Capital flows, credit growth, and labour reallocation

Mario Huzel

UNIBZ

09/03/2018 - UNCTAD
Outline

1. Introduction

2. Motivation
   - Global liquidity
   - Local liquidity
   - Empirical evidence

3. Structural implications
   - Labour allocation
   - Small open economy
   - Theory & Data

4. Summary
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)
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

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Global liquidity (2)

(a) Federal Funds Rate

(b) Bond spread

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Local liquidity (1)

(a) Regional Lending Rates

(b) Regional credit stock

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Local liquidity (2) - Link?

(a) Regional credit stock

(b) Non-traded to Traded Output

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Fixed effects regression (1)

- Our panel regression for lending rates:

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

with

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

- and the following variables

\[ y_{it} = \text{lending\_rates}_{it}; \quad (1c) \]

\[ X_{it} = (\text{port\_gdp}_{it}, \text{dir\_gdp}_{it}, \text{oi\_gdp}_{it}, \text{cab\_gdp}_{it}, \text{bond\_gdp}_{it}); \quad (1d) \]
### Lending rates & global liquidity

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Portfolio flows</td>
<td>0.102</td>
<td>−0.399</td>
<td>0.086</td>
</tr>
<tr>
<td></td>
<td>(0.311)</td>
<td>(0.656)</td>
<td>(0.341)</td>
</tr>
<tr>
<td>Direct investment</td>
<td>0.059</td>
<td>0.075</td>
<td>−0.053</td>
</tr>
<tr>
<td></td>
<td>(0.193)</td>
<td>(0.121)</td>
<td>(0.276)</td>
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<tr>
<td>Other investment</td>
<td>−0.409</td>
<td>−0.726</td>
<td>−0.222</td>
</tr>
<tr>
<td></td>
<td>(0.298)</td>
<td>(0.591)</td>
<td>(0.308)</td>
</tr>
<tr>
<td>Current Account</td>
<td>0.317**</td>
<td>0.539**</td>
<td>−0.076</td>
</tr>
<tr>
<td></td>
<td>(0.138)</td>
<td>(0.273)</td>
<td>(0.060)</td>
</tr>
<tr>
<td>Outstanding debt</td>
<td>−0.789***</td>
<td>−3.274***</td>
<td>−0.388***</td>
</tr>
<tr>
<td></td>
<td>(0.175)</td>
<td>(0.610)</td>
<td>(0.131)</td>
</tr>
<tr>
<td>Observations</td>
<td>864</td>
<td>432</td>
<td>432</td>
</tr>
</tbody>
</table>

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

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Liquidity and structural change

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Fixed effects regression (2)

- Our panel regression for the credit stock:

\[ y_{it} = X'_{it} \beta + u_{it}; \quad i = 1, \ldots, N \quad \text{and} \quad t = 1, \ldots, T \]  

with

\[ u_{it} = \mu_i + \lambda_t + \nu_{it}; \]  

- and the following variables

\[ y_{it} = \text{credit_stock}_{it}; \]  

\[ X_{it} = (\text{port}_gdp_{it}, \text{dir}_gdp_{it}, \text{oi}_gdp_{it}, \text{cab}_gdp_{it}, \text{bond}_gdp_{it}); \]
## Credit stock & global liquidity

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<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Portfolio flows</td>
<td>−0.937</td>
<td>−0.003</td>
<td>0.065</td>
</tr>
<tr>
<td></td>
<td>(1.054)</td>
<td>(1.625)</td>
<td>(1.158)</td>
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<tr>
<td>Direct investment</td>
<td>0.027</td>
<td>2.109***</td>
<td>−0.572</td>
</tr>
<tr>
<td></td>
<td>(1.018)</td>
<td>(0.381)</td>
<td>(1.212)</td>
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<tr>
<td>Other investment</td>
<td>−0.004</td>
<td>0.965</td>
<td>−0.110</td>
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<tr>
<td></td>
<td>(0.781)</td>
<td>(0.677)</td>
<td>(0.814)</td>
</tr>
<tr>
<td>Current Account</td>
<td>0.138</td>
<td>−0.546***</td>
<td>−0.549**</td>
</tr>
<tr>
<td></td>
<td>(0.150)</td>
<td>(0.159)</td>
<td>(0.230)</td>
</tr>
<tr>
<td>Outstanding debt</td>
<td>0.479**</td>
<td>1.587</td>
<td>−0.413</td>
</tr>
<tr>
<td></td>
<td>(0.190)</td>
<td>(1.364)</td>
<td>(0.417)</td>
</tr>
<tr>
<td>Observations</td>
<td>864</td>
<td>432</td>
<td>432</td>
</tr>
</tbody>
</table>

*Note:*  
* p<0.1; ** p<0.05; *** p<0.01
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?
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)
What happens to the individual components during credit boom periods?

\[
1 + \frac{\Delta(y/l)}{y/l} = \left[ 1 + \frac{\Delta(l_s/l)}{l_s/l} \right] \left[ 1 + \frac{\Delta(y_s/l_s)}{y_s/l_s} \left( \frac{y_s}{y} \right) \right]
\]

Common component

\[
+ \text{cov} \left( \frac{\Delta(l_s/l)}{l_s/l}, \left( \frac{\Delta(y_s/l_s)}{y_s/l_s} \right) \frac{y_s}{y} \right)
\]

Allocation component
Labour allocation (3)

(a) Allocation component

(a) Common component

Deviation of private credit from mean

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Summary (2)

- 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
Economic theory

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:

\[ U \equiv \int_{0}^{\infty} \frac{1}{\epsilon} C^{\epsilon} e^{-\beta t} dt, \quad -\infty < \epsilon \leq 1 \]  \hspace{1cm} (4a)

subject to her flow budget constraint

\[ \dot{a} = ra + P_c C - w \]  \hspace{1cm} (4b)
Firm problem

Value of the firm expressed in traded goods

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

(5a)

subject to capital and credit accumulation

\[ \dot{K} = I - \delta K \]

(5b)

\[ \dot{a} = x \]

(5c)

the factor allocation constraints

\[ K_T + K_N = K \]

(5d)

\[ L_T + L_N = 1 \]

(5e)
Intuition

Interest rate shock $r^*$

FIRMS

Investment (traded only)

Demand CN and CT

Credit demand

HOUSEHOLDS

Production YN/YT

Import CT

Tobins Q

local $r$

Price effect

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Propositions

- **Proposition 1** – Global & local liquidity:
  - positive link between foreign interest rate ($r^* = \text{FED assets}$) 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
Structural Vector Autoregressive Model (VARX) with 6 endogenous variables and \( r^* = assets_t \) as exogenous variable:

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

where

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

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

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

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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
<table>
<thead>
<tr>
<th>Traded activities</th>
<th>Non-traded activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>• A (Agriculture, forestry and fishing)</td>
<td>• F (Construction)</td>
</tr>
<tr>
<td>• B,C,D,E (Manufacturing, mining and quarrying and other industrial activities)</td>
<td>• G,H,I (Wholesale and retail trade, transportation and storage, accommodation and food service activities)</td>
</tr>
<tr>
<td></td>
<td>• J (Information and communication)</td>
</tr>
<tr>
<td></td>
<td>• K (Financial and insurance activities)</td>
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<tr>
<td></td>
<td>• L (Real estate activities)</td>
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<tr>
<td></td>
<td>• M,N (Professional, scientific, technical, administrative and support service activities)</td>
</tr>
<tr>
<td></td>
<td>• O,P,Q (Public administration and defence, education, human health and social work activities)</td>
</tr>
<tr>
<td></td>
<td>• R,S,T and U (other service activities)</td>
</tr>
</tbody>
</table>

Table: Distinction between non-traded and traded activities


