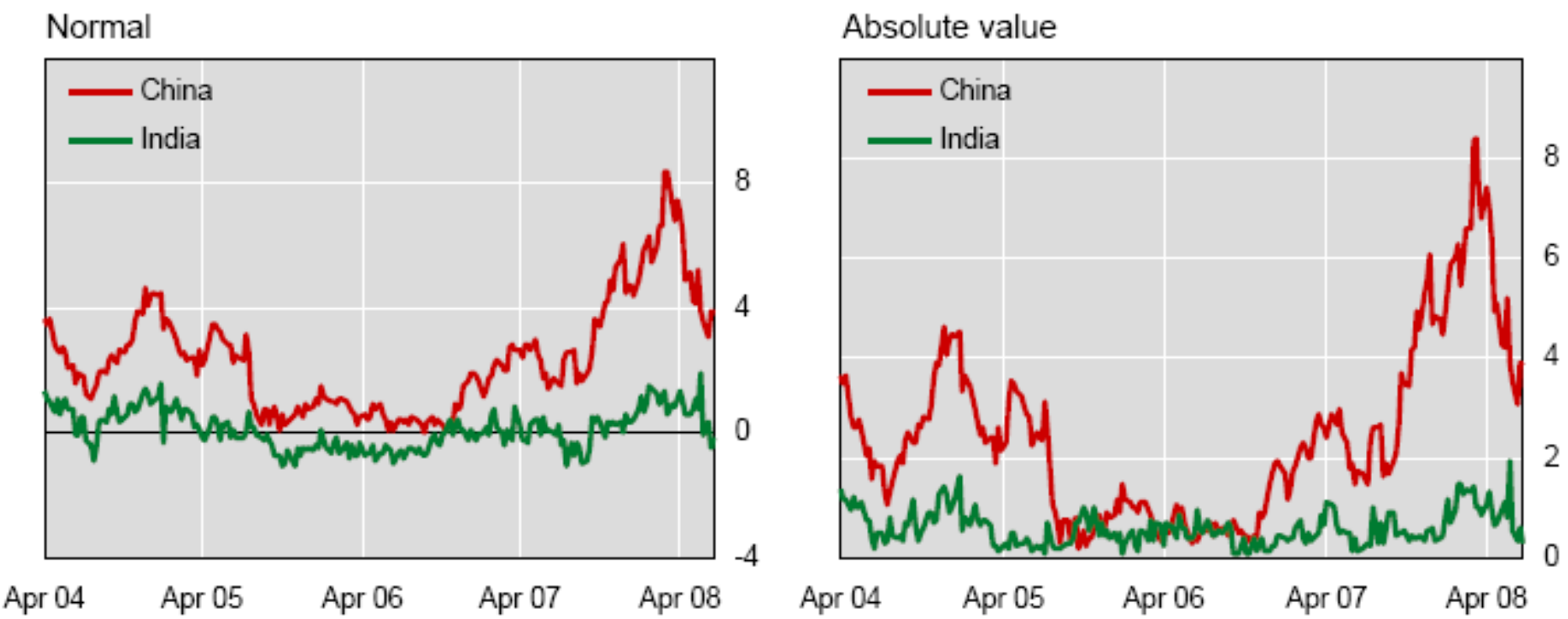
	H-A premium 40 dual-listed companies	H-A premium 9 triple-listed companies	ADR-A premium 9 triple-listed companies	ADR-H premium 9 triple-listed companies	ADR-India premium 11 dual-listed companies
	(1)	(2)	(3)	(4)	(5)
α	–0.286***	–0.440***	–0.431***	–0.075***	0.224***
	(0.036)	(0.092)	(0.096)	(0.014)	(0.033)
β	–0.003***	–0.005***	–0.006***	–0.513***	–0.022***
	(0.000)	(0.001)	(0.001)	(0.011)	(0.002)
φ_1	–0.030***	–0.026**	–0.061***	–0.183***	–0.255***
	(0.005)	(0.011)	(0.012)	(0.010)	(0.009)
φ_2	–0.052***	–0.045***	–0.048***	–0.079***	–0.159***
	(0.005)	(0.010)	(0.011)	(0.009)	(0.008)
Half-life (days)	260.0	128.1	112.8	1.0	30.9
Adjusted R^2	0.005	0.005	0.009	0.337	0.088
DW statistics	1.997	1.977	1.983	2.036	2.059
# of observations	45,008	7,857	7,358	13,718	12,970

V. Combined price evidence and implications

- Two composite price gap indicators are constructed
- Fixed-income market price gap indicator
  - China is 4 to 10 times larger than India
- Summary price gap indicator for all four markets
  - Equity market price gap scaled down by a factor of ten
  - Similar scale of overall market pressure
- On balance, price evidence indicates greater market tensions and pressure on China than on India
- The Chinese and Indian composite indicators are highly correlated --- above 70%

Graph 12: Onshore-offshore fixed-income price gap indicator

In percentage points[1]



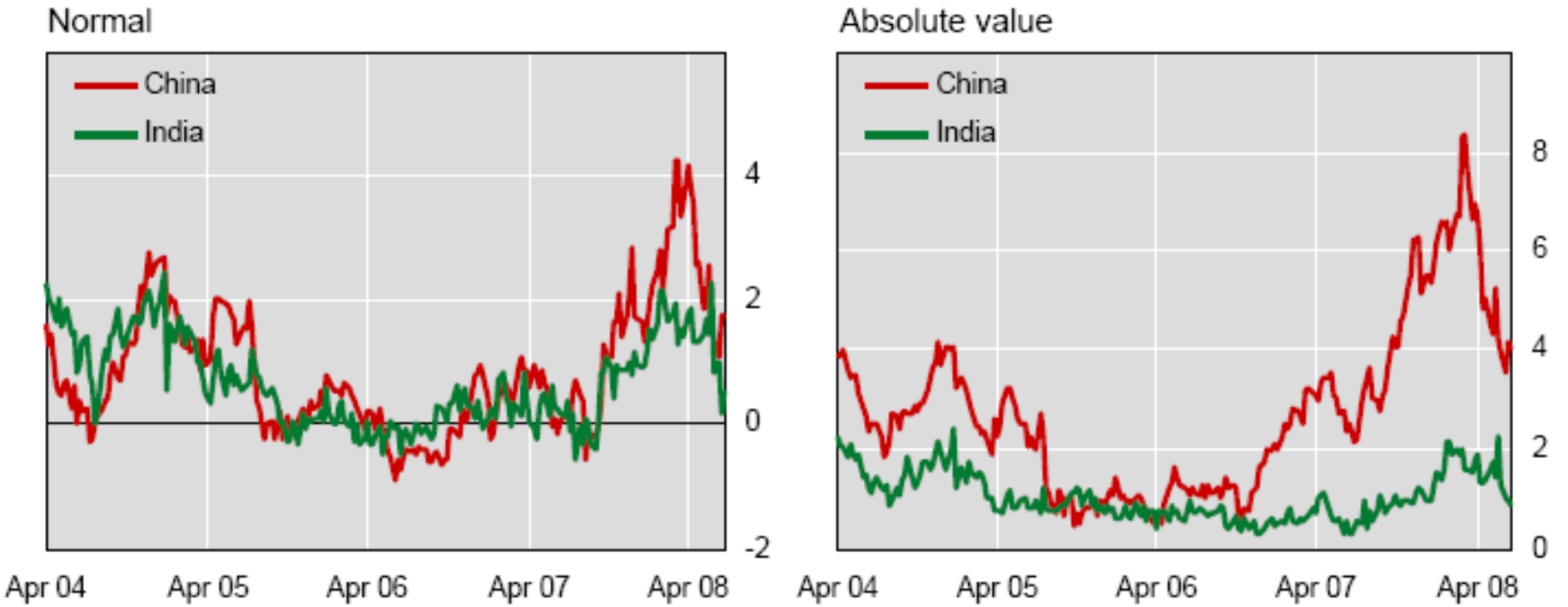
Note: Weekly data. Sample period is from 9 April 2004 to 27 June 2008. [1] Weighted average of the price gaps of all five instruments considered. The three fixed-income markets receive equal weights, and within each market, all instruments receive the same weight.

Sources: Bloomberg; authors' calculations.

Graph number

Graph 13: Summary onshore-offshore price gap indicator

In percentage points[1]



Note: Weekly data. Sample period is from 9 April 2004 to 27 June 2008. [1] Weighted average of the price gaps of all instruments considered (seven for China and six for India). Within each fixed-income or stock market, all instruments receive the equal weight of 50%. But the weight on the stock market is one tenth of that on a fixed-income market.

Sources: HKMA; Bloomberg; CEIC; authors' calculations.

Graph number

Implications for capital account opening

- China is in a stronger financial position with current account surplus and creditor position
- India is more often tested by reversals of volatile portfolio flows and faces smaller price-based market tensions
- Overall, quantity and price evidence points to smaller and easing market tensions for India than for China
- China's required adjustments could be bigger in capital account opening
- Policymakers in both economies may manage opening for certain markets cautiously, given current market pressure and prospect of increased exposure to external shocks

VI. Summary

- Cross-border transactions and price convergence both condition capital account opening
- Quantity evidence gives a mixed picture
  - China is more financially integrated in aggregate and in a stronger financial position
  - India has a more open domestic banking market and is more experienced in coping with two-way portfolio flows
- Combined price evidence points to considerable impediments to cross-border arbitrage and inflow pressure on both economies
  - More so on China than on India
  - Onshore-offshore price gaps indicate harder challenges ahead for China in further opening