

# Capital flows, credit growth, and labour reallocation

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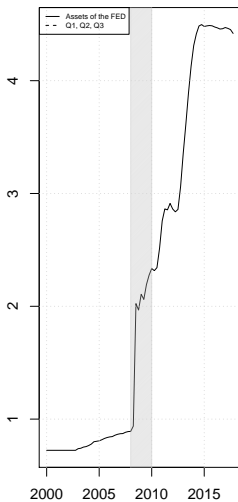
- Variation of the summer school's theme on money, finance and debt
  - **Capital flows**
  - **Credit provision**
  - **Economic structure**
- External shocks and economic performance in emerging markets
  - **Global liquidity:** Shin et al. (2013), Bruno and Shin (2017), Avdjiev et al. (2018)
  - **Economic performance:** Calvo et al. (1996), Canova (2005), Uribe and Yue (2006) and Anaya et al. (2017)
  - **Economic structure:** Benigno and Fornaro (2014), Benigno et al. (2015), Varela (2017), Gopinath et al. (2017)

Central question:

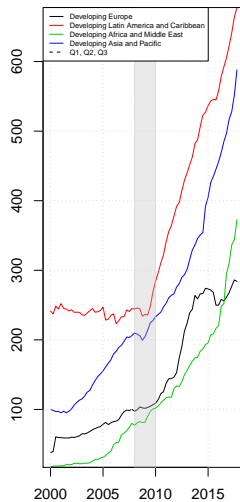
When the core of the world economy sneezes, do emerging markets *only* catch a cold?

# Global liquidity (1)

(a) UMP – Total assets

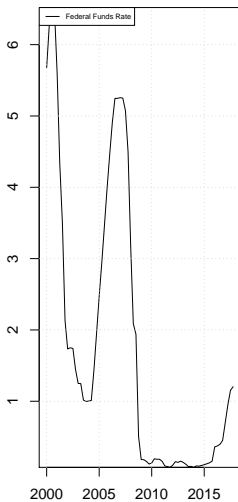


(b) Foreign debt issuance

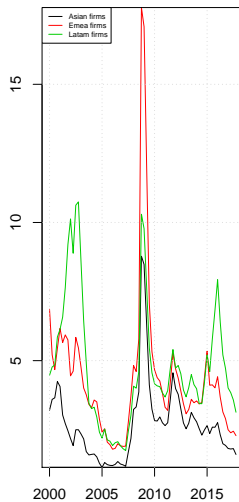


# Global liquidity (2)

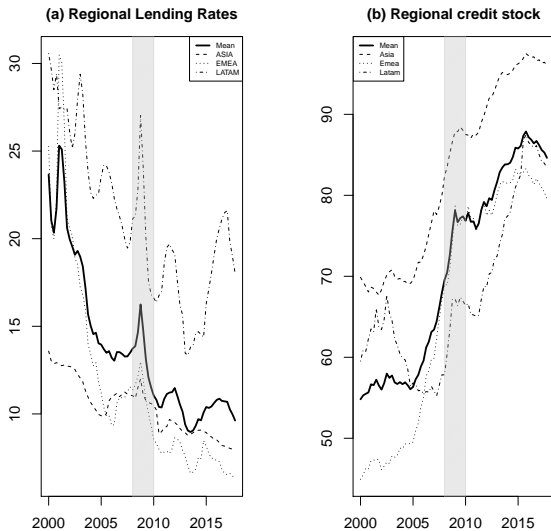
(a) Federal Funds Rate



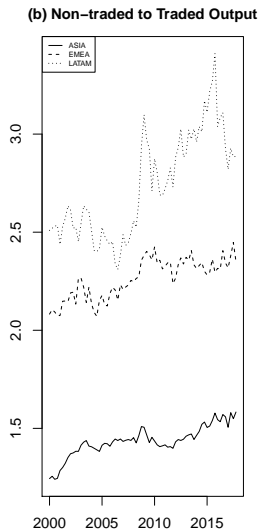
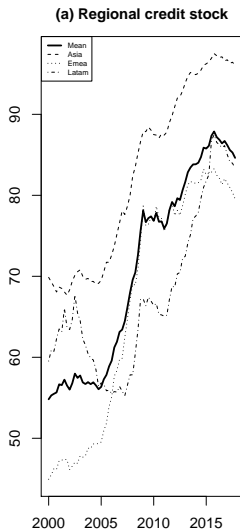
(b) Bond spread



# Local liquidity (1)



# Local liquidity (2) - Link?





# Fixed effects regression (1)

- Our panel regression for lending rates:

$$y_{it} = X'_{it}\beta + u_{it}; \quad i = 1, \dots, N \quad \text{and} \quad t = 1, \dots, T \quad (1a)$$

with

$$u_{it} = \mu_i + \lambda_t + v_{it}; \quad (1b)$$

- and the following variables

$$y_{it} = \textit{lending\_rates}_{it}; \quad (1c)$$

$$X_{it} = (\textit{port\_gdp}_{it}, \textit{dir\_gdp}_{it}, \textit{oi\_gdp}_{it}, \textit{cab\_gdp}_{it}, \textit{bond\_gdp}_{it}); \quad (1d)$$

# Lending rates & global liquidity

	<i>Dependent variable: local lending rates</i>		
	2000 - 2017	2000 - 2008	2009 - 2017
	(1)	(2)	(3)
Portfolio flows	0.102 (0.311)	-0.399 (0.656)	0.086 (0.341)
Direct investment	0.059 (0.193)	0.075 (0.121)	-0.053 (0.276)
Other investment	-0.409 (0.298)	-0.726 (0.591)	-0.222 (0.308)
Current Account	0.317** (0.138)	0.539** (0.273)	-0.076 (0.060)
Outstanding debt	-0.789*** (0.175)	-3.274*** (0.610)	-0.388*** (0.131)
Observations	864	432	432

*Note:*

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

## Fixed effects regression (2)

- Our panel regression for the credit stock:

$$y_{it} = X'_{it}\beta + u_{it}; \quad i = 1, \dots, N \quad \text{and} \quad t = 1, \dots, T \quad (2a)$$

with

$$u_{it} = \mu_i + \lambda_t + v_{it}; \quad (2b)$$

- and the following variables

$$y_{it} = \text{credit\_stock}_{it}; \quad (2c)$$

$$X_{it} = (\text{port\_gdp}_{it}, \text{dir\_gdp}_{it}, \text{oi\_gdp}_{it}, \text{cab\_gdp}_{it}, \text{bond\_gdp}_{it}); \quad (2d)$$

# Credit stock & global liquidity

	<i>Dependent variable: private non-financial sector credit</i>		
	2000 - 2017	2000 - 2008	2009 - 2017
	(1)	(2)	(3)
Portfolio flows	-0.937 (1.054)	-0.003 (1.625)	0.065 (1.158)
Direct investment	0.027 (1.018)	2.109*** (0.381)	-0.572 (1.212)
Other investment	-0.004 (0.781)	0.965 (0.677)	-0.110 (0.814)
Current Account	0.138 (0.150)	-0.546*** (0.159)	-0.549** (0.230)
Outstanding debt	0.479** (0.190)	1.587 (1.364)	-0.413 (0.417)
Observations	864	432	432

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

# Summary (1)

- Local lending rates
  - negative association between international debt securities by EME issuers and local lending rates
  - current account surpluses are associated with higher lending rates (not in post-GFC period)
  - caveat: the magnitude of the respective coefficients vs. graphical evidence
- Local credit stock
  - positive association between international debt securities and the credit stock
  - positive association between direct investment inflows and the credit stock in the pre-GFC period
  - a higher credit stock is associated with a current account deficit, see also Lane and McQuade (2014)
- How relevant are private sector debt issuances for macroeconomic performance / long-run development?

# Labour allocation (1)

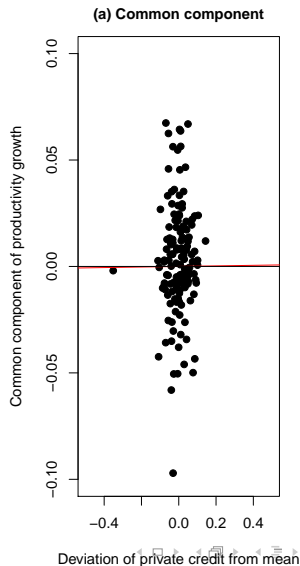
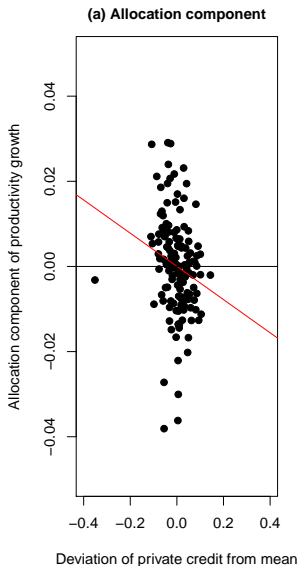
- Q: How relevant are private sector debt issuances for macroeconomic performance / long-run development?
  - How do credit 'booms' affect the reallocation of productive resources?
- A: Possible answer (1): Borio et al. (2016) decompose aggregate productivity growth into two components:
  - (1) overall within period aggregate productivity growth across sectors (common component)
  - (2) within period covariance between labour share growth and sectoral productivity growth across sectors (allocation component)

## Labour allocation (2)

- What happens to the individual components during credit boom periods?

$$1 + \frac{\Delta(y/l)}{y/l} = \underbrace{\left[ 1 + \frac{\overline{\Delta(l_s/l)}}{l_s/l} \right] \left[ 1 + \frac{\overline{\Delta(y_s/l_s)}}{y_s/l_s} \left( \frac{y_s}{y} \right) \right]}_{\text{common component}} + \underbrace{\text{cov} \left( \frac{\Delta(l_s/l)}{l_s/l}; \left( \frac{\Delta(y_s/l_s)}{y_s/l_s} \right) \frac{y_s}{y} \right)}_{\text{allocation component}} \quad (3)$$

# Labour allocation (3)





- Evidence from productivity growth
  - credit booms affect productivity growth negatively (see also Borio et al. (2016))
    - Main reason: labour reallocation between sectors (during credit boom times labour tends to move into sectors with lower productivity)
  - Problem: simple bivariate analysis that requires more rigorous econometric investigation or more theoretical reasoning

- Q: How relevant are private sector debt issuances for macroeconomic performance / long-run development?
  - Is global liquidity directly associated with the reallocation of productive resources?
- A: Possible answer (2): Two-sector general equilibrium model of a small open economy (Turnovsky, 1997) with the following characteristics:
  - traded and non-traded sector
  - credit frictions (surrogate financial intermediaries)
  - carry trade opportunities

# Household problem

Household utility is given by:

$$U \equiv \int_0^{\infty} \frac{1}{\epsilon} C^\epsilon e^{-\beta t} dt, \quad -\infty < \epsilon \leq 1 \quad (4a)$$

subject to her flow budget constraint

$$\dot{a} = ra + P_c C - w \quad (4b)$$

# Firm problem

Value of the firm expressed in traded goods

$$V(0) = \int_0^{\infty} ((F(K_T, L_T) + pH(K_N, L_N) + ra - w - I - \frac{\gamma}{\chi}a^X - (1 + \zeta)x - D)e^{-r^*t} dt \quad (5a)$$

subject to capital and credit accumulation

$$\dot{K} = I - \delta K \quad (5b)$$

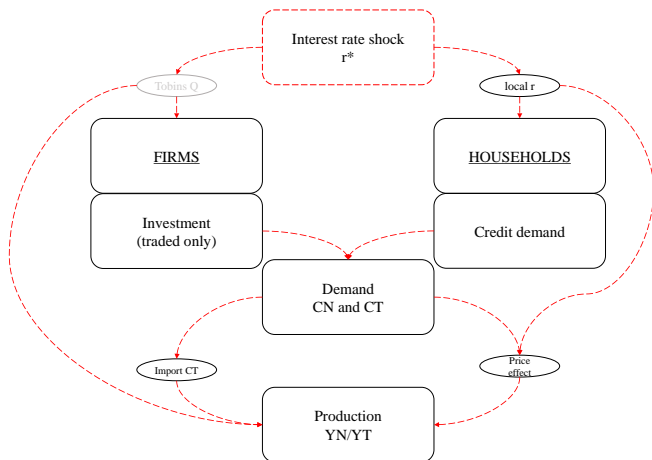
$$\dot{a} = x \quad (5c)$$

the factor allocation constraints

$$K_T + K_N = K \quad (5d)$$

$$L_T + L_N = 1 \quad (5e)$$

# Intuition



- **Proposition 1** – Global & local liquidity:
  - positive link between foreign interest rate ( $r^* = \mathbf{FED\ assets}$ ) and the domestic interest rate ( $r$ )
- **Proposition 2** – Credit shock:
  - negative link between foreign interest rate ( $r^*$ ) and the domestic credit stock
- **Proposition 3** – Structural change:
  - positive relation between credit provision and the reallocation of capital and labour

# Vector autoregressive model

Structural Vector Autoregressive Model (VARX) with 6 endogenous variables and  $r^* = assets_t$  as exogenous variable:

$$Ay_{i,t} = \eta_i + \sum_k^p A_k y_{i,t-k} + Fx_t + \epsilon_t, \quad \text{where } t = 1, 2, \dots, T \quad (6a)$$

where

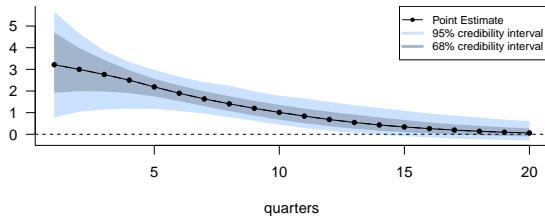
$$y_{i,t} = [pcr_{i,t}, nttr_{i,t}, cifi_{i,t}, lending_{i,t}, exr_{i,t}, spr_{i,t}] \quad (6b)$$

$$x_t = [assets_t] \quad (6c)$$

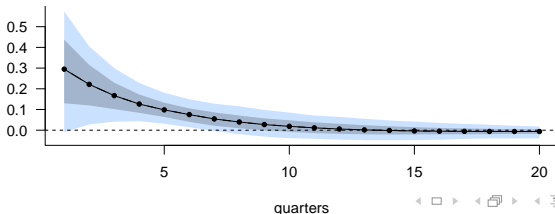
$$\epsilon_{i,t} = [\epsilon^{pcr_{i,t}}, \epsilon^{nttr_{i,t}}, \epsilon^{cifi_{i,t}}, \epsilon^{lending_{i,t}}, \epsilon^{exr_{i,t}}, \epsilon^{spr_{i,t}}] \quad (6d)$$

# Impulse response functions (1)

(a) p.p. deviation in creditstock



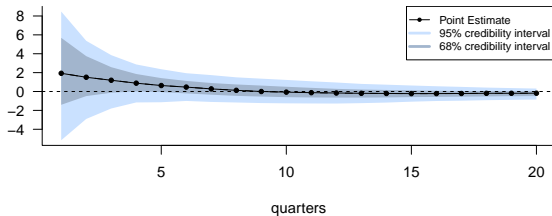
(b) p.p. deviation in NT/T ratio



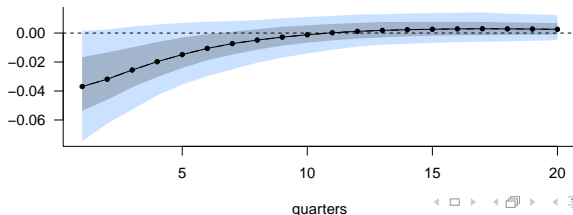


# Impulse response functions (2)

(c) p.p deviation in capital inflows

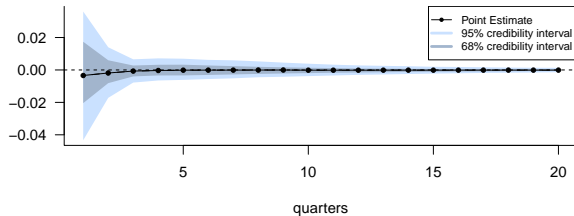


(d) % deviation in lending rates

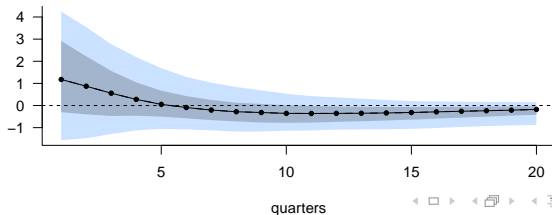


# Impulse response functions (3)

(e) % deviation in REER



(f) p.p. deviation in spread



## Central question:

When the core of the world economy sneezes, do emerging markets *only* catch a cold?

- Result: external shocks cause *sugar rush* of economic activity
  - main actor: EME non-financial firms
  - main carrier: cross-border capital flows
  - main impulse: local credit provision
- Cyclical risk: maturity and currency mismatches ("*when booms go bust*" Schularick and Taylor (2012))
- Structural risk: medium to long-run damage to the 'economic tissue'
  - reallocation of productive resources
  - obstacle for sustainable development ("*premature deindustrialization*" Rodrik (2016))

# Questions & suggestions



Traded activities	Non-traded activities
<ul style="list-style-type: none"> <li>● A (Agriculture, forestry and fishing)</li> <li>● B,C,D,E (Manufacturing, mining and quarrying and other industrial activities)</li> </ul>	<ul style="list-style-type: none"> <li>● F (Construction)</li> <li>● G,H,I (Wholesale and retail trade, transportation and storage, accommodation and food service activities)</li> <li>● J (Information and communication)</li> <li>● K (Financial and insurance activities)</li> <li>● L (Real estate activities)</li> <li>● M,N (Professional, scientific, technical, administrative and support service activities)</li> <li>● O,P,Q (Public administration and defence, education, human health and social work activities)</li> <li>● R,S,T and U (other service activities)</li> </ul>

Table: Distinction between non-traded and traded activities

# References I

- Anaya, P., Hachula, M., and Offermanns, C. J. (2017). Spillovers of us unconventional monetary policy to emerging markets: The role of capital flows. *Journal of International Money and Finance*, 73:275–295.
- Avdjiev, S., Shin, H. S., et al. (2018). Gauging procyclicality and financial vulnerability in asia through the bis banking and financial statistics. Technical report, Bank for International Settlements.
- Benigno, G., Converse, N., and Fornaro, L. (2015). Large capital inflows, sectoral allocation, and economic performance. *Journal of International Money and Finance*, 55:60–87.
- Benigno, G. and Fornaro, L. (2014). The Financial Resource Curse\*. *The Scandinavian Journal of Economics*, 116(1):58–86.
- Borio, C. E., Kharroubi, E., Upper, C., and Zampolli, F. (2016). Labour reallocation and productivity dynamics: financial causes, real consequences.

## References II

- Bruno, V. and Shin, H. S. (2017). Global dollar credit and carry trades: A firm-level analysis. *The Review of Financial Studies*, 30(3):703–749.
- Calvo, G. A., Leiderman, L., and Reinhart, C. M. (1996). Inflows of capital to developing countries in the 1990s. *The Journal of Economic Perspectives*, 10(2):123–139.
- Canova, F. (2005). The transmission of us shocks to latin america. *Journal of Applied econometrics*, 20(2):229–251.
- Gopinath, G., Kalemli-Özcan, Ş., Karabarbounis, L., and Villegas-Sanchez, C. (2017). Capital allocation and productivity in south europe. *The Quarterly Journal of Economics*, 132(4):1915–1967.
- Lane, P. R. and McQuade, P. (2014). Domestic credit growth and international capital flows. *The Scandinavian Journal of Economics*, 116(1):218–252.

## References III

- Rodrik, D. (2016). Premature deindustrialization. *Journal of Economic Growth*, 21(1):1–33.
- Schularick, M. and Taylor, A. (2012). Credit booms gone bust: Monetary policy, leverage cycles and financial crises, 1879–2008. *The American Economic Review*, 102(2):1029–1061.
- Shin, H. S. et al. (2013). The second phase of global liquidity and its impact on emerging economies. In *Federal Reserve Bank of San Francisco Proceedings*, number Nov, pages 1–10.
- Turnovsky, S. J. (1997). *International Macroeconomic Dynamics*. MIT Press, Cambridge, Massachusetts.
- Uribe, M. and Yue, V. Z. (2006). Country spreads and emerging countries: Who drives whom? *Journal of International Economics*, 69(1):6–36.
- Varela, L. (2017). Sector heterogeneity and credit market imperfections in emerging markets. *Journal of International Money and Finance*, 70:433–451.