Financial Openness and External Adjustment in Emerging and Frontier Market Economies

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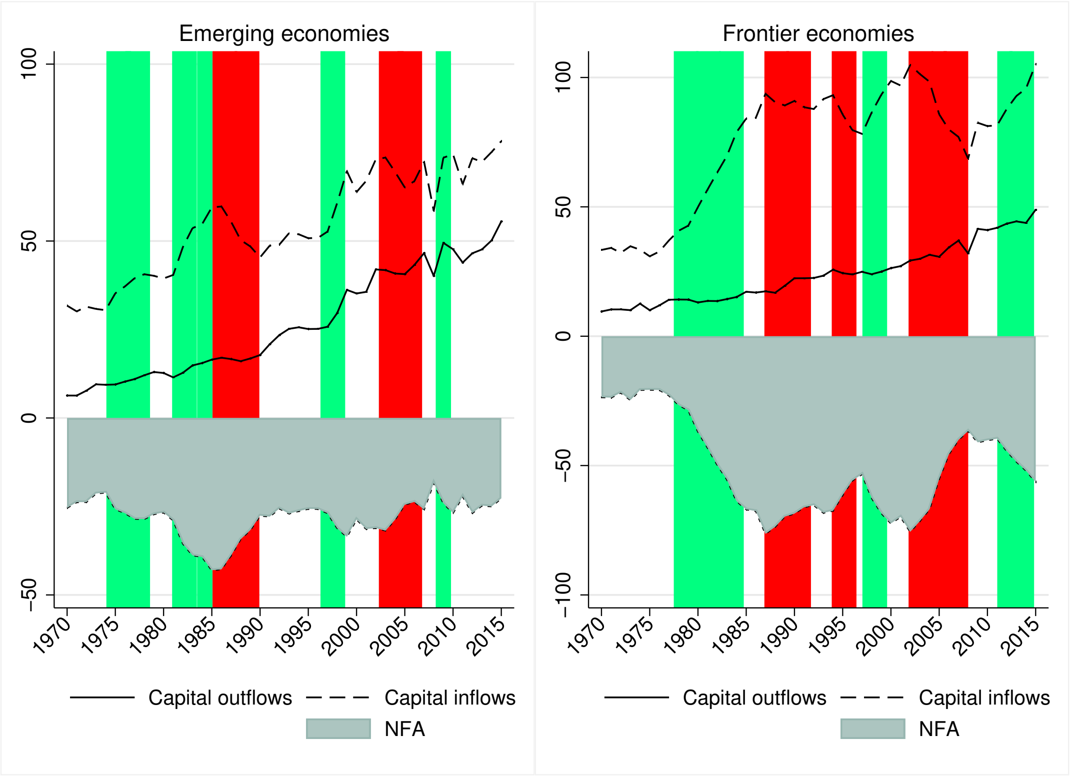
Background

- Capital flow volatility and drivers of capital flows have extensively motivated economic research (Forbes and Warnock, 2021).
- This is because large swings in capital flows can cause excessive disruption to the business cycle (Buch et al., 2005; Edwards, 2004, 2007).
- Policy debates have been inconclusive on how EMFEs should transition to being more financially open. In the discussion, literature is leaning more on capital inflow controls. For instance, Edwards (2004) and Erten et al. (2021) report control on capital outflows as ineffective.

Background...cont'd

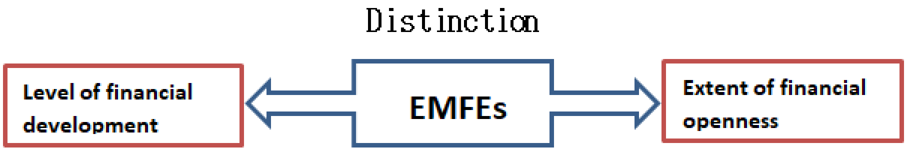
EMFEs are prone to surges, sudden stops and reversals (Edwards, 2004)



Source: author. Red color - reversals & Green color - surge

Motivation

This background motivate the need for a macro model that can help EMFEs counter adverse foreign financial shocks as they transition to more financially open economies.



Gap

- existing studies neglect the implications of disruptions caused by capital controls under imperfect financial markets with risk-taking players (e.g Gabaix and Maggiori (2015))
- macroeconomic implications and welfare cost of capital control in EMFEs not adequately addressed (e.g Korinek (2011))

Contribution

This study contribute to the theory on financial openness, imperfect financial markets, exchange rate determination and external adjustments by:

- calibrating a model with risk-taking financiers and a bank funding technology that captures financial openness
- analysing the relative importance of channels of external adjustment in economies and transmission of shocks to the real economy

Key equations

Household Utility

$$\max E_0 \sum_{t=0}^{\infty} \beta^t [\frac{\left[(C_t^T)^{\vartheta}(C_t^N)^{1-\vartheta}\right]^{1-\sigma_c}}{1-\sigma_c} + \frac{aD_t^{1-\sigma_d}}{1-\sigma_d} - \frac{(\frac{H_t^{\omega_j}}{\omega_j})^{1+\sigma_h}}{1+\sigma_h}]$$

s.t

$$p_t^T C_t^T + C_t^N + D_t + R_{t-1}^h B_{t-1}^h = W_t H_t + \Pi_t^{B,F} + R_{t-1}^d D_{t-1} + B_t^h$$

Domestic production

$$\max_{K_t^j, H_t^j, S_t^j, B_t^j} E_t \sum_{t=0}^{\infty} \beta^t \Lambda_t \Pi_t^j \quad ; \quad j = T, N$$

s.t

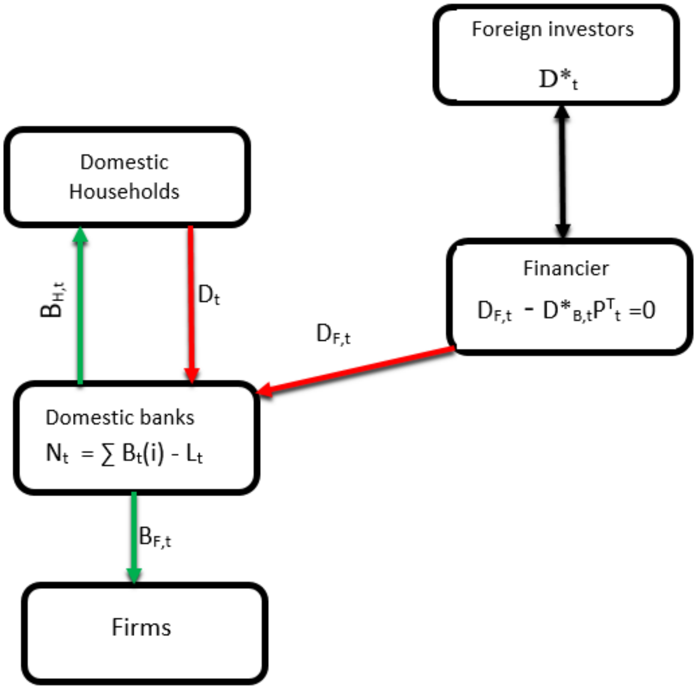
$$\Pi_t^j = p_t^j Y_t^j - W_t H_t^j - R_t^k K_t^j - p_t^T (S_t^j - S_{t-1}^j) + P_t^T (B_t^j - R_{t-1}^{L,j} B_{t-1}^j)$$

$$Y_t^j = Z_t^j K_t^{\alpha_j} H_t^{1-\alpha_j}$$

$$S_t^j \;\geq\; \varphi^j \; [W_t^j H_t^j + R_t^k K_t^j] \tag{1}$$

Key equations: Financiers

Banking sector set up



$$D_{F,t} = \frac{1}{\Gamma} E[P_t^T - \frac{R_t^f}{R_t^{DF}} P_{t+1}^T] \quad (2)$$

Financiers: Transmission mechanism

- Capital inflows exert appreciation pressure on the currency of receiving country thus a corresponding fall in exports and output (Clarida and Magyari, 2016; Ahmed and Zlate, 2014; Gourinchas and Rey, 2014)
- Countries that have recently received capital inflows tend to have risky currencies that depreciate if financiers' risk-bearing capacity is disrupted Gabaix and Maggiori (2015).
- Change in capital flows disrupt financiers balance sheet hence financiers require more compensation for bearing currency risk
- The behavior of financiers determine exchange rate movement
- In the end, financial market frictions are transmitted to the real economy. This adjustment as well impact the external position

Deposit branch

$$\max_{D_t, D_t^*} \; R_t^L L_t - R_t^d D_t - R_t^{df} D_t^f$$

$$L_t = \left[\alpha_b^{\frac{\xi_L}{1+\xi_L}} (D_t)^{\frac{1}{1+\xi_L}} + (1-\alpha_b)^{\frac{\xi_L}{1+\xi_L}} (D_t^f)^{\frac{1}{1+\xi_L}} \right]^{(1+\xi_L)} \tag{3}$$

Loan branch

$$\max_{B_t(i), L_t} R_t^B(i) B_t(i) - R_t^L L_t - \frac{\kappa_j}{2} \left(\frac{N_t}{B_t(i)} - \tau \right)^2 N_t \quad ; \quad j = H, T, N$$

s.t

$$N_t = \sum_i B_t(i) - L_t \tag{4}$$

Key equations

Cost of lending

$$R_t^B(i) - R_t^L = -\kappa_j \left(\frac{N_t}{B_t(i)} - \tau \right) \left(\frac{N_t}{B_t(i)} \right)^2 \quad ; \quad j = H, T, N \tag{5}$$

Shocks

$$z_t = \rho_z z_{t-1} + \varepsilon_t^z \quad \ldots \quad technology$$

$$\mu_t = \rho_\mu \mu_{t-1} + \varepsilon_t^\mu \quad \ldots \quad bank$$

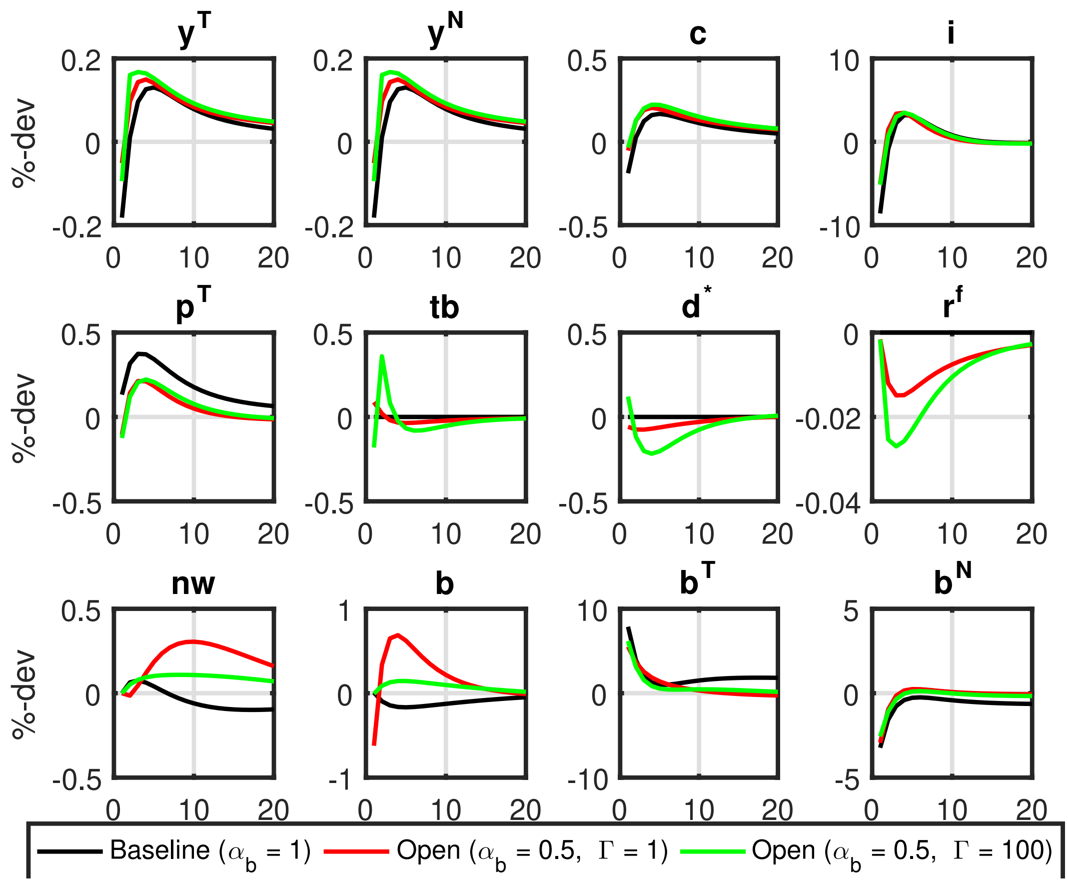
$$r_t^* = \rho_{r^*} r_{t-1}^* + \varepsilon^{r^*} \quad \ldots \quad world\ interest$$

$$\eta_t = \rho_\eta \eta_{t-1} + \varepsilon_t^\eta \quad \ldots \quad capital\ flow$$

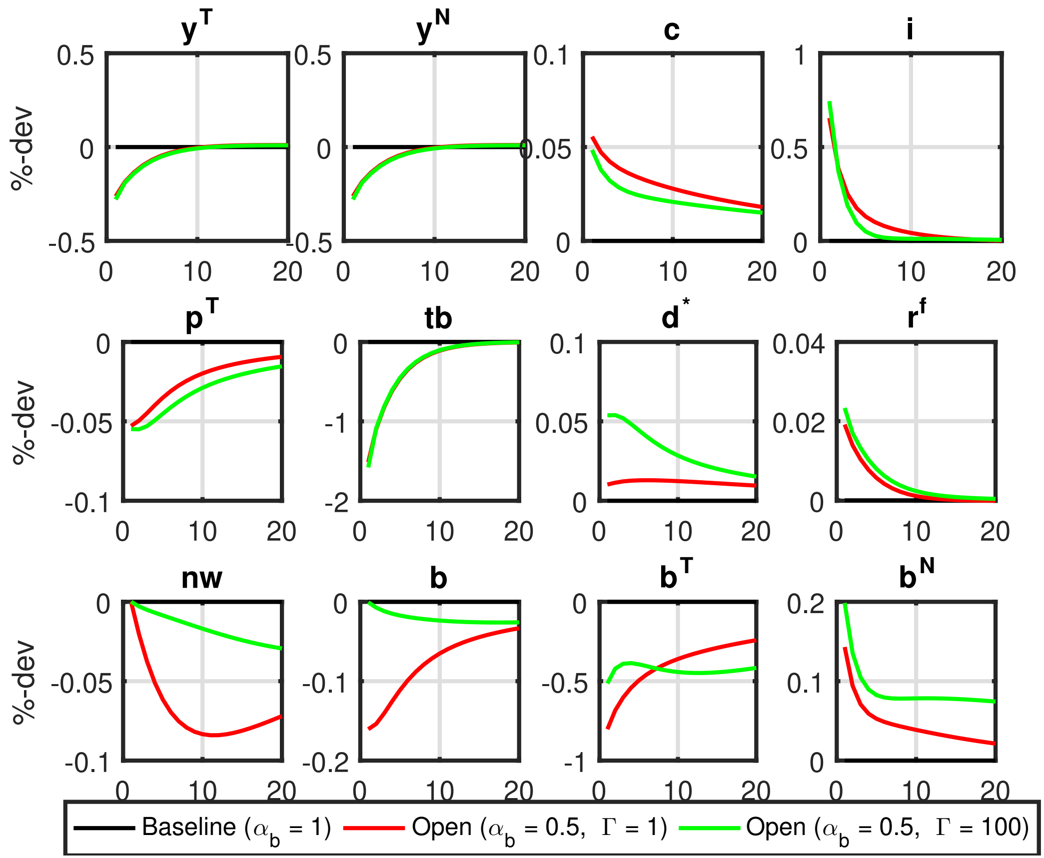
Parameters

Parameter	Value	Description
ϑ	0.30	Share of tradables
σ_c	2	Relative risk aversion
σ_d	5	Inverse interest rate elasticity of deposits
σ_h	1	Elasticity of labour supply
β	0.97	Discount factor home
δ	0.03	Rate of depreciation
ϕ^k	0.5	Physical capital adjustment cost
α_N	0.30	Nontradable share of capital
α_T	0.50	Tradable share of capital
φ	5	Working capital parameter
$\bar{r}^*_{ss}$	1.02	Average international interest rate
ϕ^{d^*}	0.01	Debt elasticity of domestic interest
α_b	**1(0.5)**	**Degree of financial openness**
Γ	**0(100)**	**Financiers risk-bearing capacity**
ξ_L	1	Bank funding elasticity of substitution
τ	0.15	Net worth (capital) to asset ratio
δ^b	0.10	Bank capital depreciation rate
κ	5	Bank capital asset ratio adjustment costs
ρ_{z_j}	0.75	Productivity shock persistence
ρ_μ	0.75	Bank capital shock persistence
ρ_η	0.75	Capital flow shock persistence
ρ_{r^*}	0.75	World interest rate persistence

Response to positive technology shock



Response to positive capital flow shock



Loss analysis

Optimal simple rule and standard deviations

	Policy 1 $\alpha_b = 1$	*Policy 2* $\alpha_b = 0.5, \Gamma = 1$	*Policy 3* $\alpha_b = 0.5, \Gamma = 100$
Technology shock			
Loss (Y)	0.0071	0.0035	0.0041
Bank capital shock			
Loss (Y)	0.1136	0.0015	0.0028
Capital flow shock			
Loss (Y)	0	0.0117	0.0141
World interest rate shock			
Loss (Y)	0	0.0043	0.0042
All shocks			
Loss (Y)	**0.1207**	**0.021**	**0.0252**

Concluding remarks

- When an economy is financially open (no capital controls) and its risk-bearing capacity is low, adjustments in the exchange rate, trade balance, and output increase.
- In contrast, under stricter capital inflow controls exchange rate stabilization is better achieved through improved risk-bearing capacity.
- Welfare analysis based on a quadratic loss function indicates that relaxing capital inflow controls (becoming more financially open) and a more-developed financial system (greater risk-bearing capacity) minimizes output variability.

Policy implication

Policymakers should look to sequence capital flow liberalization to allow for the development of the financial system to bear risk.

Future research

So far, I assume there are no nominal rigidities. In my next study

- I will estimate a model with sticky prices, and
- Analyze the role of monetary policy and the impact of large-scale FX interventions by governments. Introducing FX intervention introduces financial imperfection that will alter financiers' balance sheet hence a alteration to their demanded compensation.

End

Thank You!

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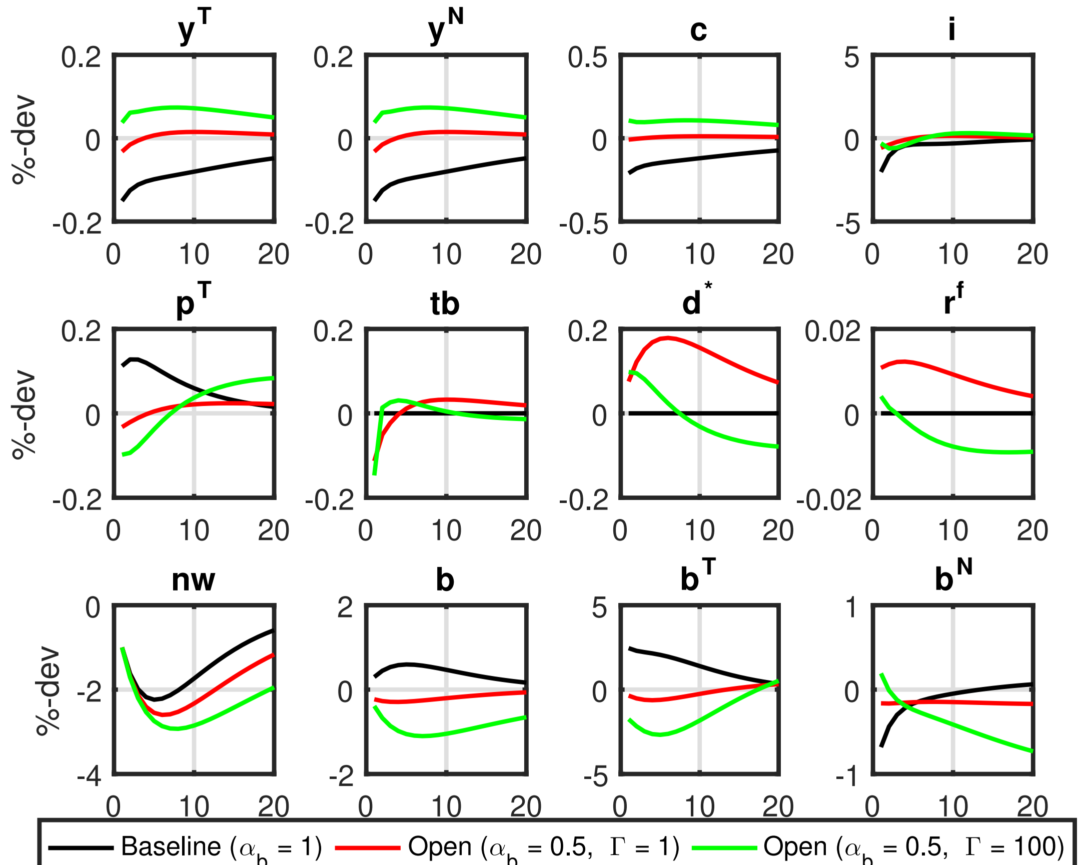
Response to negative bank capital shock



Response to positive world interest shock