

Relationship between Central Banking and Interbank Market liquidity. By Massimiliano Affinito

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BANCO DE MÉXICO

I. Overview of main results in the paper

1. LIQUIDITY INTERDEPENDENCIES EMPIRICALLY IDENTIFIED FOR ITALY

- **Interbank Markets (IM)** is influenced by **Central Bank (CB) liquidity policies**.
- CB Liquidity Policies influences IM connections.
- CB Liquidity Policies influences Retail Distribution Markets.



2. PERIODS OF FINANCIAL DISTRESS

- IM and CB liquidity have a complementary role.
- CB liquidity spreads throughout the network to other Banks in the IM.
- CB liquidity provisions to single banks amplifies the IM's main liquidity role.
- CB liquidity provisions increases both interbank and retail lending.



**FINANCIAL DISTRESS IS ALSO CONSIDERED
BY THE G20, WITH INITIATIVES LIKE THE
BIS-INTERNATIONAL BANKING STATISTICS
(ULTIMATE RISK BASIS)**

(*) **DISCLAIMER:** The views expressed here are solely those of the author and do not necessarily reflect those of Banco de México.

II. Review of the model

1. INFORMATION USED

- Statistical monthly data for 17 years (1998 to 2015) of financial reporting Institutions.
- Variables used for each financial institution i in the system using information with 1 month of delay

a) **Banks Characteristics or Regressors (M_{t-1}^R):**
Total Assets, Retail Loans, Retail Fundraising
Non-performing loans, ROE, Tier 1 Capital,
Government Debt Securities (domestic),
Government Debt Securities (EU), Bonds.

b) **Instruments to explain CB liquidity ($M_{1,t-1}^I$):**
Lagged CB liquidity (to each bank),
Eurosystem total assets, ECB Interest Rates,
Euro-area GDP, Euro-area Inflation Rates.

c) **Instruments to estimate IM Positions ($M_{2,t-1}^I$):**
Lagged IM positions, Credit Ratings (Fitch),
Banks without ratings (0 or 1)

**THE EXPLANATORY VARIABLES
ARE ONE MONTH DELAYED (t-1).**

**IS THERE ANY GRANGER
CAUSALITY !?**

**IMPORTANT MONETARY POLICY
VARIABLES CONSIDERED: IR,
GROWTH AND INFLATION.**

**QUESTION: EXCHANGE RATE IS
MISSING !?**

II. Review of the model

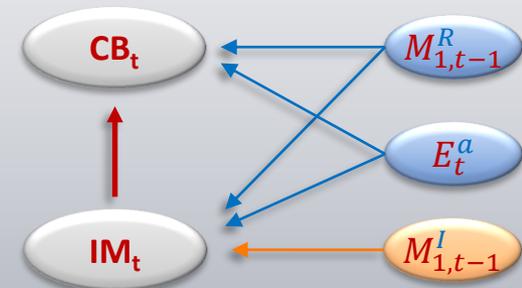
LOOKS LIKE AN EQUILIBRIUM MODEL WITH LAGGED INFORMATION.

2. THE MODEL

- Two systems with two linear equations each: *bank characteristics* ($M_{1,t-1}^R$ and $M_{2,t-1}^R$), *matrices of instruments* ($M_{1,t-1}^I$ and $M_{2,t-1}^I$), *banks and time periods fixed effects* (E_t), idiosyncratic normally distributed errors ($\varepsilon_{1,t}$, $\xi_{1,t}$, $\varepsilon_{2,t}$ and $\xi_{2,t}$) and CB_t as Central Bank liquidity.

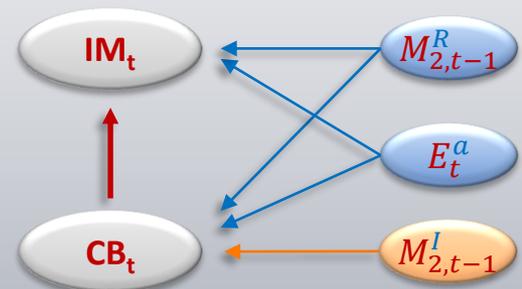
- CB liquidity auctions equate IM borrowing liquidity:** Depends on M_{t-1}^I , represented mainly by macroeconomic variables (IR, GDP, Inflation)

$$\begin{cases} CB_t = a_1 IM_t + a_2 M_{1,t-1}^R + a_3 E_t + \varepsilon_{1,t}^a, \\ IM_t = a_4 M_{1,t-1}^I + a_5 M_{1,t-1}^R + a_6 E_t + \xi_{1,t}^a \end{cases}$$



- CB's liquidity complements IM liquidity:** Depends on M_{t-1}^I , represented mainly by previous IM positions and Credit Ratings.

$$\begin{cases} IM_t = a_1 CB_t + a_2 M_{2,t-1}^R + a_3 E_t + \varepsilon_{2,t}^a, \\ CB_t = a_4 M_{2,t-1}^I + a_5 M_{2,t-1}^R + a_6 E_t + \xi_{2,t}^a \end{cases}$$



II. Review of the model

3. PARAMETERS ESTIMATION WITH IV (2SLS)

- Estimation with **Instrumental Variables in Two-Stage regression with Least-Squares**.
- The estimation results were **exhaustively verified with several robustness tests**, comprising most technical questions mainly by empirical means.
- It was reassuring that the **idiosyncratic errors** assumptions were reported:

$$\mathbb{E}[\xi_{1,i,\cdot}], \mathbb{E}[\xi_{2,i,\cdot}], \mathbb{E}[\varepsilon_{1,i,\cdot}], \mathbb{E}[\varepsilon_{2,i,\cdot}] \approx 0$$

**THE PAPER PROPOSES TO INCLUDE
ADDITIONAL SYSTEMS OF LINEAR
EQUATIONS (COUNTERPARTIES),
HOWEVER IT MIGHT BE NECESSARY TO
CHECK FOR CONSISTENCY BETWEEN
EQUATIONS AND STATISTICAL
SIGNIFICANCE...**

III. Paper and the BIS-International Banking Statistics (IBS)

❖ INTERNATIONAL LIQUIDITY DISTRESS CONTAGION:

- **Paper** local contagious effects at institutions level (Italy / EU)
- **IBS** contagious effects across different countries (Branches or Subsidiaries abroad) at countries level. [1]

❖ ISSUES IDENTIFIED AFTER THE 2007 CRISIS:

- **Paper** includes many explanatory variables and identifies crisis periods.
- **BIS** has recognised “critical gaps in the [IBS] information available to monitor and respond to financial stability risks.” [2,3]

❖ LIQUIDITY RISKS SIGNALS AND CAPACITY TO RECOVER.

- **Paper** focus mainly in liquidity network interrelations and crisis periods identification.
- **IBS** incorporates ultimate risk basis as a measure to monitor the capacity of the bank parent to overcome distresses. [1,2]

[1] **Bruno Tissot**, Globalisation and financial stability risks: is the residency-based approach of the national accounts old-fashioned?; **BIS Working Papers**, October 2016.

[2] **BIS**, Guidelines for reporting the BIS international banking statistics; **BIS Monetary and Economic Department**, 2003.

[3] **Avdjiev S., McGuire P., Wooldridge P.**, Enhanced data to analyse international banking; **BIS Quarterly Review**, September 2015.

[4] **Ben S. Bernanke**, Speech Four Questions about the Financial Crisis; **Board of Governors of the Federal Reserve System**, April 14, 2009.

[5] **Janet L. Yellen**, Speech Macroeconomic Research After the Crisis; **Board of Governors of the Federal Reserve System**, October 14, 2016.

III. Paper and the BIS-International Banking Statistics (IBS)

❖ LIQUIDITY LIFETIME FEEDBACKS AND SIDE EFFECTS:

- **Paper** explores short term liquidity (monthly basis) and up to 5 months for different robust tests.
- **IBS** splits the information of foreign and local balance positions in different time buckets (< 1 yr, up to 2 yrs, > 2 yrs) [2]
- **Going further:** After the 2007 crisis, there was concern of long term side effects and feedbacks (e.g. low interest rates, balance risk, etc.) [4,5]. How does the model cope with it?
- **Going further:** When microdata is available (say on a daily basis), might it provide additional insights into liquidity risks?

❖ IN CONCLUSION:

- The **Paper** introduces a model using empirical information to analyse liquidity risk, identification of crisis periods and liquidity transmission mechanisms.
- It has common ground with the **IBS** initiative, using massive information available.
- The **Paper** might complement well with other initiatives like the **IBS** in its quest to “monitor and respond to financial stability risks”

[1] Bruno Tissot, Globalisation and financial stability risks: is the residency-based approach of the national accounts old-fashioned?; **BIS Working Papers**, October 2016.

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