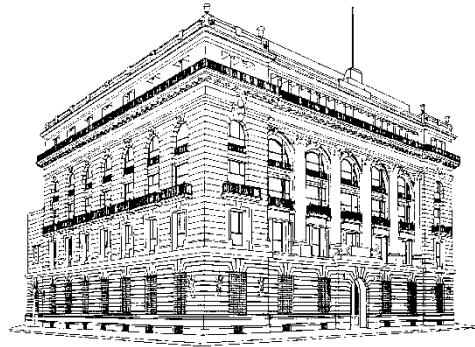


The identification of systemically important financial institutions, markets and instruments



May 2010.


BANCO DE MEXICO



I. Financial Institutions

a) Size

b) Interconnectedness

c) Substitutability

II. Financial Markets

III. Policy Options



I. Financial Institutions

a) Size

b) Interconnectedness

c) Substitutability

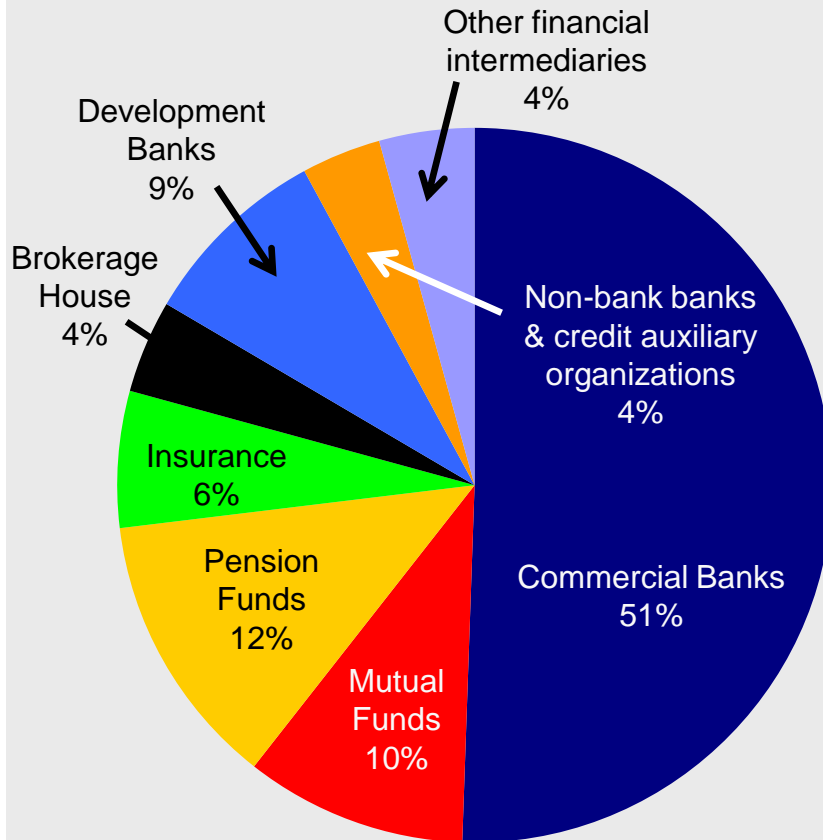
II. Financial Markets

III. Policy Options



I. Financial Institutions

Financial System Assets
(Percent)



Figures as of December 2009.
Source: Banco de México

| Size | USD (billion) | As % of GDP |
|-----------------------------|---------------|-------------|
| Financial System | 722 | 75.0 |
| Stock Market Capitalization | 352 | 36.5 |
| Local debt markets | 209 | 21.7 |

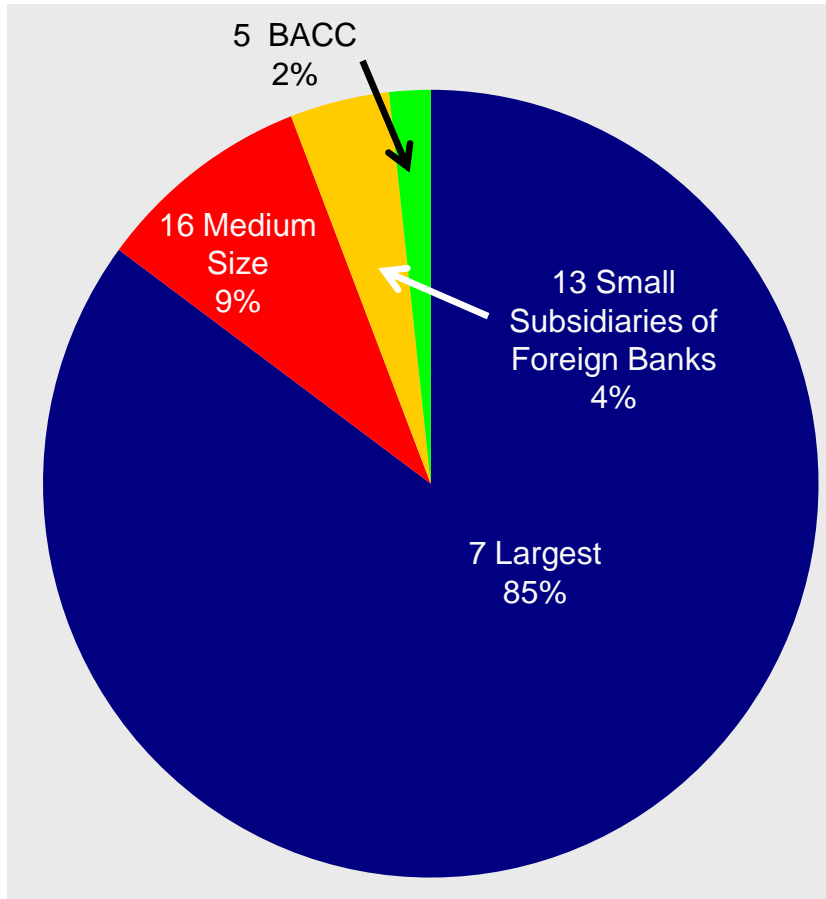
| Institution | Number |
|----------------------------|--------|
| Commercial banks | 41 |
| Mutual funds | 494 |
| Pension funds | 10 |
| Insurance companies | 98 |
| Brokerage houses | 35 |
| Development banks | 7 |
| Non-bank banks | 1,399 |
| Non-bank banks (regulated) | 22 |
| Other Intermediaries* | 257 |

* Includes financial leasing companies, factoring, warehousing, savings and loans, credit unions and bonding companies.
Source: CNBV, CONSAR, CNSF, CONDUSEF.



I. Banking System

**Commercial Banks' Assets
(Percent)**



Source: Banco de México

7 Largest Banks

| Bank | Market Share |
|--------------------------------------------------------------------------------------------------------|--------------|
|  BBVA Bancomer | 23.2 |
|  Banamex (Citibank) | 22.6 |
|  Santander | 12.2 |
|  Banorte | 11.1 |
|  HSBC | 8.2 |
|  Inbursa | 4.2 |
|  Scotiabank | 3.8 |



I. Financial Institutions

a) Size

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I. Interconnectedness: Contagion Risk

1. Contagion arising from direct interbank exposures
 - a) Domestic banks (including subsidiaries)
 - b) Foreign financial counterparties

2. Common exposures and contagion risk.



I. Interconnectedness: Contagion Risk

Domestic banks

Banks' exposures to other banks

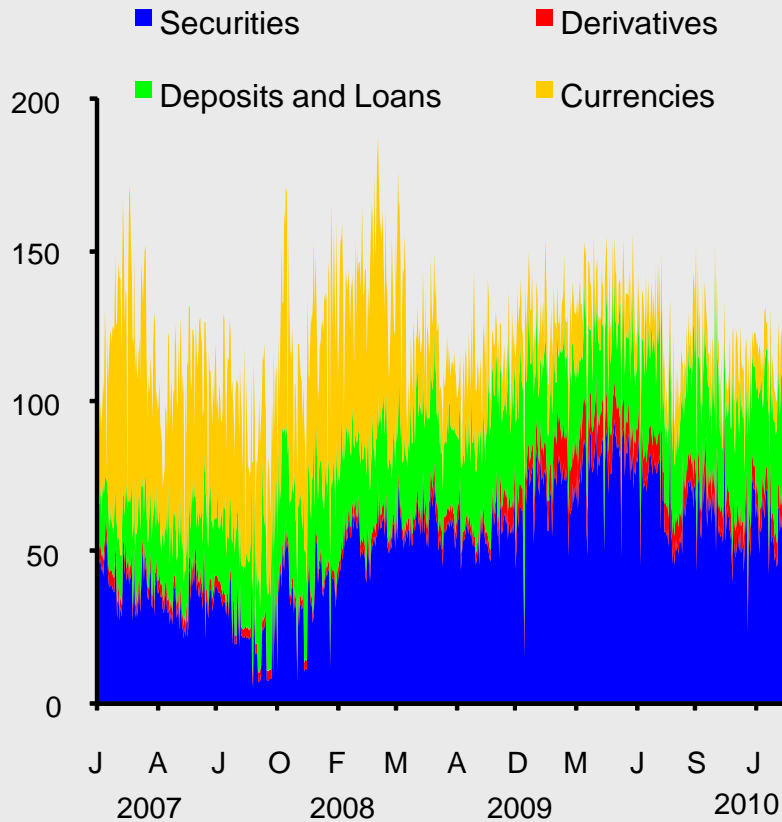
- Loans & Deposits
- Securities issued by bank counterparties
- Credit risk components in repos and derivatives (Net positions only)
- Foreign Exchange transactions (excluding CLS).



I. Interconnectedness: Contagion Risk

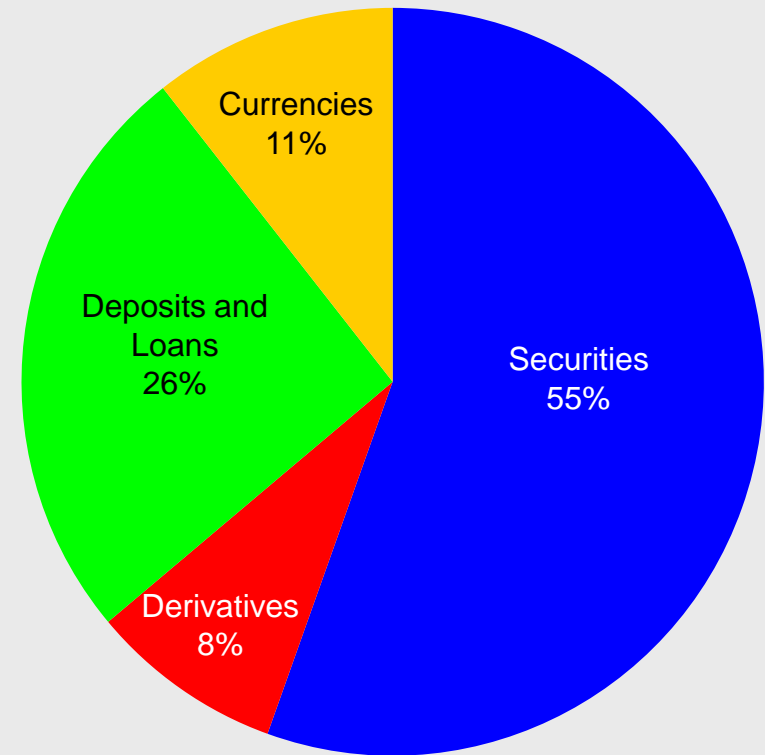
Interbank Risk Exposure

Daily Value of interbank Risk Positions
(Billion pesos)



Source: Banco de México.

Composition of interbank Risk Positions
(Percent)



Average through 2009-2010.
Source: Banco de México



I. Interconnectedness: Contagion Risk

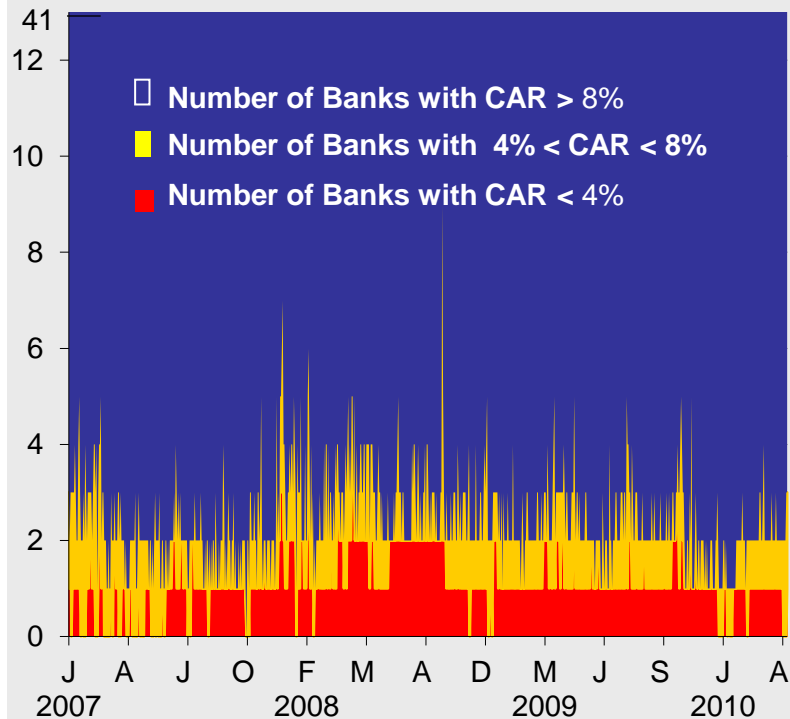
Contagion risk

1. Daily matrix of bilateral risk exposures for all (41) commercial banks.
2. Impact of the failure of a bank on regulatory capital of all remaining banks (first round).
 - Loss given default (LGD): 100%
 - Capital Adequacy Ratio (CAR) at which a bank “fails”: 8% (or 4%).
2. If the initial insolvency causes other institutions to fail, second rounds effects are estimated. Subsequent rounds are considered until no more failures take place.
3. In order to assess the risk of contagion effect, all banks are allowed to fail one by one. Therefore, we obtain a contagion chain for each bank for every day of the considered period.



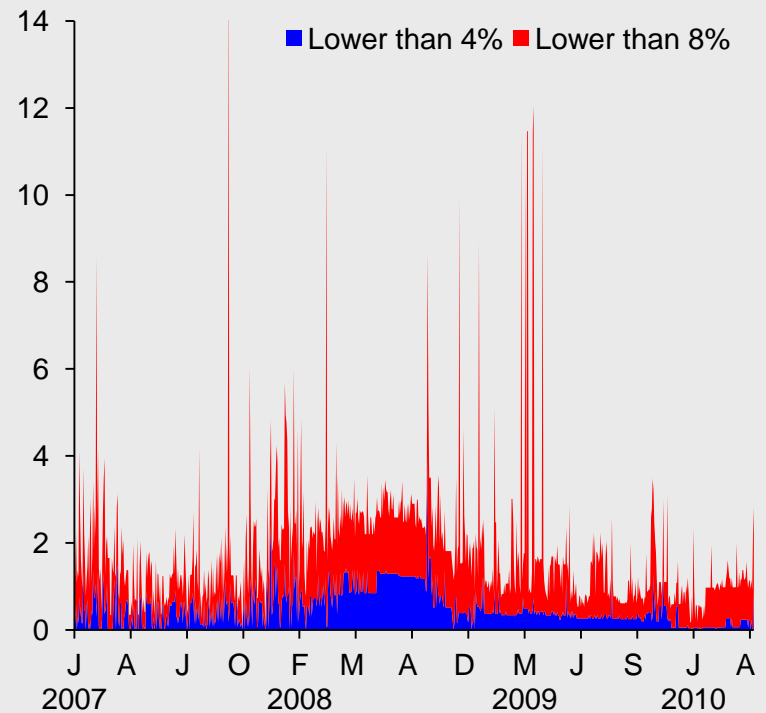
I. Interconnectedness: Contagion Risk

Capital Adequacy Indexes arising from a worst chain of Contagion occurring daily
(Number of banks)



Source: Banco de México.

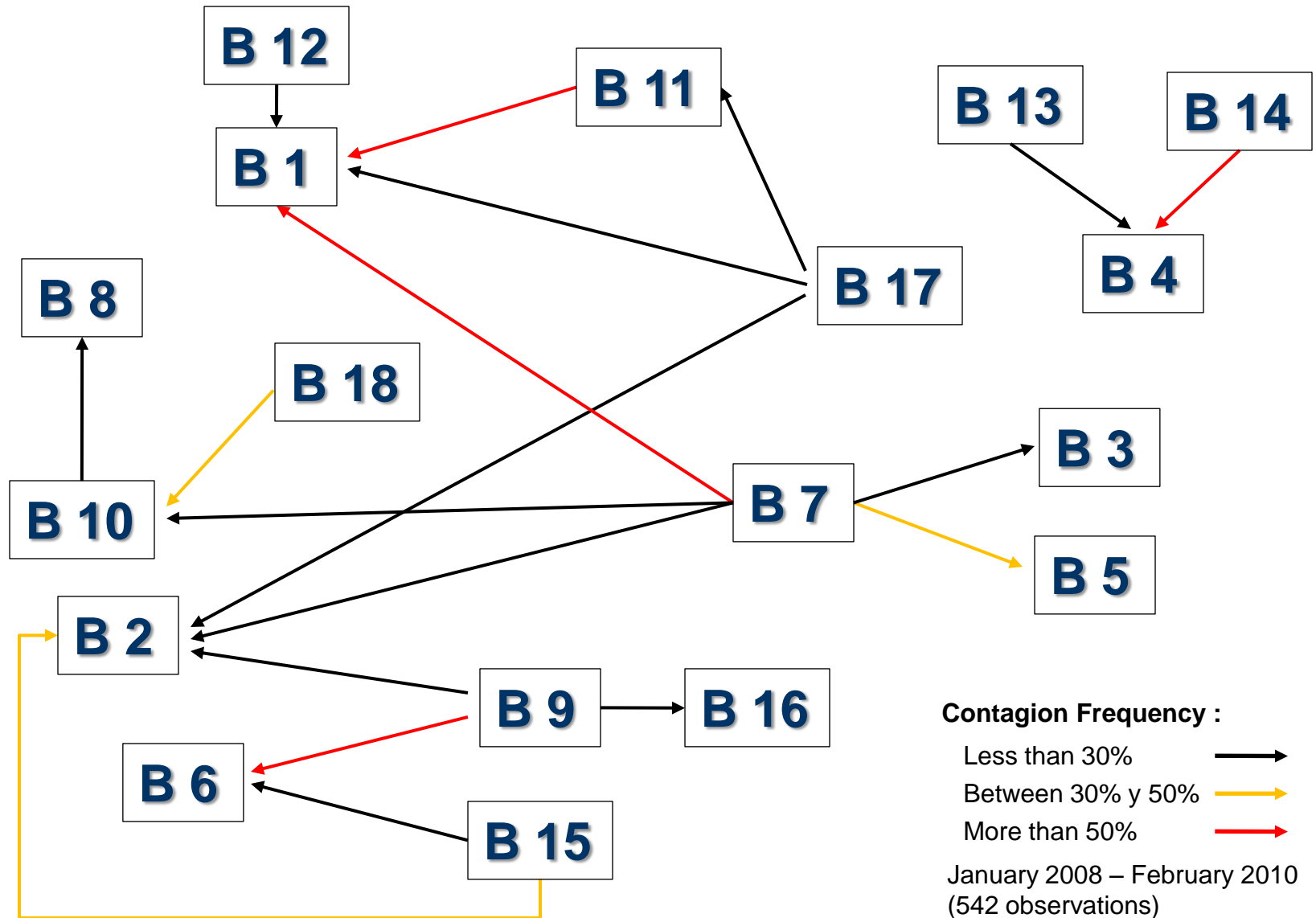
Assets of banks whose capital would be affected in the event of a worst chain of contagion occurring daily
(Percentage of total banking assets)



Source: Banco de México.



I. Interconnectedness: Contagion Risk





I. Interconnectedness: Contagion Risk

Mexican banks exposures to foreign banks:

- Loans and deposits (daily)
- Securities issued by bank counterparties (monthly)
- Credit risk components in repos and derivatives (Net positions only) (monthly)
- Foreign Exchange transactions (excluding CLS) (monthly)

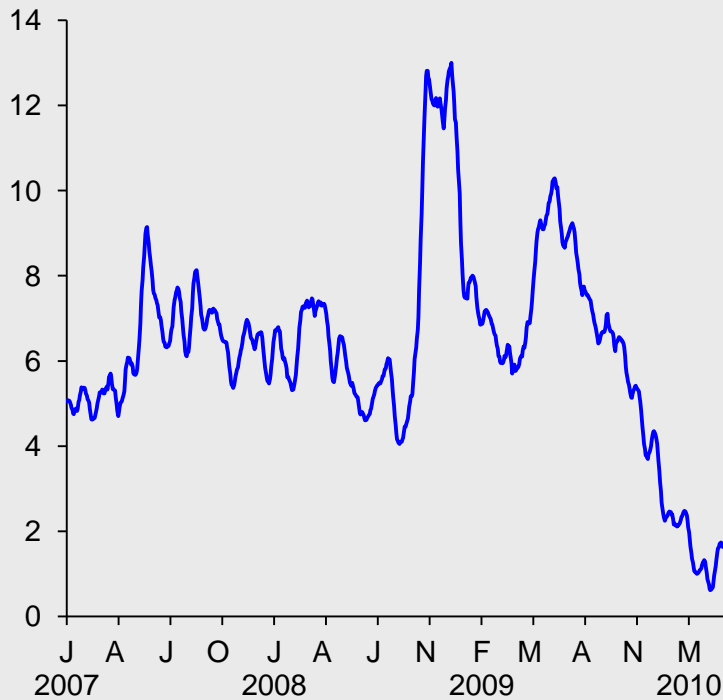
Foreign Counterparties:

- **United States:** Citibank, Wells Fargo, JP Morgan, Bank of America, Bank of New York, American Express.
- **Spain:** Santander, BBVA.
- **United Kingdom:** Barclays, Standard Chartered Bank, RBS, HSBC.
- **Canada:** Royal Bank of Canada, Scotiabank,
- **France:** BNP Paribas, Societe Generale.
- **Rest of Europe:** Credit Suisse, UBS, Deutsche Bank, ING, Svenska Handelsbanke.



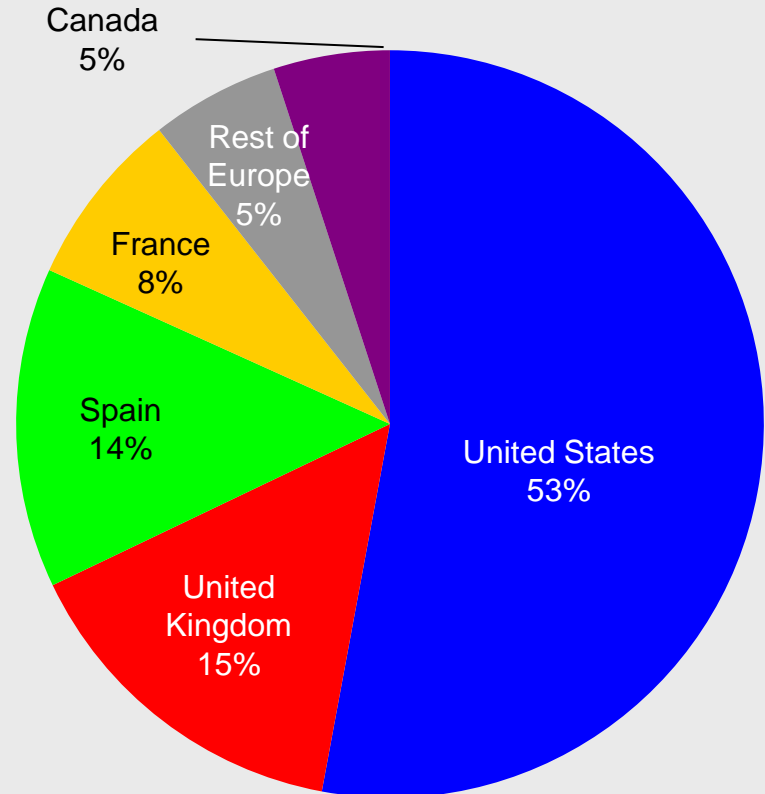
I. Interconnectedness: Contagion Risk

Daily Value of Banks exposures to international counterparties
(Billion dollars)



Source: Banco de México.

Exposure according the Country of origin of the counterparty
(Percentage)

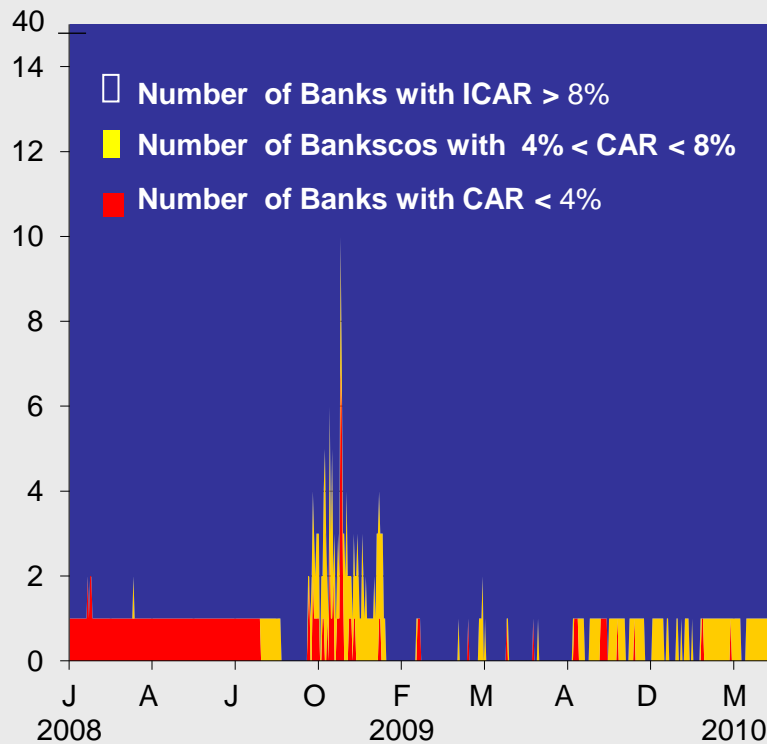


Average through 2008 - 2010.
Source: Banco de México



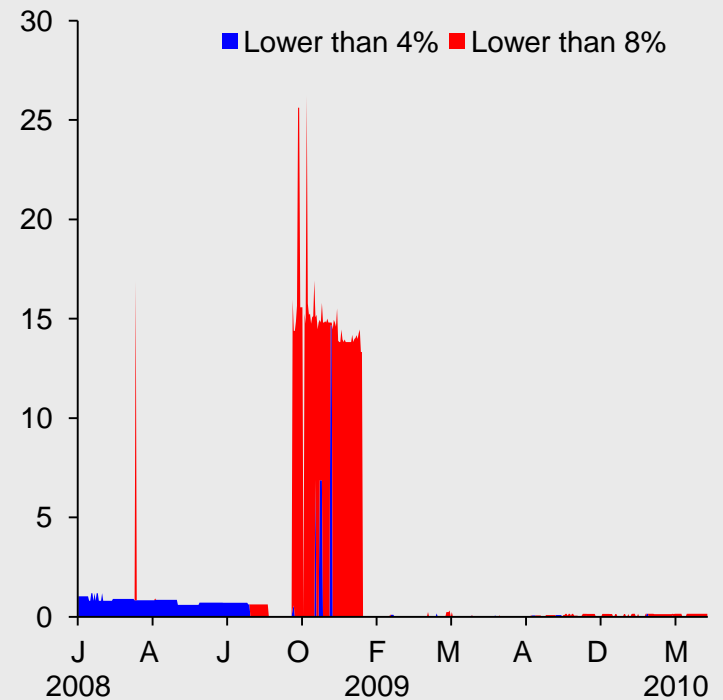
I. Interconnectedness: Contagion Risk

Capital Adequacy Indexes arising from a worst chain of Contagion occurring daily
(Number of banks)



Source: Banco de México.

Assets of banks whose capital would be affected in the event of a worst chain of contagion occurring daily
(Percentage of total banking assets)



Source: Banco de México.

I. Interconnectedness: Common Exposures

Contagion risk methodology considering:

- Macroeconomic shocks affecting the banking system as a whole.
- Coherent stress tests including second round effects.



I. Financial Institutions

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I. Substitutability

Retail services:

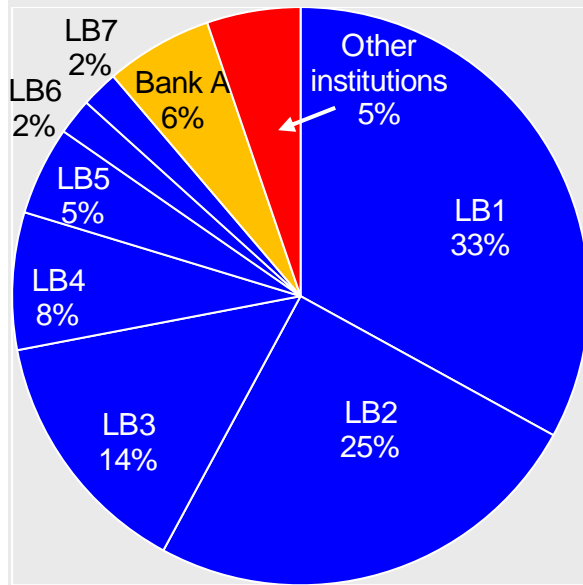
- Payment services
- Account services

Payment systems

- Custody of securities
- Retail payments:
 - Concentration vs. dispersion

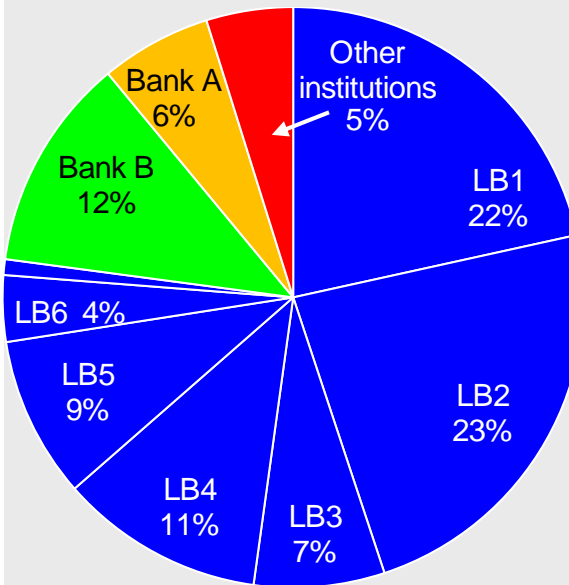
I. Substitutability: Credit, Debit Cards and ATM's

**Number of credit cards
(Percentage)**



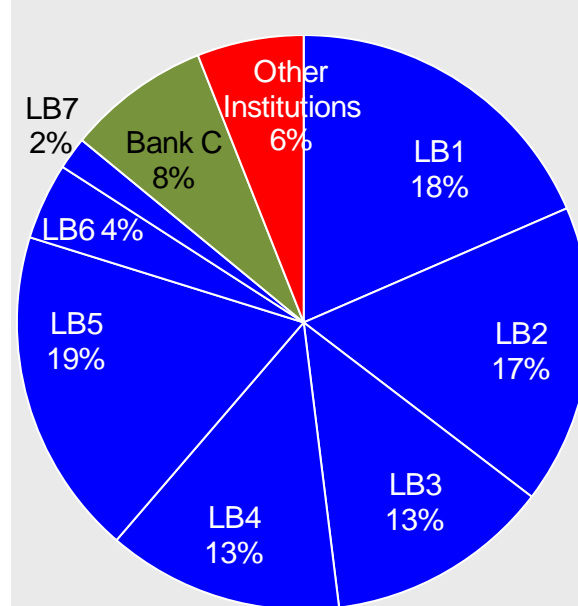
Source: Banco de México

**Number of debit cards
(Percentage)**



Source: Banco de México

**Number of ATM's
(Percentage)**

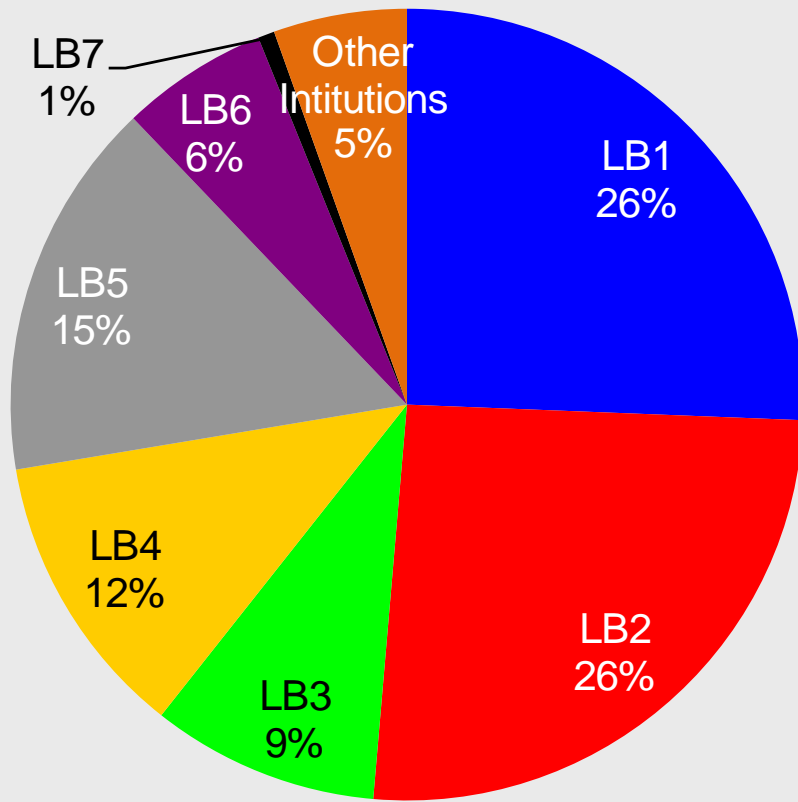


Source: Banco de México



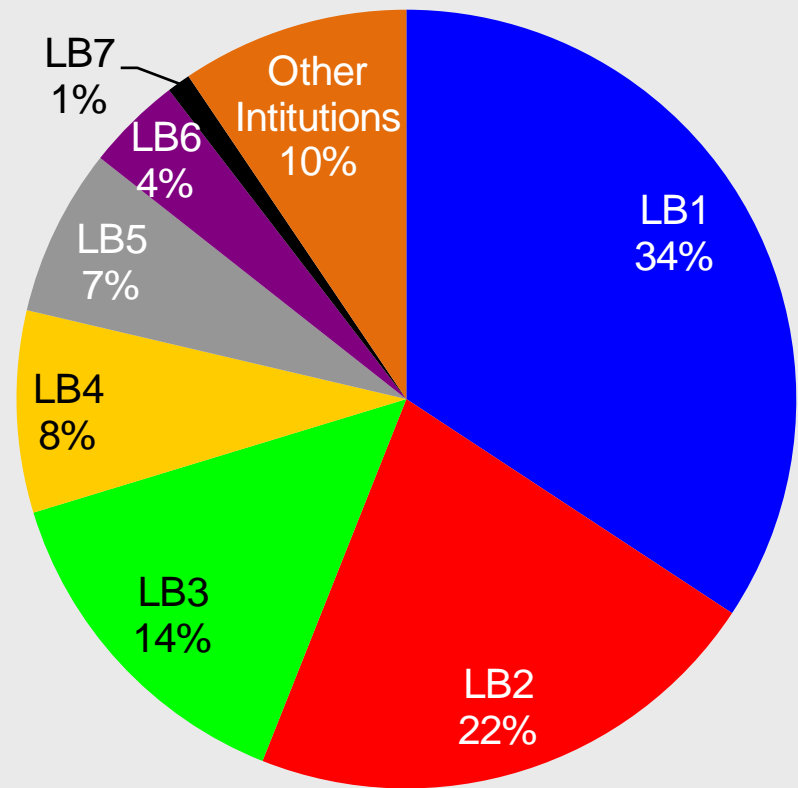
I. Substitutability: Retail electronic payments (volume)

Payments in
(Percentage)



Source: Banco de México

Payments out
(Percentage)

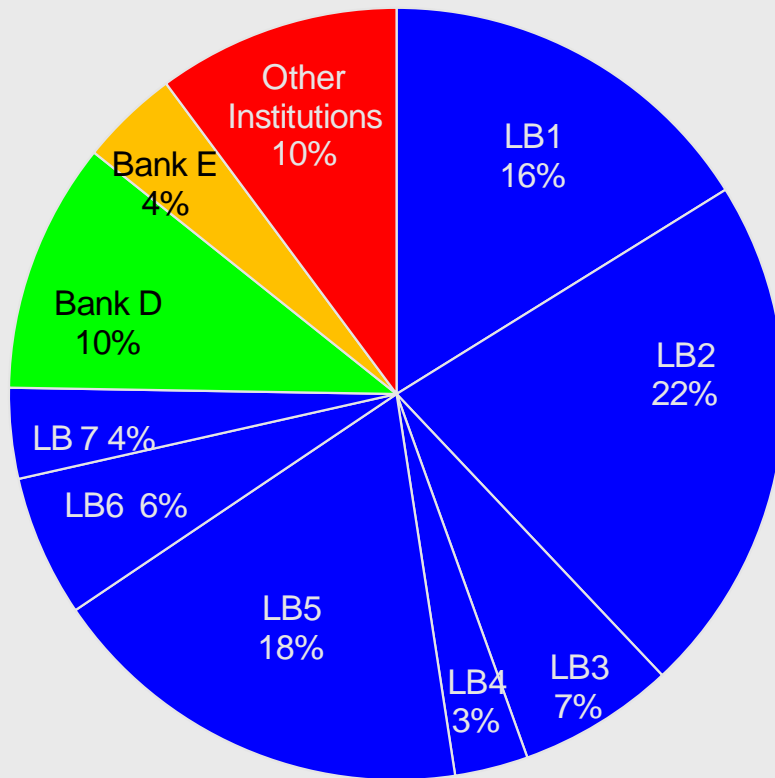


Source: Banco de México



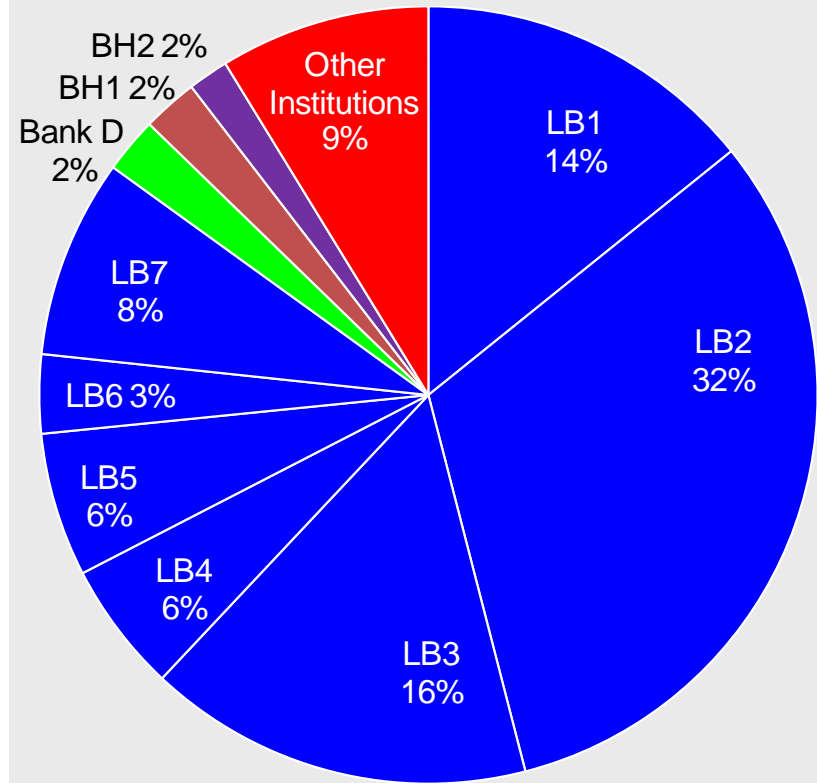
I. Substitutability: underwriting and custody

Underwriting
(Percentage)



Source: Banco de México

Custody
(Percentage)



Source: Banco de México



I. Financial Institutions

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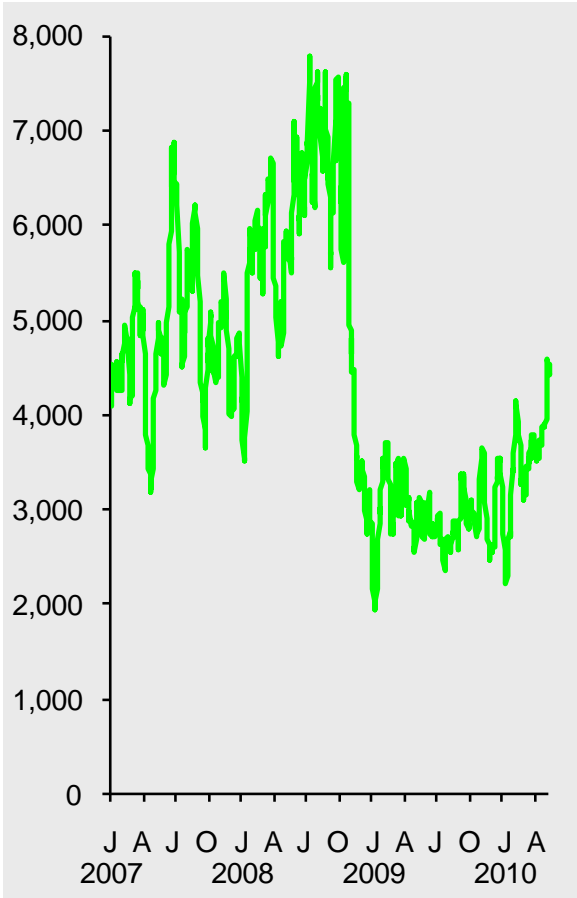
II. Financial Markets

III. Policy Options



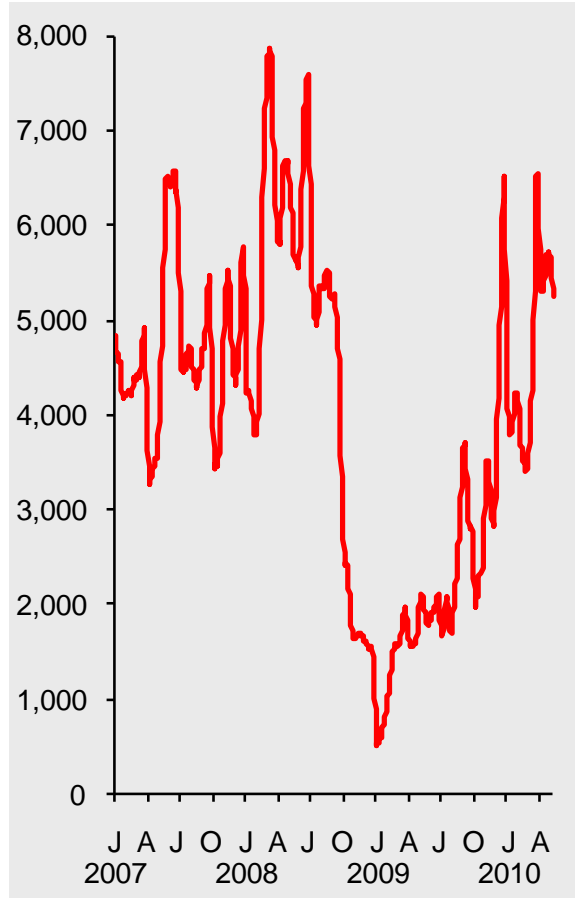
II. Financial Markets: Foreign Exchange

Daily Turnover in Cash in the Mexican Foreign Exchange Market
Million dollars (10-day MA)



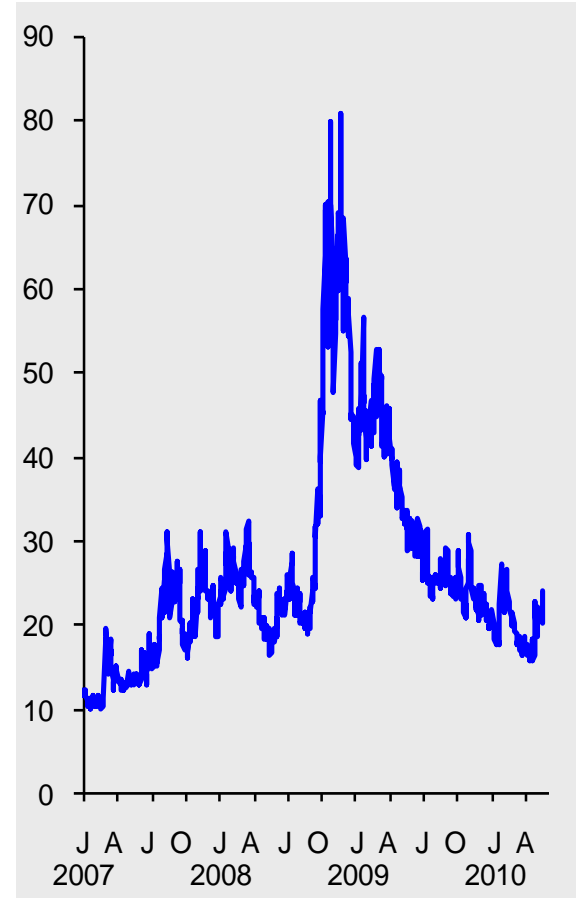
Source: Banco de México

Open Interest Peso-Dollar Contracts in the CME
Number of contracts



Source: Chicago Mercantile Exchange

VIX Index^{1/}
Index



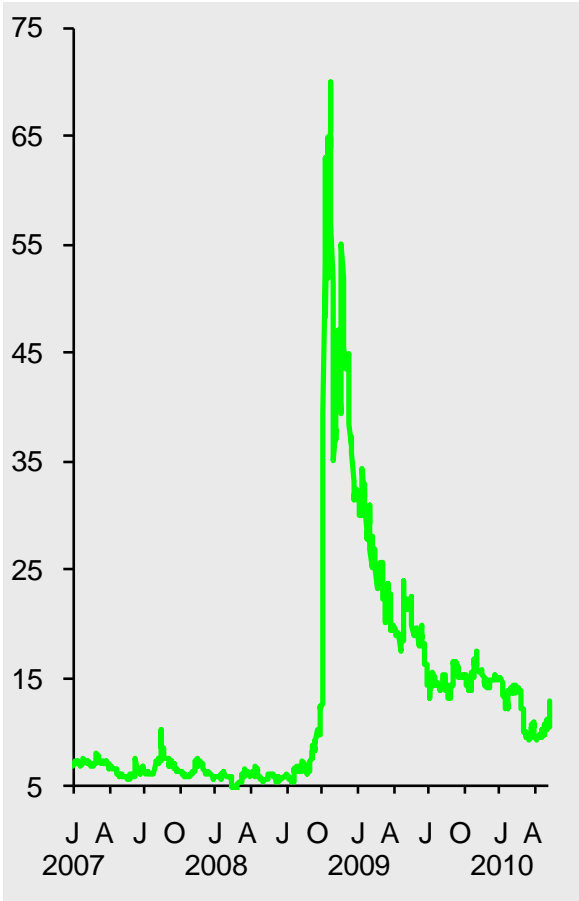
Source: Reuters

^{1/}The VIX Index measures the volatility in options contracts on the S&P500 index and is used to demonstrate investor risk aversion. 23



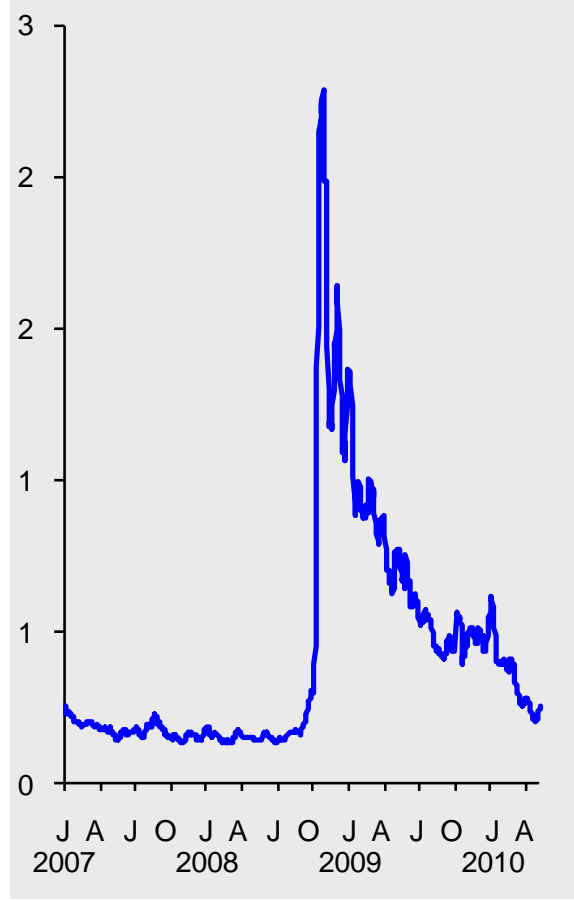
II. Financial Markets: Foreign Exchange

Implied Volatility in One-Month Peso-Dollar OTC Transactions
Percent



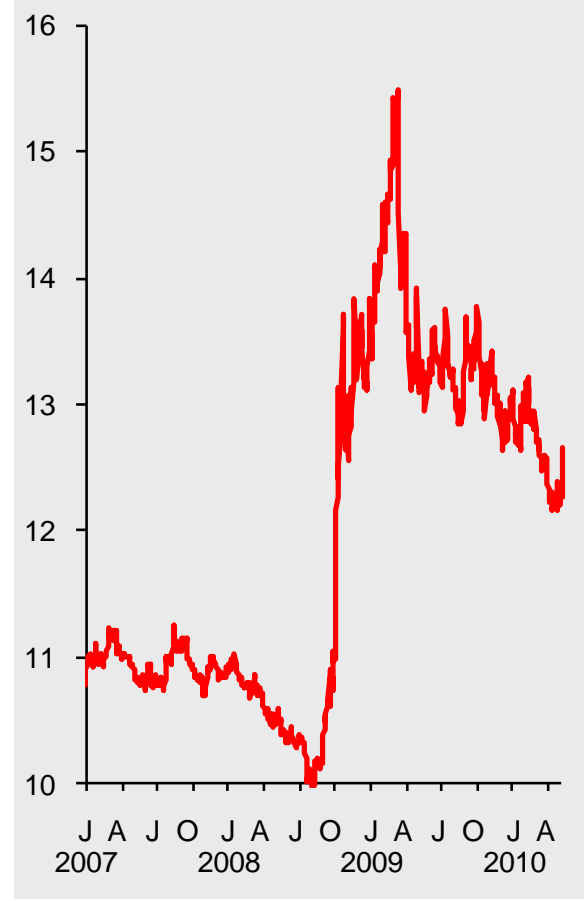
Source: UBS

Buy/Sell Spreads
Peso cents (10-day moving average)



Source: Reuters

Peso-Dollar Exchange Rate
Pesos per dollar

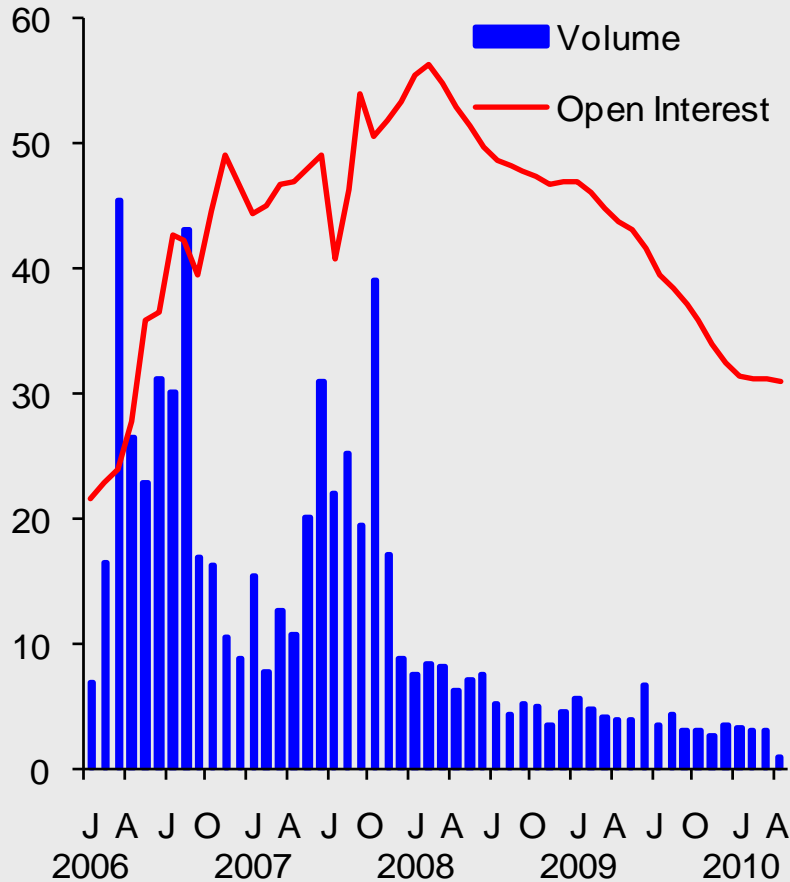


Source: Reuters



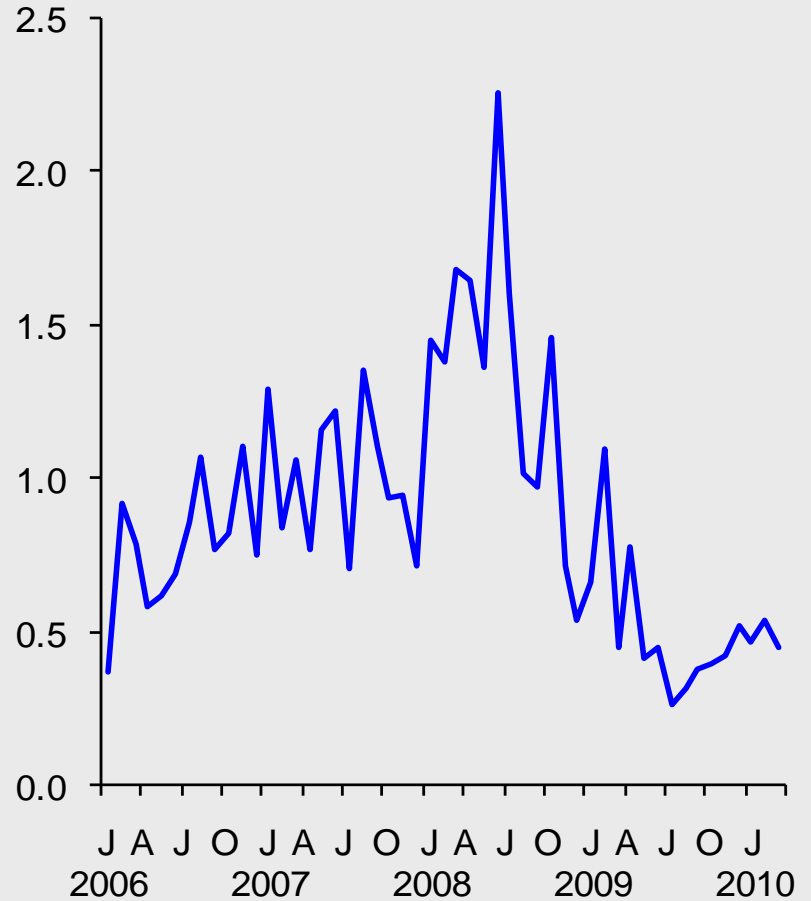
II. Financial Markets: Derivatives Market

Financial Derivatives
Millions of contracts



Source: Mexder

OTC Derivatives Market
(forwards and swaps)
Notional amount outstanding
(Millions of pesos)

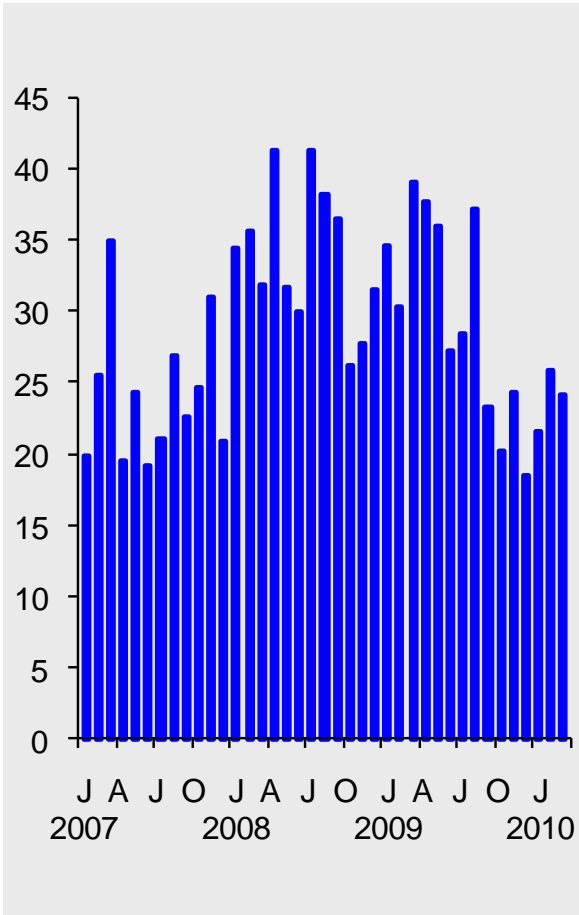


Source: Banco de México



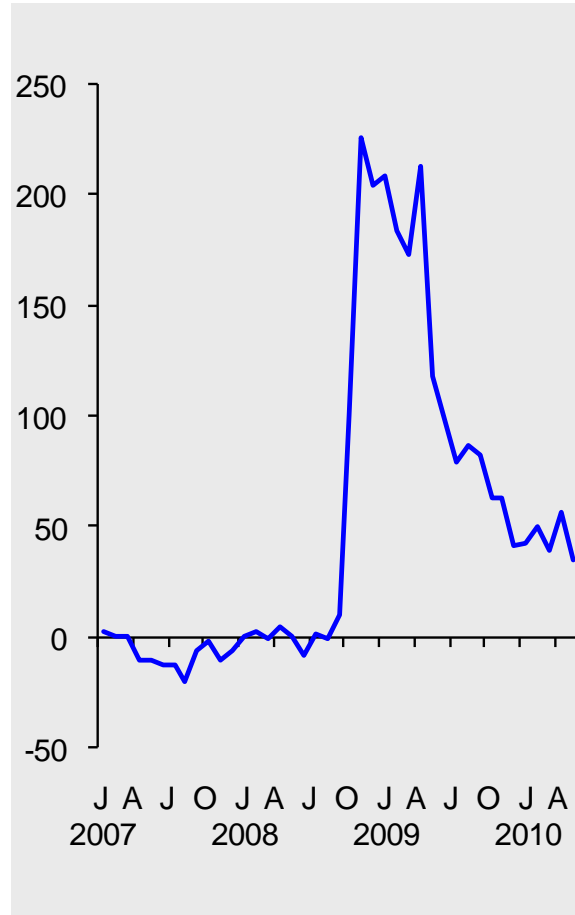
II. Financial Markets: Debt Markets

Monthly Placement of Commercial Paper Billion pesos



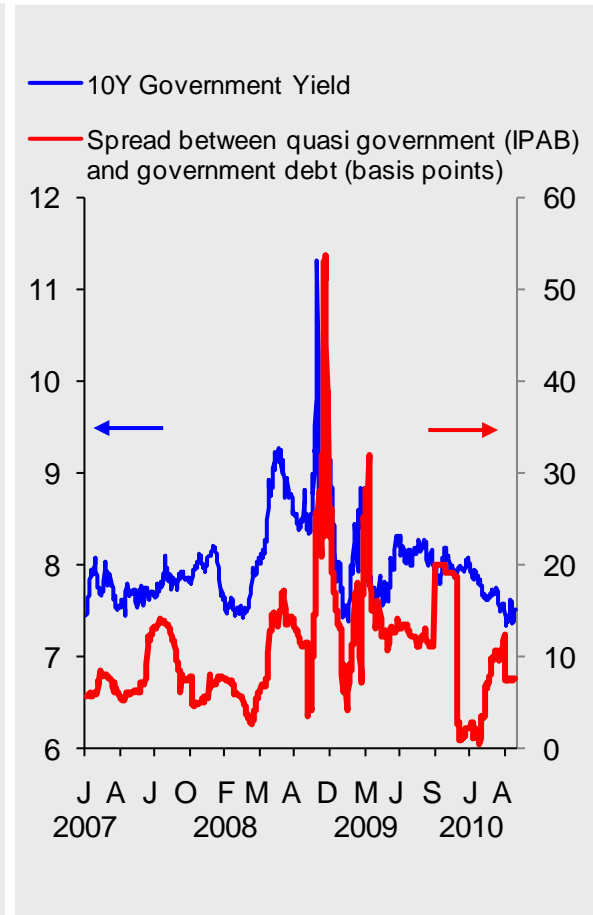
Source: Bank of Mexico

Spread Between Interest Rates and the 28d TIEE of Commercial Paper Issues Basis Points



Source: Bank of México

Government and quasi-government debt



Source: Bank of México



I. Financial Institutions

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III. Policy Options

TO DO:

a) Importance of sound macroeconomic framework and macro oversight

- i. FS Councils for systemic oversight; coordination between authorities.
- ii. Intensity supervision

b) Reduce interbank contagion risk:

- i. Limit exposures (among banks and related parties)
- ii. Centralized netting or CCP's

c) Reduce risks in OTC derivatives

- i. Better disclosure
- ii. CCPs, trade repositories

d) Resolution authority and instruments



III. Policy Options

CONCERNS:

a) Identify institutions

- i. Could produce more moral hazard

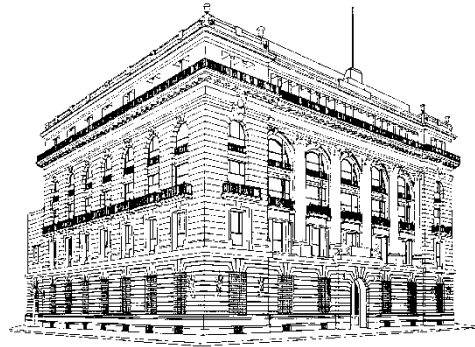
b) Capital/liquidity surcharges

- i. Potentially, unequal distribution of costs and benefits between home and hosts
- ii. Extra regulatory cost would be passed on to customers.
- iii. Bad-equilibrium: more costly operation, higher intermediation costs and systemic risk.

c) Levies (ex-ante or ex-post)

d) Constraints on business activities

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