< ∃⇒

- A 🖻 🕨

< □ > < 同 >

æ

Macro-Modelling

with a focus on the role of financial markets

ECON 244, Spring 2013 Empirical Evidence

Guillermo Ordoñez, University of Pennsylvania

March 17, 2013

- ∢ ≣ ▶

3 N

< □ > < 同 >

э.

Financial Development and Growth

• Are differences in financial development associated with differences in economic growth rates?

< ∃ →

- Seminal work, Goldsmith (1969).
- He uses value of financial intermediary assets divided by GNP as a measure of financial development, from 1860 to 1963.
- Main assumption: The size of the financial system is positively correlated with the provision and quality of financial services.
- He found a close relation between financial development and growth

< ∃ >

- Seminal work, Goldsmith (1969).
- Weaknesses
 - Limited observations (only 35 countries).
 - No controls.
 - No analysis if financial development is associated with productivity growth and/or capital accumulation.
 - No identification of any causality direction.
 - Size of financial intermediaries may not be an accurate measure of financial performance.

< ∃ →

- King and Levine (1993).
- Solve these problems.
 - More countries (80 countries in 1960-1989).
 - Controls (e.g., income per capita, education, political stability, indicators of exchange rate, trade, fiscal, and monetary policy).
 - Explicit analysis of impact on productivity growth and capital accumulation.
 - Discussion about causality.

∃ ⊳

- King and Levine (1993).
- Better measures of financial development.
 - DEPTH: Liquid liabilities in financial system/GDP.
 - BANK: Bank credit/(Bank credit + central bank domestic assets).
 - PRIVATE: Credit to private firms/Total domestic credit.
 - PRIVY: Credit to private firms/GDP.

Financial Properties in Different Countries

TABLE 1 Financial Development and Real Per Capita GDP in 1985						
Indictors	Very rich	Rich	Poor	Very poor	Correlation with Real per Capita GDP in 1985	(P-value)
DEPTH	0.67	0.51	0.39	0.26	0.51	(0.0001)
BANK	0.91	0.73	0.57	0.52	0.58	(0.0001)
PRIVATE	0.71	0.58	0.47	0.37	0.51	(0.0001)
PRIVY	0.53	0.31	0.20	0.13	0.70	(0.0001)
RGDP85	13053	2376	754	241		
Observations	29	29	29	29		

Source: King and Levine (1993a)

Very rich: Real GDP per Capita > 4998

Rich: Real GDP per Capita > 1161 and < 4998

Poor: Real GDP per Capita > 391 and < 1161

Very poor: Real GDP per Capita < 391

DEPTH = Liquid liabilities to GDP

BANK = Deposit money bank domestic credit divided by deposit money bank + central bank domestic credit

PRIVATE = Claims on the non-financial private sector to domestic credit

PRIVY = Gross claims on private sector to GDP

RGDP85 = Real per capita GDP in 1985 (in constant 1987 dollars)

Separating Accumulation from Productivity

IABLE 2 Growth and Contemporaneous Financial Indicators, 1960–1989					
Dependant Variable	DEPTH	BANK	PRIVATE	PRIVY	
Real Per Capita GDP Growth	0.024*** [0.007]	0.032*** [0.005]	0.034*** [0.002] 0.52	0.032*** [0.002]	
R ² Real Per Capita Capital Stock Growth	0.022*** [0.001]	0.022** [0.012]	0.020** [0.011]	0.025*** [0.001]	
\mathbb{R}^2	0.65	0.62	0.62	0.64	
Productivity Growth	0.018°° [0.026]	0.026°° [0.010]	0.027*** [0.003]	0.025°°° [0.006]	
\mathbb{R}^2	0.42	0.43	0.45	0.44	

Source: King and Levine (1993b)

* significant at the 0.10 level, ** significant at the 0.05 level, *** significant at the 0.01 level.

[p-values in brackets]

Observations = 77

DEPTH =	Liquid liabilities to GDP
BANK =	Deposit bank domestic credit divided by deposit money bank + central bank domestic
	credit
PRIVATE =	Claims on the non-financial private sector to total claims
PRIVY =	Gross claims on private sector to GDP
Productivity Growth =	Real Per Capita GDP Growth - (0.3) Real Per Capita Capital Stock Growth

Other explanatory variables included in each of the 12 regressions: log of initial income, log of initial secondary school enrollment rate, ratio of government consumption expenditures to GDP, inflation rate, and ratio of export plus imports to GDP.

イロン イ団と イヨン イヨン

Ξ.

Using Controls

	Per Capita GDP	Per Capita Capital	Per Capita Productivity
	Growth, 1960–1989	Growth, 1960–1989	Growth, 1960–1989
Constant	0.035°°°	0.002	0.034***
	[0.001]	[0.682]	[0.001]
Log (Real GDP per	-0.016***	-0.004°	-0.015°°°
Person in 1960)	[0.001]	[0.068]	[0.001]
Log (Secondary school	0.013***	0.007°°°	0.011***
enrollment in 1960)	[0.001]	[0.001]	[0.001]
Government	0.07°	0.049°	0.056°
consumption/GDP in 1960	[0.051]	[0.064]	[0.076]
Inflation in 1960	0.037	0.02	0.029
	[0.239]	[0.238]	[0.292]
(Imports plus Exports)/GDP	-0.003	-0.001	-0.003
in 1960	[0.604]	[0.767]	[0.603]
DEPTH (liquid liabilities)	0.028***	0.019°°°	0.022°°°
in 1960	[0.001]	[0.001]	[0.001]
R ²	0.61	0.63	0.58

 TABLE 3

 GROWTH AND INITIAL FINANCIAL DEPTH, 1960–1989

Source: King and Levine (1993b)

* significant at the 0.10 level, ** significant at the 0.05 level, *** significant at the 0.01 level.

[p-values in brackets]

Observations = 57

< ∃ >

э

Causality

• These empirical studies do not resolve the issue of causality.

- Financial development may predict growth simply because financial systems develop in anticipation of future economic growth.
- Differences in political systems, legal traditions, or institutions may be driving both financial development and economic growth.

Causality

- Efforts to solve the causality problem.
- Rajan and Zingales (1996).
 - They use the US as a benchmark country, assuming financial markets are relatively frictionless.
 - They determine the degree of dependence to external funding across different industries.
 - They find that industries that rely heavily on external funding grow comparatively faster in countries with well-developed intermediaries and stock markets than they do in countries that start with relatively weak financial systems.

(日)、

< ≣⇒

3

< ∃ →

Causality

- Efforts to solve the causality problem.
- Demirguc- Kunt and Maksimovic (1996).
 - They argue that firms with access to more developed stock markets grow at faster rates.
- Jayaratne and Strahan (1996).
 - When individual states of the U.S. relaxed intrastate branching restrictions, this boosted bank lending quality and accelerated real per capita growth rates, even after controlling for other growth determinants.

Country-Case Studies

- Cameron et al. (1960)
- They analyze the historical relationships between banking development and the early stages of industrialization for,
 - England (1750-1844)
 - Scotland (1750-1845)
 - France (1800-1870)
 - Belgium (1800-1875)
 - Germany (1815-1870)
 - Russia (1860-1914)
 - Japan (1868-1914)
- They find the banking system played a positive, growth-inducing role.

イロト イポト イヨト イヨト

- 32

< ≣ >

3

Country-Case Studies

- Haber (1996) compares Brazil, Mexico and the United States from 1830 to 1930.
- McKinnon's (1973) book "Money and Capital in Economic Development" studies the relationship between the financial system and economic development in Argentina, Brazil, Chile, Germany, Korea, Indonesia, and Taiwan in the post World War II period.

◆□▶ ◆□▶ ◆三▶ ◆三▶ ○○○

Country-Case Studies

- Haber (1996) compares Brazil, Mexico and the United States from 1830 to 1930.
- McKinnon's (1973) book "Money and Capital in Economic Development" studies the relationship between the financial system and economic development in Argentina, Brazil, Chile, Germany, Korea, Indonesia, and Taiwan in the post World War II period.
- All case studies show well-functioning financial systems have greatly spurred economic growth.

< ∃ →

Effects of Liquidity and Risk on Growth

- Levine and Sara Zervos (1996)
 - 49 countries over the period 1976-1993.
 - Two measures of liquidity
 - Value traded ratio: Value of shares traded on a country's stock exchanges / GDP.
 - Turnover ratio: Value of shares traded on a country's stock exchanges / Value of listed shares (stock market capitalization).
 - Weakness: Only based on stock markets. Banks and bond markets also provide liquidity.

Effects of Liquidity and Risk on Growth

GROWTH AND INITIAL STOCK MARKET LIQUIDITY, 1976–1993				
Dependant Variable	Value Traded Ratio	Turnover Ratio		
Real Per Capita GDP Growth	0.098°°° [0.003]	0.027*** [0.006]		
Adjusted R ²	0.33	0.34		
Real Per Capita Capital Stock Growth	0.093°°° [0.005]	0.022*** [0.023]		
Adjusted R ²	0.38	0.35		
Productivity Growth	0.075°°° [0.001]	0.020** [0.030]		
Adjusted R ²	0.21	0.21		

m DT T

Source: Levine and Zervos (1996)

 significant at the 0.10 level, "* significant at the 0.05 level, "*" significant at the 0.01 level. [p-values in brackets]
 Observations = 42

Value Traded Ratio = Value of domestic equity transactions on domestic stock exchanges divided by GDP Turnover Ratio = Value of domestic equity transactions on domestic stock exchanges divided by domestic market capitalization.

Other explanatory variables included in each of the six regressions:

log of initial income, log of initial secondary school enrollment, initial ratio of government expenditures to GDP, initial inflation rate, initial black market exchange rate premium, initial ratio of commercial bank lending to private enterprises divided by GDP.

< ∃ >

Effects of Information on Growth

- Empirical evidence that (long list in Levine, 1997),
 - When outsiders find it expensive to evaluate a particular firms, those firms find it relatively difficult to raise capital for investment and rely disproportionately on internal sources of finance.
 - Borrowers with longer banking relationships pay lower interest rates and are less likely to pledge collateral.
 - Countries with financial institutions that are effective at relieving information barriers promote faster economic growth.

Patterns of Financial Development

- Demirguc-Kunt and Levine (1996). 50 countries during 1970-1993.
- As countries get richer.
 - Financial intermediaries get larger relative to GDP.
 - Banks grow relative to the central bank in allocating credit
 - Non-banks financial intermediaries grow in importance
 - Stock markets become larger and more liquid.

Patterns of Financial Development





Sources: IMF (International Financial Statistics), IFC (Emerging Markets Data Base), and individual country reports by central banks, banking commissions, and stock exchanges.

Notes: (1) The data are for 12 low-income economies (Bangladesh, Egypt, Ghana, Guyana, India, Indonesia, Kenya, Nigeria, Pakistan, Zaire, Zambia, and Zinnabaw), 22 middle-income economies (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, El Salvador, Greece, Guatemala, Jamaica, the Republic of Korea, Malayaia, Mexico, Paraguay, The Philippines, Taiwan, Thaliand, Tunisia, Turkey, Uruguay, and Venezuela), and 14 high-income economics (Austrilla, Canada, Demmark, Finland, Germany, Italy, Japan, The Netherlands, Singapore, Spain, Sweden, the United Kingdon, and the United States) data permitting. In 1990, Iow-income economies had an average CDP per capita of \$400; middle-income economies, \$22,740, and high-income economies had an average CDP per capita of \$400; middle-income economies, \$25,740, and high-income economies, \$4057.

(2) Non-bank financial institutions include insurance companies, pension funds, mutual funds, brokerage houses, and investment banks.

(3) Financial depth is measured by currency held outside financial institutions plus demand deposits and interest-bearing liabilities of banks and nonbank financial intermediaries.

(4) For stock market trading as a percentage of GDP, Taiwan is omitted because its trading/GDP ratio in 1990 was almost ten times larger than the next highest trading/GDP ratio (Singapore). With Taiwan included, the middle-income stock trading ratio becomes 37.3 percent.

Structure of Financial Development

- Bank-based versus market-based financial systems have been used to compare Germany and Japan with the United States. (Allen and Gale, 1995 and Demirguc-Kunt and Levine, 1996)
 - Bank-based financial systems: Reduce information asymmetries, allocate capital and exert corporate control more efficiently.
 - Market-based financial systems: Advantages in terms of boosting risk sharing opportunities.

< ∃ →

3

Structure of Financial Development

- Analytical problems with linking financial structure to economic performance.
 - The same financial structure can differ in their performance across countries.
 - Identification and controls.
 - Complementarities in functions between banks and asset markets.
 - Studies have been based on a restricted sample of countries.

Financial Liberalization

- In the last 50 years many developed and underdeveloped countries have liberalized their financial systems.
 - Easing or lifting bank interest rate ceilings
 - Lowering compulsory reserve requirements and entry barriers
 - Reducing government interference in credit allocation decisions
 - Privatizing many banks and insurance companies
 - Actively promoting the development of local stock markets
 - Encouraging entry of foreign financial intermediaries.

◆□▶ ◆□▶ ◆三▶ ◆三▶ ○○○

Pros and Cons - Financial Liberalization

- **Financial liberalization**, by fostering financial development, can increase the long-run growth rate of the economy.
 - By reducing the cost of funds.
 - By improving corporate governance. Foreign competition pushes local firms to adopt international accounting and regulatory standards.
- Financial repression can have benefits as well.
 - By improving the average quality of the pool of loan applicants by reducing interest rates
 - By increasing firm equity by lowering the price of capital
 - By accelerating the rate of growth if credit is targeted toward profitable sectors such as exports or sectors with high technological spillovers.
 - By reducing fragility.

Financial Liberalization

Average liberalization index



a. Financial liberalization is based on the indicators developed in Kaminsky and Schmukler (2001). We take the simple average of liberalization in the capital account, the domestic financial system, and the stock market. This measures ranges from 1 to 3, with 3 representing full liberalization. Details on the construction of the index are in the data pendix. The average liberalization index is the simple average of the liberalization measure across countries in each year.

(日)、

< ∃⇒

э

イロト イポト イヨト イヨト

3

Financial Liberalization



Source: Lora (2001); World Bank (2001).

a. For details on the financial liberalization measure, see the note to figure 1. Privatizations are measured as the cumulative value of sales and transfers of public companies as a proportion of GDP for each year. Tariffs on trade refer to the average tariff.

▲ロト ▲圖ト ▲画ト ▲画ト 三直 - 釣A@

Financial Liberalization and Growth

- Standard problems of causality in cross country studies.
- Galindo, Micco and Ordonez (2002)
 - We follow the methodology of Rajan and Zingales (1996). Industry external dependence.
 - We have a panel of 28 countries, from 1973 to 1998.
 - Measures of financial liberalization in:
 - Capital account: Corporations can borrow abroad and there are no multiple exchange rate mechanisms or other sorts of capital controls.
 - Domestic financial sector: No interest rate controls, directed credit policies or limitations on foreign currency deposits.
 - Stock market: Foreigners are allowed to own domestic equity and no restrictions on repatriation of capital, dividends, and interest.

- ∢ ≣ ▶

- E - E

< □ > < 同 >

= nar

Financial Liberalization and Growth

- Galindo, Micco and Ordonez (2002)
 - Value added per industry: Industrial Statistics Yearbook, from United Nations.

$$\begin{aligned} \mathsf{GROWTH}_{ijt} &= \alpha_0 + \alpha_1 \mathsf{SHARE}_{ijt-1} + \alpha_2 \mathsf{FINLIB}_{it} \mathsf{REQ}_j \\ &+ \alpha_2 \mathsf{FINLIB}_{it} \mathsf{REQ}_j \mathsf{LEG}_i + \mu_{ij} + \lambda_{it} + \epsilon_{ijt} \end{aligned}$$

3 N

Financial Liberalization and Growth

- Galindo, Micco and Ordonez (2002)
 - Financial liberalization reduces the cost of capital, boosting the relative growth rates of economic sectors that for technological reasons rely heavily on external (to the firm) finance.
 - The effects of financial liberalization are more notable in countries that enforce regulations to protect property rights.

・ロト ・聞 と ・ ヨ と ・ ヨ と …

Financial Liberalization and Growth

• •			
Explanatory variable	(1)	(2)	(3)
Industry's share in $t - 1^{b}$	-3.766 (0.551)***	-3.722 (0.539)***	-3.723 (0.539)***
Credit to private sector * External dependence	0.107 (0.032)***		
Total liberalization * External dependence		0.036 (0.011)***	
Domestic financial system liberalization * External dependence			0.033 (0.013)***
Capital account liberalization * External dependence			0.003 (0.011)
Differential in growth ^c	1.60	1.33	1.33
Summary statistic			
No. observations	18,344	19,546	19,546
No. counties	27	28	28
Country-year dummies	Yes	Yes	Yes
Country-industry dummies	Yes	Yes	Yes

TABLE 1. Financial Development, Financial Liberalization, and Industry Growth*

*** Significant at 1 percent.

Financial Liberalization and Growth

Explanatory variable	(1)	(2)	(3)	(4)	(5)
Industry's share in $t - 1^{b}$	-3.722 (0.538)***	-3.735 (0.537)***	-3.739 (0.536)***	-3.722 (0.538)***	-3.769 (0.526)***
Dom. financial system liberation (DFSL)*External dependence	0.036 (0.011)***	0.010 (0.016)	0.005 (0.013)	0.028 (0.041)	0.021 (0.011)**
DFSL*External Dependence*Effective Creditor Rights		0.086 (0.039)**			
DFSL*External Dependence *Creditor Rights			0.072 (0.031)**		
DFSL*External Dependence*Rule of Law				0.012 (0.049)	
DFSL*External Dependence*English Legal Origin					0.100 (0.041)**
Differential in growth ^c (institutional measure in average)	1.3***				
(institutional measure in percentile 25)		0.7	0.9**	1.2*	
Differential in growth (institutional measure in percentile 75)		1.9***	2.2***	1.4***	
Differential in growth (no English legal origin)					0.8**
(English legal origin) (English legal origin)					4.5***
Summary statistic					
No. observations	19,546	19,546	19,546	19,546	19,546
No. countries	28	28	28	28	28
Country-year dummies	Yes	Yes	Yes	Yes	Yes
Country-Industry dummies	Yes	Yes	Yes	Yes	Yes
F test" Prob > F		8.15*** 0.000	6.11*** 0.002	8.62*** 0.000	6.74*** 0.001

T A B L E 2. Financial Liberalization and Growth: Interactions with Legal Protections*

* Significant at 10 percent. ** Significant at 5 percent.

*** Significant at 1 percent

지수는 지수는 지수는 지수는 지수는 지수는 것이 가지?

■ のへで

Financial Liberalization and Size

Legar route thoms					
Explanatory variable	(1)	(2)	(3)	(4)	(5)
Log of real GDPpc (t – 1)	0.094 (0.030)***	0.047 (0.021)**	0.064 (0.025)***	0.077 (0.025)***	0.058 (0.024)**
Domestic financial system liberalization (DFSL)	0.117 (0.036)***	-0.021 (0.024)	-0.014 (0.029)	-0.008 (0.067)	0.066 (0.025)***
DFSL*Effective creditor rights		0.525 (0.110)***			
DFSL*Creditor rights			0.335 (0.095)***		
DFSL*Rule of law				0.192 (0.090)**	
DFSL*English legal origin					0.331 (0.067)***
Impact of financial lib. on development (in % GDP)	11.7***				
Impact of financial lib. on development (in % GDP) (institutional variable in percentile 25)		4.1**	7.0***	8.3**	
Impact of financial lib. on development (in % GDP) (institutional variable in percentile 75)		23.2***	23.7***	17.1***	
mpact of financial lib. on development (in % GDP) (no Finalish lenal origin)					6.6***
mpact of financial lib. on development (in % GDP) (English legal origin)					39.7***
Summary statistic	691	601	691	601	691
No. countries	27	27	27	27	27
Country dummies	Yes	Yes	Yes	Yes	Yes

T A B L E 4. Financial Liberalization and the Size of Financial Systems: Interactions with Legal Protections⁴

** Significant at 5 percent.

*** Significant at 1 percent.

a. The dependent variable is the credit to private sector as percent of GDP. DFSL is domestic financial system liberalization, measured

and a second second second and and a second with the second of the second second

イロン 不同と 不同と 不同とう

= nac

Financial Liberalization and Efficiency

Explanatory variable	(1)	(2)	(3)	(4)
Industry's share in $t - 1^{6}$	-3.920 (0.596)***	-3.921 (0.596)***	-3.921 (0.596)***	-3.910 (0.597)***
Credit to private sector*External dependence	0.096 (0.035)***	0.094 (0.035)***	0.094 (0.035)***	0.111 (0.034)***
Total financial liberalization*External dependence	0.023 (0.012)*			
Domestic financial liberalization *External dependence		0.024 (0.013)*	0.024 (0.011)**	
Capital account liberalization*External dependence		0.000 (0.012)		0.011 (0.010)
Summary statistic				
No. observations	17,774	17,774	17,774	17,774
No. countries	28	28	28	28
Country-year dummies	Yes	Yes	Yes	Yes
Country-industry dummies	Yes	Yes	Yes	Yes

TABLE 5. Financial Liberalization and Domestic Financial System Efficiency⁴

* Significant at 10 percent.

** Significant at 5 percent.

*** Significant at 1 percent.

a. The dependent variable is the annual value added growth for each ISC industry, in each county and in each year. Financial development is messured as credit to the private sector as percent of GOP. Total financial liberalization is the simple average of domenic financial system, notot market, and capital account liberalization. Dimensit in fancial liberalization is the average of domenic financial system and stock market. Ilberalization. All variables are interacted with industries' external financial requirements. Standard errors consider clusters by county and industry and are exported in partmetees.

b. The industry's share of total value added in manufacturing in year t - 1.

< ∃ →

Financial Fragility

- Many banking crises in the 80s and 90s, suggest the benefits of financial liberalization may have to be weighed against the cost of increased financial fragility.
- Demirguc-Kunt and Detragiache (1998). Banking crises
 - are more likely to occur in countries with a liberalized financial sector.
 - do not happen at the immediate aftermath of liberalization.
 - happen more likely in a weak institutional environment.

Financial Fragility

- Why financial liberalization introduces fragility?
 - Financial liberalization reduces franchise value of banks and increase moral hazard, by reducing reputation concerns.
 - Reduction of controls on international capital movements open foreign exchange risk (raise funds in foreign currency and lending them to local borrowers in domestic currency).

Currency crises are preceded by banking crises (Kaminsky and Reinhart, 1996).

 Skills to screen and monitor risky borrowers and the skills to perform efficient supervision, can only be acquired gradually. Then, banks in newly liberalized systems are more vulnerable.

< ∃⇒

э

Financial Fragility

- Demirguc-Kunt and Detragiache (1998)
- Multivariate Logit with 53 countries from 1980 to 1995.
- Main variables
 - Banking crisis dummy.
 - Financial liberalization dummy.
 - Measures of institutional quality.
 - Control variables.

Financial Fragility

Financial Liberalization and Institutions:

FIN. LIB.	1.956***	1.770*	4.053***	4.732***	1.803*	1.823*
FIN. LIB. x GDP/CAP	089* ^(6%) (.048)	((1.542)	(1.557)	(1.002)	(1.050)
FIN. LIB. x LAW & ORDER		405** (.205)				
FIN. LIB. x DELAY			727 (.678)			
FIN. LIB. x CONT. ENFORCEMENT				938* (.574)		
FIN. LIB. x BUR. QUALITY					380* (.223)	
FIN. LIB. x CORRUPTION						403* ^(6%) (.215)
Past Crisis:						
DURATION of last period	.112** (.051)	.181** (.081)	.028 (.067)	.031 (.067)	.171** (.079)	.156** (.078)
No. of Crisis	32	22	21	21	22	22
No. of Obs.	639	425	406	406	418	418
% correct	77	72	78	80	72	73
% crisis correct	63	55	67	71	59	59
model χ^2	60.08***	35.69***	49.65***	51.34***	34.16***	34.77***
AIC	218	161	140	138	162	162

< ∃ →

æ

*, **and *** indicate significance levels of 10, 5 and 1 percent respectively.

・ロン ・個人 ・モン ・モン

Financial Fragility

Country†	Bank Crisis Start Date	Probability of Crisis Predicted by Baseline at Crisis Date ⁺	Predicted Probability of Crisis had the Country not Liberalized on or prior to the Bank Crisis Date
Chile	1981	.174	.035
Colombia	1982	.047	.008
Finland	1991	.119	.023
Guyana	1993	.028	.005
India	1991	.221	.047
Indonesia	1992	.306	.071
Italy	1990	.028	.005
Japan	1992	.071	.012
Jordan	1989	.786	.387
Kenva	1993	.412	.108
Malavsia	1985	.170	.034
Mexico	1994	.207	.043
Nigeria	1991	.044	.008
Norway	1987	.031	.006
Papua N.Guinea	1989	.259	.057
Paraguay	1995	.114	.022
Peru	1983	.347	.084
Philippines	1981	.052	.009
Portugal	1986	.133	.026
Sri Lanka	1989	.104	.019
Sweden	1990	.033	.006
Turkey	1991	.221	.047
	1994	.443	.121
Uruguay	1981	.358	.087
United States	1980	.459	.126
Venezuela	1993	.424	.113

ECON 244, Spring 2013 Empirical Evidence Macro-Modelling

< ∃⇒

э

Similar Forces?

- Banking Panics and Asset Bubbles
 - Can be generated by beliefs or fundamentals.
 - Difficult to distinguish their causes.
 - Difficult to recommend policy responses.
 - Costly consequences.
 - Intimately related to economic recessions.

Banking Crises

- Numerous banks fail simultaneously, leading to a reduction in bank credit, that spread problems to real activity.
- We already study why banks are naturally illiquid. They have shortterm liabilities and long-term assets.
- Are very susceptible to fail if funds dissipate (bank runs)
 - 1867-1845: All recessions but one was associated with bank runs.
 - 1945-1971: Almost no bank runs.
 - 1975-1997: 54 banking crises.
- They are very costly for governments to solve.

æ

Banking Crises

Country	Crises Dates	Estimated Cost of Bailout
Anomtine (1)	1000 1002	(43 /0 0) 001)
Argentina (+)	1960-1962	55
Indonesia (+)	1997-1998	55
China	1990s	47
Jamaica (+)	1994	44
Chile (+)	1981-1983	42
Thailand (+)	1997	35
Macedonia	1993-1994	32
Israel	1977-1983	30
Turkey (+)	2000	30
Uruguay	1981-1984	29
Korea	1998	28
Cote d'Ivoire	1988-1991	25
Japan	1990s	24
Uruguay	1981-1984	24
Malaysia (+)	1997-1998	20

(+)Country with more than one banking crisis since 1980. The reported crisis is the largest. Source: Caprio and Klingbiel (2003).

ECON 244, Spring 2013 Empirical Evidence

Banking Crises - Belief Based

- For some reason, all depositors want to withdraw their deposits, even when nothing fundamental changes for the bank. Liquidity Crisis.
- Kindleberger (1978). People acts irrationally.
- Diamond and Dybvig (1983). Rational choice of depositors, when the expectation about what other depositor will do, change.
 - Multiple equilibria
 - Good equilibria: Only depositors that need the money withdraw it.
 The bank has enough money to cover them.
 - Bad equilibria: All depositors want to withdraw their deposits (since they think everybody else will). The bank cannot cover all of them.
 - The government can always select the good equilibria by promising deposit insurance. They have proven very effective, except lately.

< ∃ >

Banking Crises - Fundamental Based

- Allen and Gale (1998). Something impact the asset side and make banks not able to pay liabilities. **Solvency Crisis.**
 - Negative shocks to net worth of banks.
 - Negative shocks to the profitability of banks.
- Deposit insurance can be counterproductive, increasing moral hazard and weakening the real position of banks.
- Government can avoid a fragile position with precautionary regulation.

Banking Crises

- To disentangle between these two types of crises is critical.
- Belief-based crises
 - Are inefficient.
 - Generate real economics problems (panic of 1873).
 - Deposit insurance may explain the disappearance of crises after the Fed introduce it.
- Fundamental-based crises
 - May be efficient.
 - Magnify real economic problems (Great Depression).
 - Deregulation in the 80s may explain the new irruption of crises.

イロト イポト イヨト イヨト

э

< ∃ →

Evidence

- Gorton (1988)
 - US banking data from 1873 to 1972.
 - Banking crises are related to weaker economic fundamentals.
- Caprio and Levine (2006)
 - Strict regulation is not related to more efficiency in the system.
 - If something, it reduces efficiency through an increase in corruption.
 - Positive relation between banking efficiency and accurate financial information. The market provides better incentives.

.⊒...>

Evidence

- Dell'Ariccia, Detragiache and Rajan (2005)
 - US sectors more dependent on external financing perform worse than other sectors during banking crises.
 - This result is stronger when economic fundamentals are the weakest.
- Belief-based crises have not being tested empirically.

< ∃ >

3

Costs of Banking Crises

- Costs in terms of growth
 - Demirguc-Kunt, Detragiache and Gupta (2000): Growth falls 4% after a crisis.
 - Barro (2001): Growth falls 0.6% after a crisis.
- Costs in terms of output
 - Hutchinson and Neuberger (2005): 8-10% of precrises GDP, between 2-4 year after the crisis.
 - Boyd, Kwak and Smith (2005): Developed countries do not experience losses. Underdeveloped countries have a discounted expected loss of 60-300% of pre-crises trend.

글 > 글

Asset Bubbles

- Prices of assets above those prices that can be justified purely by asset's financial fundamentals and borrower's characteristics.
- The burst of these bubbles are associated to severe recessions (Great Depression, recent crisis, etc).
- Different that banking crises. Bubbles never disappeared!

Ξ.

Asset Bubbles

Bubble	Percentage Rise Bull Phase	Length of Up Phase (months)	Percentage Decline Peak to Through	Length of Down Phase (months)	
Tulips Holland (1634-1637)	+5900	36	-93	10	
Mississippi shares France (1719-1721)	+6200	13	-99	13	
South Sea shares Great Britain (1719-1720)	+1000	18	-84	6	
U.S. stocks United States (1921-1932)	+497	95	-87	33	
Mexican stocks Mexico (1978-1981)	+785	30	-73	18	
Silver United States (1979-1982)	+710	12	-88	24	
Hong Kong stocks Hong Kong (1970-1974)	+1200	28	-92	20	
Taiwan stocks Taiwan (1986-1990)	+1168	40	-80	12	
NASDAQ tech stocks United States (1999-2000)	+733	60	-78	32	
Japanese stocks Japan (1965-?)	+3720	288			
Source: Cecchetti (2006).			< □		• •

ECON 244, Spring 2013 Empirical Evidence

3 N

Asset Bubbles - Belief Based

- Kindleberger (1989). People acts irrationally.
 - Speculative manias and panics.
 - Speculation is often debt-financed and investors become highly leveraged (returns are very sensitive to small changes in the market).
 - Booms usually start with either financial liberalization or a expansionary monetary policy.
 - "Greater fool theory" (Who cares if I overpay for an asset, as long as there is a bigger fool that I can sell it to?)

< ∃ >

3

Asset Bubbles - Fundamentals Based

- Kaminsky and Reinhart (1999).
 - Financial liberalization or expansionary monetary policy make banks to take more risks and expand credit.
 - This credit is used to speculate in asset markets.
 - An external shock takes place.
 - Asset prices, net worth and collateral values decline, while bankruptcies increase.
 - Credit tightens, spilling over the rest of the economy.

Asset Bubbles - Relation with Banking Panics

- Allen and Gale (2000).
 - Speculation is financed with credit.
 - This is always associated with moral hazard, which increases the attractiveness of risky assets (with higher returns), in limited supply (more room for price increase).
 - This relation between credit and speculation creates the link between asset bubbles and banking crises.
 - Still the empirical relation between them is not clear.

Evidence Asset Bubbles

- Again, testing belief-based theories is difficult.
- Fundamental-based theories.
- De Bondt and Thaler (1987)
 - Stock prices overreact to new information (more than justified by the fundamental information content)
- Helbling and Terrones (2003)
 - Output losses from housing busts are twice as large as those from stock market crashes.
 - Why? Hoseholds have a larger fraction of their wealth in their homes than in equity or bonds.

イロト イポト イヨト イヨト

= 900

< ∃ >

3

Summary of Evidence

- Financial markets do seem to increase growth.
- Financial markets seem to be fragile and magnify crises when they do occur.
- The positive and negative effects are associated to institutional strength.
- Big open questions:
 - Are banking crises and bubbles belief-driven or fundamental-driven phenomena?
 - This open the door for financial markets to also generate crises.