



FLINDERS BUSINESS SCHOOL

**REAL EXCHANGE RATE MISALIGNMENT,
FINANCIAL INTEGRATION AND ECONOMIC GROWTH:
THE CASE OF EAST ASIAN ECONOMIES**

Presented by: Pham Van Dai

BACKGROUND

- The experience from the recent development in emerging countries, especially China, indicates that a competitive exchange rate might be favourable for economic growth.
- However, competitive EXR => hyperinflation in Latin American countries
- Both researchers and practitioners are concerned about the impact of RER misalignment on economic performance.
 - ✓ *Researcher: Does the misalignment-growth link exist and how can it exist?*
 - ✓ *Practitioner: What is the optimal exchange rate policy for economic growth?*

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BACKGROUND (cont)

An emerging debate:

- Washington consensus/neo-classical: Misalignment, both overvaluation & undervaluation, is harmful
- Rodrik (2008)/ neo-mercantilism: Overvaluation is harmful but undervaluation could support growth

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Literature review

- Theoretical:
 - Theoretical research is just at the beginning state ([P. Montiel & Servén, 2008](#))
 - [Rodrik \(2008\)](#)'s model: undervaluation counterbalances the negative effects of government intervention/market failures on the tradable sector. But the model assumption is criticized ([Henry & Woodford, 2008](#)). Why government intervention/market failures are more severe in tradable sector than nontradables?
 - It is not clear that through which channels depreciated exchange rate can influence economic growth ([Nouira & Sekkat, 2012](#)).

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Literature review : Empirical

- An increasing body of empirical research
 - A positive undervaluation & growth relationship is reported in a number of empirical studies. But their validity is questioned:
 - ✓ Misinterpreted nonlinearity: overvaluation is harmful rather than undervaluation & growth relationship (Nouira & Sekkat, 2012)
 - ✓ Heterogeneity in estimation using panel data (Schröder, M, 2013)
 - ✓ Recent regressions found that there is not a significant relationship (Nouira & Sekkat, 2012, Schröder, M, 2013)
- ⇒ a competitive exchange rate is not a general rule for economic growth (Nouira & Sekkat, 2012).
- ⇒ “the real exchange rate is best thought of as a facilitating condition” (Eichengreen, 2008)
- ⇒ It may only work under certain circumstances?

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The gap in literature

- Theoretical:
 - ✓ The channels through which undervaluation can promote growth?
- Empirical:
 - ✓ Large samples of developing&industrial countries were used, but a more homogeneous country group might improve the robustness of empirical analysis.
 - ✓ GMM is best for large N & small T sample but there is issue of valid instrument. Other regression technique for smaller panel could give more robust result
 - ✓ What are the circumstances under which undervaluation could promote growth?
 - ✓ New regression techniques to address the nonlinearity issues

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The gap in literature

- ⇒ Financial integration plays a role
- ✓ Countries without financial integration cannot finance their imported capital good ⇒ not obtaining the optimal position: Balance of payments constraint
 - ✓ Undervaluation supports capital accumulation ⇒ obtaining the optimal position ⇒ promote growth
- ❖ **Hypothesis:** The positive impact of undervaluation is stronger in countries which less integrated
- ⇒ Why empirical evidence on large sample of developing countries are not likely to be significant and consistent.

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Empirical analysis

- Examine the interaction between misalignment and financial integration:

$$GDPG_{it} = \beta_0 + \sum_{p=1}^m \beta_1 GDPG_{i,t-p} + \sum_{p=1}^n \beta_2 MIS_{i,t-p} + \sum_{p=1}^m \beta_3 MIS_{i,t-p} * F_{i,t-p} + \sum_{p=1}^n \beta_3 F_{i,t-1} + \sum_{p=1}^l \theta C_{i,t-p} + u_{it}$$

Where *GDPG* is the per capita income growth rate; *F* is a variable proxying for a country's degree of financial integration; *C* is a vector of control variables including the share of government spending in GDP (*GOV*), inflation (*INF*) and the ratio of gross fixed capital formation in GDP (*FCF*). RER misalignment index (*MIS*)

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RER misalignment estimation

$$RER_{it} = \frac{NER_{it} PI_i^* PI_{US,t}}{NER_i^* PI_{it} PI_{US}^*}$$

$$RER_{it} = \alpha_0 + \alpha_1 TOT_{it} + \alpha_2 GDPR_{it} + \alpha_3 OPN_{it} + \alpha_4 FDI_{it} + \alpha_5 FIC_{it} + u_{it}$$

$$MIS_{it} = \frac{RER_{it}}{\overline{RER}_{it}}$$

Where *TOT* is the terms of trade; *GDPR* is the ratio of a country's per capita income to US per capita income; *OPN*, *FDI* and *FIC* is the degree of openness, foreign direct investment inflows and foreign income to GDP.

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Sample

9 East Asian economies:

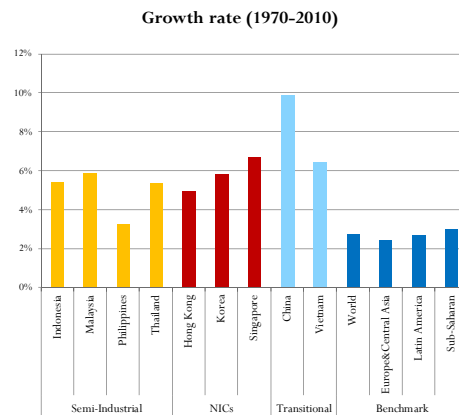
- Semi-industrial: Indonesia, Malaysia, Philippines, Thailand (1970-2010)
- NICs: Hong Kong, Korea, Singapore (1970-2010)
- Transition: China (1980-2010), Vietnam (1990-2010)



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Shared features

- Geographic: East Asian region exclude Japan, and low-income country
 - Strong intra-region intra-regional trade and investment relationship
 - High performing economies: East Asian miracle
 - The role of manufacturing sector
- => Exchange rate might have important influence



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Regression strategy

- Financial integration indicator:
 - ✓ [Ahmed, A. D. \(2011\)](#): Five common indicators
 - ✓ Only FDI data available for the sampled countries
 - ✓ A subjective categorical variable is used: NICs (higher integrated), four semi-industrial (high integrated), transitional (low integrated)
 - ✓ Capital openness index ([Chinn & Ito, 2008](#)): a higher value of the index indicates a higher degree of financial integration
- Regression method:
 - ✓ Panel corrected standard errors (PCSEs): Large T, small N

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Panel unit root tests

Criterion to chose number of lags	AIC	BIC	HQIC
0	-10.7776***	-11.1024***	-11.6275***
1	-1.4521*	-1.2014	-1.4521*
2	-1.2227	-1.6472**	-1.2227
3	-2.6189***	-4.0739***	-2.8897***
4	-2.5882***	-3.1372***	-3.4332***
5	-7.4662***	-6.1296***	-5.4811***
6	-2.4049***	-2.6205***	-2.6205***
7	-1.5585*		

Note:

a: $\hat{\alpha}$ indicator was calculated by using CPI

b: $\hat{\alpha}$ indicator was calculated by using GDP deflator

*: There was an insufficient number of time periods to compute $\hat{\alpha}$ as lagged terms are introduced in the Augmented Dickey-Fuller regressions. For this reason, zero lag length was used.

***, ** and * indicate significance at 1%, 5% and 10%, respectively.

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Panel regression of economic growth, using CPI as a price index

$GDPG_{t-1}$	0.4762*** (0.0789)	0.4746*** (0.0768)	0.4007*** (0.0756)	0.3466*** (0.0756)	0.3541*** (0.0745)	0.4724*** (0.0764)
MIS_{t-1}	0.0209* (0.0120)	0.0386*** (0.0139)	0.0691*** (0.0153)	-0.0069 (0.0176)	0.0070 (0.0126)	0.0385*** (0.0147)
FDI_{t-1}	-0.0347 (0.0317)	0.2404* (0.1299)	-0.0441 (0.0316)	-0.0744** (0.0317)	-0.0409 (0.0308)	-0.0339 (0.0302)
$(MIS * FDI)_{t-1}$		-0.2832** (0.1427)				
FOP_{t-1}			0.0327*** (0.0089)			
$(MIS * FOP)_{t-1}$			-0.0324*** (0.0088)			
L				-0.1152** (0.0483)	-0.1084** (0.0424)	
$(MIS * L)_{t-1}$				0.1332*** (0.0462)	0.1212*** (0.0404)	
H				-0.0064 (0.0226)		0.0370* (0.0216)
$(MIS * H)_{t-1}$				0.0163 (0.0242)		-0.0365 (0.0232)
GOV_{t-1}	0.1840*** (0.0694)	0.1904*** (0.0668)	0.1518** (0.0701)	0.0739 (0.0665)	0.0939 (0.0657)	0.1735** (0.0687)
INF_{t-1}	-0.0574 (0.0352)	-0.0696** (0.0349)	-0.0987*** (0.0344)	-0.0824** (0.0346)	-0.0940*** (0.0330)	-0.0745** (0.0361)
INF_{t-2}	0.0558** (0.0268)	0.0559** (0.0264)	0.0566** (0.0256)	0.0223 (0.0248)	0.0269 (0.0243)	0.0535** (0.0264)
FCF_{t-1}	0.0758* (0.0399)	0.0806** (0.0401)	0.1205*** (0.0407)	0.0464 (0.0391)	0.0694* (0.0380)	0.0824** (0.0408)
Intercept	-0.0395** (0.0156)	-0.0574*** (0.0169)	-0.0896*** (0.0181)	0.0121 (0.0223)	-0.0085 (0.0180)	-0.0565*** (0.0173)
No. of Obs	240	240	240	240	240	240
R-squared	0.6623	0.6698	0.6799	0.6889	0.6845	0.6673

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Panel regression of economic growth, using DFL as a price index

$GDPG_{t-1}$	0.4682*** (0.0789)	0.4632*** (0.0778)	0.4145*** (0.0756)	0.3684*** (0.0747)	0.3762*** (0.0744)	0.4401*** (0.0756)
MIS_{t-1}	0.0263** (0.0117)	0.0403*** (0.0127)	0.0534*** (0.0132)	0.0102 (0.0151)	0.0095 (0.0114)	0.0521*** (0.0164)
FDI_{t-1}	-0.0392 (0.0314)	0.1816 (0.1129)	-0.0391 (0.0327)	-0.0629** (0.0315)	-0.0387 (0.0306)	-0.0281 (0.0305)
$(MIS * FDI)_{t-1}$		-0.2160* (0.1121)				
FOP_{t-1}			0.0215*** (0.0081)			
$(MIS * FOP)_{t-1}$			-0.0221*** (0.0078)			
L				-0.0989** (0.0415)	-0.1064*** (0.0397)	
$(MIS * L)_{t-1}$				0.1151*** (0.0390)	0.1179*** (0.0376)	
H				0.0167 (0.0239)		0.0499** (0.0244)
$(MIS * H)_{t-1}$				-0.0086 (0.0253)		-0.0506* (0.0262)
GOV_{t-1}	0.1891*** (0.0703)	0.1904*** (0.0668)	0.1384* (0.0745)	0.0756 (0.0689)	0.0875 (0.0693)	0.1928*** (0.0691)
INF_{t-1}	-0.0660* (0.0353)	-0.0761** (0.0350)	-0.0882*** (0.0341)	-0.0850*** (0.0328)	-0.0854*** (0.0323)	-0.0932*** (0.0357)
INF_{t-2}	0.0534** (0.0268)	0.0535** (0.0266)	0.0479* (0.0253)	0.0288 (0.0249)	0.0331 (0.0247)	0.0499* (0.0260)
FCF_{t-1}	0.0887** (0.0394)	0.0915** (0.0392)	0.1164*** (0.0400)	0.0611 (0.0381)	0.0790** (0.0383)	0.1061*** (0.0399)
Intercept	-0.0481*** (0.0166)	-0.0613*** (0.0169)	-0.0700*** (0.0161)	-0.0069 (0.0205)	-0.0117 (0.0184)	-0.0740*** (0.0198)
No. of Obs	240	240	240	240	240	240
R-squared	0.6681	0.6739	0.6762	0.6925	0.6879	0.6736

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Findings

- Regressions (1a) and (1b) illustrate the influence of RER misalignment on economic growth.
- Growth enhancing effect of a competitive real exchange rate is more robust in less financially integrated countries
- Benefit of a policy targeting an undervalued RER could be substantial when it helps a less financially integrated economy overcome the obstacles caused by a balance of payments constraint.
- In contrast, in a highly financially integrated economy not facing a serious balance of payments constraint, such a policy has minor benefit that might not outweigh its side effects.

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