Crísis Financieras y Política Macroeconómica

Pablo Cuba Borda

February 17, 2025

Universidad Católica Boliviana San Pablo
Semestre I, 2025

Banking Crisis

Questions

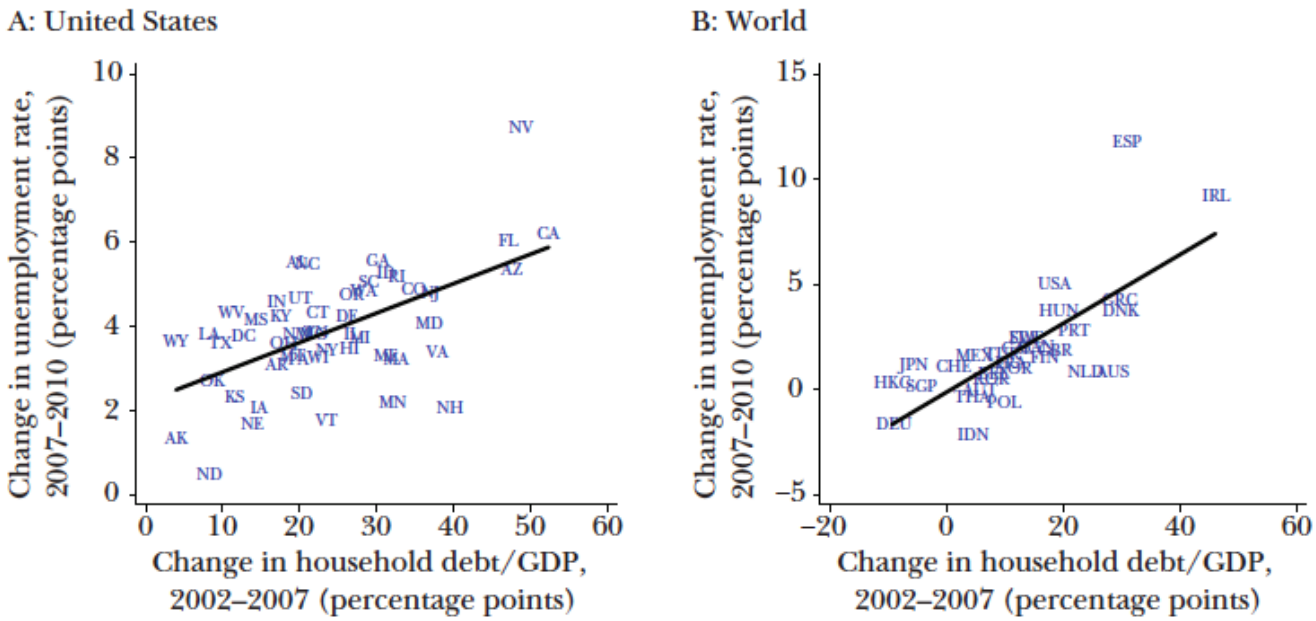
- What is the role of the financial sector in explaining business cycles?
- What channels transform expansion in credit growth into macroeconomic vulnerabilities?
- What is the role of banks?
- What are banking crisis and how do they unfold?
- How costly and recurrent are banking crisis?

Credit-driven household demand channel

- Expansion in credit supply
- Credit boom boosts household demand without affecting productive capacity
- Deleveraging leads to severe contraction in economic activity

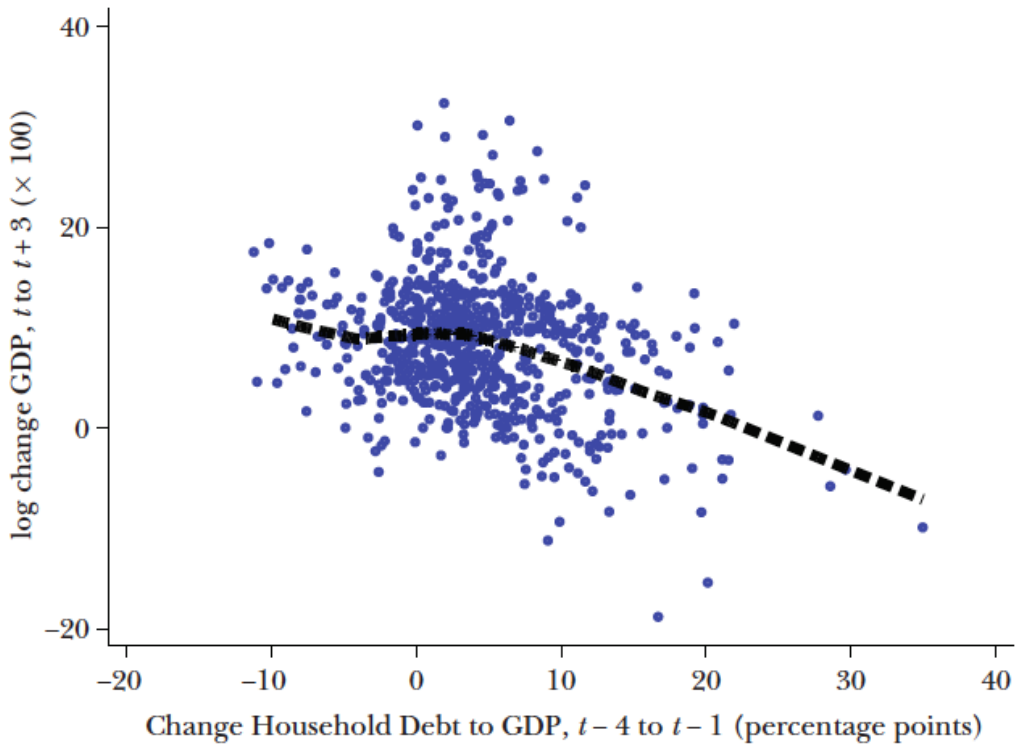
Figure 1

Household Debt and Unemployment



Household debt and GDP growth

- A rise in household debt systematically predicts a decline in subsequent GDP growth



Note: Figure 2 is based on a sample of 30 mostly high-income countries from 1960 to 2012 in the Mian, Sufi, and Verner (2017b) sample. Each point represents a given country and a given year. This figure plots real GDP growth from year t to $t+3$ against the rise in the household debt to GDP ratio from year $t-4$ to year $t-1$. See Mian, Sufi, and Verner (2017b) for more details.

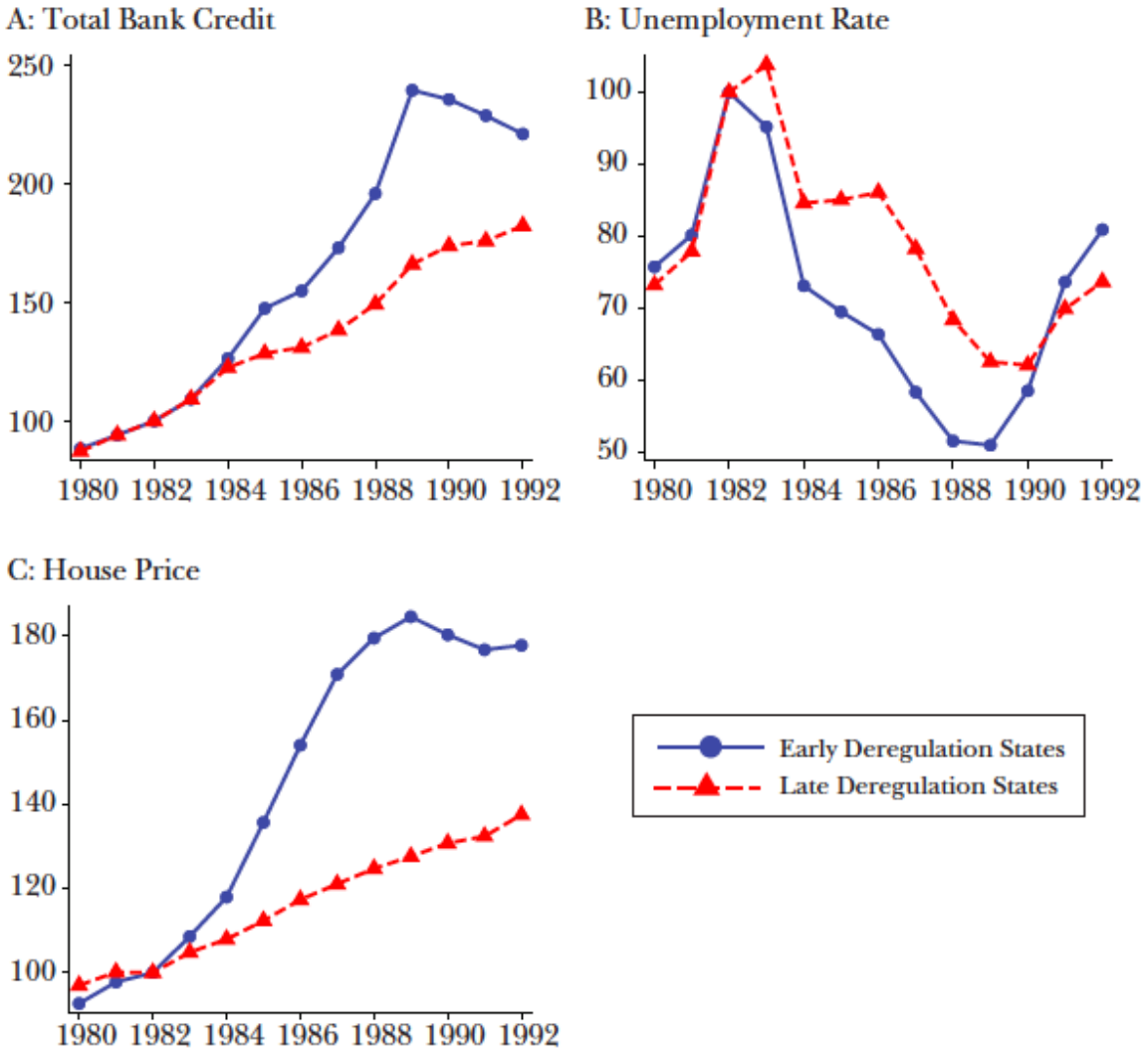
What drives the increase in household debt?

- Increase in debt could arise from increase in supply or credit or increase in demand for credit
- Supply: Willingness of lenders (banks), lower perception of risks, financial de-regulation
- Demand: Increase in household permanent income, changes in the wealth distribution, demographic changes, beliefs

Quasi-natural experiment: credit supply shocks

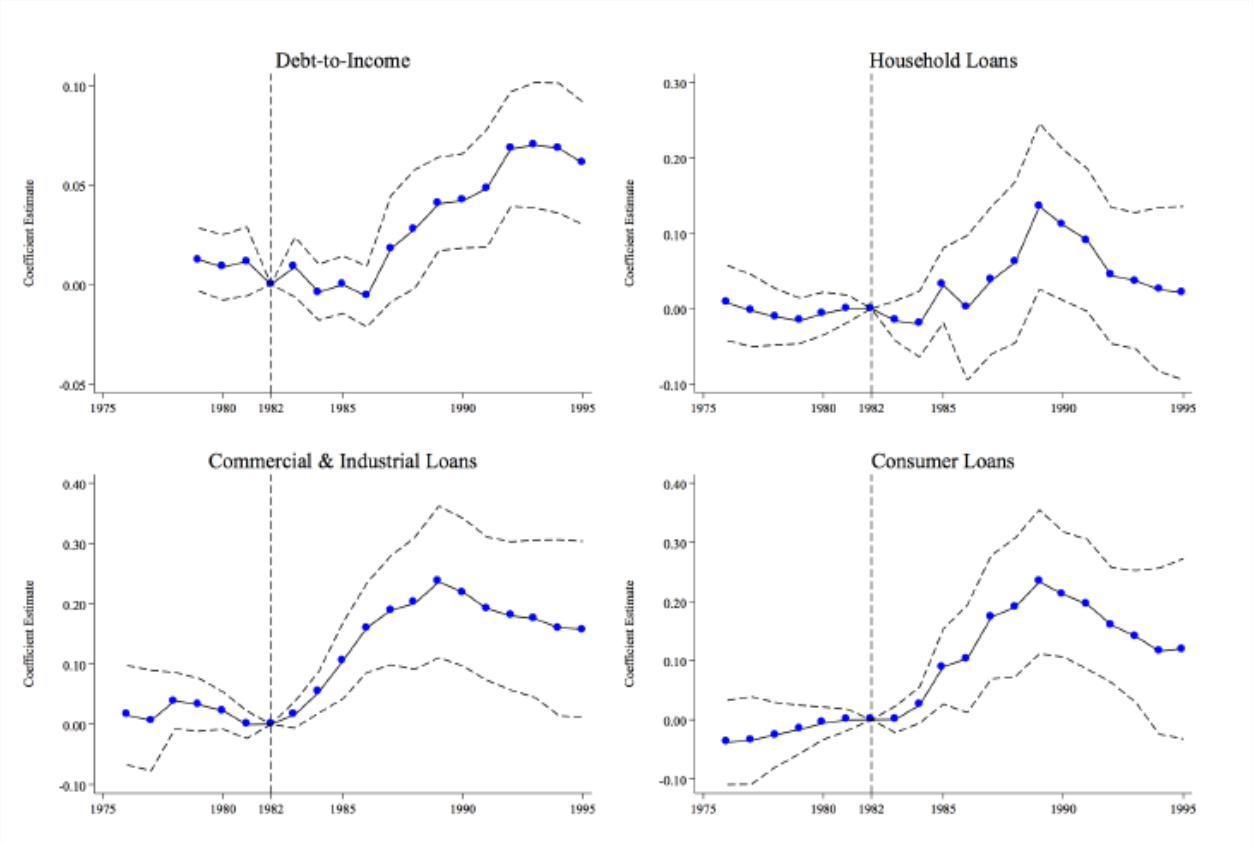
US Banking Deregulation Quasi-Experiment

(outcomes indexed to 100 in 1982)



Credit growth and deregulation

- Pre-1982, credit growth and household debt are similar across all states
- From 1982 to 1989, faster credit growth in early deregulation states



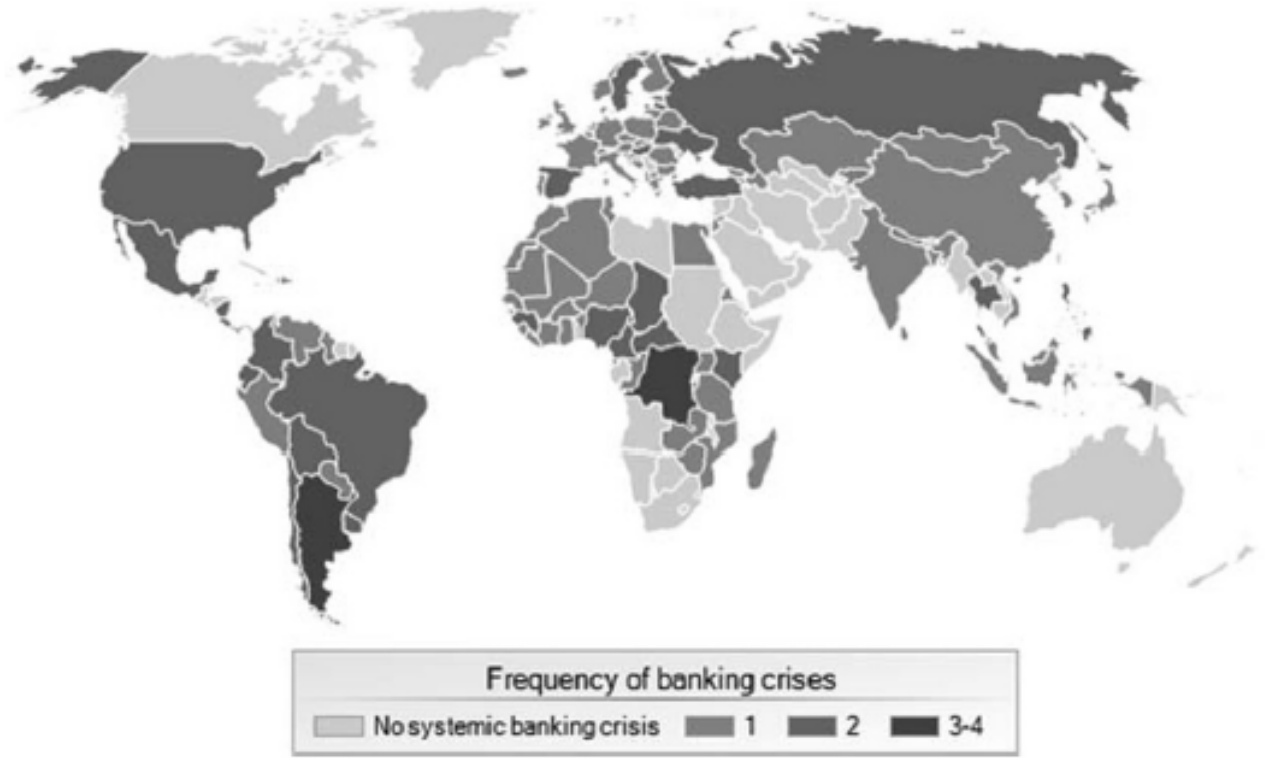
From credit growth to banking crisis

- Credit-bust is followed by a contraction in economic activity
- Credit crunch can trigger a financial accelerator mechanism: lower demand $\rightarrow$ tighter credit supply $\rightarrow$ deleveraging $\rightarrow$ lower demand $\rightarrow \ldots$
- Example: Credit supply contraction during Great Recession in the U.S.
- Remember: household debt key asset held by banks
- Credit bust will damage banks balance sheets and disrupts functioning of credit markets leading to banking crisis

Banking crisis around the world

- How prevalent are banking crisis?

Figure 3. Frequency of Systemic Banking Crises Around the World, 1970–2011



Identification of banking crisis

- Multiple manifestation of banking crisis
- No direct indicator to measure banking stress, need multiple signals
- Sometimes *subjective* criteria are used to identify events
- Definition:
  1. Significant signs of financial distress in banking system
  2. Significant policy intervention to prop-up institutions in the banking system

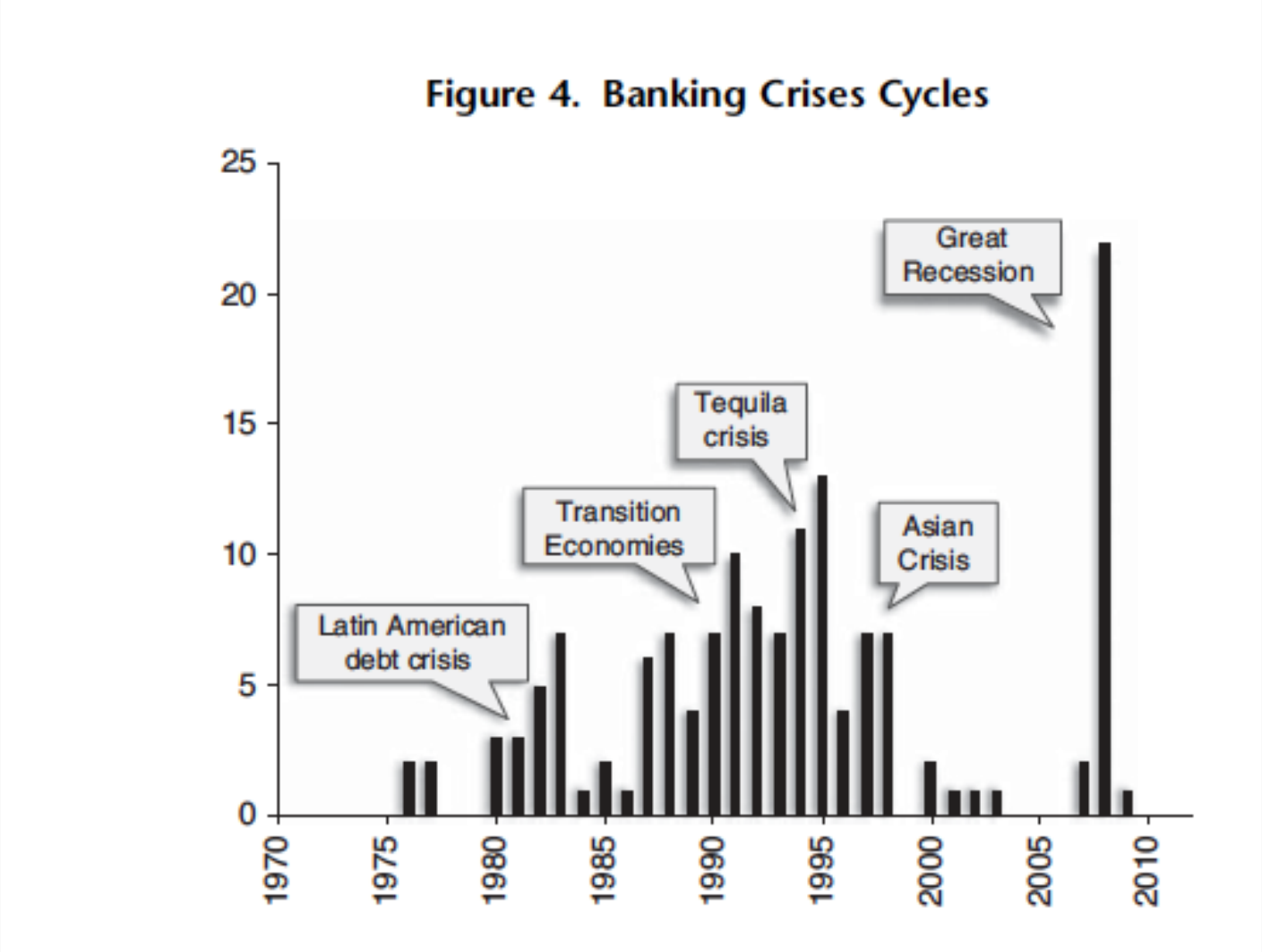
Identification of banking crisis

- Examples of policy intervention

Table 1. Systemic Banking Crises, 2007–2011

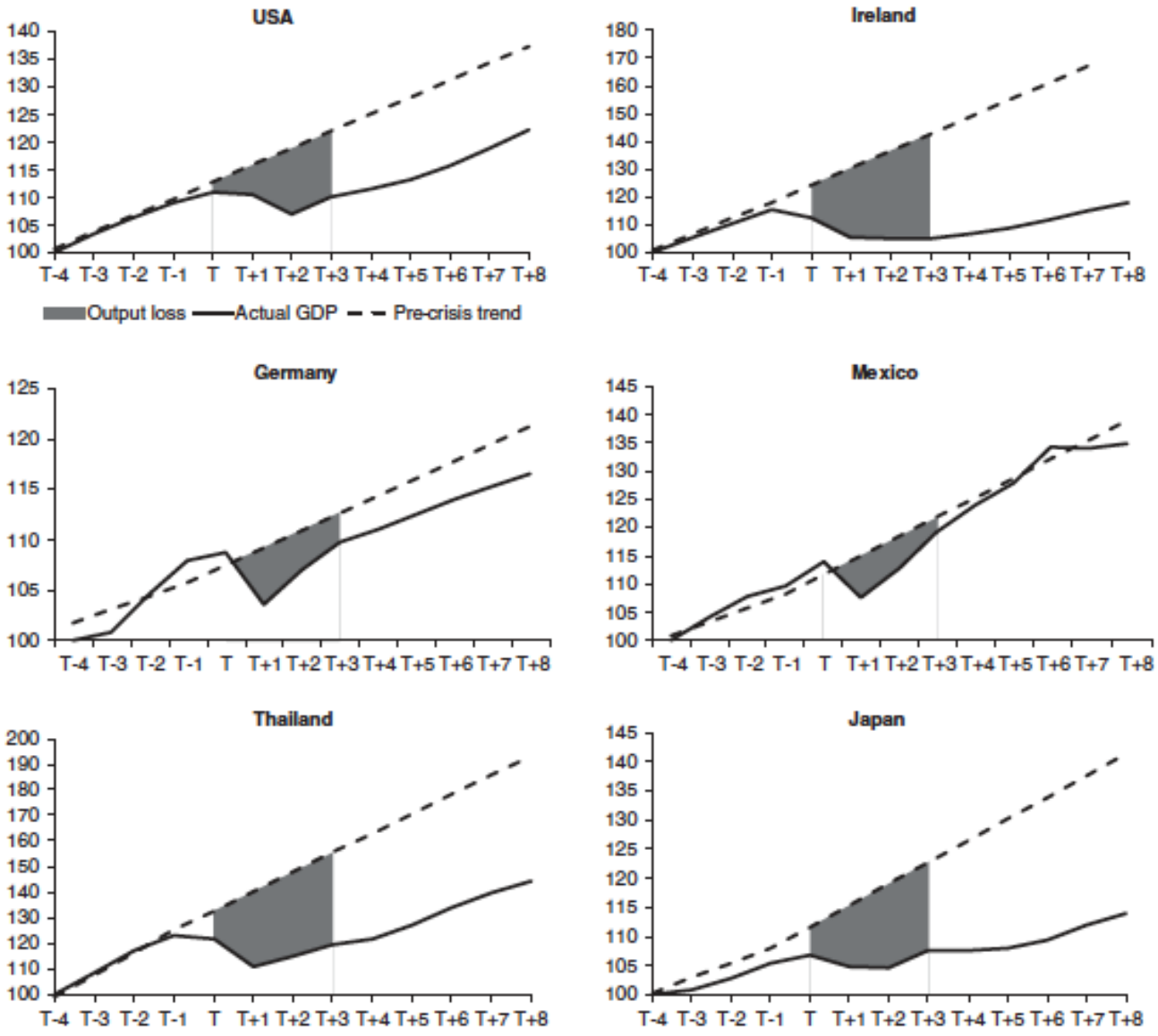
Country	Start of Crisis	Date when Systemic	Extensive Liquidity Support	Significant Guarantees on Liabilities	Significant Restructuring Costs	Significant Asset Purchases	Significant Nationalizations
Systemic cases							
Austria	2008	2008	✓	✓	✓		✓
Belgium	2008	2008	✓	✓	✓		✓
Denmark	2008	2009	✓	✓			✓
Germany	2008	2009	✓	✓			✓
Greece	2008	2009	✓	✓	✓		
Iceland	2008	2008	✓	✓	✓		✓
Ireland	2008	2009	✓	✓	✓	✓	✓
Kazakhstan	2008	2010	✓		✓		✓
Latvia	2008	2008	✓	✓			✓
Luxembourg	2008	2008	✓	✓	✓		✓
Mongolia	2008	2009	✓	✓	✓		✓
Netherlands	2008	2008	✓	✓	✓		✓
Nigeria	2009	2011	✓	✓	✓	✓	✓
Spain	2008	2011	✓	✓	✓		
Ukraine	2008	2009	✓		✓		✓
United Kingdom	2007	2008	✓	✓	✓	✓	✓
United States	2007	2008	✓	✓	✓	✓	✓

Recurrence of banking crisis



Cost of banking crisis

Figure 6. Output Losses for Selected Crises Episodes



Sources: *World Economic Outlook* and authors' calculations.

Debt Crisis

Questions

- What do we understand by sovereign default?
- Why do countries pay their international debt?
- What are the empirical regularities related to international lending and default episodes?
- What are the costs of default?

Definitions

- Sovereign debt = debt incurred by the government
- Why is sovereign debt different?
- Sovereign default (legal) = episode in which a scheduled debt service is not paid (partially or fully)
- Sovereign default (technical) = restructuring of debt commitments at terms less favorable than the original contract
- Sovereign debt $\neq$ **total** debt repudiation
- Duration of default = time from default event to restructuration

Credit-rating agencies are the main source of data for default episodes

Credit-rating agencies definitions

- **Entry to default:** SP defines default as the failure to meet a principal or interest payment on the due date. This includes situations in which the sovereign forces an exchange of old debt for new debt with less-favorable terms or converts debt into a different currency of less value.
- **Exit from default:** SP considers a country to have emerged from default when it resumes payments of interest and principal (including arrears), or after a debt settlement that leads the rating agency to conclude that no further near-term resolution of creditors' claims is likely.

Sovereign vs private debt

- Incentives to borrow are different
  - Goverments might feel the obligation to provide constant stream of government services.
  - $G(\tau Y_t, \dots)$ vs $\bar{G} \rightarrow$ but $B'(\tau Y_t) < 0$.
- Collateral
  - Households can pledge real assets as collateral $\rightarrow$ enforcement through bankruptcy law (e.g. courts might garnish wages)
  - Government cannot be forced to surrender assets
  - No international legal courts of bankruptcy to settle sovereign default disputes
- Politico-economic considerations (?)

Stylized Facts

Table 13.1 Frequency And Length of Sovereign Defaults: 1824-2014

Country	Number of Defaults 1824-2014	Probability of Default all years	Probability of Default years not in default	Years in State of Default per Default Episode
Argentina	5	0.026	0.035	10
Brazil	7	0.037	0.047	6
Chile	3	0.016	0.020	14
Colombia	7	0.037	0.058	10
Egypt	2	0.010	0.012	11
Mexico	8	0.042	0.056	6
Philippines	1	0.005	0.006	32
Turkey	6	0.031	0.037	5
Venezuela	10	0.052	0.079	6
Mean	5.4	0.029	0.039	11

Note. The sample includes only emerging countries with at least one external-debt default or restructuring episode between 1824 and 1999. The 2014 selective default of Argentina with 1 percent of the holdout investors that did not enter the debt restructurings of 2005 and 2010 is not counted as a default event. Source: Own calculations based on Reinhart, Rogoff, and Savastano (2003) table 1 for the period 1824-1999 and USG (2017) table 13.19 for the period 2000-2014.

- Average probability of default is between 2.9% - 3.9% per year.(every 25-34 years)
- Average default duration = 11 years

Source: Uribe and Schmidt-Grohe (2017)

Stylized Facts: Size of defaults

- Sovereign debt $\neq$ **total** debt repudiation.
- Haircut = Loss inflicted to creditors upon restructuring = $\Delta \sum_{s=0}^{T} \frac{1}{R_{t+s}} \frac{D_{t+s}^{new}}{D_{t+s}^{old}}$, D_t = debt payments at time t
- Average haircut = 40%, σ = 22%

Country	Date	Mill USD	Haircut	Discount Rate
Argentina	06 / 2005	60,572	76.8%	10.4%
Bolivia	04 / 1993	171	76.5%	14.1%
Brazil	04 / 1994	43,257	29.3%	11.8%
Cote d'Ivoire	04 / 2010	2,940	55.2%	9.9%
Ecuador	08 / 2000	6,700	38.3%	17.3%
Ethiopia	01 / 1996	226	92.0%	16.0%

Source: Cruces and Trebesch (2013):
https://sites.google.com/site/christophtrebesch/data

Stylized facts: Debt before default

Table 13.3 Debt-to-GNP Ratios Among Defaulters: 1970-2000

Country	Average Debt-to-GNP Ratio	Debt-to-GNP Ratio in Year of Default
Argentina	37.1	54.4
Brazil	30.7	50.1
Chile	58.4	63.7
Colombia	33.6	
Egypt	70.6	112.0
Mexico	38.2	46.7
Philippines	55.2	70.6
Turkey	31.5	21.0
Venezuela	41.3	46.3
Average	44.1	58.1

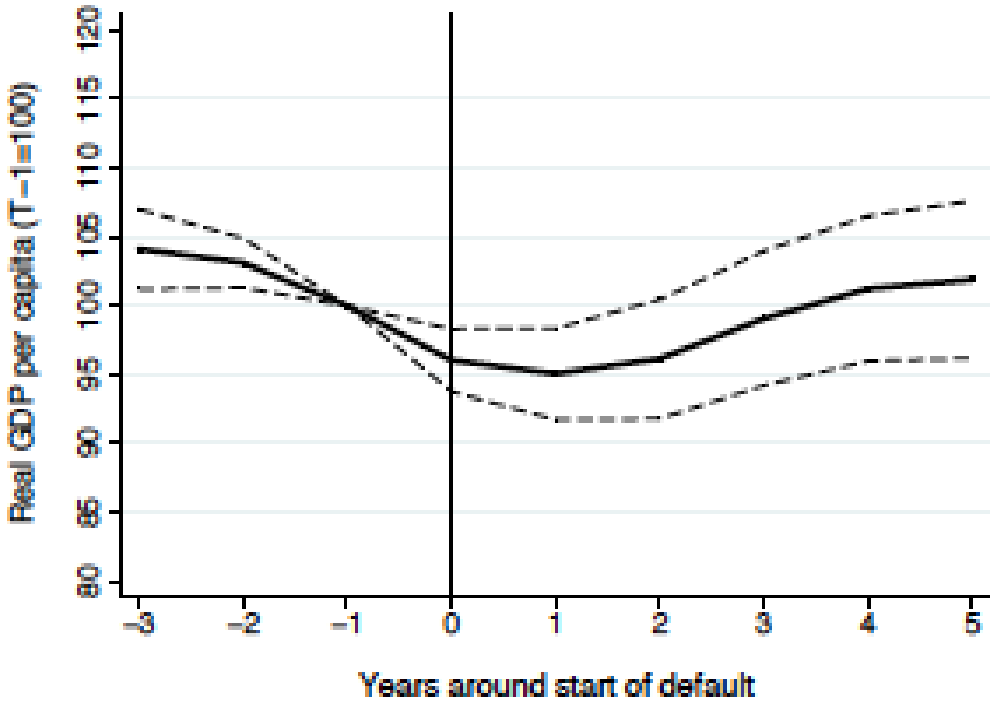
Source: Schmidt-Grohe and Uribe (2017)

Stylized facts: GDP around default

- Default happens during bad times

Figure 4: Real GDP around the start of default

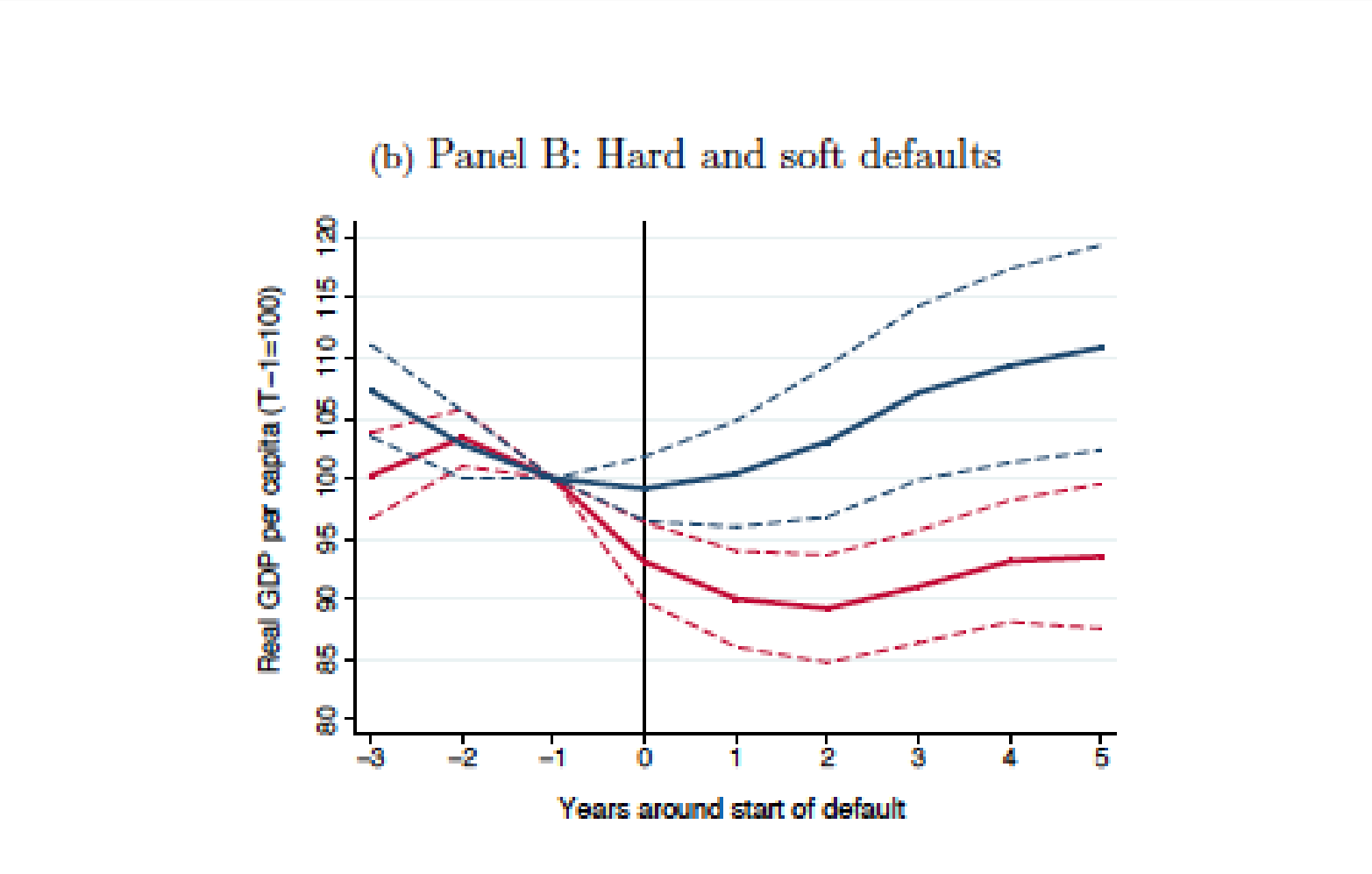
(a) Panel A: All defaults



Source: Cruces and Trebesch (2013)

Stylized facts: Hard vs Soft Default

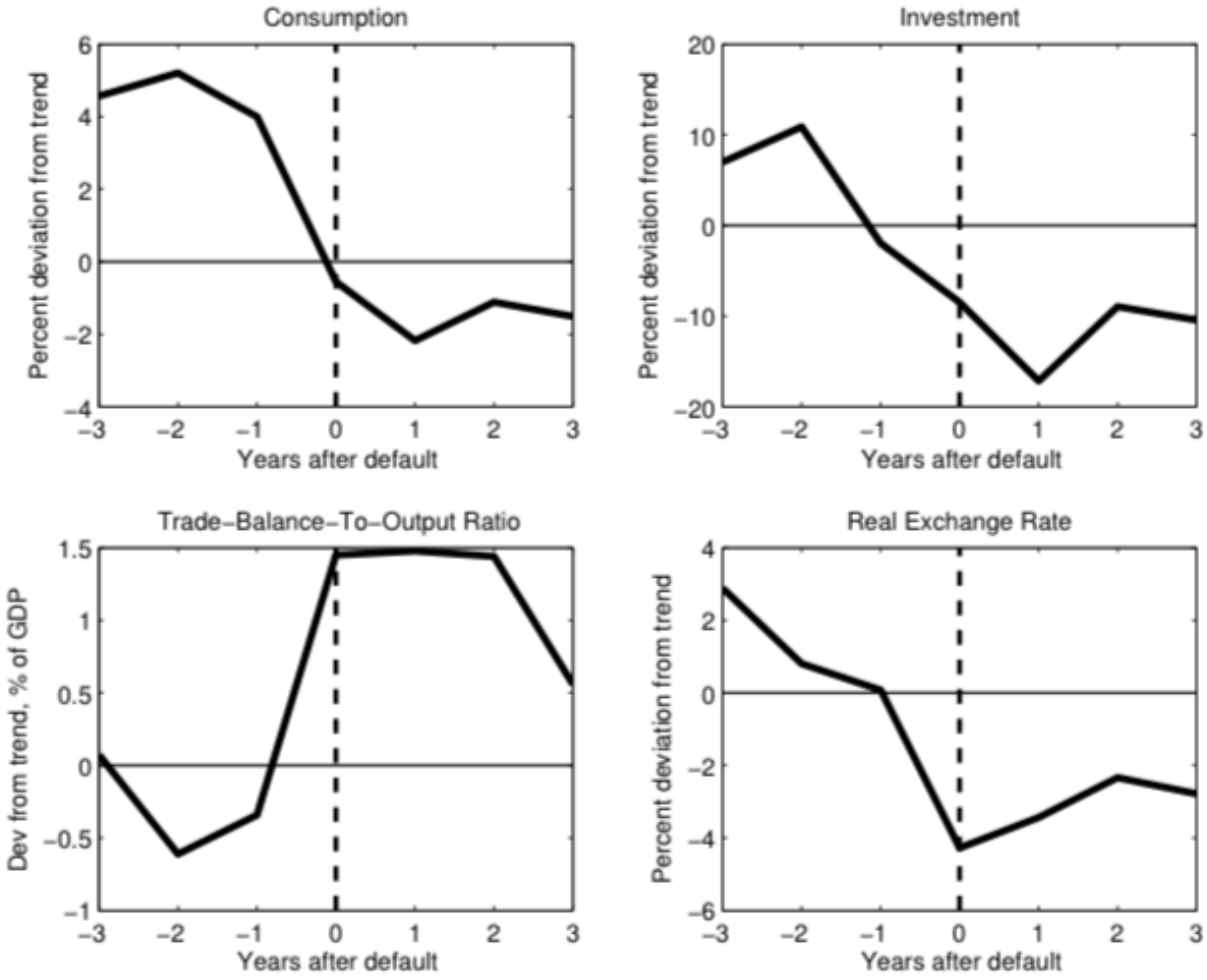
- Cost depends on ability of creditor to **coerce** debtors to pay



Source: Cruces and Trebesch (2013)

Stylized facts: Debt before default

Figure 13.3 Consumption, investment, the trade balance, and the real exchange rate around default episodes



Source: Schmidt-Grohe and Uribe (2017)

Historical perspective

- Does external debt surges are a recurring antecedent to banking crises?
- Do banking crises often precede or accompany sovereign debt crises?
- Does public borrowing surges ahead of an external sovereign debt crisis?
- Does the composition of debt shifts when countries are close to default?

Debt and default cycles

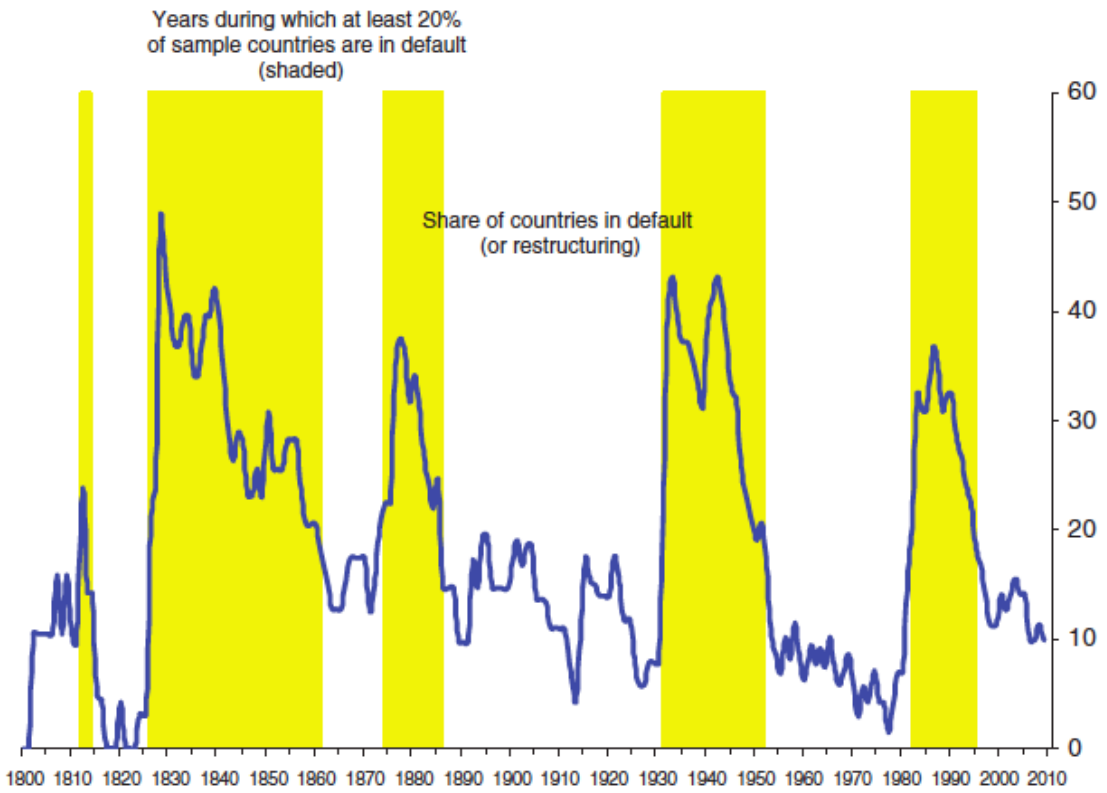


FIGURE 2. GLOBAL SOVEREIGN EXTERNAL DEFAULT CYCLES: 1800–2009
(*share of countries in default or restructuring*)

Notes: Sample includes all countries, out of a total of 70 listed in Appendix Table A1, that were independent states in the given year. Specifically, the number of countries increases from 19 in 1800 to 32 in 1826, as Latin American colonies gain independence; following World War II, newly independent Asian states swell the number to 58; and in the following decades, as African nation-states are born, the number of sovereigns increases to a total of 70—the full sample.

Source: Reinhart and Rogoff (2011)

Debt and default cycles

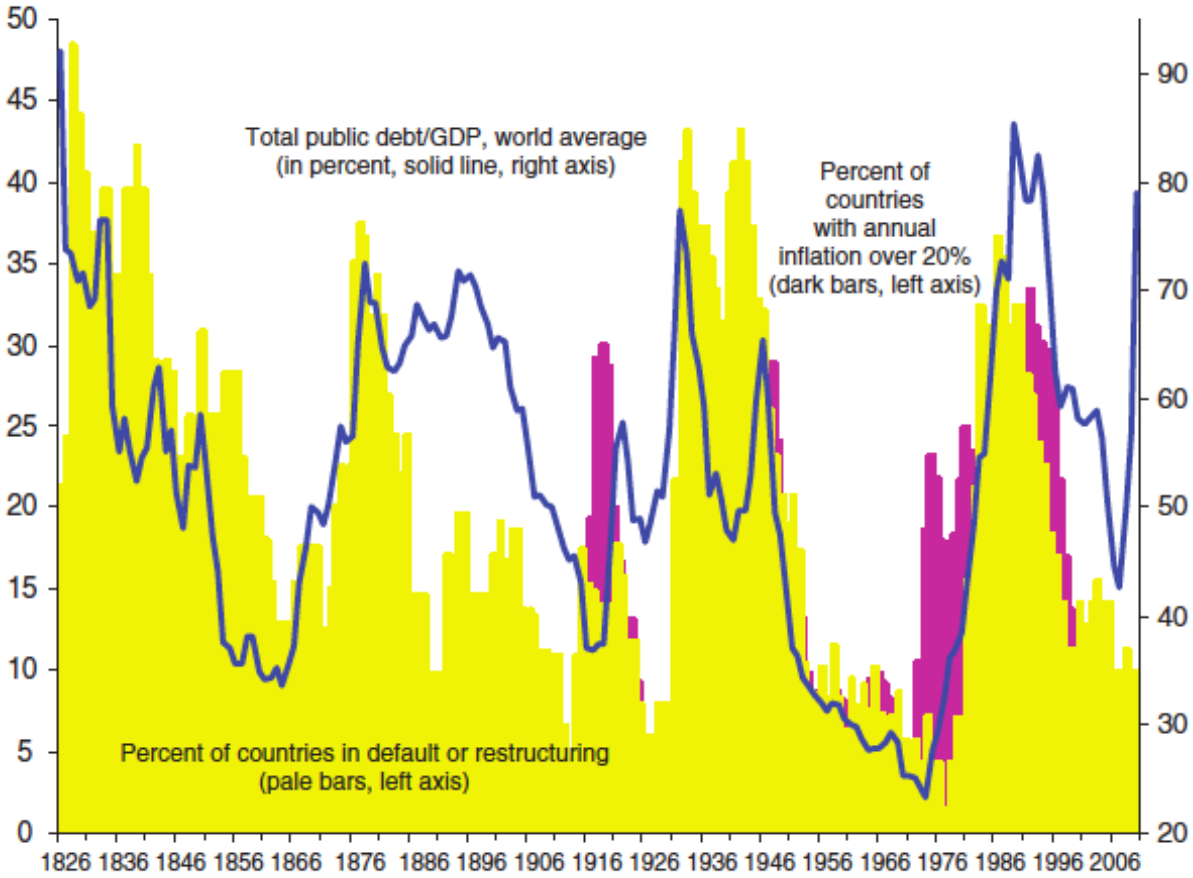


FIGURE 3. SOVEREIGN DEFAULT ON EXTERNAL DEBT, TOTAL (DOMESTIC PLUS EXTERNAL) PUBLIC DEBT, AND INFLATION CRISES: WORLD AGGREGATES, 1826–2010 (*debt as a percent of GDP*)

Source: Reinhart and Rogoff (2011)

Serial default

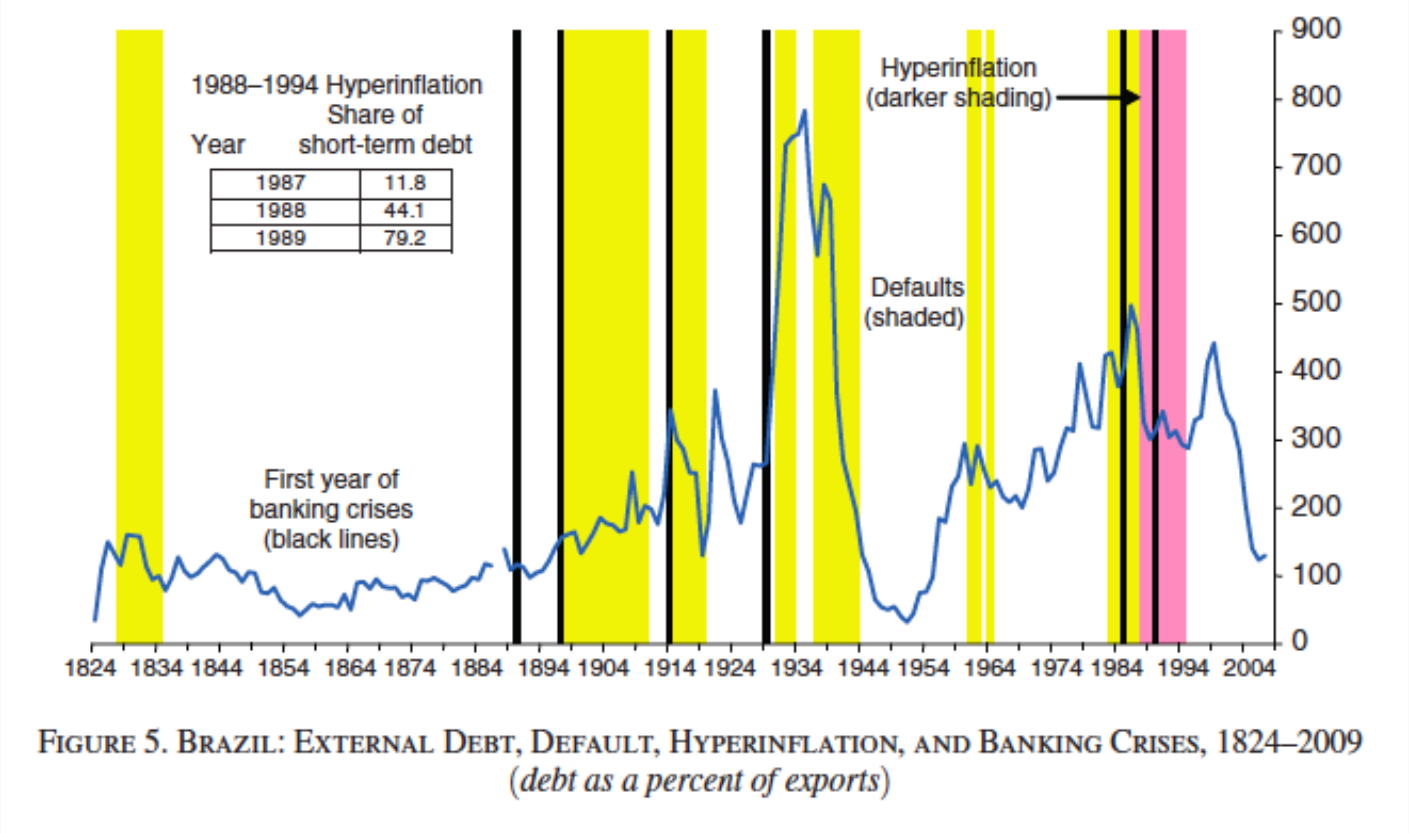


FIGURE 5. BRAZIL: EXTERNAL DEBT, DEFAULT, HYPERINFLATION, AND BANKING CRISES, 1824–2009
(*debt as a percent of exports*)

Source: Reinhart and Rogoff (2011)

Banking and debt crises

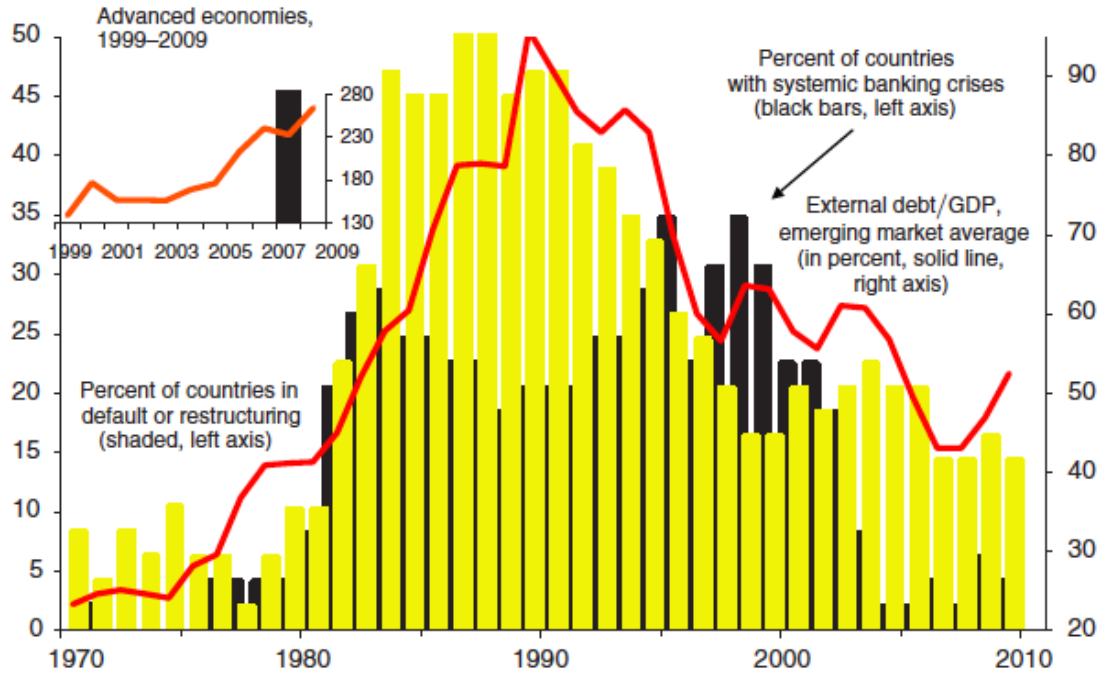


FIGURE 9. GROSS EXTERNAL DEBTS (PUBLIC AND PRIVATE), SOVEREIGN DEFAULT, AND SYSTEMIC BANKING CRISES: ADVANCED ECONOMIES (INSET ONLY) AND EMERGING MARKETS, 1970–2009
(*debt as a percent of GDP*)

Source: Reinhart and Rogoff (2011)

Banking and debt crises

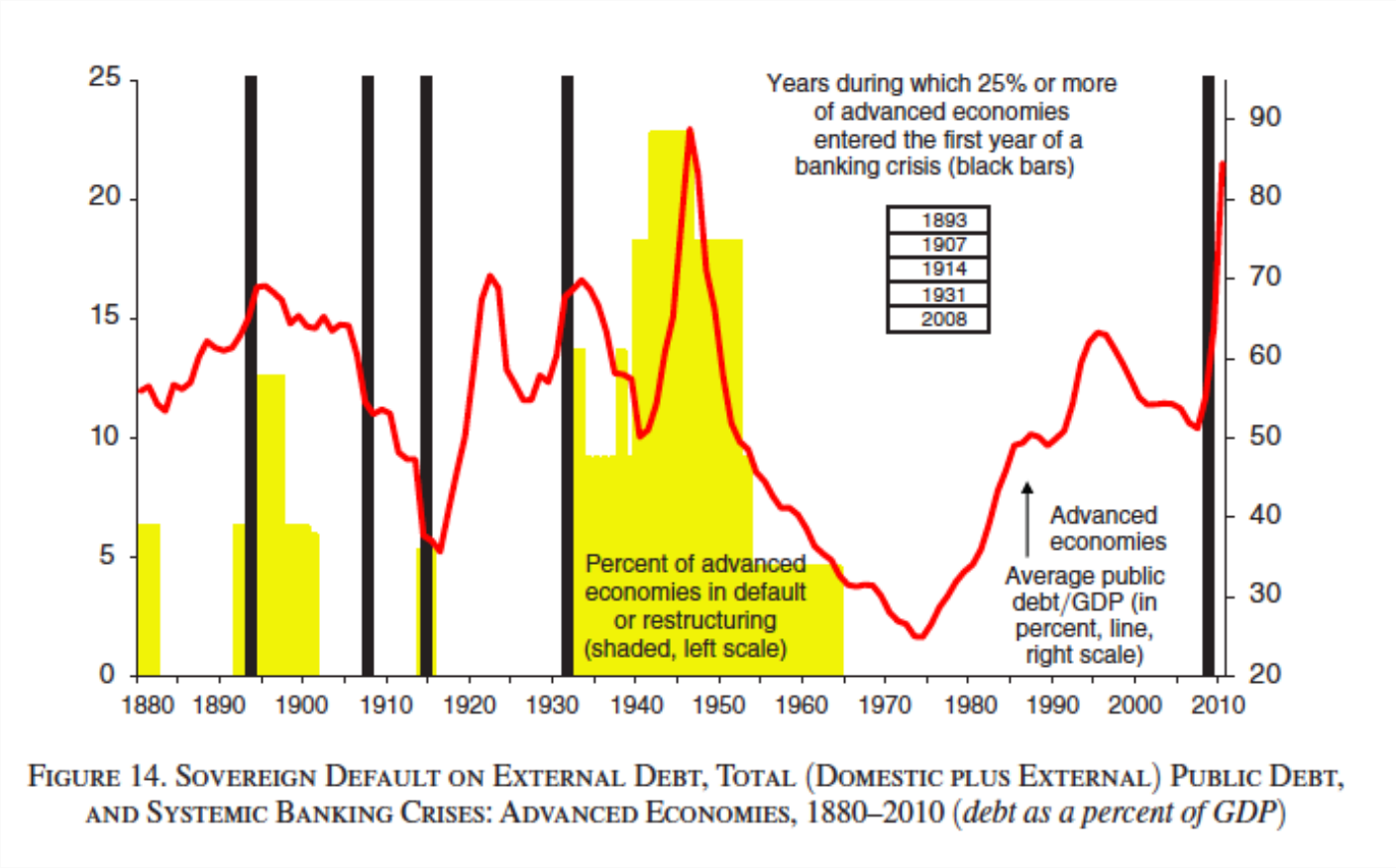
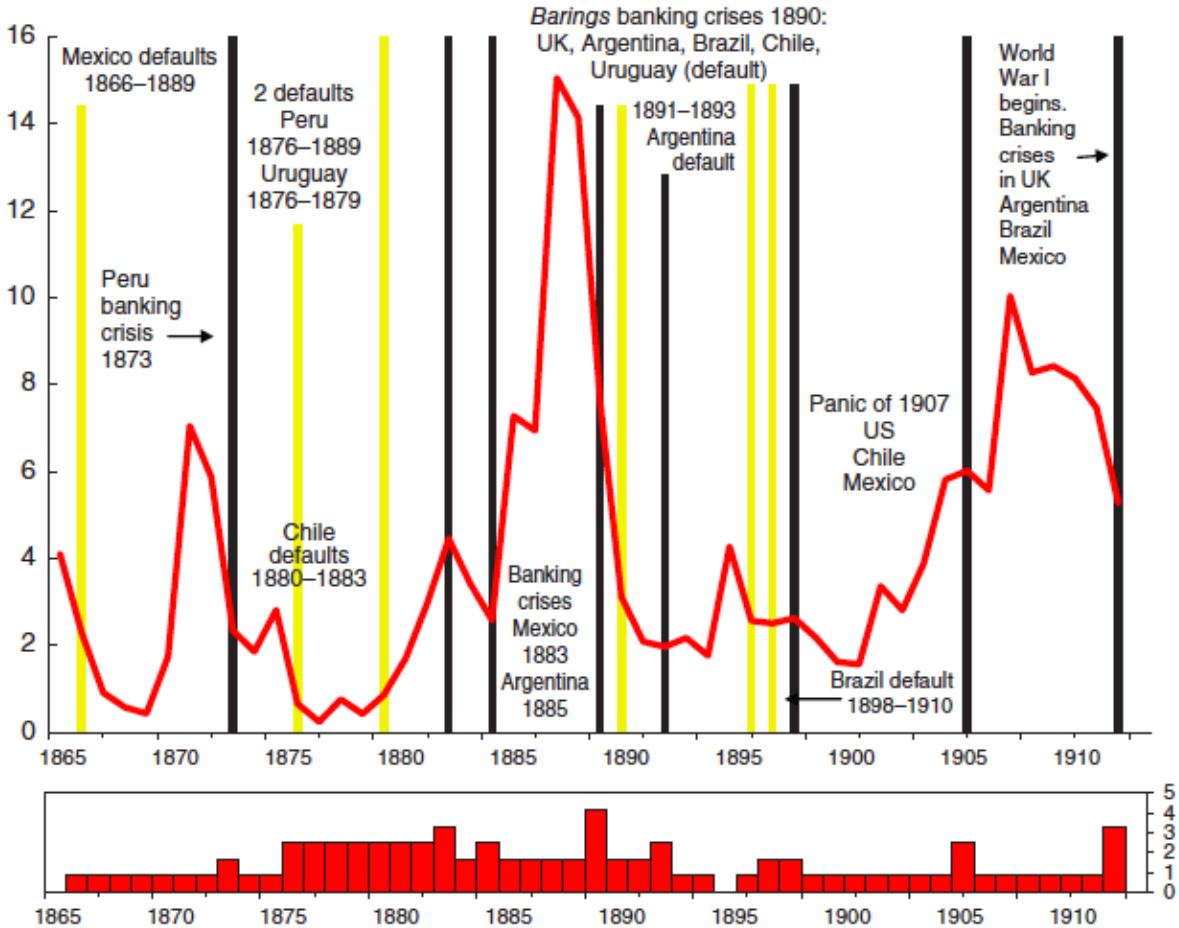


FIGURE 14. SOVEREIGN DEFAULT ON EXTERNAL DEBT, TOTAL (DOMESTIC PLUS EXTERNAL) PUBLIC DEBT, AND SYSTEMIC BANKING CRISES: ADVANCED ECONOMIES, 1880–2010 (*debt as a percent of GDP*)

Source: Reinhart and Rogoff (2011)

Banking, debt crises and capital flows



Number of new banking crises and new or ongoing defaults for:
Argentina, Brazil, Chile, Mexico, Peru, and Uruguay, 1865–1914

FIGURE 11. LATIN AMERICA: PRIVATE AND PUBLIC CAPITAL INFLOWS FROM THE UNITED KINGDOM, DEFAULT AND BANKING CRISES, 1865–1914 (*capital flows as a percent of UK exports*)

Source: Reinhart and Rogoff (2011)

Banking, debt crises and capital flows

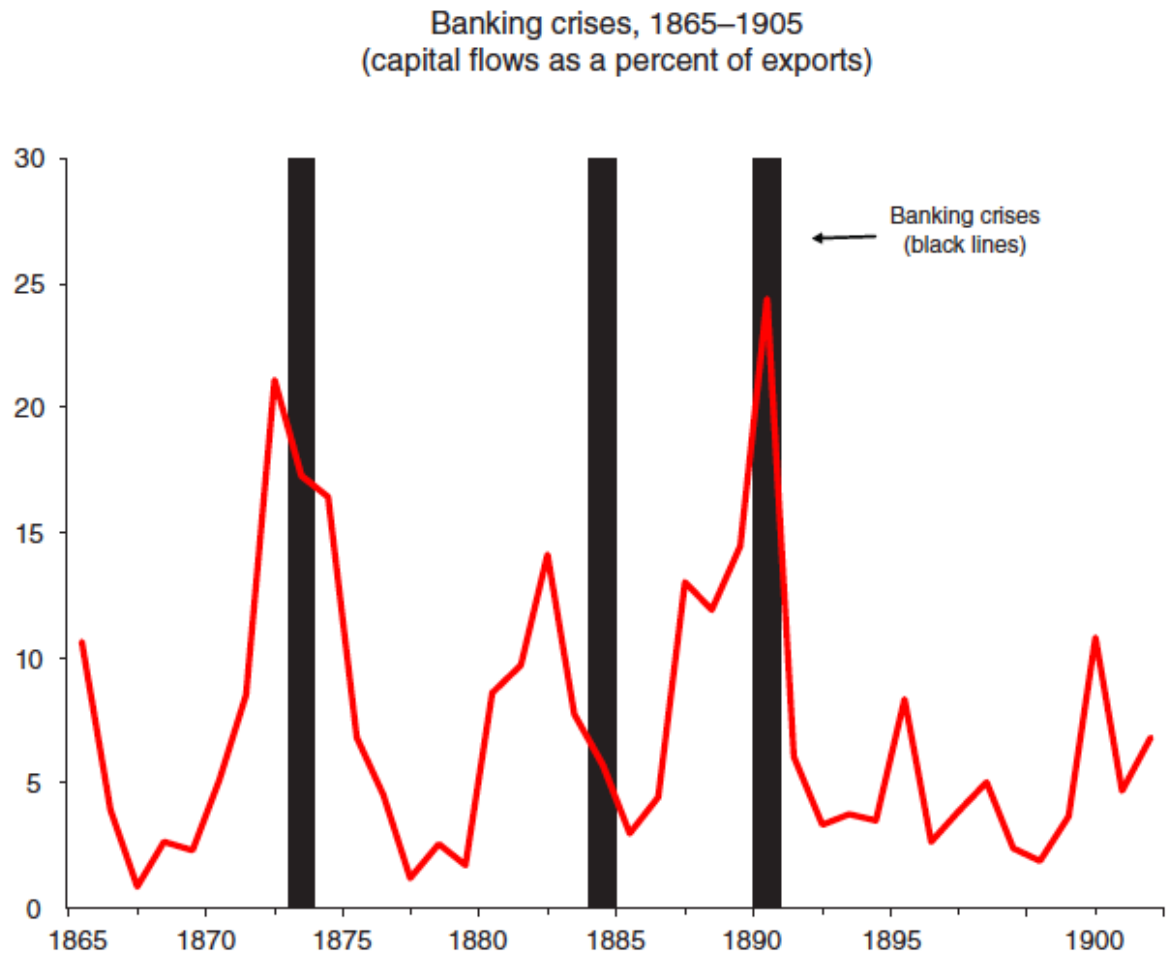


FIGURE 12. UNITED STATES: PRIVATE CAPITAL INFLOWS FROM THE UNITED KINGDOM AND BANKING CRISES, 1865–1905 (*capital flows as a percent of exports*)

Source: Reinhart and Rogoff (2011)

Composition and maturity of debt

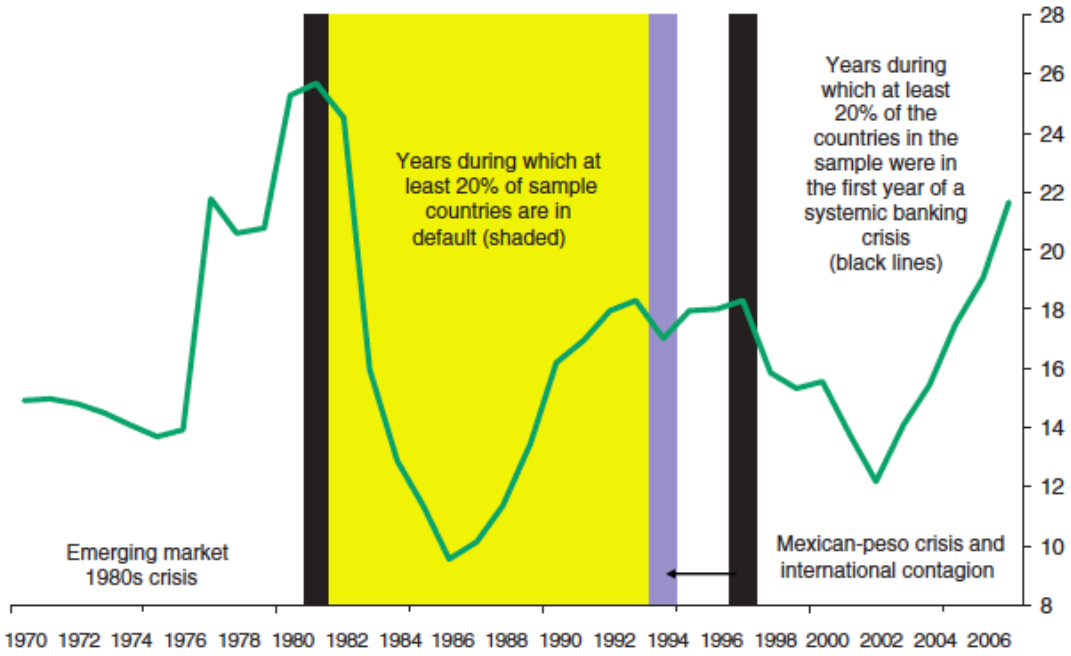


FIGURE 15. SHARE OF SHORT-TERM GROSS EXTERNAL DEBT (PUBLIC PLUS PRIVATE): EMERGING MARKETS, 1970–2009
(*in percent*)

Source: Reinhart and Rogoff (2011)

Summary

- Serial default is a widespread
- There are *serial defaulters* in the sample e.g. Brazil and Greece, but *serial default* cuts across regions and across time
- Debt surges on the eve of a debt crisis, banking crisis, or both
- Median duration of default spells has declined after World War II by 1/2
- Banking crises most often either precede or coincide with sovereign debt crises
- Short-term debts escalate on the eve of banking crises $\times 2$

Summary

A Hedge Fund, A Country, And A Big Sailboat

▸ Listen

Overlapping Crisis

Questions

- What is the interaction between banking and currency crises?
- How prevalent are twin crisis?
- What is the behavior of macroeconomic indicators around twin crisis?
- Does policy help or exacerbate imbalances?

Twin Crisis: Currency and Banking Crisis

- Negative feedback loop:
  - Problems in banking sector precede collapse of currency
  - Currency crisis deepens banking crisis
- Boom-bust dynamics fueled by credit
- Financial liberalization precedes banking crisis

Twin Cs: Currency and Banking Crisis

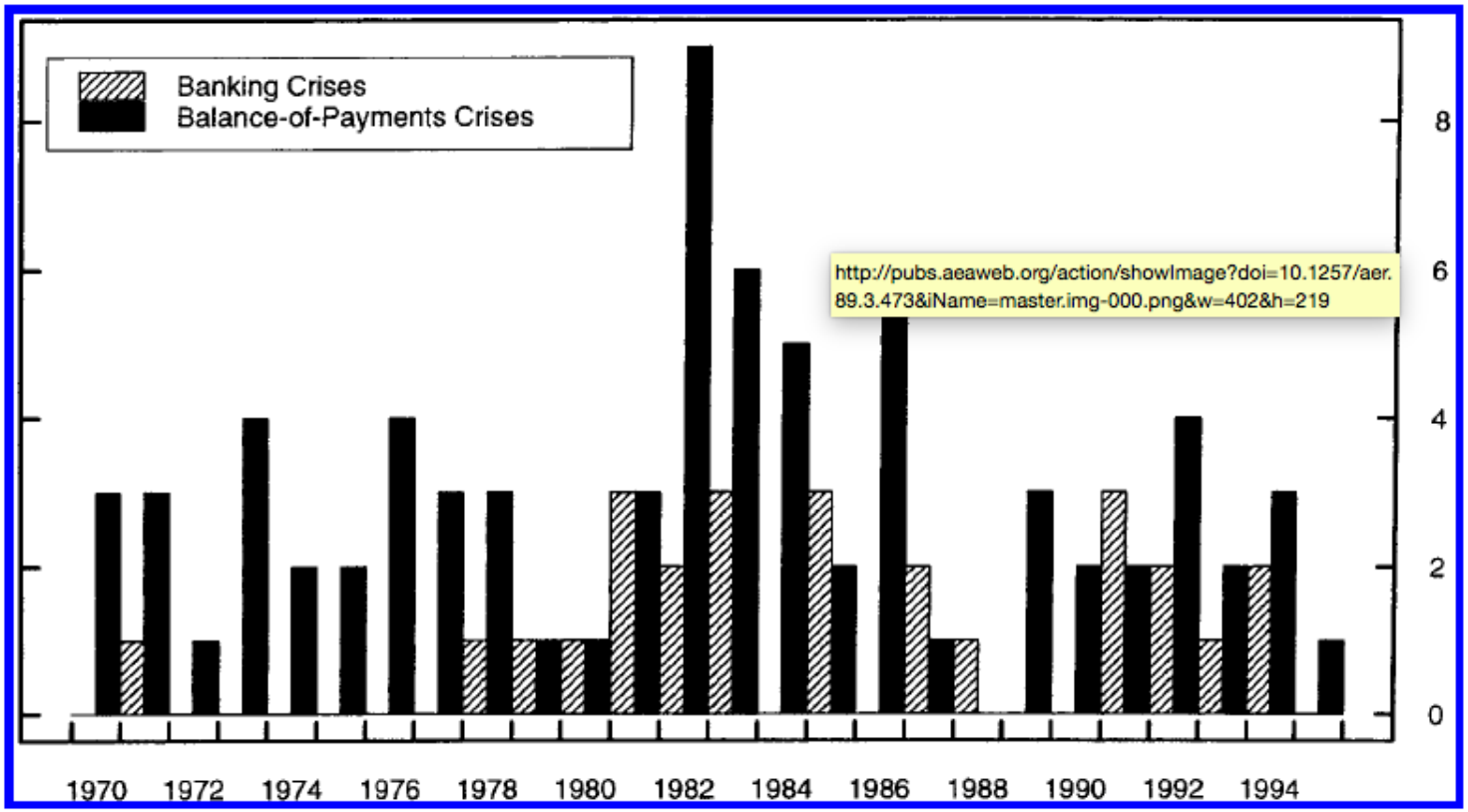


FIGURE 1. NUMBER OF CRISES PER YEAR

Twin Cs: Frequency

TABLE 3—PROBABILITIES OF CRISES

Probabilities of balance-of-payment crises	
Type	Value (in percent)
Unconditional	29
Conditional on the beginning of a banking crisis	46
Conditional on the peak of a banking crisis	22

Probabilities of banking crises	
Type	Value (in percent)
Unconditional	10
Beginning of a banking crisis conditional on a balance-of-payments crisis	8
Beginning of a banking crisis conditional on financial liberalization	14
Peak of a banking crisis conditional on a balance-of-payments crisis	16

Twin Cs: Costs during Twin Cs episodes

- Cost of bailout: $\sim \times 3$
- Loss of reserves: $\sim \times 4$
- Real depreciation: $\sim =$

Twin Cs: Empirical Regularities

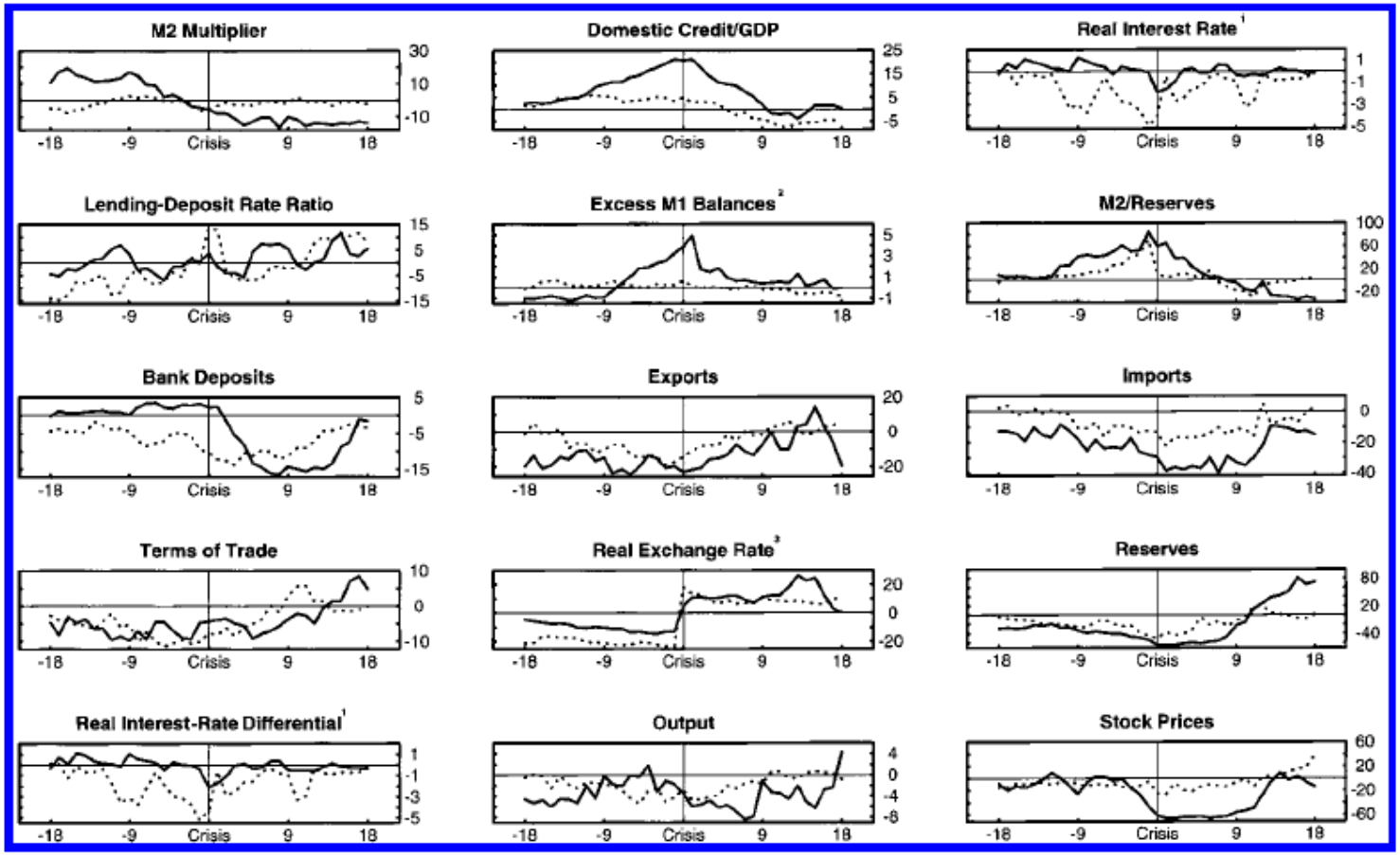


FIGURE 4. EMPIRICAL REGULARITIES DURING TWIN CRISES

Twin Cs: Early warning indicators

- Define crisis:
  - Currency crisis: Index of currency market turbulence $I = \frac{\Delta e}{e} - \frac{\sigma_e}{\sigma_R}\frac{\Delta e}{\Delta R}$
  - Banking crisis: See lecture 1.
- Define variables:
  - M2 multiplier, Dom Credit/GDP, real interest rate, lending deposit rate, bank deposits, ... See KR appendix.
- Define signal: empirical distribution and $min\frac{B/(B+D)}{A/(A+C)}$

Signal	Crisis happens	No crisis happens
(+)	A	B
(0)	C	D

- Define time-frame
  - For currency crises look 24-months before episode
  - For banking crises look 12-months before episodes

Twin Cs: Early warning indicators

TABLE 7—ECONOMIC FRAGILITY ON THE EVE OF CRISES

Number of indicators signaling a crisis (in percent)	Number of crises (in percent)					
	Balance-of-payments crises					
	Total	Single	Twin	Before financial liberalization	After financial liberalization	Banking crises
80–100	26.7	28.6	21.1	40.0	17.8	30.8
60–79	45.3	41.1	57.9	23.3	60.0	53.8
40–59	20.0	21.4	15.8	20.0	20.0	11.5
20–39	6.7	8.9	0.0	13.3	2.2	3.9
Less than 20	1.3	0.0	5.3	3.3	0.0	0.0

Notes: This table captures the state of distress of the economy in different crisis episodes. Each cell represents the proportion of crises with a given proportion of signals. For example, 21.1 percent of the twin balance-of-payment crises had 80–100 percent of indicators signaling a crisis. Episodes in which the beginning of a banking crisis is followed by a balance-of-payments crisis within 48 months are classified as twin crises.

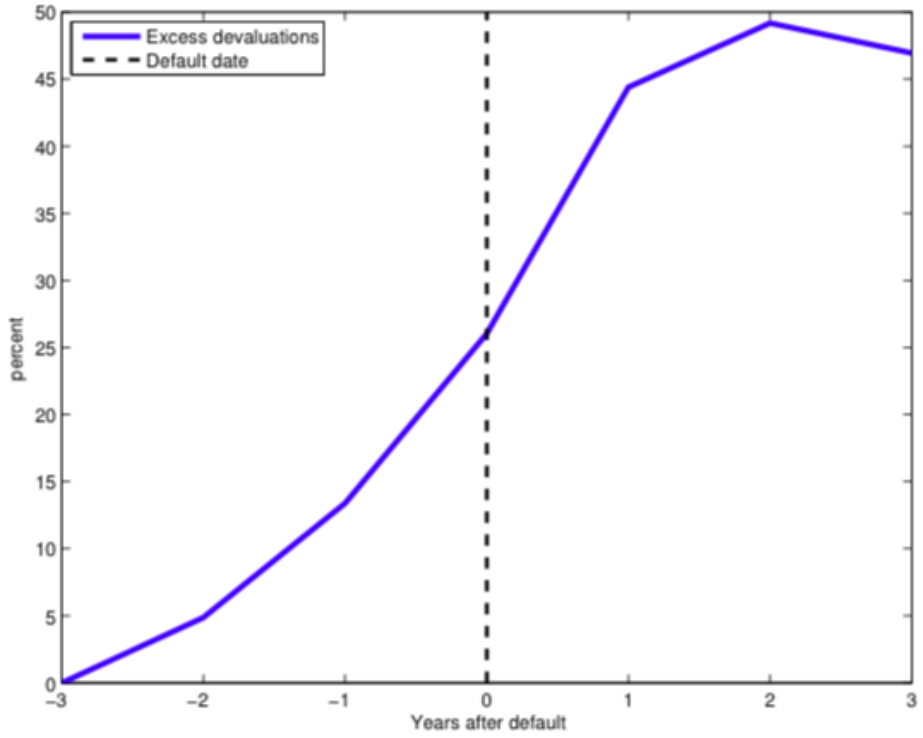
Twin Ds: Sovereign Default and Banking Crises

- Link between sovereign default and large devaluations
- Probability of a large devaluation in any 24- month period is 17%
- Probability of a large devaluation **conditional** on the 24-month period containing a default is 84%
- Devaluation in persistent $\rightarrow$ no increase in the rate of devaluation post-default

Twin Ds: Sovereign Default and Banking Crises

Evidence

Figure 13.14: Excess Devaluation Around Default, 1975-2013



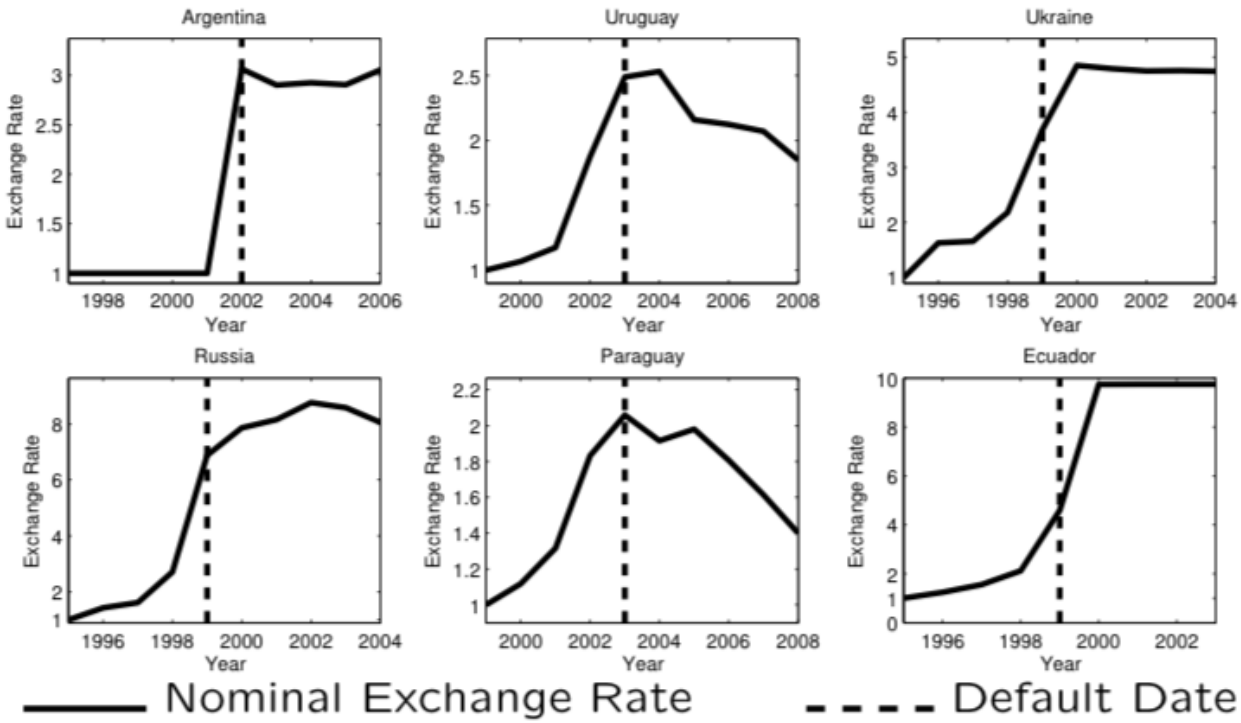
Median of cumulative devaluations conditional on default in year 0 minus unconditional median. Sample contains 116 default episodes between 1975 and 2013 in 70 countries. Data sources: Default dates, Uribe and Schmitt-Grohé (2015). Exchange rates, WDI.

Source: Schmidt-Grohe and Uribe (2017)

Twin Ds: Recent episodes

Evidence

Figure 13.15: The Twin Ds: Six Recent Examples

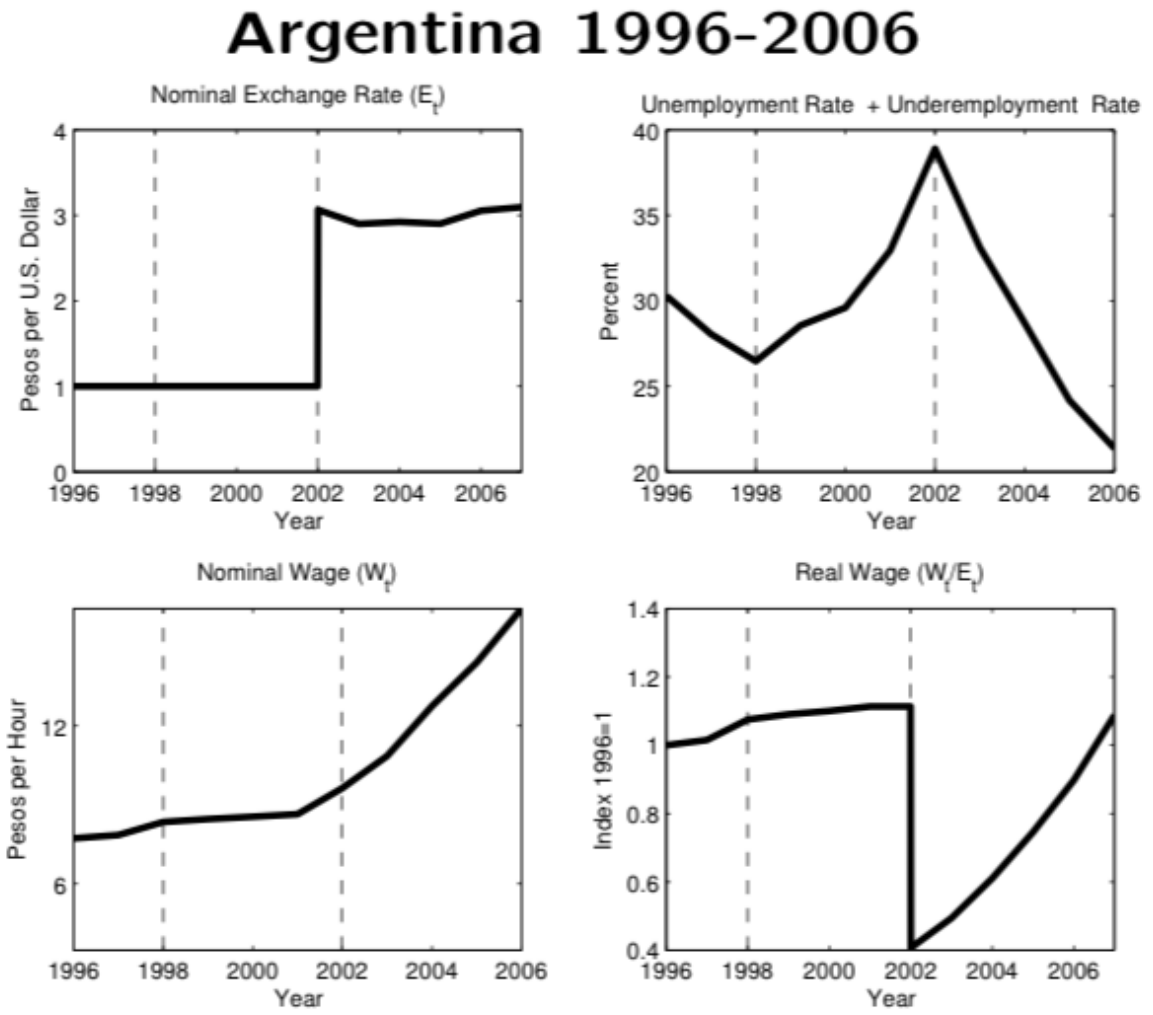


Note: Exchange rates are nominal dollar exchange rates, annual average, first observation normalized to unity.

Source: Schmidt-Grohe and Uribe (2017)

Twin Ds: Argentina

Evidence



Vertical Line 1998, beginning of recession.

Vertical Line 2002, default and devaluation.

Policy dilemmas

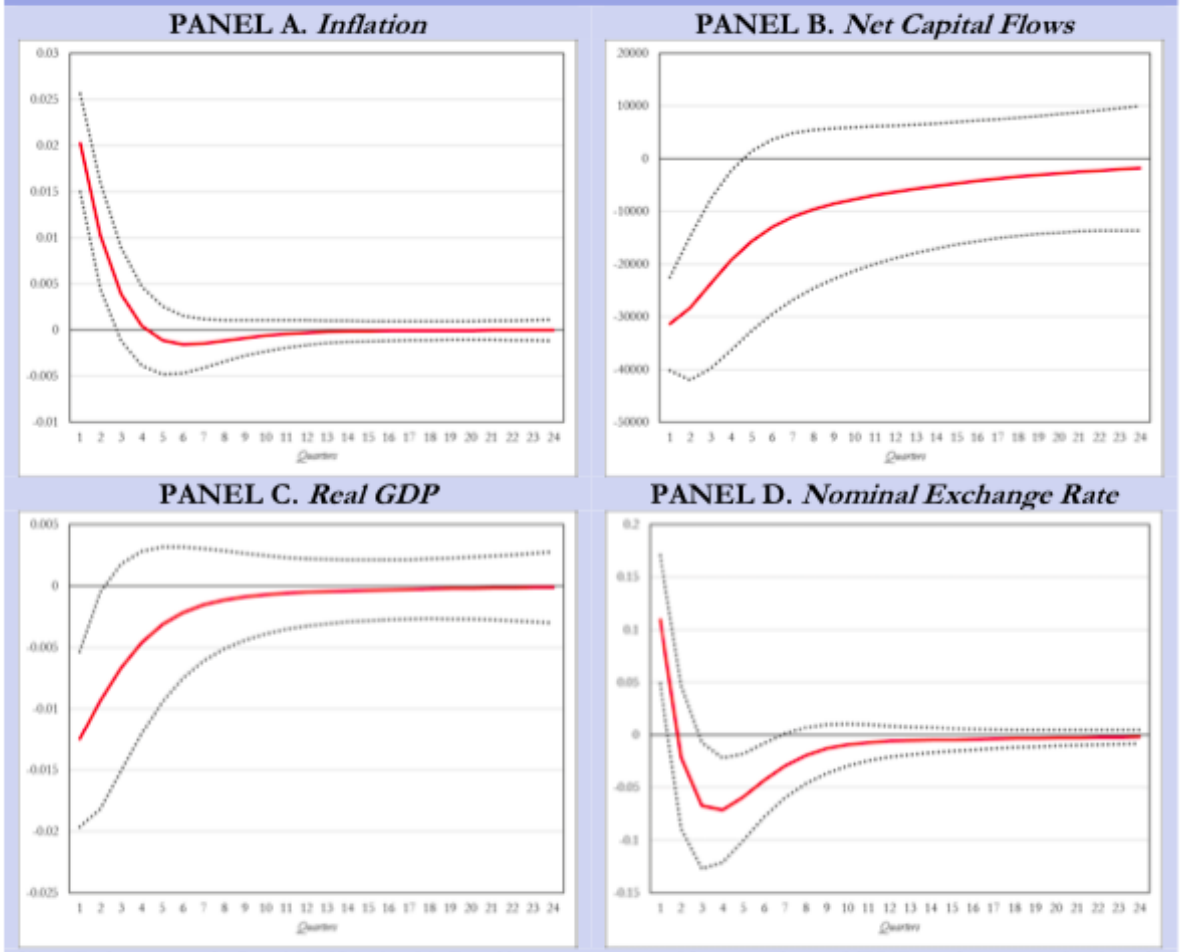
- Typical scenario of EE following a negative shock (terms of trade, interest rate, etc)
  - Economic activity slowdowns
  - Capital flows decelerate or reverse
  - Pressure on the domestic currency (depreciation)
  - Increase in inflation
- Why when it rains it pours?
- Example: What should monetary policy do?
  - $i_t \uparrow$ to defend the currency and fight inflation? but $Y \downarrow$
  - $i_t \downarrow$ to stimulate output? But risk $e \uparrow$ and $\pi \uparrow$

Stylized facts

- Net capital inflows are procyclical in most OECD and developing countries
- Fiscal policies in emerging/developing countries are predominantly procyclical
- Monetary policy in emerging/developing countries is mostly procyclical or acyclical
- In developing countries, the capital flow cycle and the macroeconomic policy cycle reinforce each other

The typical scenario

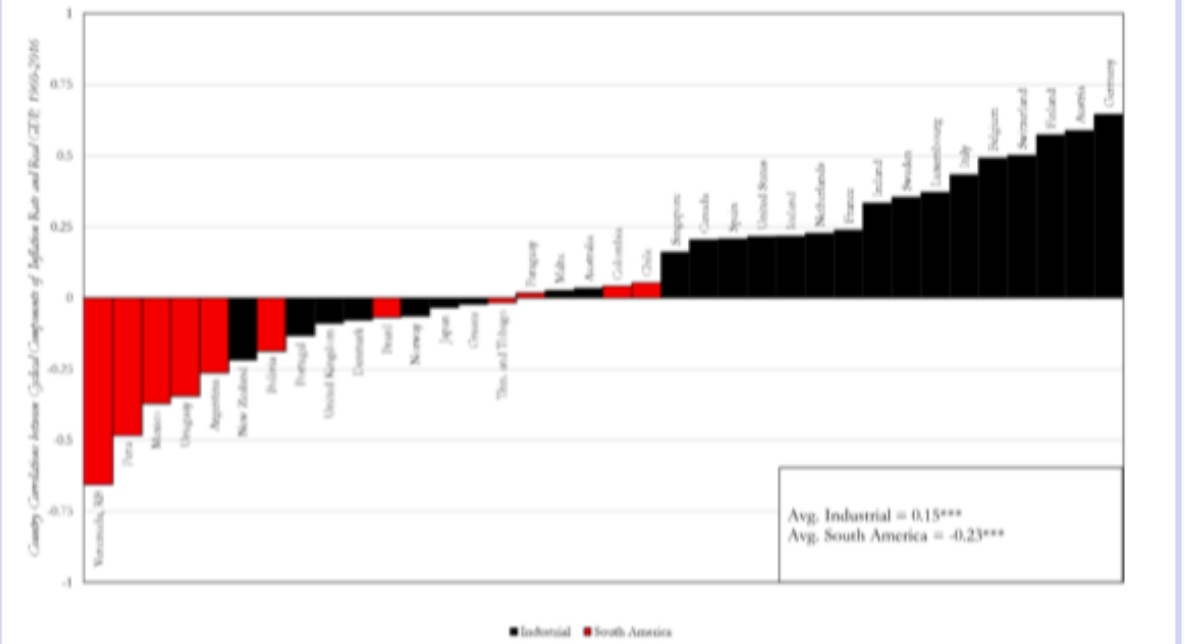
FIGURE 2.1. Typical Response of a Commodity-Exporter LAC Country to a Negative Shock to Terms of Trade



Note: The data correspond to Brazil 1995Q1-2017Q1. Dotted lines are 90 percent confidence intervals around SVAR impulse responses. See Appendix B for details. Sources: Authors' estimations, based on Banco Central do Brasil, Bloomberg, Haver Analytics, and Ipeadata.

Cyclicality of monetary policy

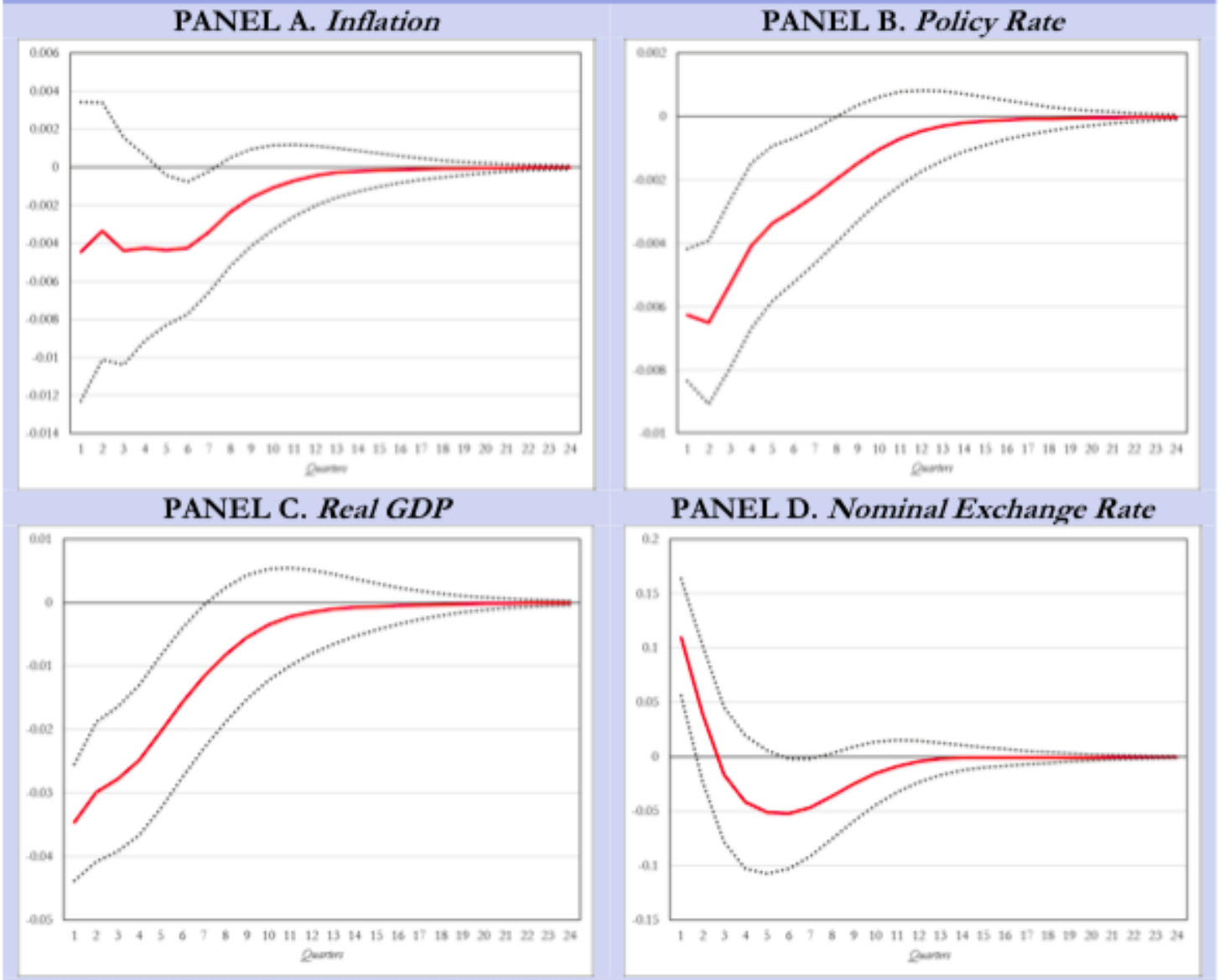
FIGURE 2.2. Country Correlations between Cyclical Components of Inflation Rate and Real GDP



Note: Cyclical components are calculated using the Hodrick-Prescott filter. Sources: Author's calculations, based on IFS and Haver Analytics.

Example: Countercyclical policy

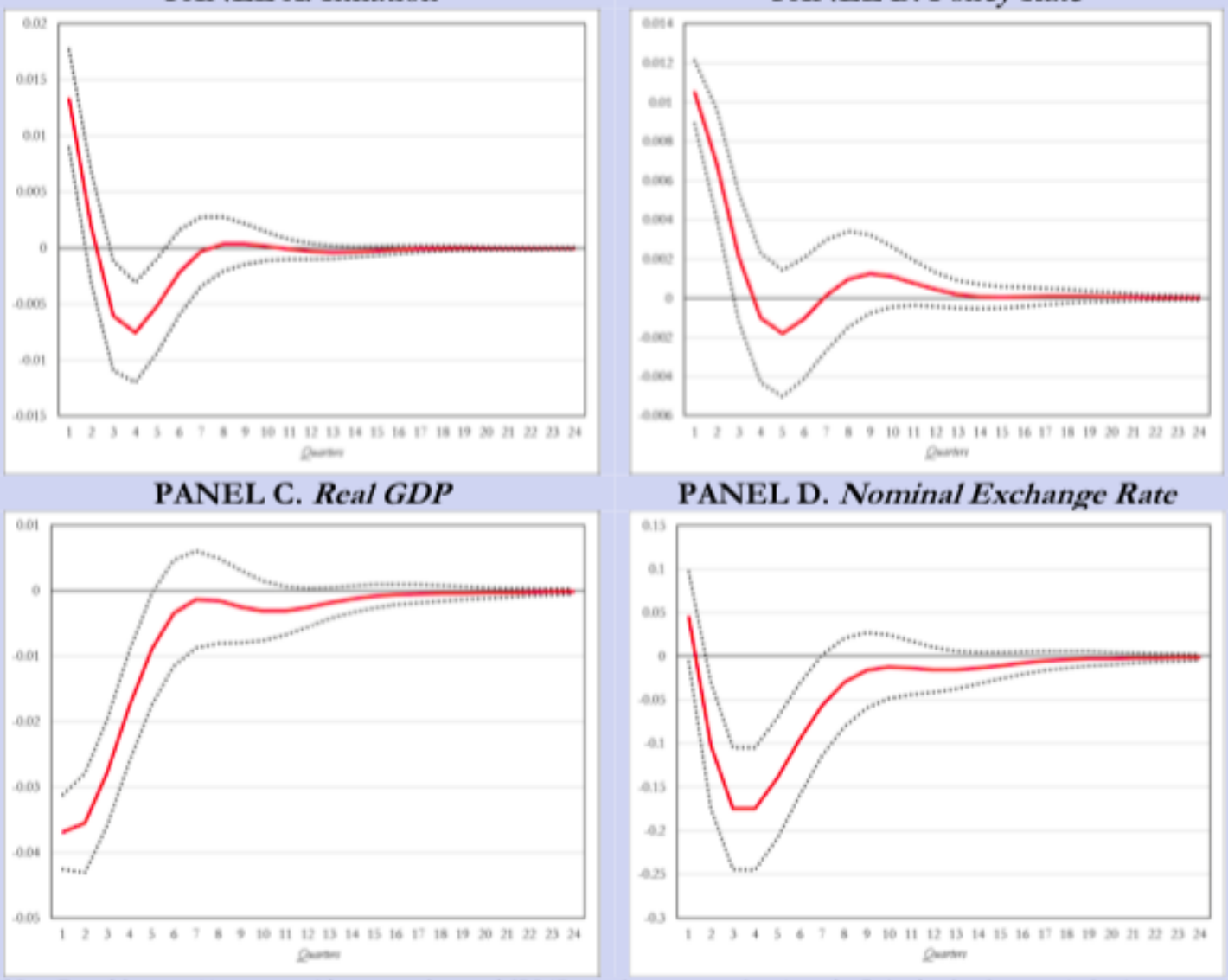
FIGURE 2.5. Chile: Countercyclical Monetary Policy Response



Note: Dotted lines are 90 percent confidence intervals around SVAR impulse responses. See Appendix B for details. Sources: Authors' estimations,

Example: Procyclical policy

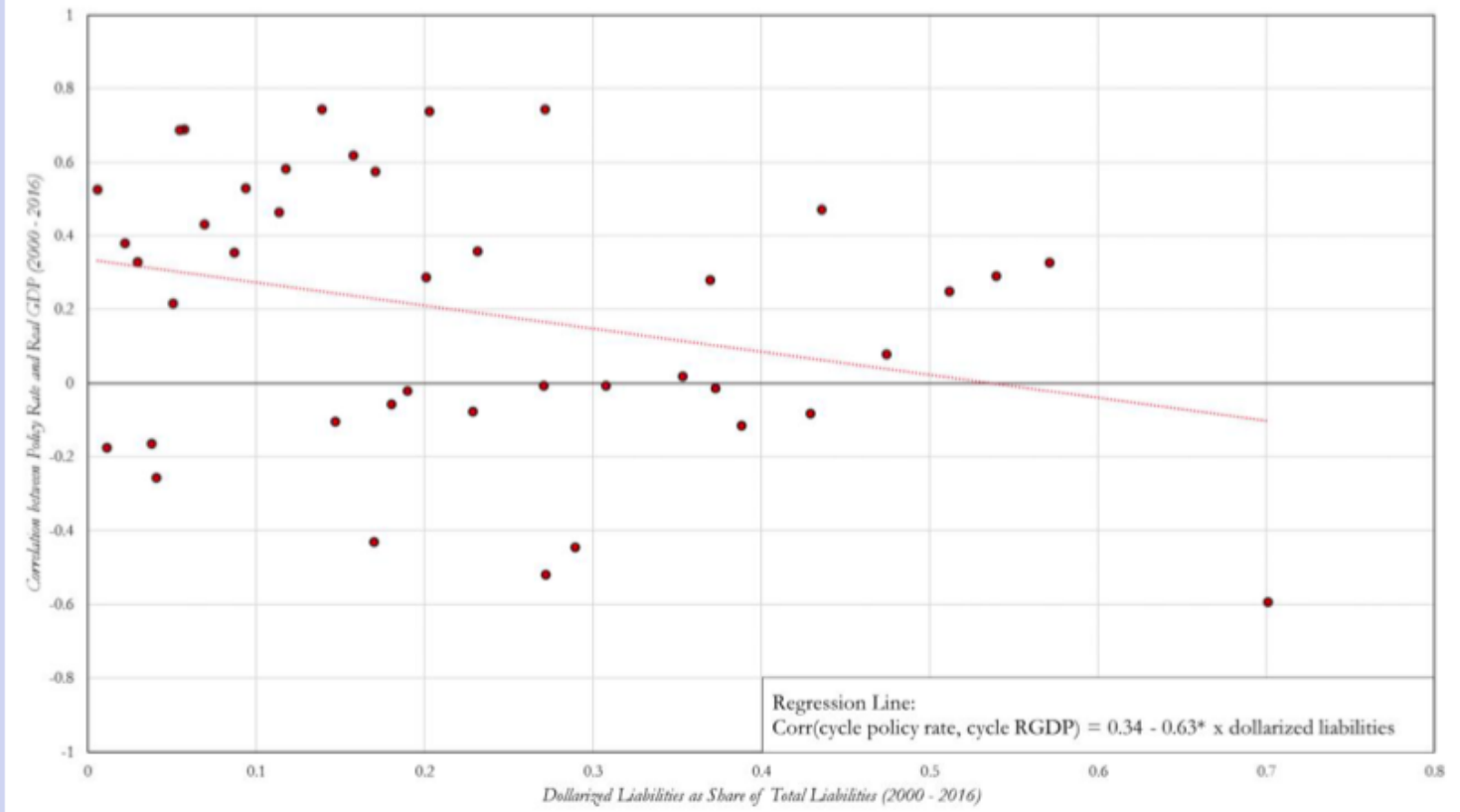
FIGURE 2.8. Brazil: Procyclical Monetary Policy Response



Note: Dotted lines are 90 percent confidence intervals around SVAR impulse responses. See Appendix B for details. Sources: Authors' estimations.

What explains cyclicality of MP

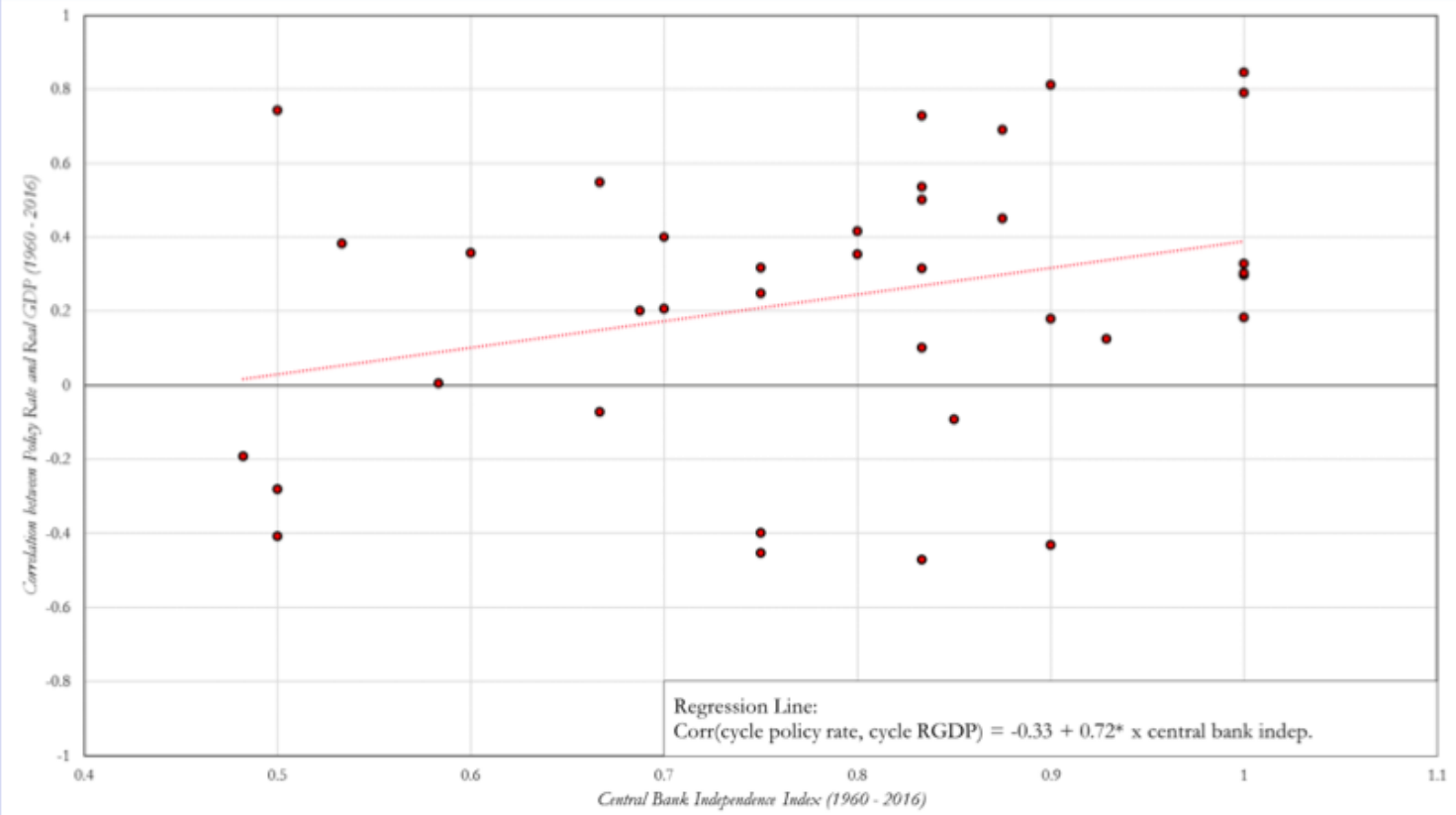
FIGURE 2.9. Cyclicality of Monetary Policy and Liability Dollarization



*Notes: Cyclical components are calculated using the Hodrick-Prescott filter. The level of dollarization is calculated as the average share of dollarized liabilities in total liabilities. *, **, and *** indicate significance at the 10, 5, and 1 percent level of a standard two-tailed means test, respectively. Sources: Authors' calculations, based on FSIs (IMF) and Haver Analytics.*

What explains cyclicality of Monetary Policy

FIGURE 2.11. Cyclicality of Monetary Policy and Central Bank Independence



*Note: Cyclical components are calculated using the Hodrick-Prescott filter. *, **, and *** indicate significance at the 10, 5, and 1 percent level of a standard two-tailed means test, respectively. Sources: Authors' calculations, based on Vuletin and Zhu (2011) and Haver Analytics.*

Procyclical fiscal policy

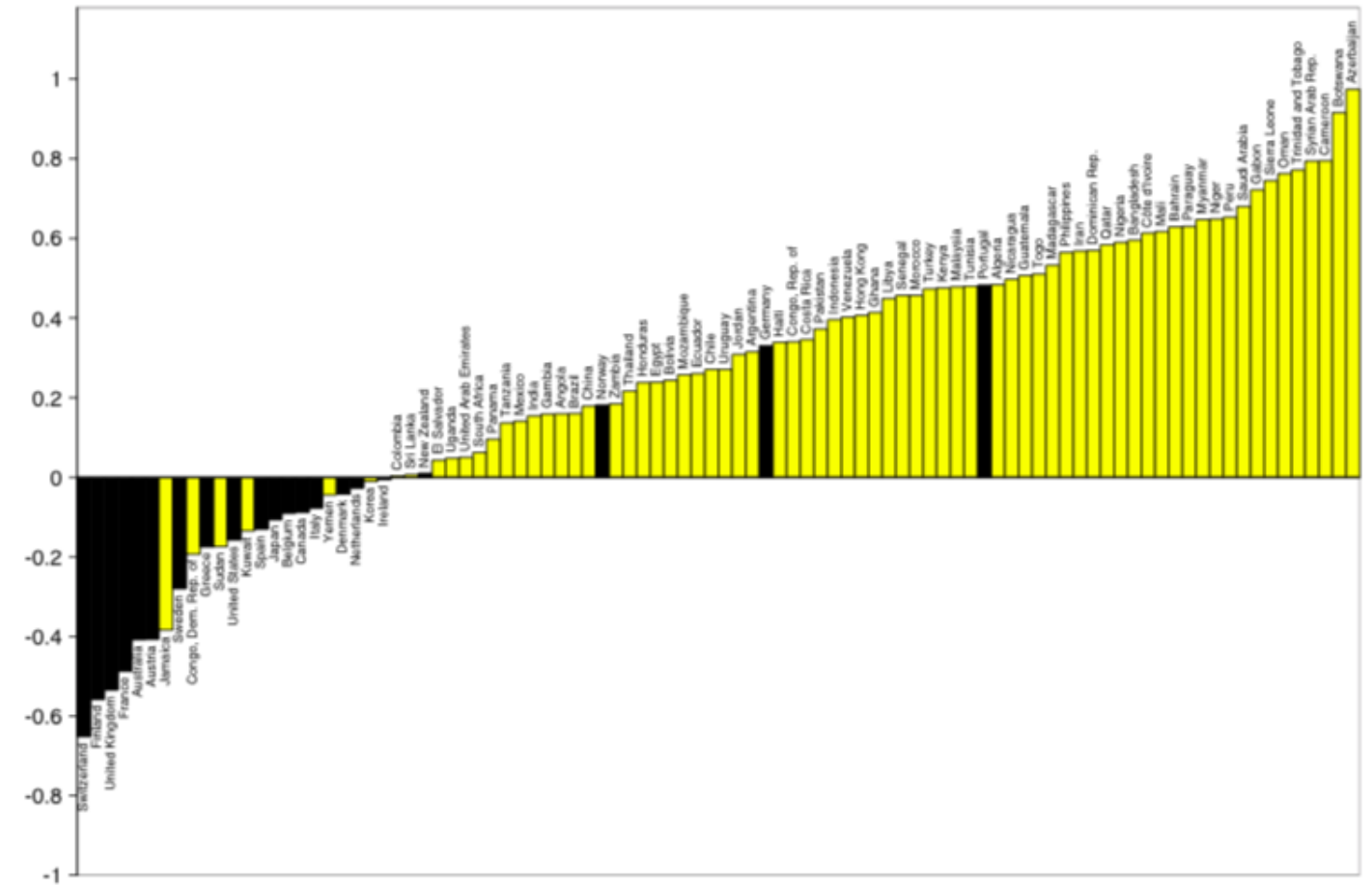


Fig. 2. Country correlations between the cyclical components of real government expenditure and real GDP. 1960–1999. Notes: Dark bars are industrial countries and light ones are developing countries. The cyclical components have been estimated using the Hodrick-Prescott Filter. A positive (negative) correlation indicates procyclical (countercyclical) fiscal policy. Real government expenditure is defined as central government expenditure and net lending deflated by the GDP deflator. See Appendix 2 for correlation values for each country.
Source: World Economic Outlook and International Financial Statistics (IMF).

Graduation from procyclicality

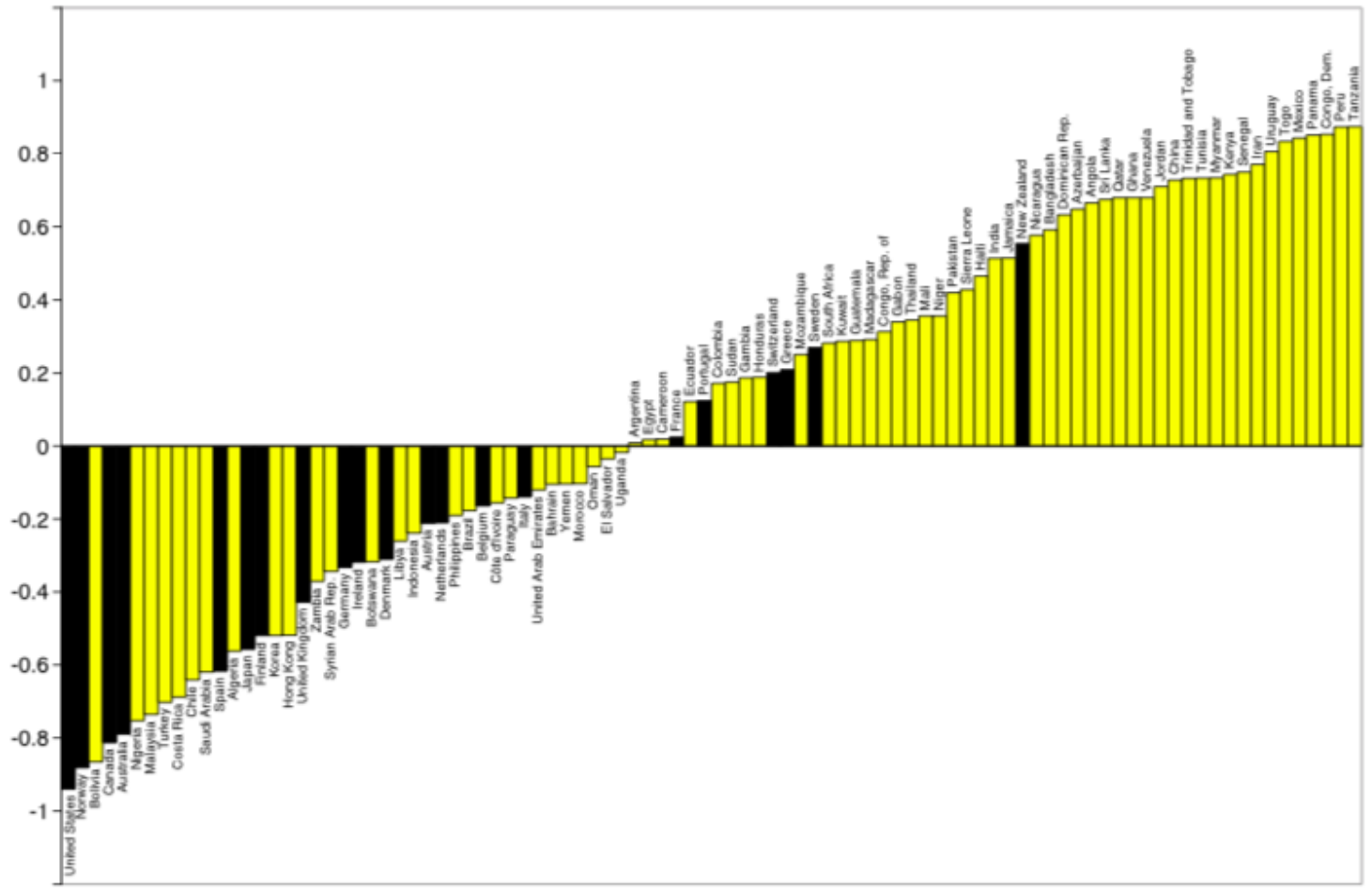


Fig. 3. Country correlations between the cyclical components of real government expenditure and real GDP. 2000–2009. Notes: Dark bars are industrial countries and light ones are developing countries. The cyclical components have been estimated using the Hodrick-Prescott Filter. A positive (negative) correlation indicates procyclical (countercyclical) fiscal policy. Real government expenditure is defined as central government expenditure and net lending deflated by the GDP deflator. See Appendix 2 for correlation values for each country. Source: World Economic Outlook and International Financial Statistics (IMF).

What explains cyclicality of Fiscal Policy