An Empirical Assessment on Procyclicality of Loan-loss Provisions of banks in EMEAP Economies

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Motivations

- Banks' loan-loss provisions (LLPs) have long been regarded as a major contributor to procyclicality (e.g. the 2008-09 crisis).

- Countercyclical (or forward-looking) provisioning is considered a macro-prudential tool to mitigate the risk to the financial system (FSB, 2009; BCBS, 2009).

- There are two important policy questions:

  (1) Do LLPs actually exhibit a significant procyclical pattern?

  (2) Conditional on a procyclical pattern of LLPs, does a rise in LLPs constrain loan supply of banks?

Motivations

- Two limitations of past studies:

  (1) Unduly focus on examinations of the first question

  (2) Assuming that all banks shared an identical degree of procyclicality

- This study, by contrast, examines the two questions for 11 EMEAP economies using panel data of 194 listed banks.

- Based on bank-level estimates for the two empirical questions, factors contributing to differences in the procyclicality between banks are analysed.

- The empirical results could shed light on the (expected) effectiveness of countercyclical provisioning measures.

Model A: estimating the effect of the business cycle on LLPs

$$\frac{LLP_{i,t}}{Loan_{i,t-1}} = \alpha_0 + \alpha_{1i}\Delta GDP_{j,t} + \alpha_{2j}\Delta Loan_{i,t} + \alpha_{3j}\frac{PBIT_{i,t}}{Assets_{i,t-1}} +$$

$$\alpha_{4j}\frac{Equity_{i,t}}{Assets_{i,t-1}} + \mu_i + \varepsilon_{i,t}$$

where i, j and t index bank, economy and time respectively.

- A negative α_{1i} indicates that LLPs tend to increase during economic downturns and decrease during upturns, supporting the hypothesis of procyclicality of LLPs.

- α_{1i} is assumed to vary across banks

Three empirical models (B)

Model B: estimating the effect of LLPs on loan supply

$$\Delta Loan_{i,t} = \beta_0 + \beta_{1i} \frac{LLP_{i,t-1}}{Loan_{i,t-2}} + \beta_{2j} \Delta GDP_{j,t} + \beta_{3j} IR_{j,t} + \nu_i + \xi_{i,t}$$

where i, j and t index bank, economy and time respectively.

- A negative β_{1i} indicates that banks tend to cut loan supply when there is a rise in LLPs.

- β_{1i} is assumed to vary across banks.

Three empirical models (C)

Model C: estimating factors contributing to differences in the procyclicality between banks

$$\alpha_{1i} \times \beta_{1i} = \gamma_0 + \gamma_1 EA_i + \gamma_2 assets_i + \gamma_3 LA_i + \gamma_4 Claims_j + \zeta_i$$

where $\alpha_{1i} \times \beta_{1i}$ ("the LLP procyclicality effect") quantifies the effect of the business cycle on loan supply transmitting from impacts of the business cycle on LLPs.
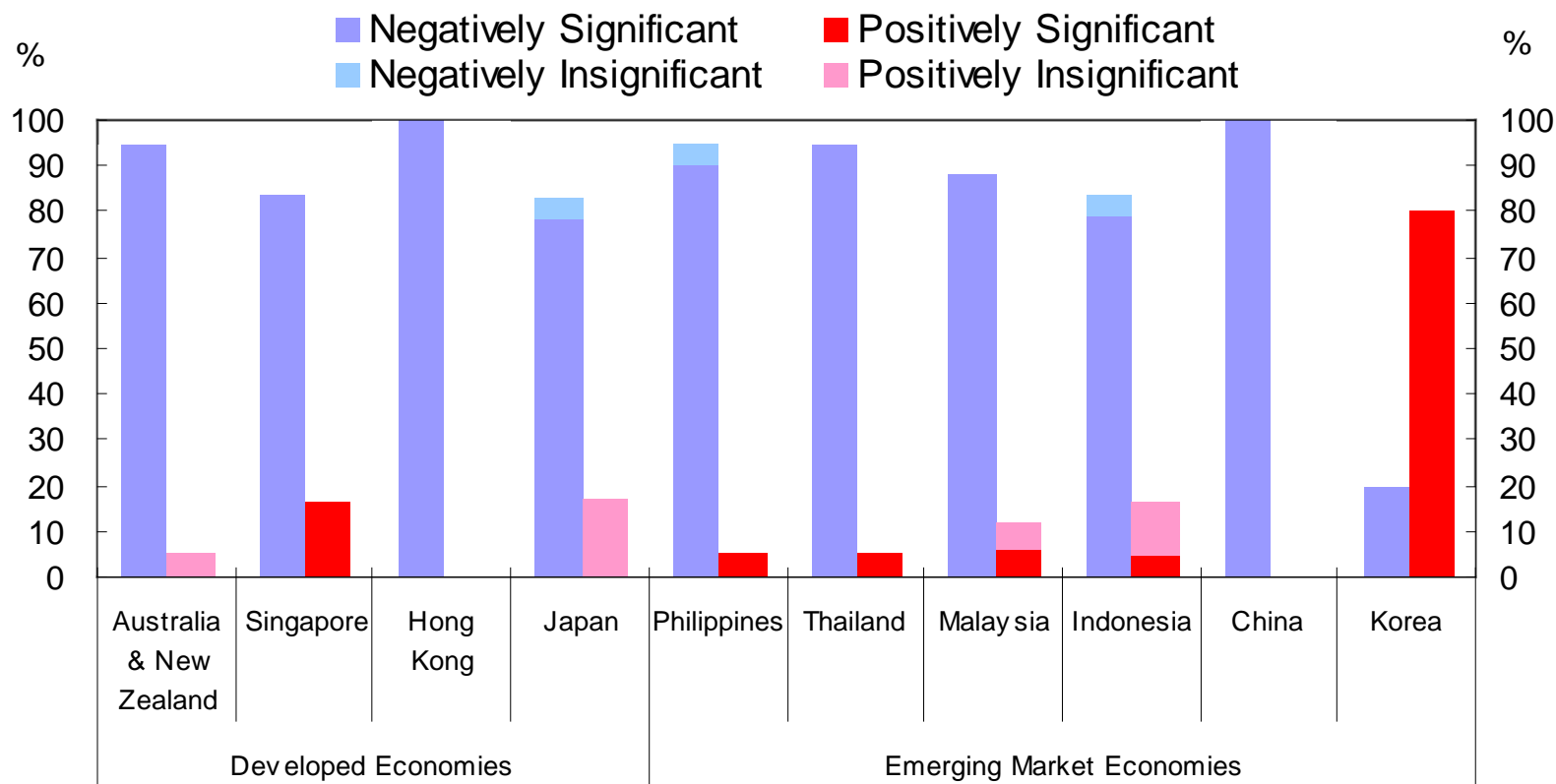
(1) *EA*: Capital measured by the ratio of shareholders' equity to total assets;

(2) *Assets*: bank size measured by total assets in log form;

(3) *Business mix*: measured by the ratio of total loans to total assets; and

(4) *Claims*: measured by the share of private sector credit in total credit intermediated by the banking sector

Main empirical findings (1)

– LLPs of banks are in general negatively correlated with the real GDP growth rate

Share of banks by the estimated sign of α_{1i}

Legend:
- Negatively Significant
- Negatively Insignificant
- Positively Significant
- Positively Insignificant

Categories: Australia & New Zealand, Singapore, Hong Kong, Japan (Developed Economies); Philippines, Thailand, Malaysia, Indonesia, China, Korea (Emerging Market Economies)
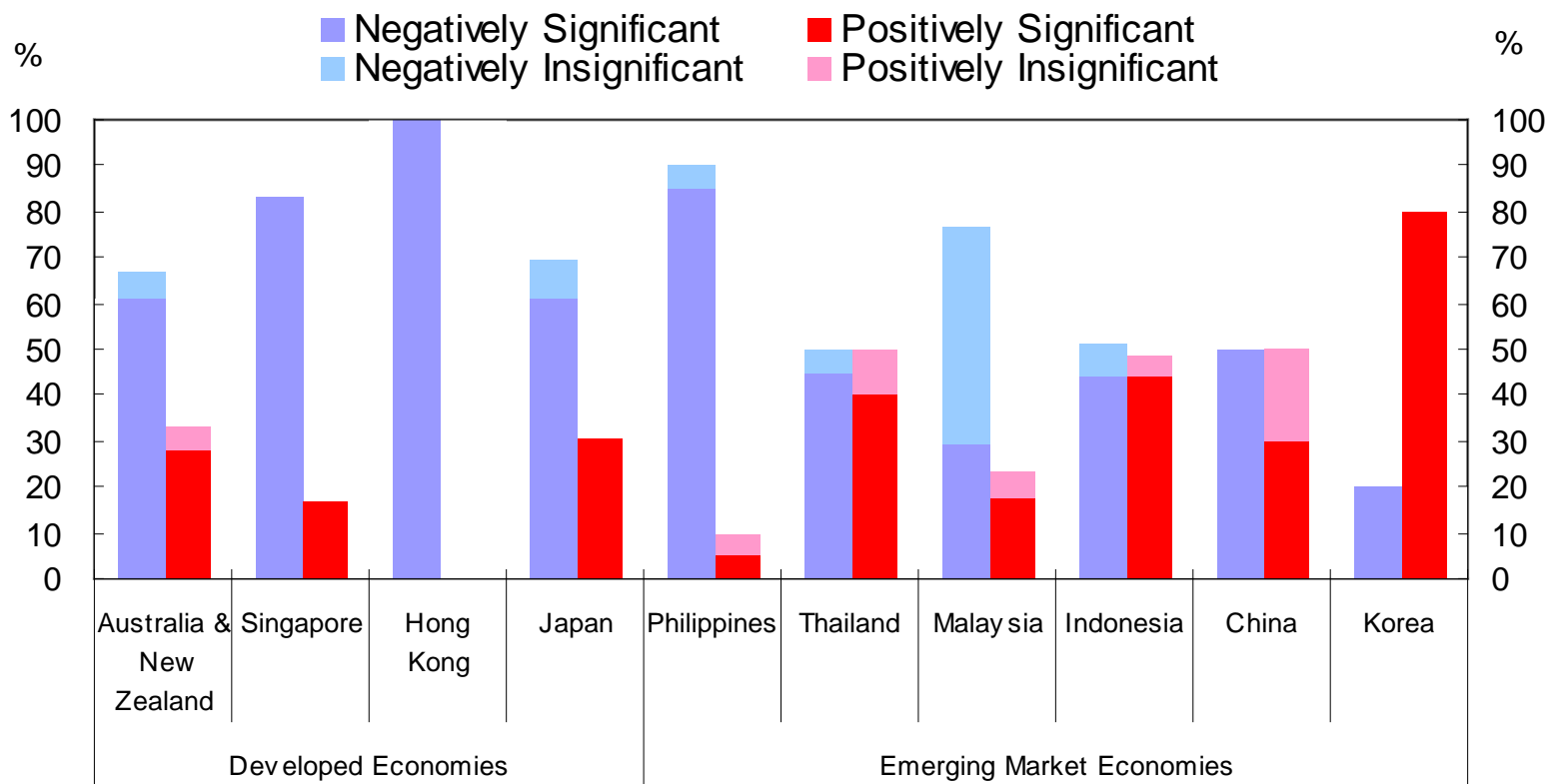
Main empirical findings (2)

- Banks in DEs show clear evidence that a rise in LLPs would reduce loan supply, while it is difficult to draw a clear conclusion for banks in EMEs.
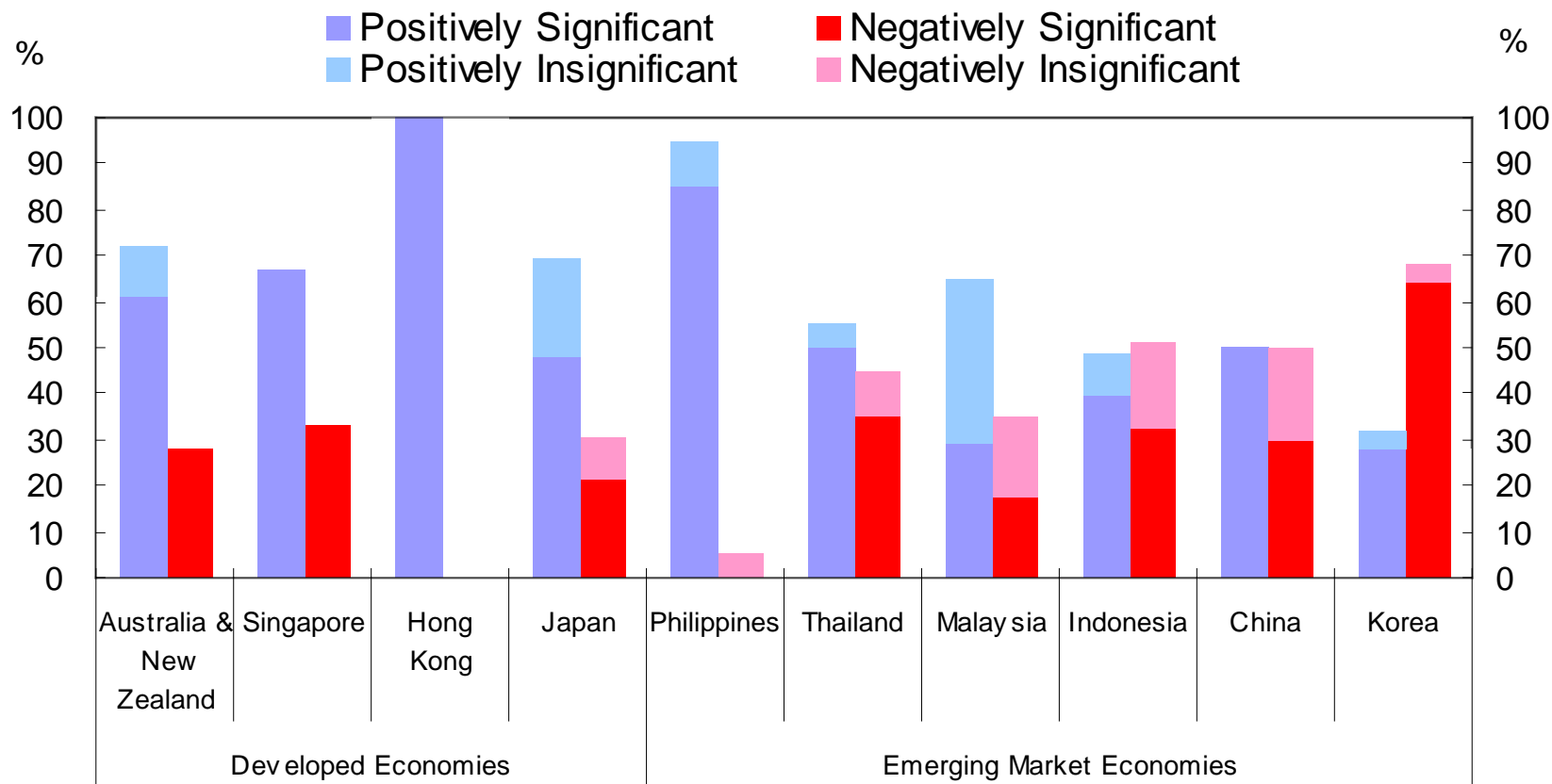
Share of banks by the estimated sign of β_{1i}

Main empirical findings (3)

– Banks in DEs in the region are more prone to the problem of procyclicality.

Share of banks by the estimated sign of $\alpha_{1i} \times \beta_{1i}$

Main empirical findings (4)

$$\alpha_{1i} \times \beta_{1i} = (\gamma_0 + \gamma_1 EA_i + \gamma_2 assets_i + \gamma_3 LA_i + \gamma_4 Claims_j) \times D_{DE}$$

$$+ (\gamma_5 + \gamma_6 EA_i + \gamma_7 assets_i + \gamma_8 LA_i + \gamma_9 Claims_j) \times D_{EME} + \zeta_i$$

where D_{DE} is a dummy variable that is defined as one for developed economies and zero otherwise.

Dependent variable	Product of two coefficients		
		Equation (3)	Equation (4)
Explanatory variable		Coefficient	Developed economies	Emerging market economies
Equity-to-assets ratio (*EA*)	-0.09	-1.30**	-0.01
Log-assets (*Assets*)	-0.49**	-2.19**	-0.44
Loan-to-assets ratio (*LA*)	0.01	0.04	-0.04
Claims on private sector /domestic credit (*Claims*)	0.01	0.11**	-0.01
Constant	8.17*	38.07**	10.15**
Adjusted R-sq	0.003	0.22	
Observations	141	141	

Note: ** and * indicate significance at 5% and 1% level respectively.

Conclusion

1. Strong evidence of a procyclical pattern of LLPs

2. Banks in DEs in the Asia-Pacific region are found to reduce their loan supply during economic downturns because of impaired lending capacity as a result of a rise in LLPs. However, it appears that no clear conclusion can be drawn for EMEs in the region.

3. The empirical findings suggest that the procyclicality of LLPs appears to vary across economies/banks, indicating that country- and bank-specific information should be considered when implementing a countercyclical provisioning policy.