

# International Interbank Markets and Debt Crises: Evidence from Mexico

Sebastian Alvarez

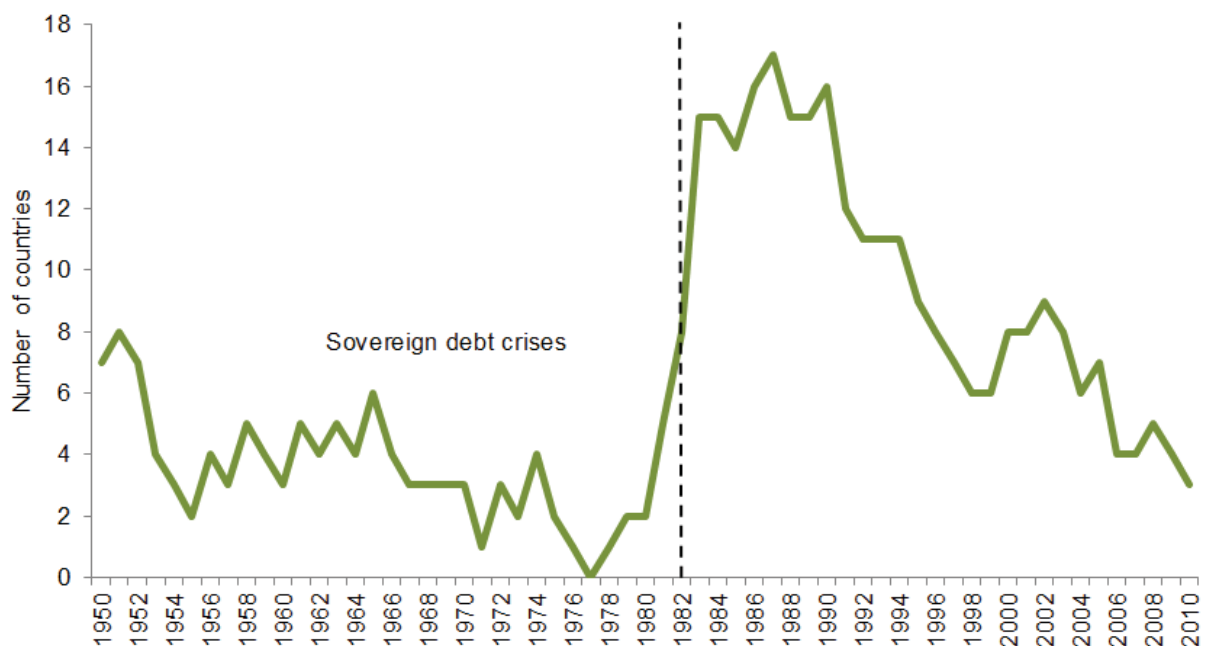
The Paul Bairoch Institute of Economic History  
University of Geneva

Workshop and Network on Global Debt Dynamics  
University of Sussex

May 26, 2016

---

## The International Debt Crisis of the 1980s



Source: Reinhart and Rogoff (2011)

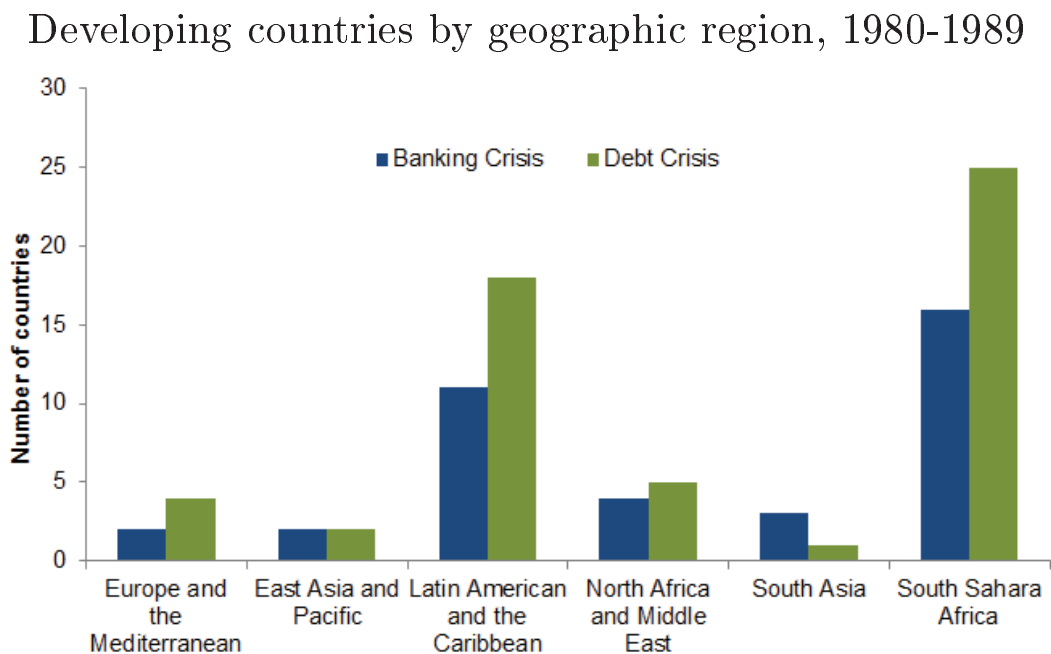
- Serial defaults and sovereign debt crises in the developing world.
- Third world debt represented 2-3 times the capital of international banks.

# Debt Crises - The Banking Sector Matters

- ① Government indebtedness and weak banking systems.
  - ▶ Recent twin bank-debt crises in Europe (Shambaugh 2012, Lane 2012).
  - ▶ Historical association (Reinhart and Rogoff 2009, 2011).
- ② Domestic banks and international interbank markets.
  - ▶ Source of vulnerability (SIC 2010, Honohan et al. 2010).
    - ★ Iceland
    - ★ Ireland
  - ▶ Reinforcing effect (Attinasi et al. 2009, CGFS 2011).
    - ★ Greece
    - ★ Spain

---

## Debt and Banking Crises in the 1980s



Source: Standard & Poor's (2002) and Laeven & Valencia (2008)

- Latin American countries accounted for about 60% of developing countries' total external bank debt.

# The Latin American Crises of the 1980s

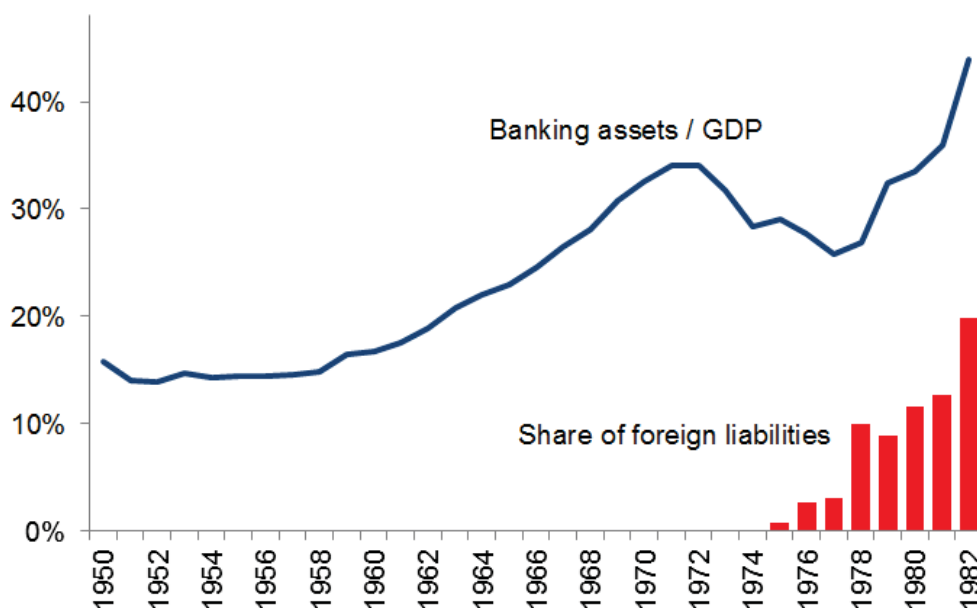
Country	External Debt 1982 (Mil. \$)	Years in Default	Banking Crisis Timeframe
Brazil	94,428	1983-94	
Mexico	86,274	1982-90	
Argentina	43,787	1982-93	1980-82
Venezuela	32,181	1983-88, 1990	
Chile	13,959	1983-90	1981-83
Peru	10,871	1983-97	1983
Colombia	10,519		1982-87
Ecuador	7,808	1982-95	1982
Costa Rica	3,766	1981-90	1987
Bolivia	3,422	1980-84, 1986-93	1986-88
Nicaragua	3,037	1979-2002	1990
Dominican Rep.	2,598	1982-94	
Honduras	1,948	1981-2002	
Uruguay	1,906	1983-85, 1987	1981-84

Source: World Debt Tables, Standard & Poor's (2002) and Laeven & Valencia (2008)

- Brazil: Failure and liquidation of three domestic banks by end-1985.
- Venezuela: Six commercial banks failed between 1981 and 1986.
- Mexico: Nationalization of the banking system on September 1, 1982.

## Mexican Banks & Foreign Finance

Mexican domestic banking sector, 1950-1982



Source: Banco de Mexico

- Financial disintermediation process from 1972 to 1976-77.
- Increasing reliance on foreign borrowing as source of funding since 1975.

# Research Questions

- How did involvement with foreign finance and international wholesale funding affect banks' risk position?
  - ▶ Increased exposure to world financial fluctuations.
    - ★ Foreign exchange.
    - ★ Interest rate.
    - ★ Funding.
  - ▶ International banks were more vulnerable than domestic-oriented banks.
    - ★ Weaker capital structure.
    - ★ Worse liquidity position.
    - ★ Less stable funding base.
- Why did Mexican banks increasingly turn to the international capital markets in the years that preceded the debt crisis of 1982?

---

## Methodology and Sources

- Vulnerabilities of the Mexican banking industry.
  - ▶ Asset and liability structure.
  - ▶ Banco de Mexico's Yearbooks and Historical Financial Statistics.
- Risk and financial position at the bank level.
  - ▶ Financial statement analysis.
  - ▶ Monthly Bulletin of the CNBS.
    - ▶ Balance sheet
- Driving factors of Mexican bank internationalization.
  - ▶ Political economy approach.
  - ▶ Minutes of the Board of Banco de Mexico and Banamex.
    - ▶ Banxico
    - ▶ Banamex

# The International Expansion of Mexican Banks

- The internationalization process:
  - ▶ London-based Eurobanks: Intermex, Libra Bank and Eulabank (1972-74)
  - ▶ Branches and agencies in main international financial centers (1975-82)
    - ★ London
    - ★ New York
    - ★ Los Angeles
- Banks involved:
  - ▶ Six largest commercial banks
    - ★ Banamex, Bancomer, Serfin and Comermex (private banks)
    - ★ Banco Mexicano-Somex and Banca Internacional (mixed banks)
  - ▶ Accounted for 75 % of the banking system
    - ▶ MBO
    - ▶ MBI

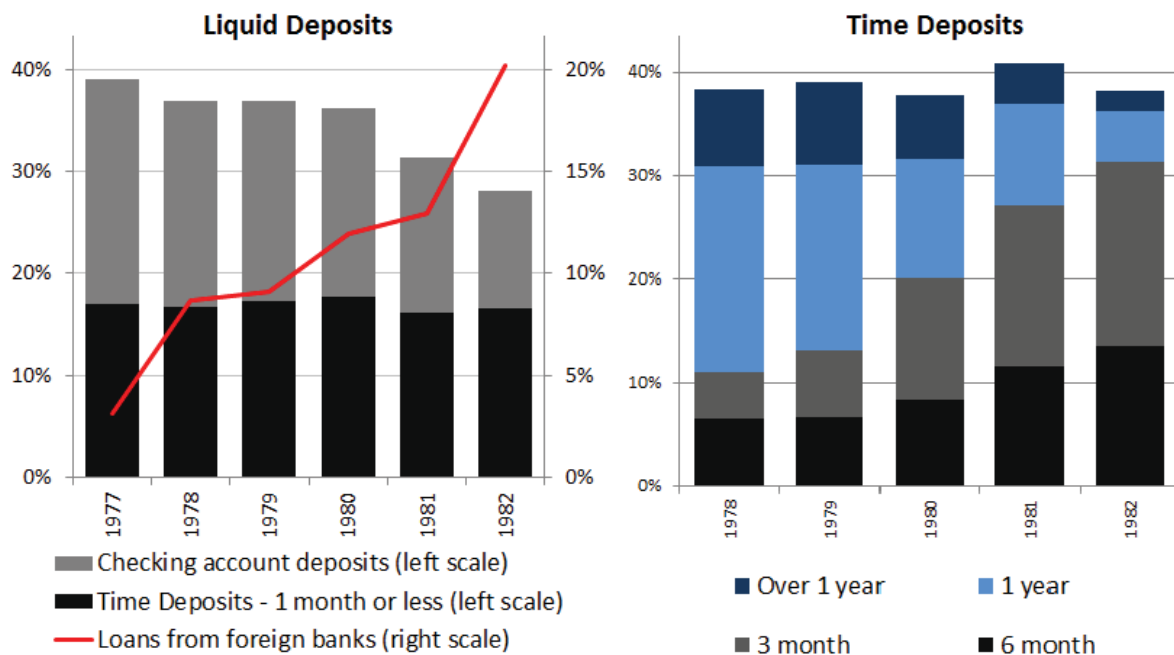
---

## Underlying Vulnerabilities: The External Front

- *The Mexican Debt Crisis Redux: International Interbank Markets and Financial Crisis, 1977-1982* (Alvarez 2015):
    - ▶ Business model based on international interbank funding.
    - ▶ Asset and liabilities mismatches:
      - ★ Maturity
      - ★ Interest rates
      - ★ Currency
    - ▶ Worsening financial imbalances and funding strains:
      - ★ Rise of international interest rate in the late 1970s
      - ★ Devaluation of February 1982
      - ★ Moratorium declaration of August 1982
      - ★ Retrenchment in international wholesale funding
- ▶ U.S. Mexican agencies

# Underlying Vulnerabilities: The Domestic Front

Funding structure of the Mexican banking system (% of all liabilities)

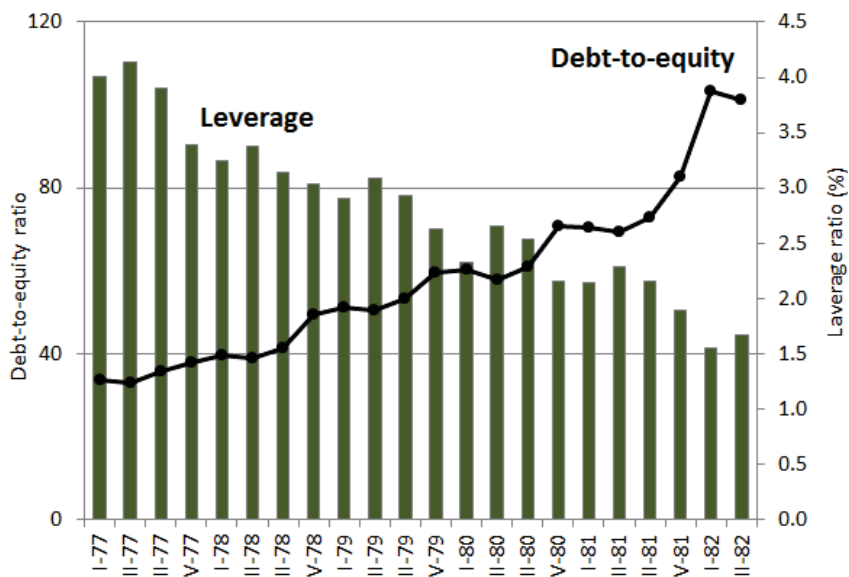


Source: Banco de Mexico

- Substitution of domestic for foreign liquidity at the cost of higher risks.
- Shortening of the maturity structure of long-term funding.

## The Weakness of the Mexican Banking System

Risk indicators at the industry level



Source: Banco de Mexico

- The industry became twice more leveraged.
- Greater reliance on debt instead of equity to finance its expansion.

# Financial Statement Analysis

- Quaterly bank level data:

- ▶ Monthly Multibank Bulletin (CNBS).
- ▶ From Q2-1979 to Q2-1982 (13 quarters).
- ▶ 23 Banks (90 % of the banking sector)
  - ★ 7 international-oriented banks (82%)
  - ★ 16 domestic-oriented banks (18%)

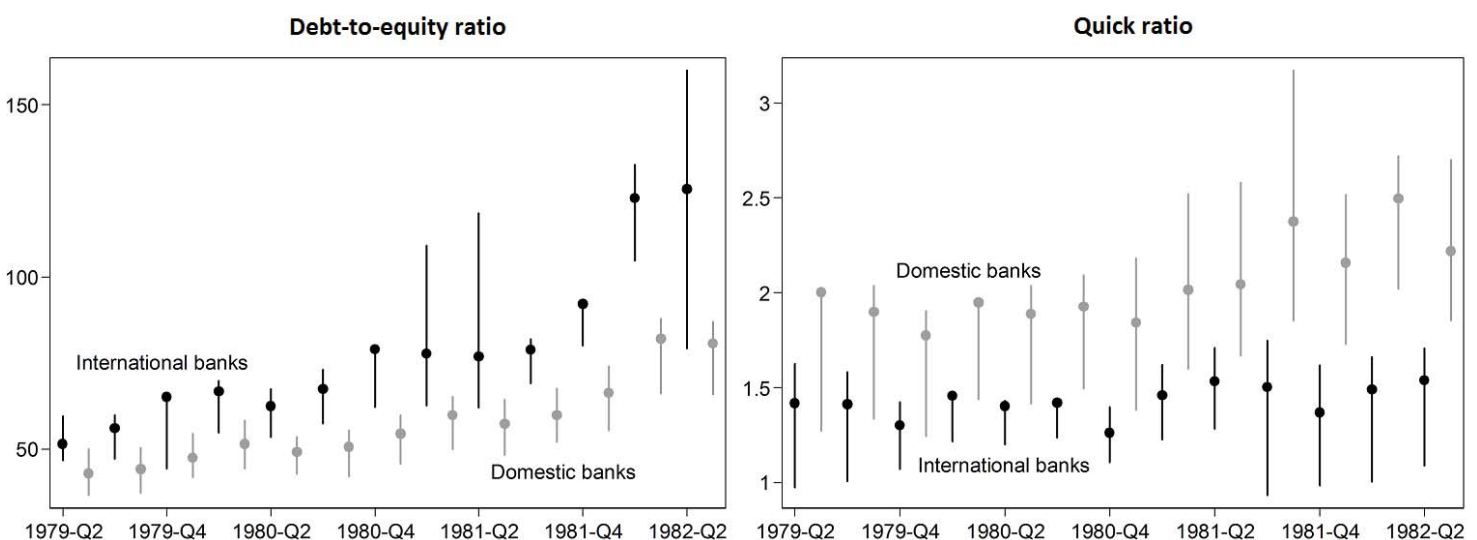
▶ [Sample](#)

- Banks risks and financial position:

- ▶ Financial ratios.
- ▶ Principal Component Analysis (PCA):
  - ★ 4 risk indicators (PC1, PC2, PC3, PC4)
  - ★ Derived form 10 balance sheet ratios.
  - ★ Account for 82% of the variation in the data set.

▶ [Loading Factors](#)

## International vs. Domestic-Oriented Banks

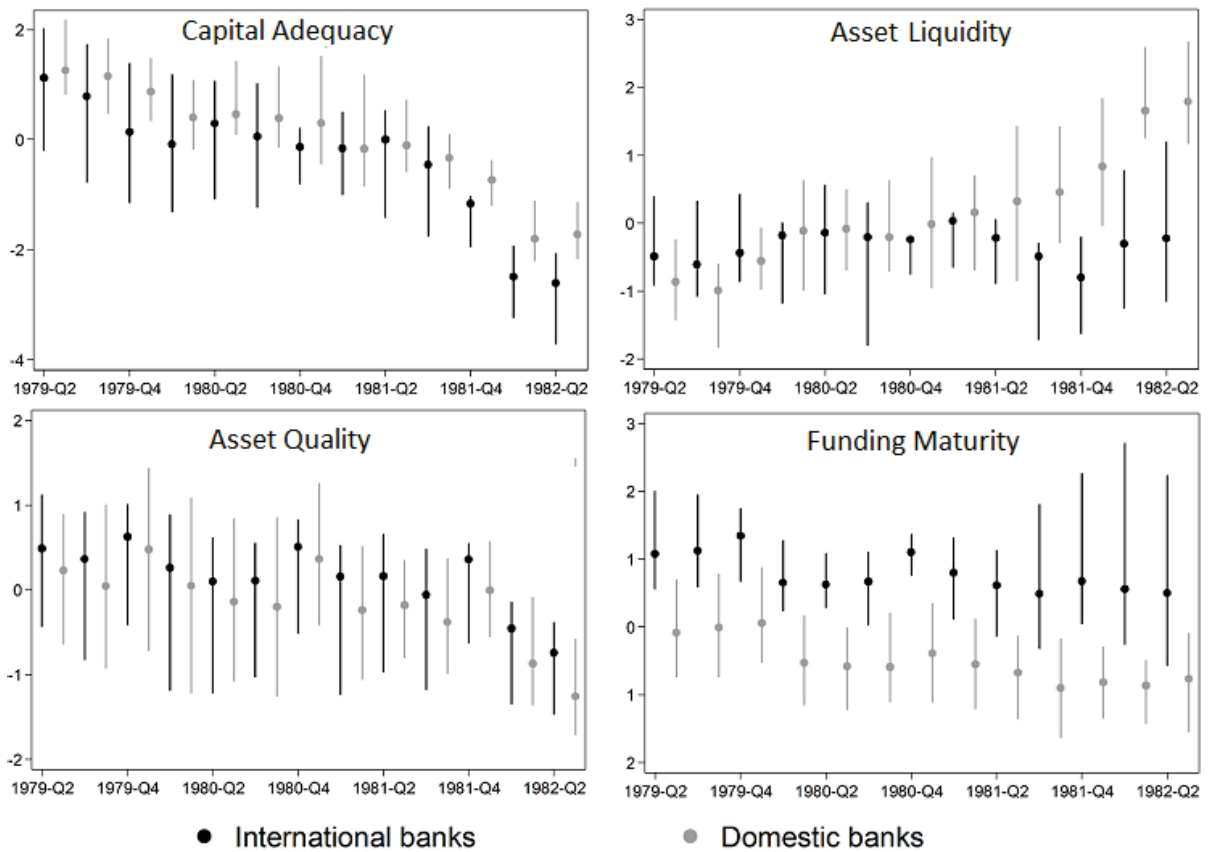


Source: CNBS Multibank Bulletin (several issues).

- Higher risk level for international-oriented banks:

- ▶ More aggressive used of debt instead of equity.
- ▶ Considerably weaker liquidity position.

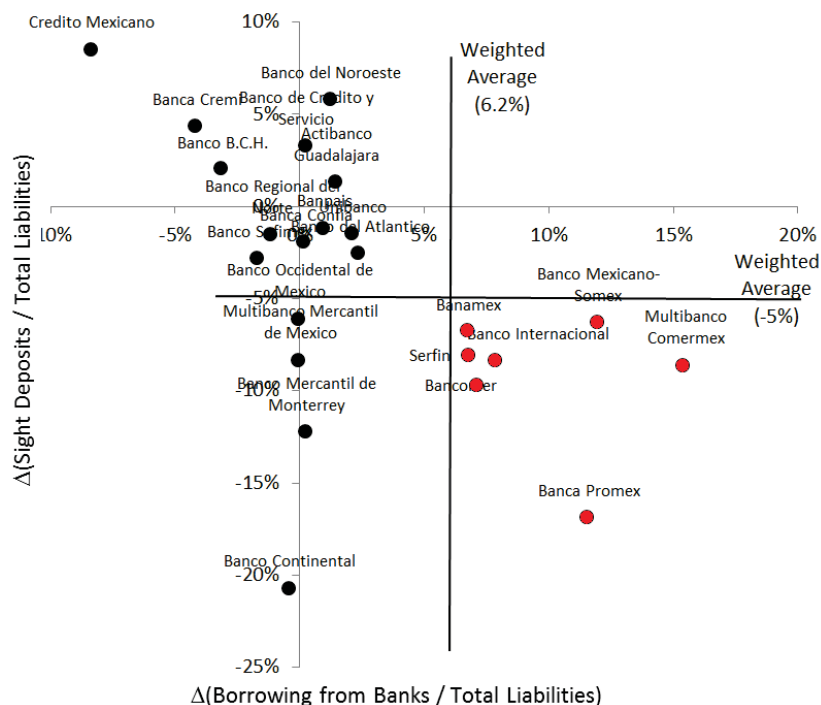
# Principal Components as Risk Indicators



Source: CNBS Multibank Bulletin (several issues).

## The Change in the Funding Structure

Change in the share of deposits and bank borrowing to all liabilities, 1978-81



● Decline in sight deposits made up by an increase of:

- ▶ Interbank funding in international banks.



# Domestic Funding and Risk Levels

Panel data regression equation with fixed effects:

$$\Delta SD_{i,t} = \alpha_i + \sum_{j=1}^4 \beta_j PC_{j,i,t-1} + \beta_5 \pi_{t-1} + \beta_6 i_{t-1} + \beta_7 TA_{i,t-1} + \epsilon_i$$

$\Delta SD$  = Quaterly change on sight deposits

PC1 = Capital adequacy

PC2 = Asset liquidity

PC3 = Funding maturity

PC4 = Asset quality

$\pi$  = CPI

$i$  = Cetes / Deposits

TA = Total Assets

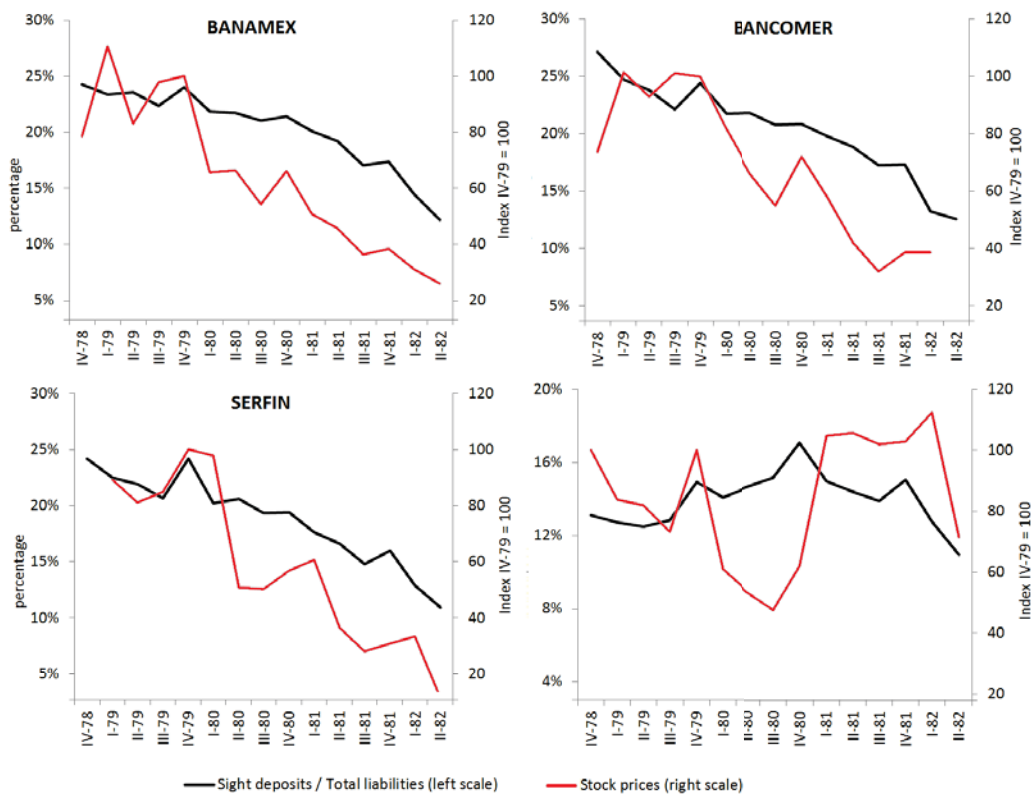
Regression analysis: domestic funding capacity and risk level.

VARIABLES	Model 1	Model 2	Model 3	Model 4
Capital adequacy	-0.00502	-0.0108	-0.0181	-0.0131
Asset liquidity	0.0737***	0.0587***	0.0559***	0.0394***
Funding maturity	-0.0871***	-0.0795***	-0.0738***	-0.0488**
Asset quality	-0.0153	-0.0212*	-0.0257**	-0.0229***
Inflation ( $\pi$ )		0.361***	-0.701**	-1.645***
Relative yield ( $i$ )		-0.00288	-0.0848	-0.192**
Size (ln TA)		-0.247***	-0.245***	-0.146
Time			0.0666***	0.118***
Lag				-0.291***
Constant	0.0803***	0.709	6.114***	10.18***
Observations	270	270	270	268
R-squared	0.21	0.24	0.26	0.38
F-statistics	24.7	18.3	17.9	15.1
Fixed effects	Yes	Yes	Yes	Yes
N° of panels (banks)	23	23	23	23

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# Information and Depositors Behavior

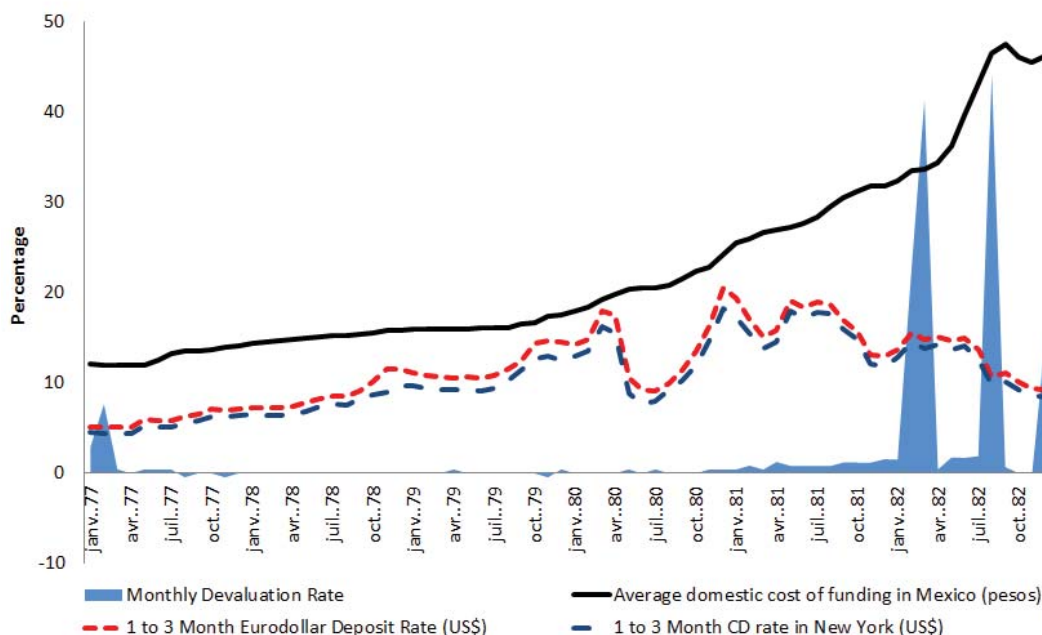
## Sight deposits account and banks' stock prices, 1978-82



Source: CNBS Multibank Bulletin and Stock Exchange Yearbook (several issues).

# Domestic vs. International Cost of Funding

## Evolution of the Interest Rates, 1977-82



Source: Banco de Mexico's Historical Statistics.

- Negative feedback mechanism between domestic funding and risk levels.

# Conclusions

- The financial position of the Mexican banking system considerably deteriorated as involvement with international finance increased in the lead-up to the 1982 debt crisis.
- International banks were the most severely affected by these problems, displaying worse capitalization levels, a weaker liquidity position and a more instable funding base than domestic-oriented banks.
- Large scale incorporation of international liquidity by commercial banks was instrumental for the state-led development strategy of the Mexican government as well as the fixed-exchange rate policy of the central bank.
- Foreign finance provided Mexican banks with an alternative to overcome domestic funding difficulties linked to high inflation and negative real interest rates in a context of increasing competition from foreign bank loans.

## Mexican banks overseas

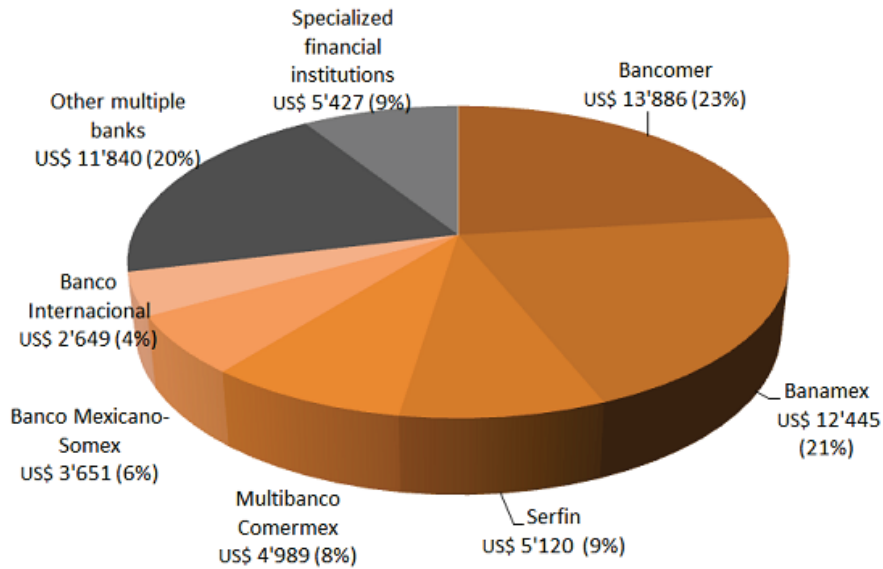
Total Liabilities of Mexican Foreign Agencies and Branches  
June 1982, Millions of dollars

	Banamex	Bancomer	Serfin	M. Comer.	Somex	B. Int.
Total Bank	13,528	13,252	5,635	4,724	5,157	2,854
Foreign branches	2,047	2,165	773	1,126	480	1,121
New York	580	1,005	33	205	1	106
Los Angeles	159	377	228	246	0	0
London	888	523	310	401	0	0
Cayman Islands	0	261	0	280	479	1,015
Nassau	420	0	201	25	0	0
F. Agencies/Bank (%)	15.1	16.3	13.7	23.8	9.3	39.3

Source: FFIEC 002, Bank of England's archives and CNBS.

# Mexican Banking Industry

Total Assets in December 1980 (in million dollars)

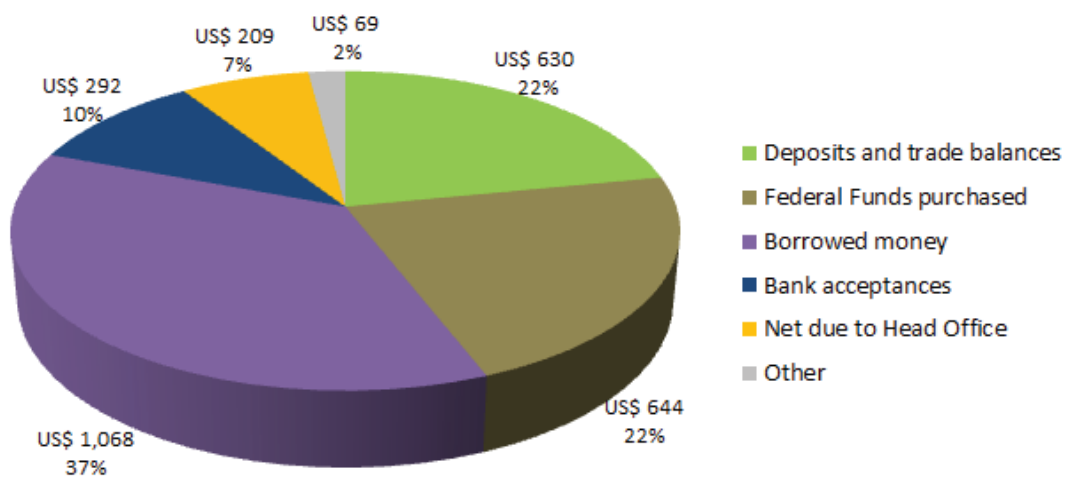


Source: Bulletin of the CNBS and Mexico's Annual Report

[Return](#)

## Mexican agencies in the U.S. - Liabilities Structure

Total Combined Liabilities as of June 1982 (millions of dollars)

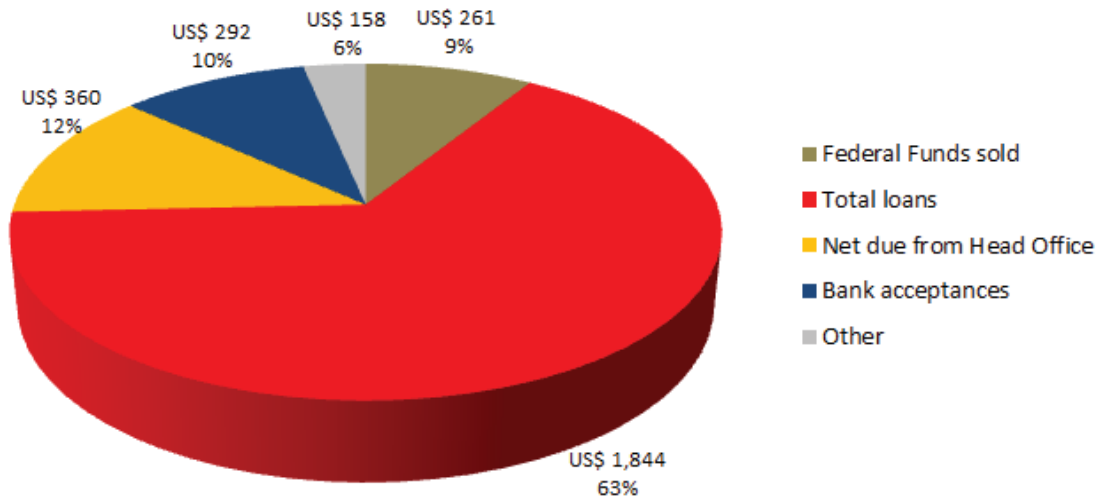


Source: FFIEC 002 Reports.

- About 80% represented deposits or lending facilities from banking institutions.
- 19% were transfers from head offices in Mexico and 1% were liabilities to the non-banking sector.

# Mexican agencies in the U.S. - Assets Structure

Total Combined Assets as of June 1982 (millions of dollars)



Source: FFIEC 002 Reports.

- Overall, an estimated 80-90% of the US agencies total assets represented claims on Mexican borrowers.
- About 60% represented loans to the Mexican government or the public sector.

▶ Return

# Balance Sheet of Banamex - December 1978

BANCO NACIONAL DE MEXICO, S. A.  
INSTITUCION PRIVADA DE BANCA MULTIPLE  
AV. ISABEL LA CATOLICA No. 44 MEXICO, D. F.  
BALANCE GENERAL CONSOLIDADO AL 31 DE DICIEMBRE DE 1978

A C T I V O		P A S I V O Y C A P I T A L	
CASA Y BANCO DE MEXICO	\$ 2,135,039,438.39	DEPOSITOS A LA VISTA	\$ 33,698,451,718.60
BANCOS DEL PAIS Y DEL EXTRANJERO	671,727,064.10	DEPOSITOS DE AHORRO	16,563,854,324.81
OTRAS DISPONIBILIDADES	4,626,643,421.35	BANCOS Y CORRESPONSALES	3,396,560,670.30
VALORES NEGOCIABLES Y DEPOSITOS CON INTERESES	56,047,056,813.00	OTRAS OBLIGACIONES A LA VISTA	3,428,809,356.03
EN BANCO DE MEXICO, S.A.	5,887,387,682.82	DEPOSITOS A PLAZO	16,810,107,213.92
VALORES DE RENTA FIJA	3,148,045,315.85	CERTIFICADOS Y CONSTANCIAS DE DEPOSITO BANCARIO	12,420,697,574.59
ACCIONES	65,082,489,811.67	OTRAS OBLIGACIONES A PLAZO	706,197,866.00
Reserva: RESERVA POR BAJA DE VALORES	346,877,323.46	BONOS HIPOTECARIOS EN CIRCULACION	2,813,336,000.00
RESERVA POR DEVALUACION	4,715,241,028.85	BONOS FINANCIEROS EN CIRCULACION	91,713,000.00
PRESTAMOS DIRECTOS Y FIDUCIARIOS	41,138,053,795.59	CERTIFICADOS FINANCIEROS EN CIRCULACION	3,791,354,560.43
PRESTAMOS DE REHABILITACION O AVIO	5,949,734,518.50	OTRAS OBLIGACIONES A PLAZO	31,640,668,000.00
PRESTAMOS REAFECTACIONES	6,312,671,387.64	ACREDORES POR REPORTOS	70,276,104,560.25
PRESTAMOS CON GARANTIA INMOBILIARIA	8,050,811,098.81	REPORTOS-VALORES A ENTREGAR	1,186,548,000.00
PRESTAMOS POR REPORTOS	66,164,811,829.43	OTROS DEPOSITOS Y OBLIGACIONES	318,437,000.00
Y OTRAS A RECIBIR POR REPORTOS	318,241,500.00	RESERVAS PARA OBLIGACIONES DIVERSAS	12,379,004.47
FUTUROS	1,127,284,507.15	CREDITOS DEFERIDOS	1,403,045,958.94
BIENES VENDIDOS CON GARANTIA HIPOTECARIA	259,405,210.29	CAPITAL SOCIAL	84,000,000,000.00
RESERVA DE FONDOS (RFO)	66,451,787.32	Menos: CAPITAL NO EXISTENTE	11,513,384,300.00
OTRAS INVERSIONES (RFO)	2,151,152,817.40	RESERVA LEGAL Y OTRAS RESERVAS	2,454,615,800.00
MOBILIARIO Y EQUIPO	1,287,731,213.38	SUPERAVIT POR REVALUACIONES	1,890,093,138.60
Reserva: RESERVA	671,601,084.34	UTILIDAD EN EL EJERCICIO DE 1978	5,800,684.22
RESERVA Y ACCIONES DE SOCIEDADES INMOBILIARIAS	1,083,374,660.38		1,305,118,639.05
Reserva: RESERVA	1,202,221.80		
CARGOS DEFERIDOS (RFO)	334,572,745.66		
	\$ 144,474,255,648.71		\$ 144,474,255,648.71

C U E N T A S D E C R E D I T O	
TITULOS DESCONTADOS CON NUESTRO ENDOSO	\$ 10,567,706,646.64
AVALES OTORGADOS	34,628,611.46
AFECTUROS DE CREDITOS IRREVOCABLES	1,246,239,516.76
BIENES EN FIDEICOMISO O MANDATO	10,795,079,803.36
BIENES EN CUSTODIA O EN ADMINISTRACION	88,451,460,636.16
CUENTAS DE REGISTRO	42,522,501,166.91

La utilidad que muestra al presente balance, se encuentra afectada por la provision que se cred para el pago de la participacion de los trabajadores en la misma.

El presente balance se formuló de acuerdo con las reglas dictadas por la H. Comision Nacional Bancaria y de Seguros, habiendo sido valorizados los saldos en monedas extranjeras al tipo de cotizacion del día, y los Administradores y Comisarios de la Sociedad han aprobado y dictaminado la autenticidad de los datos que contiene, en los términos del artículo 95 de la Ley General de Instituciones de Crédito y Organizaciones Auxiliares.

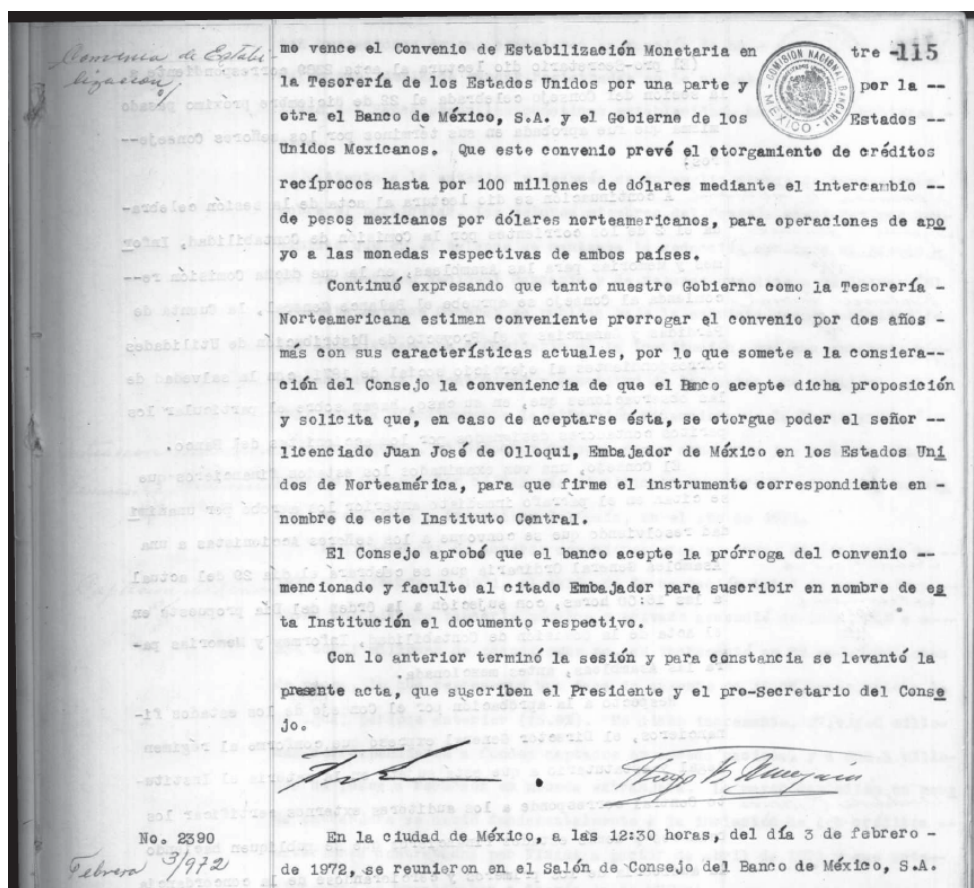
Se hace constar que de las inversiones en valores y créditos, la cantidad de \$ 883,759,742.71, representa activos cedidos en garantía de créditos a cargo de la Institución. Asimismo, se hace constar que de las inversiones en valores y créditos, la cantidad de \$2,328,874,740.81, representa activos específicamente afectos en garantía de bienes financieros emitidos por la Institución.

**AGUSTIN F. LACORTA**  
 DIRECTOR GENERAL

**LEOPOLDO REBOREJA CARRON**  
 CONTADOR GENERAL

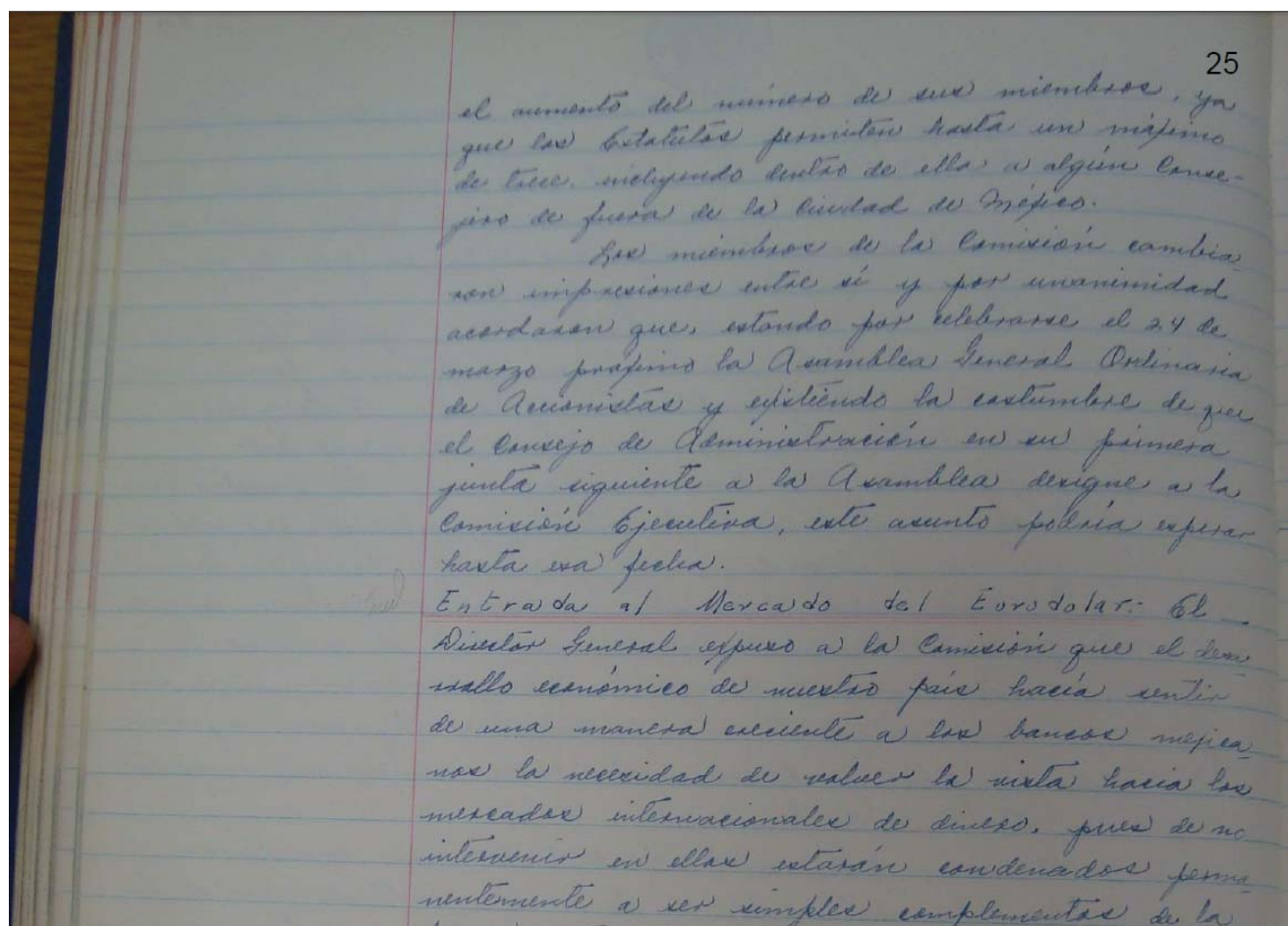
▶ Return

# Minutes of the Governing Board of Banco de Mexico



▶ Return

# Minutes of the Executive Committee of Banamex



# Invernational vs. Domestic-Oriented Banks

Total Assets of 23 Commercial Banks, January 1982, millions of dollars.

Domestic-oriented banks	13'096	International-oriented banks	58'849
Banco del Atlantico	1'618	Bancomer	18'624
Banpais	1'519	Banamex	17'145
Banco B.C.H.	1'470	Banca Serfin	7'355
Banco de Crédito y Servicio	1'237	Multibanco Comermex	5'841
Banca Cremi	1'127	Banco Mexicano-Somex	6'161
Multibanco Mercantil de Mexico	1'037	Banco Internacional	3'119
Banca Confia	979	Banca Promex	602
Credito Mexicano	573		
Banco Regional del Norte	552		
Actibanco Guadalajara	542		
Unibanco	529		
Banco Continental	477		
Banco Mercantil de Monterrey	472		
Banco del Noroeste	437		
Banco Sofimex	332		
Banco Occidental de Mexico	189		

Source: CNBS Multibank Bulletin.

[▶ Return](#)

## Principal Component Analysis (PCA)

Principal Components, Financial Ratios and Factor Loadings.

	Comp1	Comp2	Comp3	Comp4
Troubled Assets / Total Assets				0.6578
Loans / Total Assets		-0.6772		
Liquid Assets / Total Assets		0.6898		
Equity / Total Assets	0.5027			
Total Capital / Total Assets	0.5135			
Equity and Reserves / Total Liabilities	0.5844			
Returns on Assets				-0.6304
Interbank Borrowing / Total Liabilities			0.6184	
Time Deposits / Total Liabilities			-0.5487	
Sight Deposits / Total Liabilities			0.4272	
Percent of variation explained	32.04	22.31	13.77	13.46

Source: Based on CNBS Bulletin (several issues).

[▶ Return](#)

# Incursion into Foreign Finance, 1972-76

## Macroeconomic and banking indicators (%)

	1972	1973	1974	1975	1976
<b>Macroeconomic variables</b>					
GDP real growth rate	8.5	8.4	6.1	5.6	4.2
Inflation	4.9	12.1	23.8	14.9	15.8
Devaluation	0	0	0	0	23.2
Fiscal deficit/GDP	4.5	6.3	6.7	9.3	9.1
Current account/GDP	-2.9	-3.2	-4.7	-5.5	-4.0
External indebtedness/GDP	16.4	18.1	19.8	23.0	29.3
<b>Banking sector</b>					
Interest rate	7.9	8.8	11.5	12.0	12.1
Total lending/GDP	19.3	17.4	14.9	14.7	14.0
Domestic funding/GDP	32.1	30	26.9	27.4	25.7
Foreign borrowing/Total liabilities	0	0	0	0.7	2.7

Source: Banco de Mexico and INEGI.

[▶ Return](#)

# From Domestic to Foreign Funding, 1977-82

## Macroeconomic and banking indicators (%)

	1977	1978	1979	1980	1981	1982
<b>Macroeconomic variables</b>						
GDP real growth rate	3.4	8.2	9.2	8.3	7.9	-0.5
Inflation	29.1	17.5	18.2	26.4	27.9	58.9
Devaluation	46.5	0.6	0.3	0.8	6.7	121.9
Fiscal deficit/GDP	6.1	6.0	6.8	7.5	14.1	16.9
Current account/GDP	-2.4	-3.0	-3.4	-5.4	-6.2	-3.2
External indebtedness/GDP	35.9	32.6	29.6	26.5	32.1	52.9
<b>Banking sector</b>						
Interest rate	14.0	15.9	17.5	24.3	31.8	46.1
Total lending/GDP	12.8	13.3	17.8	17.9	19.2	23.1
Domestic funding/GDP	24.1	27.2	28.7	28.7	30.5	34.5
Foreign borrowing/Total liabilities	3.1	8.7	9.1	12.0	13.0	20.2

Source: Banco de Mexico and INEGI.

[▶ Return](#)