# Capital Controls and Interest Rate Parity

Evidences from China, 1999-2004

LIU Li-Gang
&
Ichiro Otani

# Recent Discussions on Capital Controls

- During and after the Asian Financial Crises
- Example. Malaysia
- Impossible Trinity

  --Fixed exchange rate

  --Free capital mobility

  --Independent monetary policy

# Previous Empirical Studies on China' Capital Controls

- Mostly legalistic interpretation of rules and regulations w.r.t. effectiveness and market integration.

- Quantitative studies—just a few.

  (1) Cheung, Chinn and Fujii (2003)

  (2) Ma, Ho, and McCauley (2004)

# Interest Rate Parity Theory

- Jeff Frankel (1992): Theory provides a useful framework for analyzing capital mobility quantitatively.

- Strictly speaking, the covered interest rate parity condition does not hold in the real world.

# Deviations from Covered Interest Rate Parity

$$[i_t^k - i_t^{k*} - (f_{t,t+k} - s_t)] = [(i_t^k - i_t^{k*}) - \Delta s_{t+k}^e] + (s_{t+k}^e - f_{t,t+k})$$

# Components of Deviations from the Parity Condition

- Deviations represent the cost of transactions
- Total, TC,
- Of which:
  --TCr,Arbitrate risks and exchange risks
  --TCp, Pure transaction costs

# Comparisons of Market Places

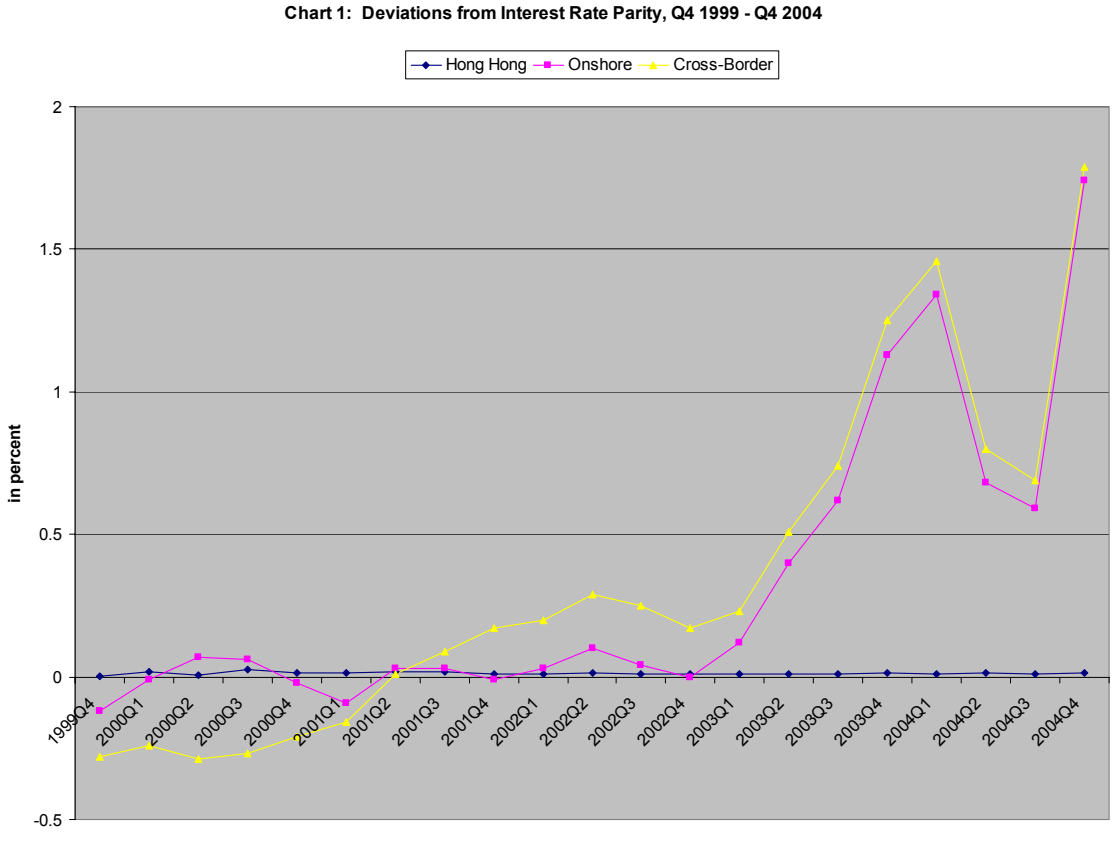
- Hong Kong:  known to be one of the most open markets.

  --TC,hk = TCp, hk
- Onshore market in China.

  --TC,on = TCp,on +TCr,on.
- Cross-border market in China.

  --TC,cb = TCp,cb + TCr,cb.
- Approximation, TCp,hk = TCp,on = TCp,cb

# Chart 1: Deviations from Parity, Q4 1999-Q4 2004



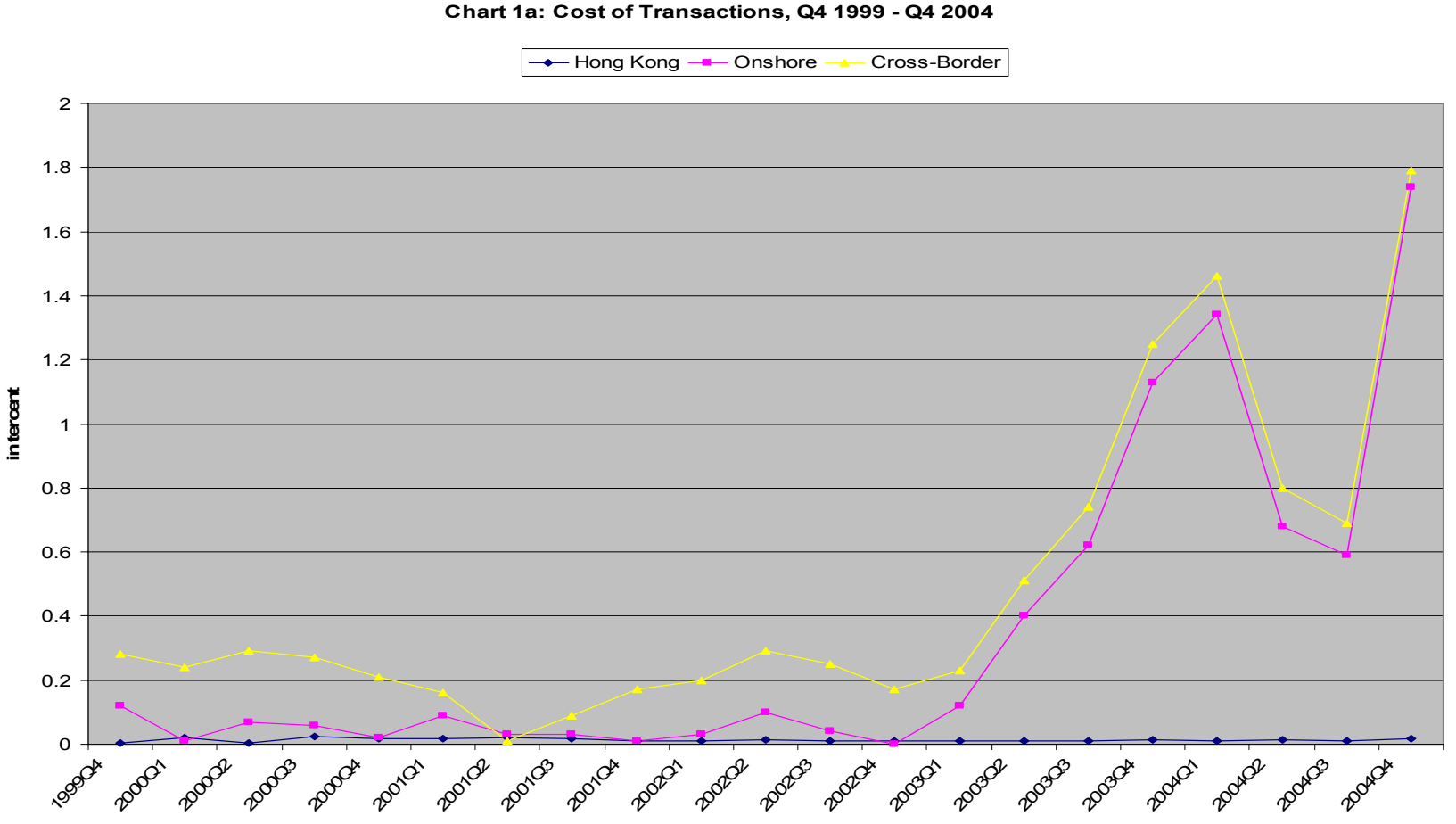
# Deviations from Parity

- Negligible deviations for Hong Kong.
  Free capital mobility.

- Negative deviations for China's cross-border in early 1999. Controls to discourage outflows from China.

- Positive deviations for China since 2000: Controls to discourage inflows into China.

# Chart 1a: Cost of Transactions, Absolute Values of Deviations



# Cost of Transactions

- Hong Kong:

  Very small: 0.013% at quarterly rate, mainly fees and charges.

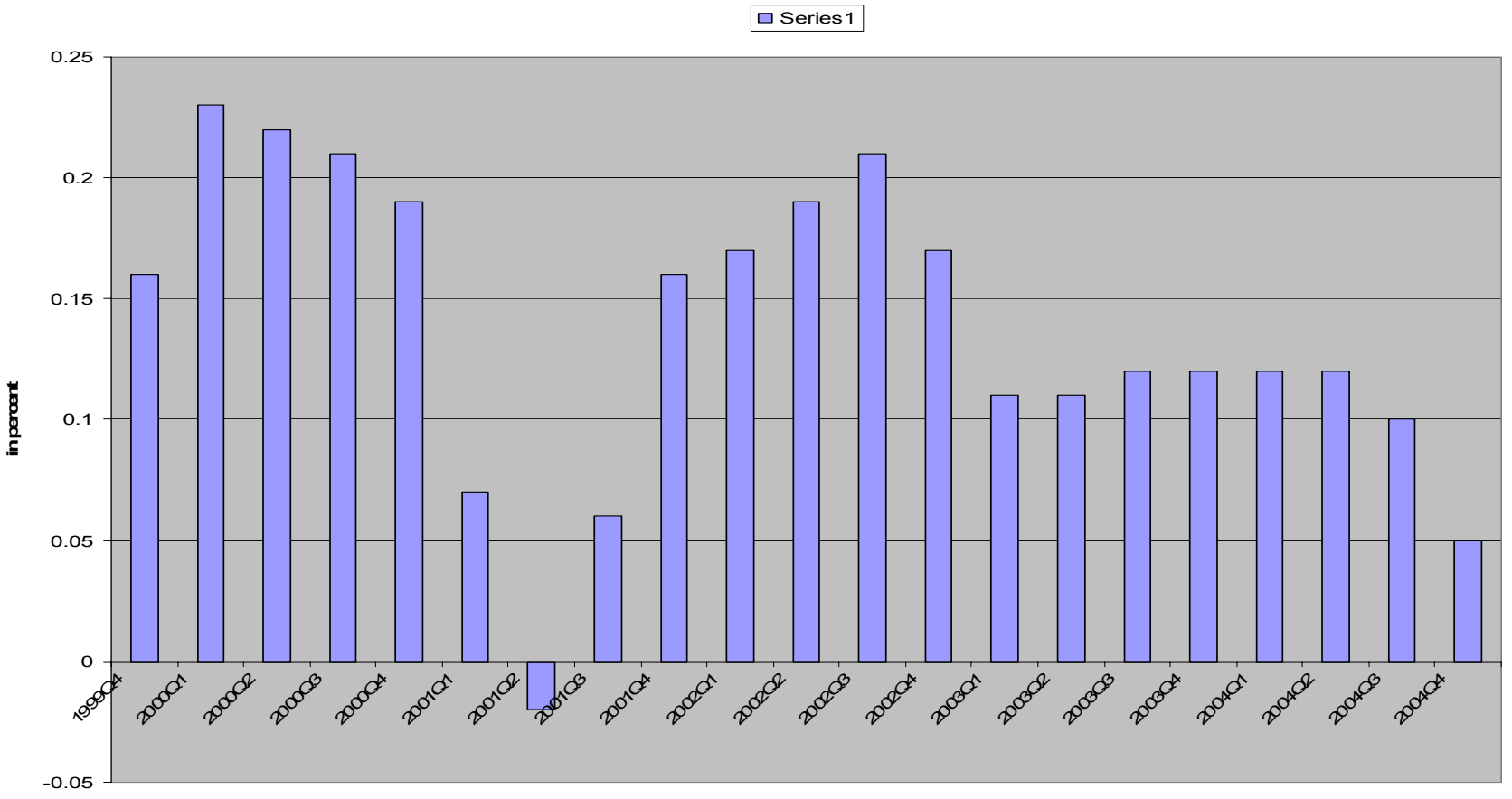
- China:

  Dominated by market pressures.

  Cross-border TC > Onshore TC

  Additional cost for cross-border transactions, driving a wedge between RMB interest rate for onshore and for cross-border transactions.

# Chart 1b: Cost Differentials btw Cross-Border and Onshore, Q4 1999 – Q4 2004



# Table 3: Cost of Capital Controls and E&O, 2000-04

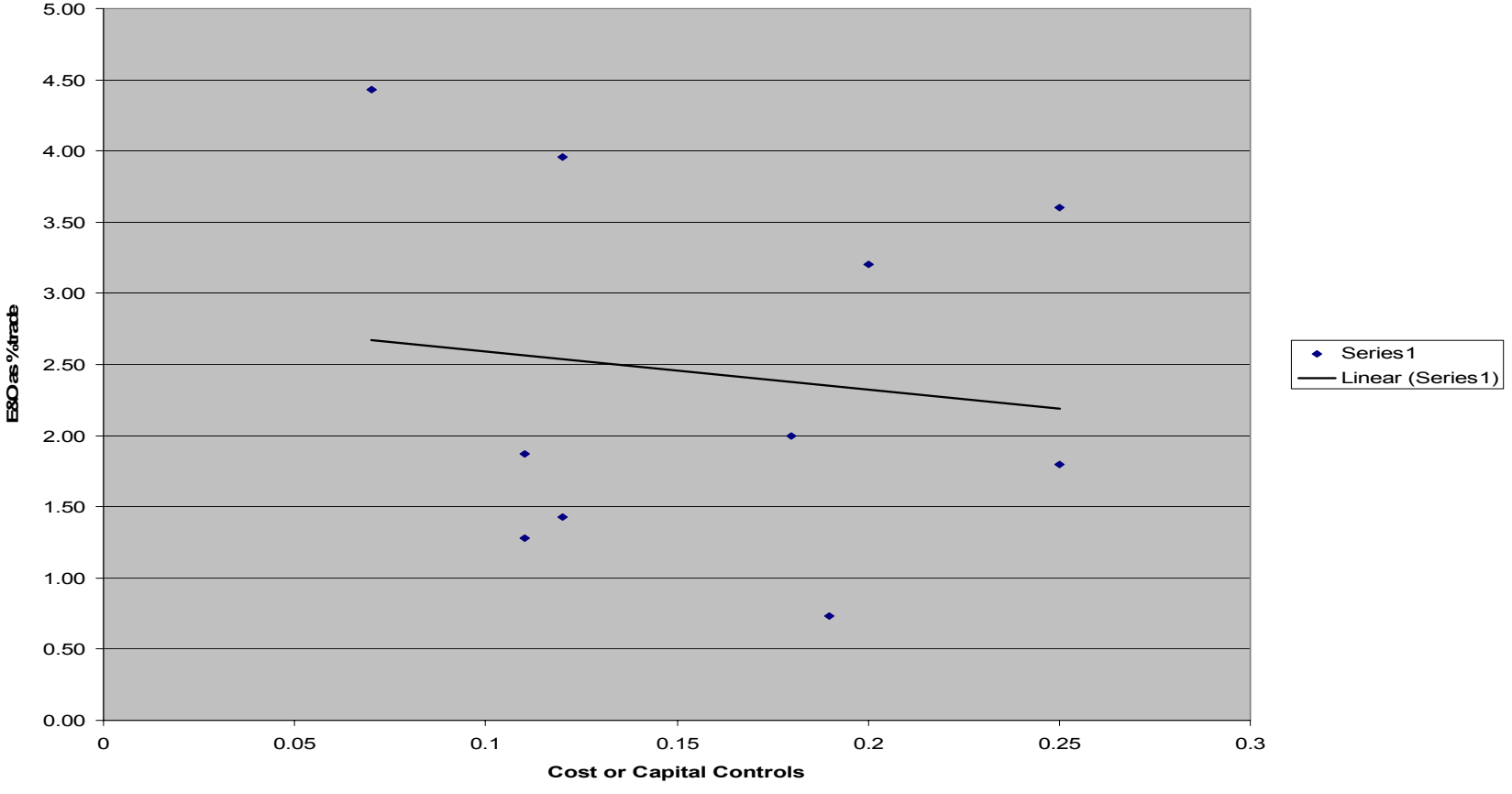
| | Table 3: Cost of Capital Controls and E&O, 1H 2000 – 2H 2004 | | | | |
|---|---|---|---|---|---|
| | | | | | |
| | | TC of Capital Controls, in % | E&O as % of Trade | | |
| | | | | | |
| 1H 2000 | | 0.25 | 1.80 | | |
| 2H 2000 | | 0.20 | 3.20 | | |
| 1H 2001 | | 0.25 | 3.60 | | |
| 2H 2001 | | 0.11 | 1.87 | | |
| 1H 2002 | | 0.18 | 2.00 | | |
| 2H 2002 | | 0.19 | 0.73 | | |
| 1H 2003 | | 0.11 | 1.28 | | |
| 2H 2003 | | 0.12 | 3.96 | | |
| 1H 2004 | | 0.12 | 1.43 | | |
| 2H 2004 1/ | | 0.07 | 4.43 | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Sources; SAFE, PRC and The authors' calculation | | | | | |
| | | | | | |
| 1/ Eatimates | | | | | |

# Some Observations

- Transaction costs affected by capital controls on a declining trend.

- Apparent negative correlation between the intensity of capital controls and the degree of illegal capital movements

# Chart 2: E&O vs Cost of Capital Controls, 1H 2000 – 2H 2004



# Assessing Money Market Integration: Uncovered Interest Rate Differentials

$$(i_t^k - i_t^{k*}) - \Delta s_{t+k}^e = [i_t^k - i_t^{k*} - (f_{t,t+k} - s_t)] + (f_{t,t+k} - s_{t+k}^e)$$

# Properties

- A) Are uncovered interest differentials mean reverting?
- B) Are the differentials predictable?
- C) Are absolute differentials shrinking?

# A: Are uncovered Interest Differentials mean reverting?

- Unit root test:
- Dicky-Fuller test:

  t-statistics:

  DUIP (12): -0.6

  DUIP (24): -0.75

  DUIP (48): -0.22

Phillips-Perron Test

t-statistics:

DUIP(12): -1.85

DUIP(24): -1.28

DUIP(48): -1.1

# B: Are the differentials predictable?

- Predictability regression results:
- AR(1): -0.12 (-4.16)***
- AR(3): -0.1 (-3.56)***
- AR(5): 0.1 (3.56)***
- AR(7): 0.006(0.07)
- AR(9): -0.03(-1.3)
- AR(11): -0.07 (-2.62)**

# C: Are the differentials shrinking?

- Dependent variable: Absolute value of Differentials:

| | Reg. (1) | Reg. (2) |
|---|---|---|
| Time trend: | 0.00005(14.3)*** | |
| Year99 | | -.003(-6.43)*** |
| Year00 | | -.005 (-16.4)*** |
| Year01 | | -.01 (-33.5)*** |
| Year02 | | -.009(-32.3)*** |
| Year03 | | -.005(-16.1)* |
| Adjusted R SQ: | 0.13 | 0.54 |

# Effectiveness of Capital Controls in Recent Years: Summary

- Qualitatively speaking, changes in capital controls had desired impact on illegal capital movements (as represented by Es&Os).
- Quantitatively, the impact was not significant and seems to be waning over time.
- Capital controls drove a wedge btw onshore and offshore interest rates.
- Deviations from uncovered interest rate parity are not random and predictable, but arbitrages could not make onshore and offshore interest rates to converge.
- Some signs of shrinking differentials.

# Road Map for Further Integration of the Capital Market

- Increase RMB interest rate and exchange rate flexibility and deepening of markets for RMB assets and Forex.
- Reduce impediments of financial movements associated with:
  - current transactions,
  - long-term equity transactions, &
  - Short-term portfolio transactions.