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Too-connected-to-fail institutions and payment system's stability: assessing challenges for financial authorities

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* This presentation reflects the views of the authors and not necessarily those of the BIS or of central banks participating in the meeting.

Too-connected-to-fail Institutions and Payments System's Stability: Assessing Challenges for Financial Authorities

Second BIS Consultative Council for the Americas Conference on Monetary Policy, Financial Stability and the Business Cycle
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Why?

*Three key criteria are helpful in identifying the systemic importance of markets and institutions: size, substitutability and **interconnectedness**.*

International Monetary Fund,
Bank for International Settlements &
Financial Stability Board (2009)

*[…] the important question is whether, **in the event of nasty shocks, our capital markets can absorb them [?]** or whether they have developed characteristics which may, as some suggest, leave them vulnerable.*

Paul Tucker (2005)
Executive Director for Markets and
Member of the Monetary Policy Committee,
Bank of England

It is most relevant to be able to assess whether *too-connected-to-fail* institutions make the financial system fragile, and whether financial authorities are prepared to cope with a *too-connected-to-fail* systemic shock or not.

Agenda

- Lessons from recent developments and their implications for the oversight framework

- Assessing systemic risk within the payments system

- Main results and analysis

- Concluding remarks

Lessons from recent developments

Too-connected-to-fail (TCTF) institutions were key in recent episodes…

Before...

Big banks were considered…

• the most connected.
• the institutions that most concentrated liquidity and payments.
• the main source of systemic risk.
• the only capable of affecting "widows or orphans" (i.e. the public).
• the most regulated and supervised.
• the target of the tools for crisis |prevention and management (lender of last resort, deposit insurance).

• Banking systemic risk was the key.
• "Funding liquidity" crisis approach.

Now...

Non-bank institutions (securities and insurance firms, mutual and pension funds, others) are also considered…

• heavily connected.
• hubs of liquidity and payments.
• an important source of systemic risk.
• capable of affecting "widows or orphans" via market prices.
• More (but still insufficiently?) regulated and supervised.

But tools for crisis prevention and management were not designed for these institutions.

• "Connectedness" is as important as size.
• "Market liquidity crisis".

How did we get here?

Why is this important?

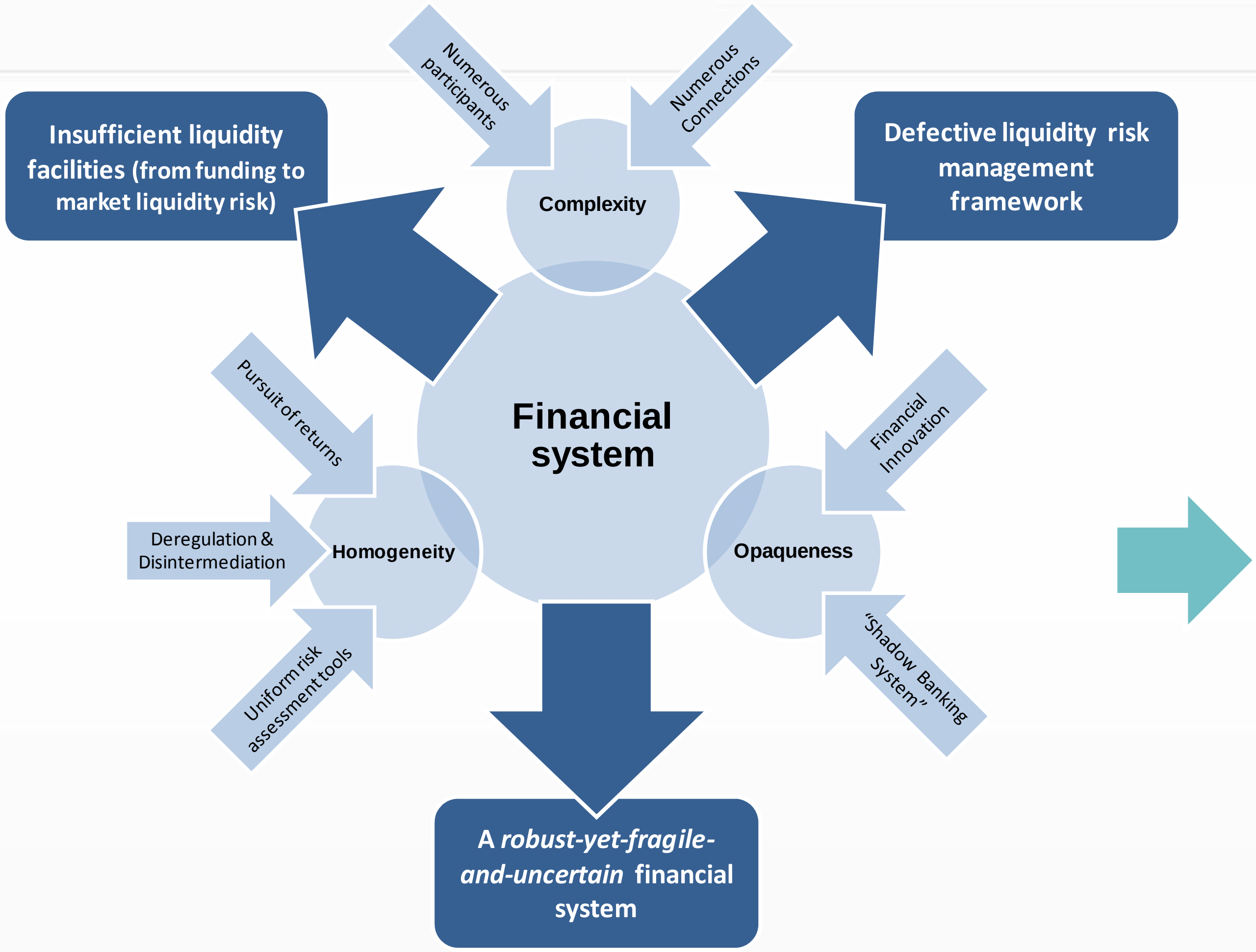
Lessons from recent developments

How did we get here?

- Complexity
- Homogenity
- Opaqueness

Why is this important?

- We live in a robust-yet-fragile and uncertain system
- Liquidity risk management is defective (non-systemic)
- Liquidity facilities may turn insufficient



Lessons from recent developments

… strengthening emphasis on macro-prudential approach is mandatory.

Consequences

Regulation and supervision were too institution-centric to see through to the systemic risk (IMF, 2009)

Micro-prudential approach […] to systemic risk […] is insufficient
The connections between components are as important as the components themselves. (León et al., 2011)

[…] preventing failure of an institution is a necessary but not sufficient condition for effective and efficient clearing and settlement where connectedness matters

It is reasonable to put more emphasis on macro-prudential regulation and supervision

From micro to macro-prudential

Micro-prudential approach	Macro-prudential approach
Focus: financial institutions	**Focus:** financial infrastructures
Metrics: financial statements and solvency ratios	**Metrics:** liquidity and connectedness (centrality).
Scope: individually analyzing and inspecting financial institutions → default risk	**Scope:** system –wide perspective on the systemic risk

[…] the use of prudential tools with the explicit objective of promoting the stability of the financial system as a whole, not necessarily of the individual institutions within it.
BIS (2010)

Agenda

- Oversight: from micro-prudential to macro-prudential
- Assessing systemic risk within the payments system
- Main results and analysis
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Assessing systemic risk within the payments system

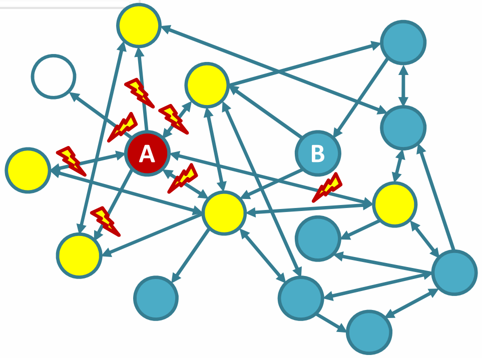
How to identify and assess systemic risk?

	TBTF	TCTF
Scope	Individually analyzing and inspecting financial institutions → default risk	Aggregately analyzing and inspecting the financial system → systemic risk
Focus	Financial institutions.	Payment systems and instruments (infrastructure)
Metrics	Assets, Deposits, Loans.	Centrality, betweenness.
Advantages	• Based on observable accounting data. • Easy to track. • "Easy" to forecast.	• Captures complexity of financial systems. • Identifies concealed sources of systemic risk. • Recognizes the increasing role of non-banking institutions ("shadow banking system")
Disadvantages	• Institution centric. • Focus on banking institutions. • Unreliable accounting data. • Unable to capture connectedness • Model risk.	• Requires models able to capture cross-dependency, context-dependency, non-linearity, complexity. • Define connection: claims? payments? • Model risk.
Key cases	• Overend Gurney and Co. Ltd. (U.K., 1866) • Baring Brothers (U.K., 1890) • The Bank of United States (U.S., 1929) • Johnson Matthey Bankers (U.K., 1984) • Continental Illinois (U.S., 1984)	• Herstatt Bankhaus (GER, 1974) • LTCM (U.S., 1987) • AIG, Bear Sterns, Lehman, Freddie Mac, Fannie Mae (U.S., 2008)

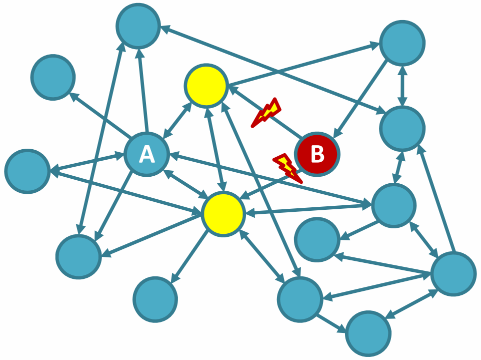
Assessing systemic risk within the payments system

Centrality: A key concept from Network Topology

If A fails…



If B fails…



Node A…
- Maintains direct links with 7 nodes
- Sends payments to 7 nodes
- Receives payments from 4 nodes

Node B…
- Maintains direct links with 3 nodes
- Sends payments to 2 nodes
- Receives payments from 1 node

<u>Network Topology</u> allows for identifying central institutions
[centrality: the importance of the participant in the payments system]

<u>Simulation techniques</u> allows for assessing the direct and indirect outcomes of "attacks" on central institutions

BR Colombia approach:

Network Topology + Simulation techniques

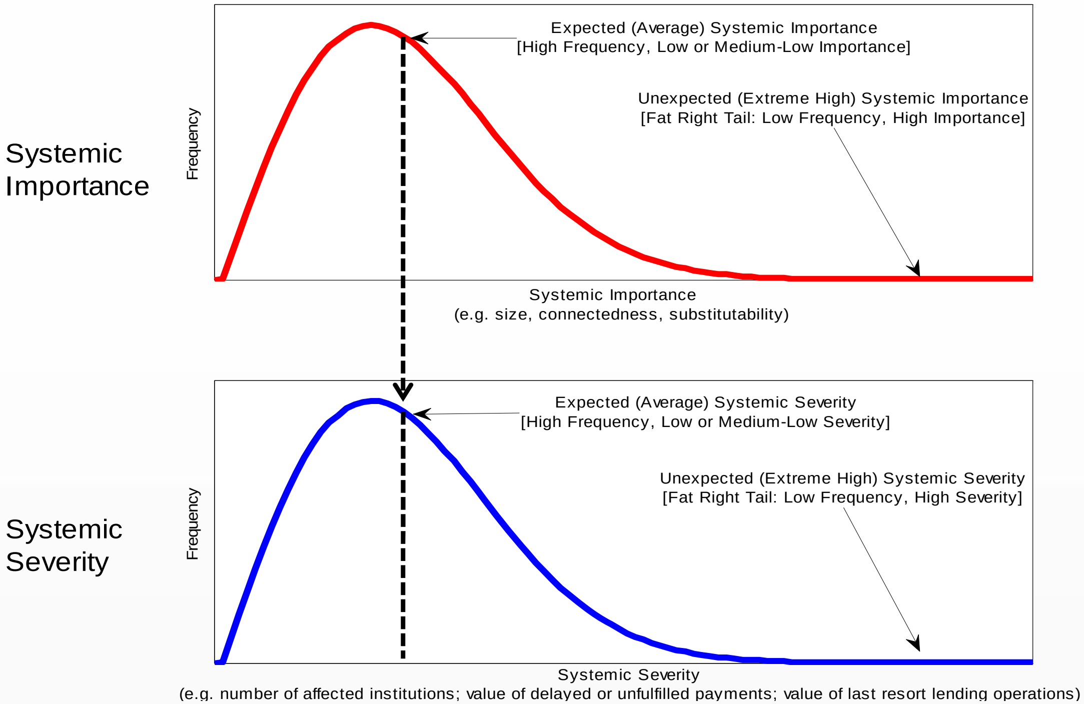
Assessing systemic risk within the payments system

Why is centrality a key concept?
Why not using the average financial institution?
Why not making random shocks to the system?

Financial and payments networks nowadays may be described as robust to random disturbances, but highly susceptible to targeted attacks (Haldane, 2009; León et al., 2011).

Systemic importance of financial institutions (i.e. size, connectedness, substitutability) being distributed with a high degree of asymmetry (right skew) and excess kurtosis, makes the average institution of low systemic importance.

As financial authorities should be prepared to confront a non-average but extreme threat to financial stability or payment systems safety, the supervision, oversight and regulation should be designed to cope with one (or even two) systemically important institution(s) failing or near failing.*



(*) As recently suggested by BIS's Committee on Payment and Settlement Systems (2011)

Assessing systemic risk within the payments system

Banco de la República approach: NT + Simulation Techniques

Liquidity sources:
- Own portfolios (eligible collateral)
- Central bank facilities

NT

Simulation Techniques

Centrality Rank by institution (NT)

Payments System Simulation [Attacking Central Institutions]

Effect on intraday individual liquidity

Individual resilience to the attack

Aggregate resilience to the attack

TCTF RELATED SYSTEMIC RISK

Liquidity requirements, unsettled transactions

Comprehensiveness of the:
- Individual liquidity responsiveness
- Financial safety net

Financial authorities' challenges

Agenda

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Main results and analysis

Banco de la República liquidity facilities

	Objective	Scope	Limit	Eligible Collateral	Term
Macro Liquidity *[OMO]*	Implementing monetary policy	OMO agents (not limited by type of institution)	Linked to reservable liabilities or capital.	Sovereign securities (Central government debt)	1 day
Payments System Liquidity: Intraday *Repo*	Payments system's efficiency and safety	OMO agents (not limited by type of institution)	Linked to reservable liabilities or capital.	Sovereign securities (Central government debt)	< 1 day
Payments System Liquidity: Overnight *Repo*	Payments system's efficiency and safety	OMO agents (not limited by type of institution)	Linked to reservable liabilities or capital.	Sovereign securities (Central government debt)	1 day
Lender of Last Resort *[Transitory Liquidity Facility]*	Tackling liquidity problems	Credit Institutions Only (Banking)	15% of liabilities with the public	Sovereign securities + financial investment + credit loans	30-180 days

Our concerns regarding central bank's role within the payments system.

Are the liquidity facilities'…

- Scope
- Limits
- Eligible collateral

adequate to cope with systemic shocks?

Main results and analysis

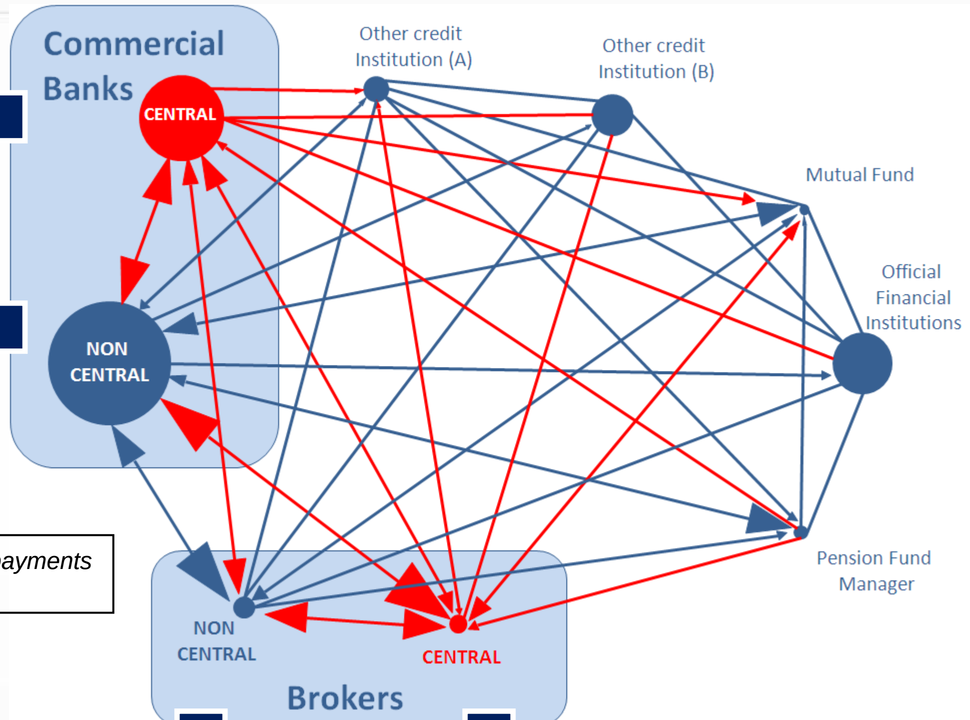
Network topology allowed for **identifying central participants**

1

Too-connected commercial banks are systemic relevant institutions (as with micro-prudential approach)

2

Commercial banks are systemic relevant institutions (as with micro-prudential approach)



Arrows: volume of payments
Nodes: asset value

3

Brokers are systemic relevant institutions **(unlike with micro-prudential approach)**

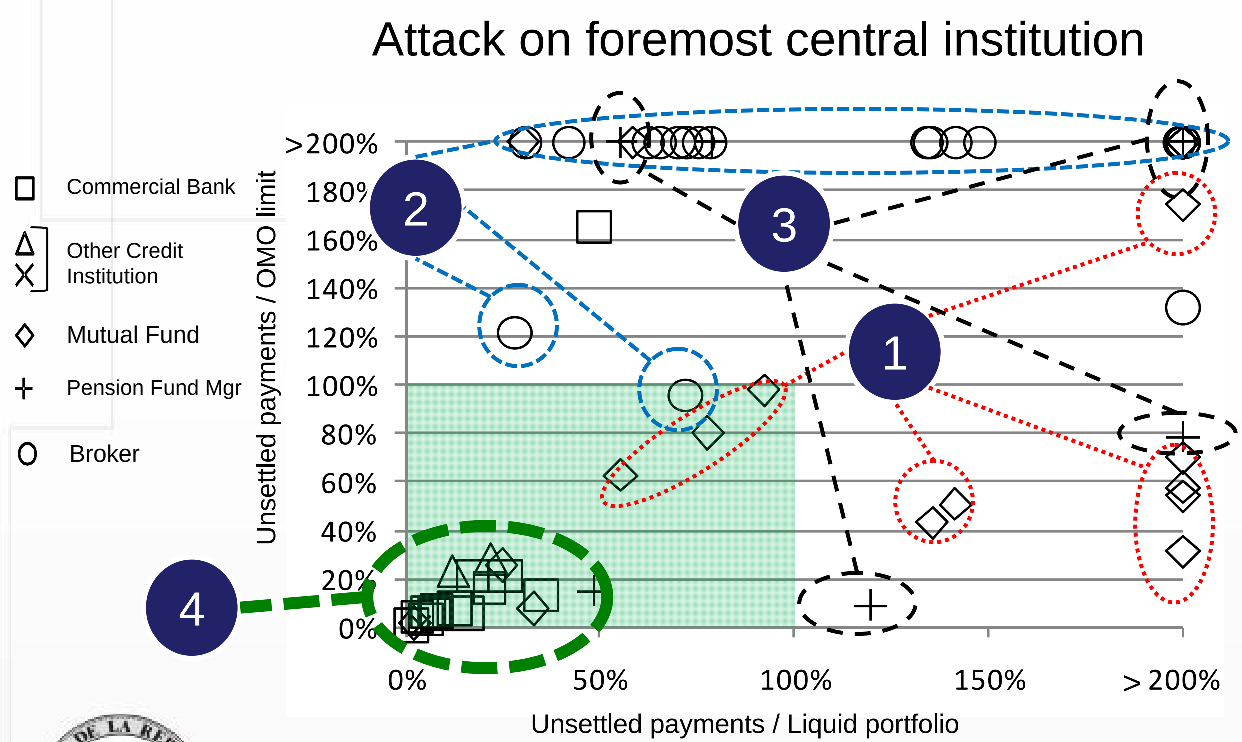
4

Too-connected brokers are systemic relevant institutions **(unlike with micro-prudential approach)**

New Info!

Main results and analysis

Simulation techniques allowed for **assessing the outcomes of attacks on (i.e. failure of selected) central institutions**



1 On average, Mutual Funds have no liquid portfolio to withstand an attack to a systemic relevant institution

2 On average, Brokers have insufficient access to OMO liquidity to withstand an attack to a systemic relevant institution

3 Some pension fund managers have insufficient access to OMO liquidity and portfolio liquidity to withstand an attack to a systemic relevant institution

New Info!

4 Banking and credit institutions have enough access to liquidity via OMO and liquid portfolios (+ LLR) to withstand an attack to a systemic relevant institution

Main results and analysis

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Lender of Last Resort *[Transitory Liquidity Facility]*		Tackling liquidity problems	Credit Institutions Only (Banking)	15% of liabilities with the public	Sovereign securities + financial investment + credit loans	30-180 days

Challenges

It is important to revise…

- OMO limits for Brokers
- Sufficiency of own eligible portfolio of Brokers and Mutual Funds.
- Access to additional liquidity facilities by Brokers → TCTF

… in order to be able to supply liquidity to preserve the payments system's integrity.

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Concluding remarks

• Recent (subprime crisis) and non-recent (1987 crash, LTCM) episodes of turmoil provide evidence of the deficiency emerging from traditional micro-prudential approaches; a macro-prudential approach to systemic risk (oversight) is necessary.

• To be able to oversee financial systems as a whole it is necessary to acquire a comprehensive vision of the payments system, where connections between participants are as important as the participants themselves.

• Banco de la República, pursuant of its oversight and financial stability duties, established in 2010 the Financial Infrastructure Oversight Department…

Concluding remarks

- First results (Machado et al., 2010 & León et al., 2011) are the mainstay of current regulatory challenges and tasks:
  - Limits on ordinary liquidity facilities for non-banking institutions and prudential requirements on own eligible portfolio for Brokers and Mutual Funds
  - Non-ordinary liquidity facilities for too-connected non-banking institutions (i.e. Brokers)

- Results will provide valuable information for financial stability purposes:
  - Assessing liquidity management by non-banking institutions
  - Supporting the Financial Authorities macro-prudential regulatory and supervisory tasks.
  - Promoting a convenient cooperation between the supervision (by the Financial Superintendence) and the oversight (by the central bank)

Concluding remarks

- Some challenges remain:
  - Assessing systemic importance with a comprehensive view on size, connectedness and substitutability.
  - Simulating reaction to systemic shocks by the other participants.
  - Simulating transactions taking place in other infrastructures of the payments system (FX settlement, public debt settlement, etc.); not only in the large-value payments system.
  - Analyzing the convenience of direct participation (Colombia) against non-direct participation (U.K.).

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