# The Liquidation of Government Debt

## Carmen M. Reinhart

*Peterson Institute for International Economics, NBER and CEPR*

## M. Belen Sbrancia

*University of Maryland*

*Macro-Financial Stability in the New Normal*

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**Throughout history, debt/GDP ratios have been reduced by:**

**(i)** economic growth;

**(ii)** fiscal adjustment/austerity;

**(iii)** explicit default or restructuring;

**(iv)** a sudden surprise burst in inflation; and

**(v)** a steady dosage of financial repression that is accompanied by an equally steady dosage of inflation.

*(Options (iv) and (v) are only viable for domestic-currency debts).*

# Financial repression

**… includes directed lending to government by captive domestic audiences (such as pension funds), explicit or implicit caps on interest rates, regulation of cross-border capital movements, and (generally) a tighter connection between government and banks.**

**It is a subtle type of debt restructuring…**

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**This paper is an empirical investigation of (iv) and (v) in that list.**

# Main results:

In the heavily regulated financial markets of the Bretton Woods, restrictions facilitated a sharp and rapid reduction in public debt/GDP ratios from the late 1940s to the 1970s.

Low nominal interest rates reduced debt servicing costs while a high incidence of negative real interest rates liquidated the real value of government debt.

# Main results:

- **For the advanced economies in our sample, real interest rates were negative roughly ½ of the time during 1945-1980.**

- **For the US and the UK our estimates of the annual liquidation of debt via negative real interest rates amounted on average from 3 to 4 percent of GDP a year. For Australia and Italy, which recorded higher inflation rates, the liquidation effect was larger (around 5 percent per annum).**

# Main results:

- **"Financial repression" was most successful in liquidating debts when accompanied by a steady dose of inflation.**

- **Inflation need not take market participants entirely by surprise and, in effect, it need not be very high (by historic standards). Indeed, there is little overlap between our dating of inflation surprises and debt reduction in our sample.**

*"Some people will think the 2 ¾ nonmarketable bond is a trick issue. We want to meet that head on. It is. It is an attempt to lock up as much as possible of these longer-term issues."*
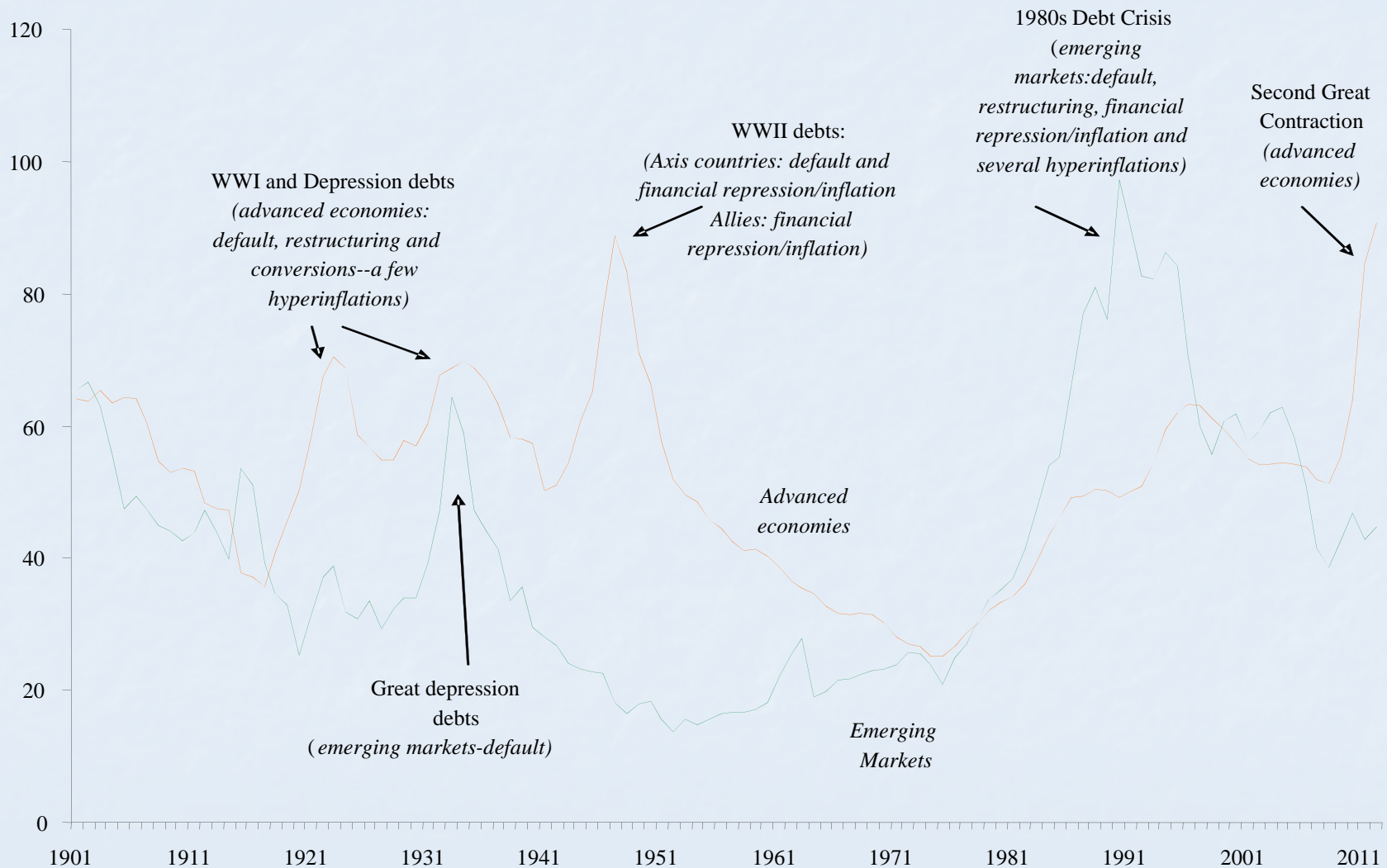
Assistant Secretary of the Treasury William McChesney Martin Jr.

FOMC minutes, March 1-2, 1951

Remarks on the 1951 conversion of short-term marketable US Treasury debts for 29-year non-marketable bonds. Mr. Martin was subsequently Chairman of the Board of Governors, 1951-1970.

# Surges in Central Government Public Debts and their Resolution: Advanced Economies and Emerging Markets, 1900-2011



1980s Debt Crisis
*(emerging markets:default, restructuring, financial repression/inflation and several hyperinflations)*

Second Great Contraction *(advanced economies)*

WWII debts: *(Axis countries: default and financial repression/inflation Allies: financial repression/inflation)*

WWI and Depression debts *(advanced economies: default, restructuring and conversions--a few hyperinflations)*

*Advanced economies*

Great depression debts *( emerging markets-default)*

*Emerging Markets*

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# Domestic Debt Conversions, Default or Restructuring, 1920s–1930s

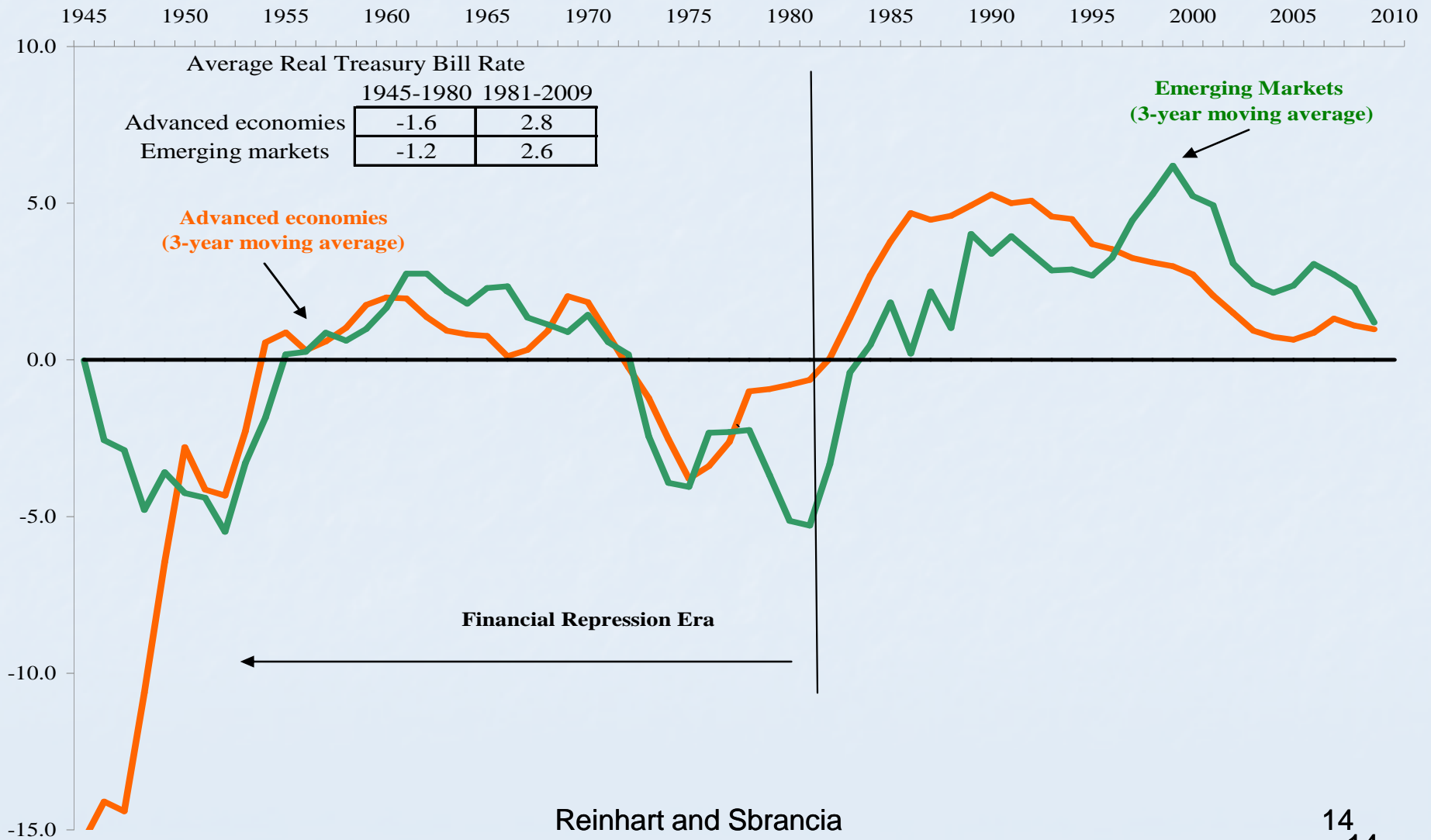| Country | Dates | Commentary |
|---|---|---|
| Australia | 1931/1932 | The Debt Conversion Agreement Act in 1931/32 which appears to have done something similar to the later NZ induced conversion. See New Zealand.[1] |
| Bolivia | 1927 | Arrears of interest lasted until at least 1940. |
| China | 1932 | First of several "consolidations", monthly cost of domestic service was cut in half. Interest rates were reduced to 6 percent (from over 9 percent) — amortization periods were about doubled in length. |
| France | 1932 | Various redeemable bonds with coupons between 5 and 7 percent, converted into a 4.5 percent bond with maturity in 75 years. |
| Greece | 1932 | Interest on domestic debt was reduced by 75 percent since 1932. |
| Italy | 1926 and 1934 | Issuance of Littorio. There were 20.4 billion lire subject to conversion. 5 % Littorio converted into 3.5 % Redimibile |
| Mexico | 1930s | Service on external debt was suspended in 1928. During the 1930s, interest payments included "arrears of expenditure and civil and military pensions." |
| New Zealand | 1933 | In March 1933 the New Zealand Debt Conversion Act was passed providing for voluntary conversion of internal debt amounting to 113 million pounds to a basis of 4 per cent for ordinary debt and 3 per cent for tax-free debt. Holders had the option of dissenting but interest in the dissented portion was made subject to an interest tax of 33.3 per cent.[1] |
| Peru | 1931 | After suspending service on external debt on May 29, Peru made "partial interest payments" on domestic debt. |
| Romania | February 1933 | Redemption of domestic and foreign debt is suspended (except for three loans). |
| United States | 1933 | Abrogation of the gold clause. In effect, the U.S. refused to pay Panama the annuity in gold due to Panama according to a 1903 treaty. The dispute was settled in 1936 when the US paid the agreed amount in gold *balboas*. |
| United Kingdom | 1932 | Most of the outstanding WWI debt was consolidated into a 3.5 percent perpetual annuity. This domestic debt conversion was apparently voluntary. However, some of the WWI debts to the United States were issued under domestic (UK) law (and therefore classified as domestic debt) and these were defaulted on following the end of the Hoover 1931 moratorium. |
| Uruguay | November 1, 1932 – February, 1937 | After suspending redemption of external debt on January 20, redemptions on domestic debt were equally suspended. |

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# Selected Measures Associated with Financial Repression

| Country | Domestic Financial Regulation Liberalization years (s) in *italics* with emphasis on deregulation of interest rates. | Capital Account-Exchange Restrictions Liberalization years (s) in *italics* |
|---|---|---|
| Turkey | *1980-82 and 1987 onwards.* Liberalization initiated in 1980 but reversed by 1982. Interest rates partially deregulated again in 1987, when banks were allowed to fix rates subject to ceilings determined by the Central Bank. Ceilings were later removed and deposit rates effectively deregulated. Gold market liberalized in 1993. | *1989.* Partial external liberalization in the early 80's, when restrictions on inflows and outflows are maintained except for a limited set of agents whose transactions are still subject to controls. Restrictions on capital movements finally lifted after August 1989. |
| United Kingdom | *1981.* The gold market, closed in early World War II, reopened only in 1954. The Bank of England stopped publishing the Minimum Lending Rate in 1981. In 1986, the government withdrew its guidance on mortgage lending. | *1979.* July 79: all restrictions on outward FDI abolished, and outward portfolio investment liberalized. Oct 1979: Exchange Control Act of 1947 suspended, and all remaining barriers to inward and outward flows of capital removed. |
| United States | *1982.* 1951-Treasury accord/debt conversion swapped marketable short term debt for nonmarketable 29-year bond. Regulation Q suspended and S&Ls deregulated in 1982. In 1933, President Franklin D. Roosevelt prohibits private holdings of all gold coins, bullion, and certificates. On December 31, 1974, Americans are permitted to own gold, other than just jewelry. | *1974.* In 1961 Americans are forbidden to own gold abroad as well as at home. A broad array of controls were abolished in 1974. |

# Real Interest Rates

# Average Ex-post Real Rate on Treasury Bills: Advanced Economies and Emerging Markets, 1945-2009 (3-year moving averages, in percent)

Average Real Treasury Bill Rate

|  | 1945-1980 | 1981-2009 |
|---|---|---|
| Advanced economies | -1.6 | 2.8 |
| Emerging markets | -1.2 | 2.6 |

**Emerging Markets (3-year moving average)**

**Advanced economies (3-year moving average)**

**Financial Repression Era**

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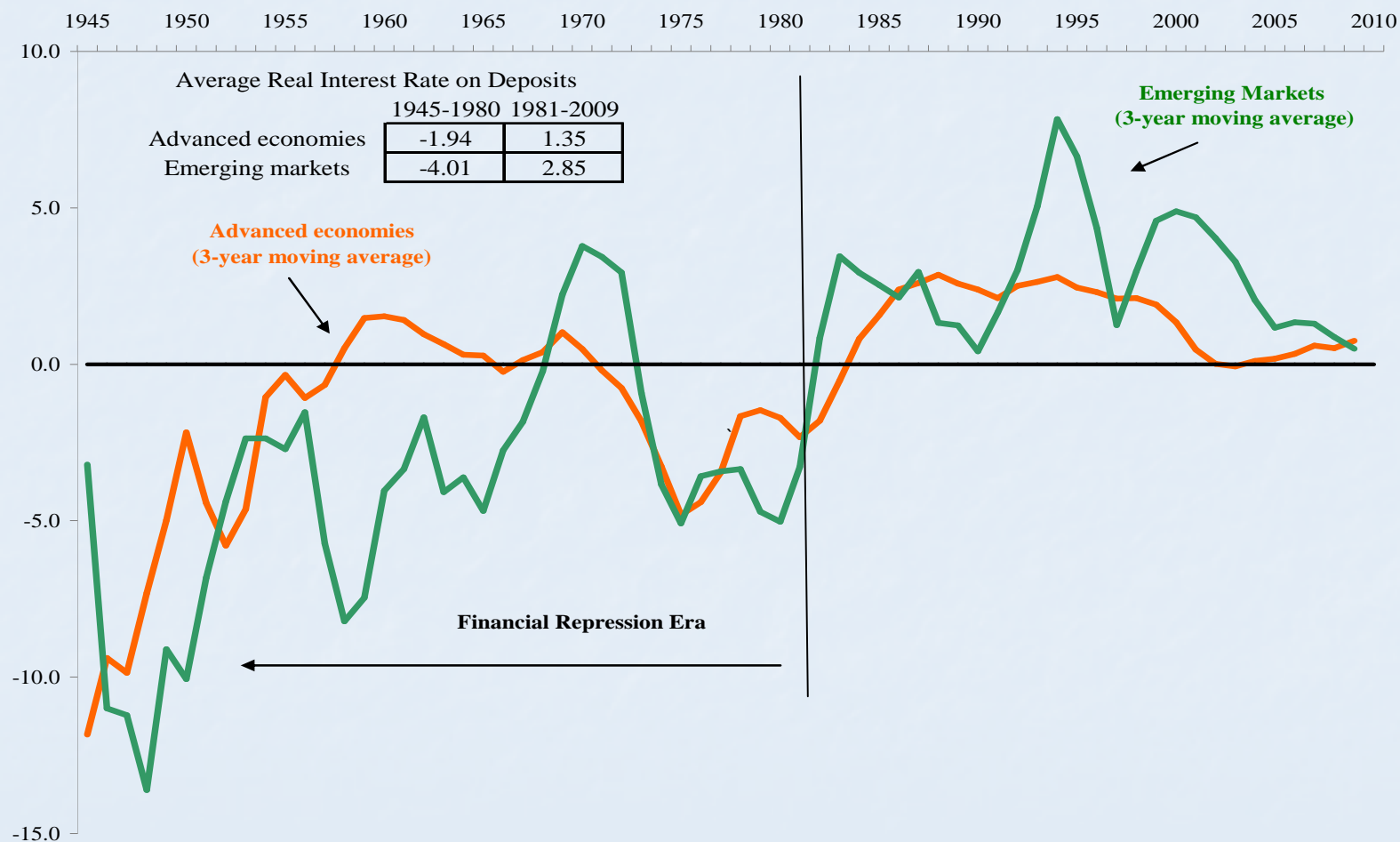
Average Ex-post Real Discount Rate: Advanced Economies and Emerging Markets, 1945-2009
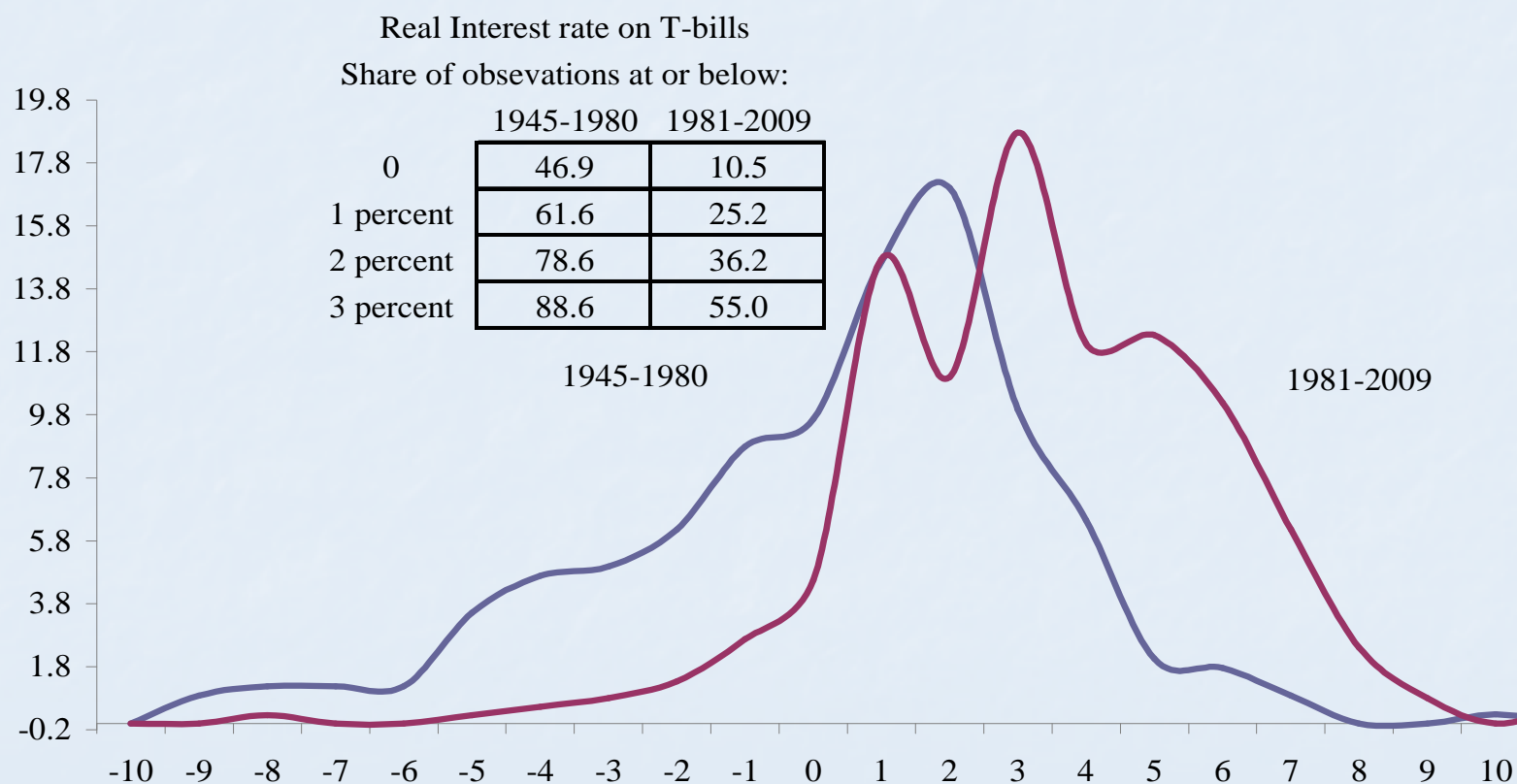(3-year moving averages, in percent)

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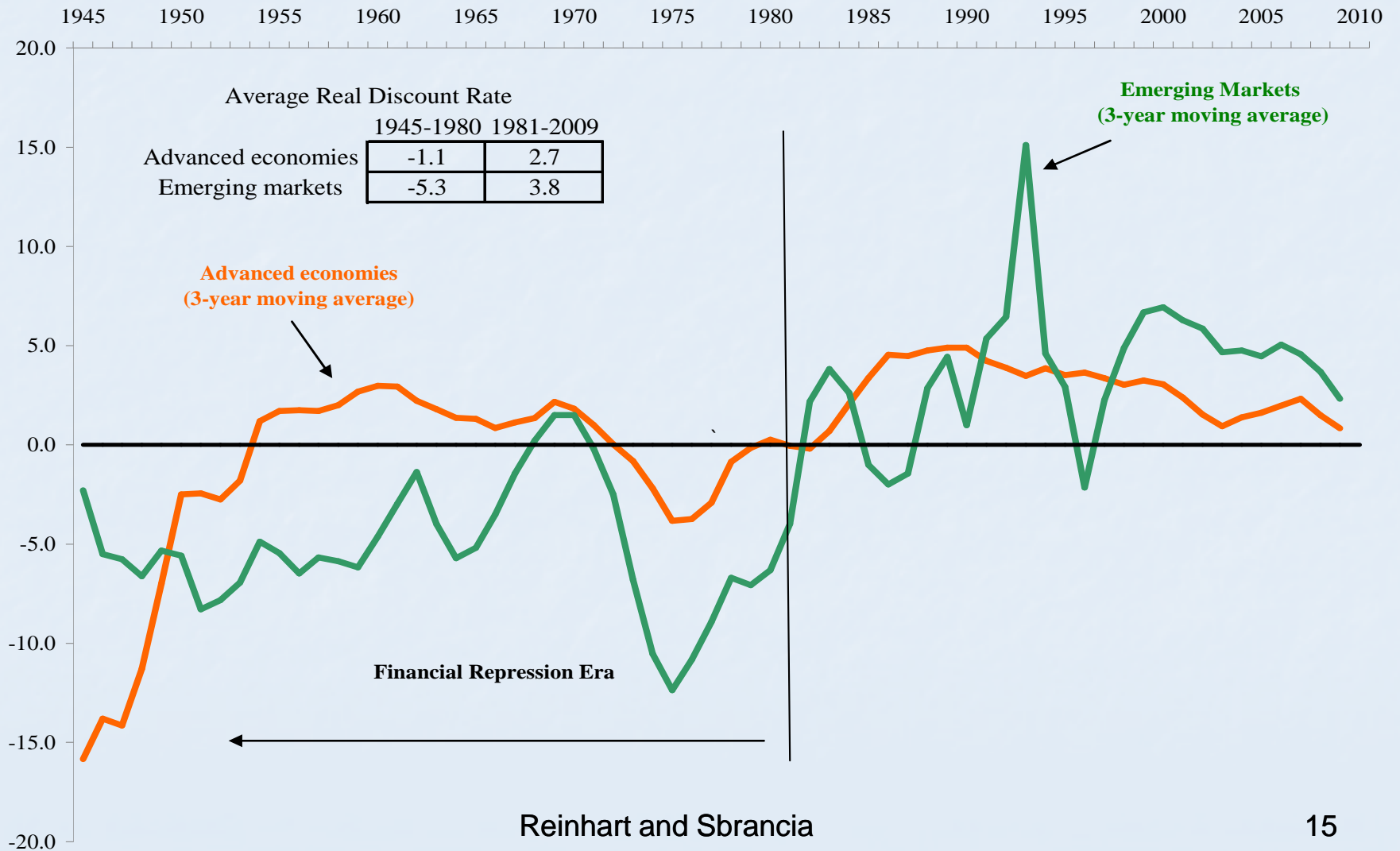
# Average Ex-post Real Interest Rates on Deposits: Advanced Economies and Emerging Markets, 1945-2009 (3-year moving averages, in percent)



| Average Real Interest Rate on Deposits | | |
| --- | --- | --- |
| | 1945-1980 | 1981-2009 |
| Advanced economies | -1.94 | 1.35 |
| Emerging markets | -4.01 | 2.85 |

Emerging Markets
(3-year moving average)

Advanced economies
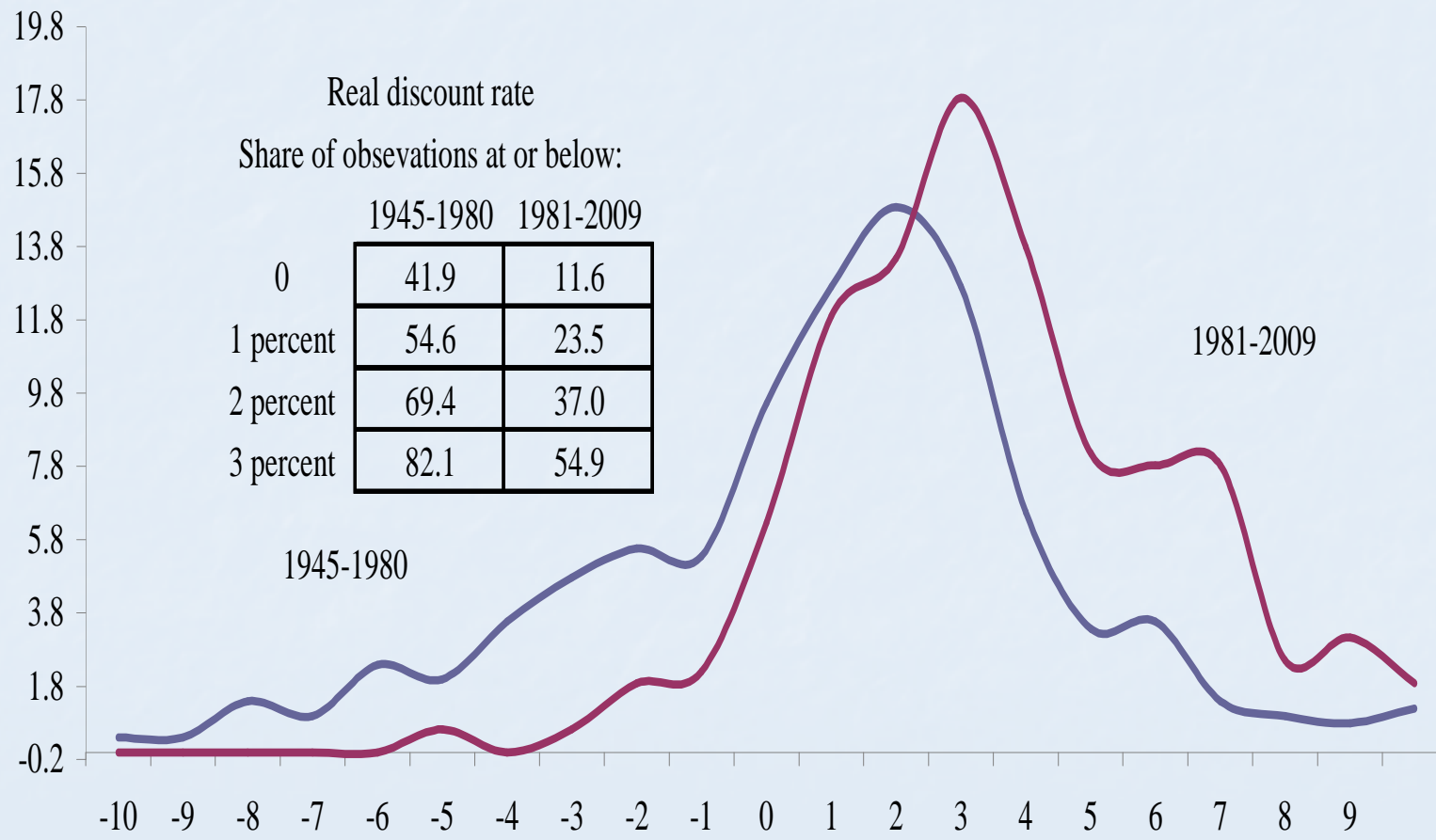(3-year moving average)

Financial Repression Era

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# Real Interest Rates Frequency Distributions: Advanced Economies, 1945-2009

*Treasury bill rate*

Real Interest rate on T-bills

Share of obsevations at or below:

| | 1945-1980 | 1981-2009 |
|---|---|---|
| 0 | 46.9 | 10.5 |
| 1 percent | 61.6 | 25.2 |
| 2 percent | 78.6 | 36.2 |
| 3 percent | 88.6 | 55.0 |

1945-1980

1981-2009



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# Real Interest Rates Frequency Distributions: Advanced Economies, 1945-2009

*Discount rate*



Real discount rate

Share of obsevations at or below:

| | 1945-1980 | 1981-2009 |
|---|---|---|
| 0 | 41.9 | 11.6 |
| 1 percent | 54.6 | 23.5 |
| 2 percent | 69.4 | 37.0 |
| 3 percent | 82.1 | 54.9 |

1981-2009

1945-1980

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# Real Interest Rates Frequency Distributions: Advanced Economies, 1945-2009

*Deposit rate*



Real Interest rate on deposits
Share of obsevations at or below:

|  | 1945-1980 | 1981-2009 |
| --- | --- | --- |
| 0 | 58.8 | 24.6 |
| 1 percent | 82.7 | 58.0 |
| 2 percent | 94.7 | 85.4 |
| 3 percent | 98.4 | 96.6 |

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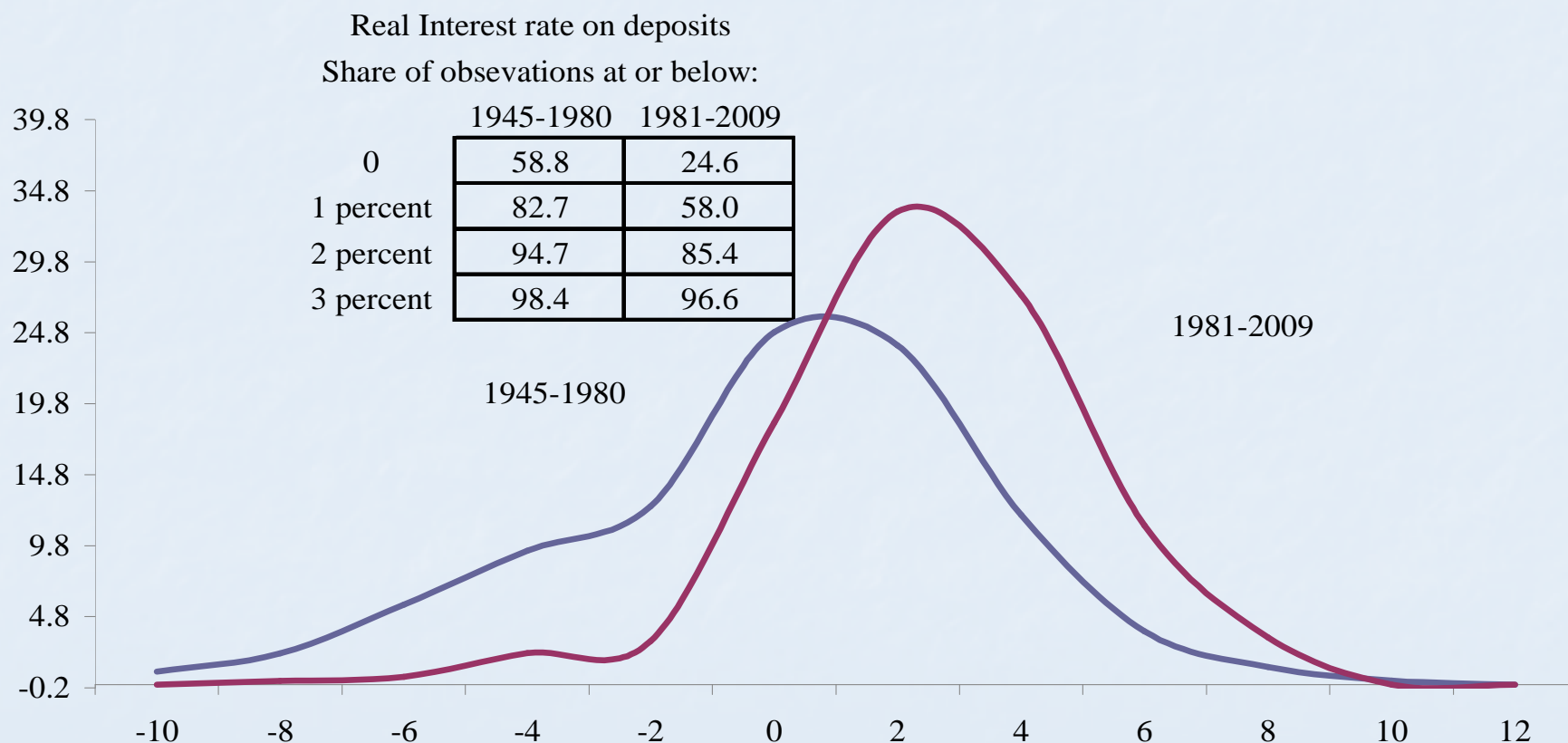
# Real Deposit Rates Frequency Distributions: United Kingdom, 1880-2010
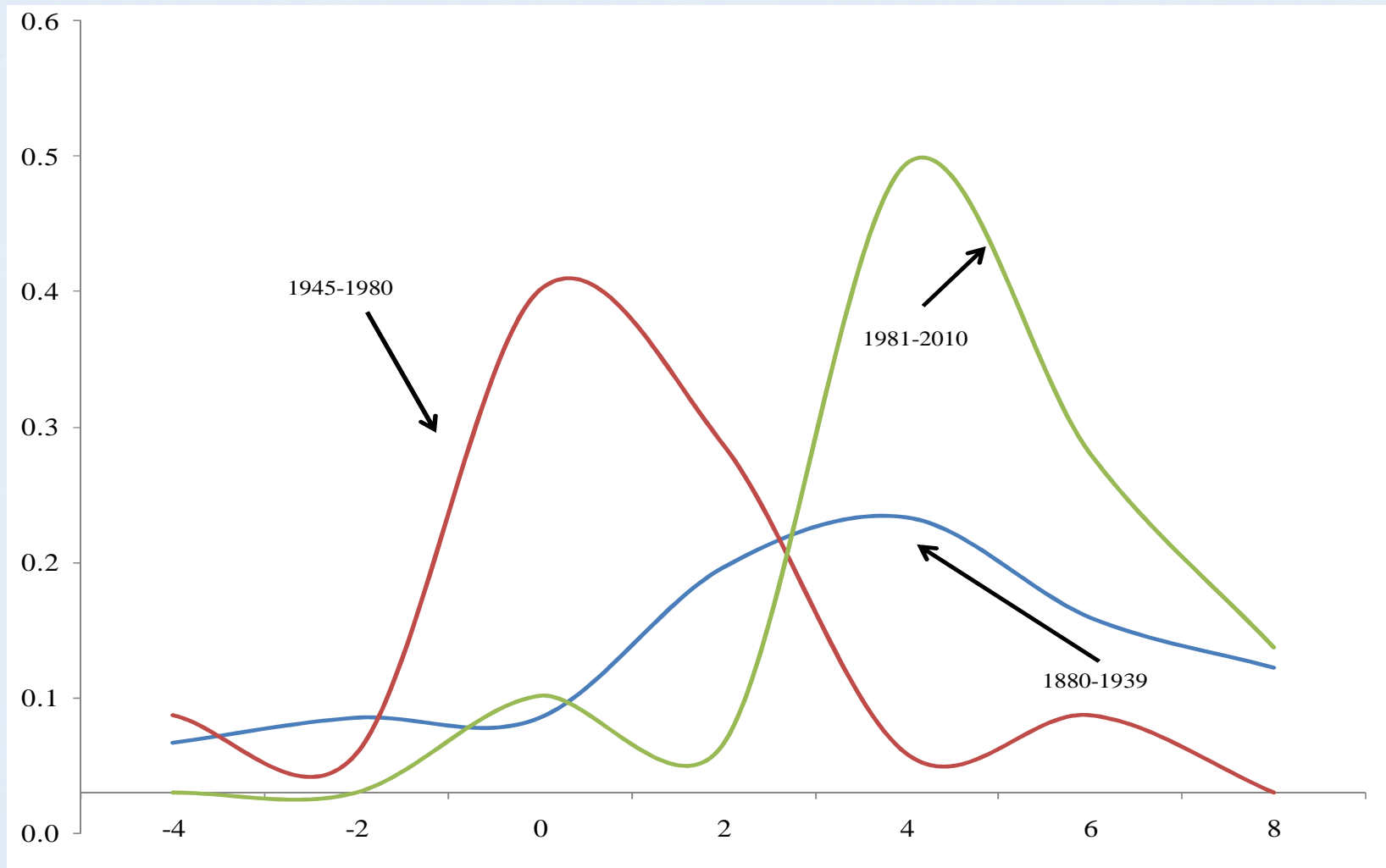
# Measuring "Taxes" from Financial Repression:
*Selected papers*

| Study | Measure(s) of financial repression | Sample and coverage | Highlight of findings |
| --- | --- | --- | --- |
| Agenor and Montiel (2008) | End-of-year effective reserve requirements ratios are calculated (see entry under Brock). The authors calculate how i mportant a share of seignorage is accounted for by the reserve requirement tax. | 32 advanced and emerging market economies 1980 -1991. | Reserve ratios are higher for emerging markets. Among the advanced economies the highest share of seignorage accounted for  by reserve ratios is  Italy over this period.  For the emerging markets, Chile and  Peru have the highest readings. |
| Beim and Calomiris (2001) | Six measures (real interest rates, reserve ratio, liquidity, private borrowing, bank lending, and stock market capi talization) of financial repression are used to construct an aggregate index.  Their aim is to provide a broad -brush cross - country comparison at a particular point in time —not a "tax equivalent" to the government. | All countries, advanced and emerging -data permitting. The most comprehensive coverage is for 1997. The annual indices are reported for 1970 and for 1990 for a subset of countries. The period of heaviest repression 1945 -early 1970s is not part of the analysis. | Based on the cross - sectional evidence , the authors conclude that financial development (the opposite of repression) contributes importantly to economic development and growth. |
| Brock (1989) | End-of-year effective reserve requirements ratios are calculated as base money less currency in circulation (central bank reserves) divided broad money (or money plus quasi -money).  Looks at the correlation between inflation rates and the reserve ratio. | 41 advanced and emerging market economies 1960 -1984. | Reserve ratios are higher for emerging markets. Among the advanced economies these are highest for Australia and Italy over this period. A positive relationship between inflation and reserve requirements is mostly present in the chronic high inflation countries of Africa and Latin America. |

| Study | Measure(s) of financial repression | Sample and coverage | Highlight of findings |
|---|---|---|---|
| Easterly (1989) | Net domestic transfers from the financial system and tax on financial intermediation. Uses inflation-adjusted flow of funds analysis to calculate the size of the transfers from reserve requirements, inflation tax, etc, | A dozen relatively large emerging markets. Flow-of-funds balance sheet from 1971 to 1986. | Estimates are highest for Mexico and Yugoslavia among the 12 countries, reaching 12-16 percent of GDP in some years. |
| Easterly and Schmitt-Hebbel (1994) | Focus on real interest rates on deposits and calculate the repression tax revenue (from that source) as the difference between domestic rates and comparable rates in OECD countries multiplied by the end-of-period stock of deposits (the tax base). | Nine emerging markets, 1970-1988 (the revenue calculations are for less than half of the countries) | This component of the financial repression tax is in the order of 1-2 percent of GDP. |
| Giovannini and de Melo (1993) | The effective interest rate on external (domestic) debt are calculated as the ratio of external (domestic) interest payments to the stock of external (domestic) debt. The government revenue from financial repression is calculated by computing the differential between the foreign borrowing cost and the domestic borrowing cost, times the average annual stock of domestic debt. | Roughly 1974-1987 (usually shorter period), depending on the country. The 24-developing-country sample does include Greece and Portugal as emerging markets. | Annual estimates of the "revenue from financial repression" are estimated from a low of 0.5 percent of GDP for Zaire (with its small domestic debt market to a high of about 6 percent for Mexico. Estimates for Greece and Portugal are 2-2.5 percent of GDP. |

# The Liquidation of government debt:

## *Conceptual issues*

# Data requirements

Differences in coupon rates, maturity and the distribution of marketable and nonmarketable debt, securitized debt versus loans from financial institutions, shape the cost of debt financing for the government. There is no "single" government interest rate that is appropriate to apply to a hybrid debt stock. A reconstruction of the government's debt profile over time is required.

# The core sample

**Government's debt profiles for 10 countries:** *Argentina, Australia, Belgium, India, Ireland, Italy, South Africa, Sweden, the United Kingdom, and the United States.* **These were constructed from primary sources over the period 1945-1990 where possible or over shorter intervals (determined by data availability).**

# Two Examples of Government Debt Profiles.
## India and the United States

**India: Composition of Domestic Debt for Selected Years, 1950-1970**
(as percentage of total domestic debt)

|  | 1950 | 1960 | 1970 |
|---|---|---|---|
| Marketable Rupee Loans | 59 | 48 | 39 |
| Treasury Bills | 15 | 25 | 21 |
| Small Savings | 17 | 17 | 19 |
| Other Obligations | 9 | 10 | 21 |

**United States: Composition of Domestic Debt for Selected Years, 1946-1976**
(as percentage of total domestic debt)

|  | 1946 | 1956 | 1966 | 1976 |
|---|---|---|---|---|
| Interest bearing obligations |  |  |  |  |
| Marketable obligations | 67.3 | 58.0 | 65.8 | 64.5 |
| Treasury Bills | 6.5 | 9.1 | 20.3 | 25.1 |
| Certificates of Indebtedness | 11.4 | 6.9 |  |  |
| Treasury Notes | 3.8 | 12.8 | 17.8 | 33.2 |
| Treasury Bonds | 45.5 | 29.2 | 27.7 | 6.2 |
| Other Bonds | 0.1 | 0.0 | 0.0 | 0. |
| Non-marketable obligations | 22.7 | 24.7 | 16.7 | 35.4 |
| Special Issues | 9.4 | 16.5 | 16.6 | n.a. |
| Matured debt on which interest has ceased | 0.2 | 0.3 | 0.1 | 0.1 |
| Debt bearing no interest | 0.4 | 0.6 | 0.8 | 0.1 |

# Benchmark estimates of the "liquidation effect"

- **We construct a "synthetic debt portfolio" for the government's total debt stock at the beginning of the year.**

- **The "aggregate" nominal interest rate for a particular year is the coupon rate on a particular type of debt instrument weighted by that instrument's share in the total stock of debt.   We then aggregate across all debt instruments.**

# Benchmark estimates of the "liquidation effect"

- **The real rate of interest,**

$$ r_t = \frac{i_{t-1} - \pi_t}{1 + \pi_t} $$

- **Our benchmark calculations define a liquidation year, as one in which the real rate of interest (as defined above) is negative (below zero).**

# Benchmark estimates of the "liquidation effect"

- **The saving (or "revenue") to the government or the *"liquidation effect"* or the *"financial repression tax"* is the real (negative) interest rate times the "tax base," which is the stock of domestic government debt outstanding.**

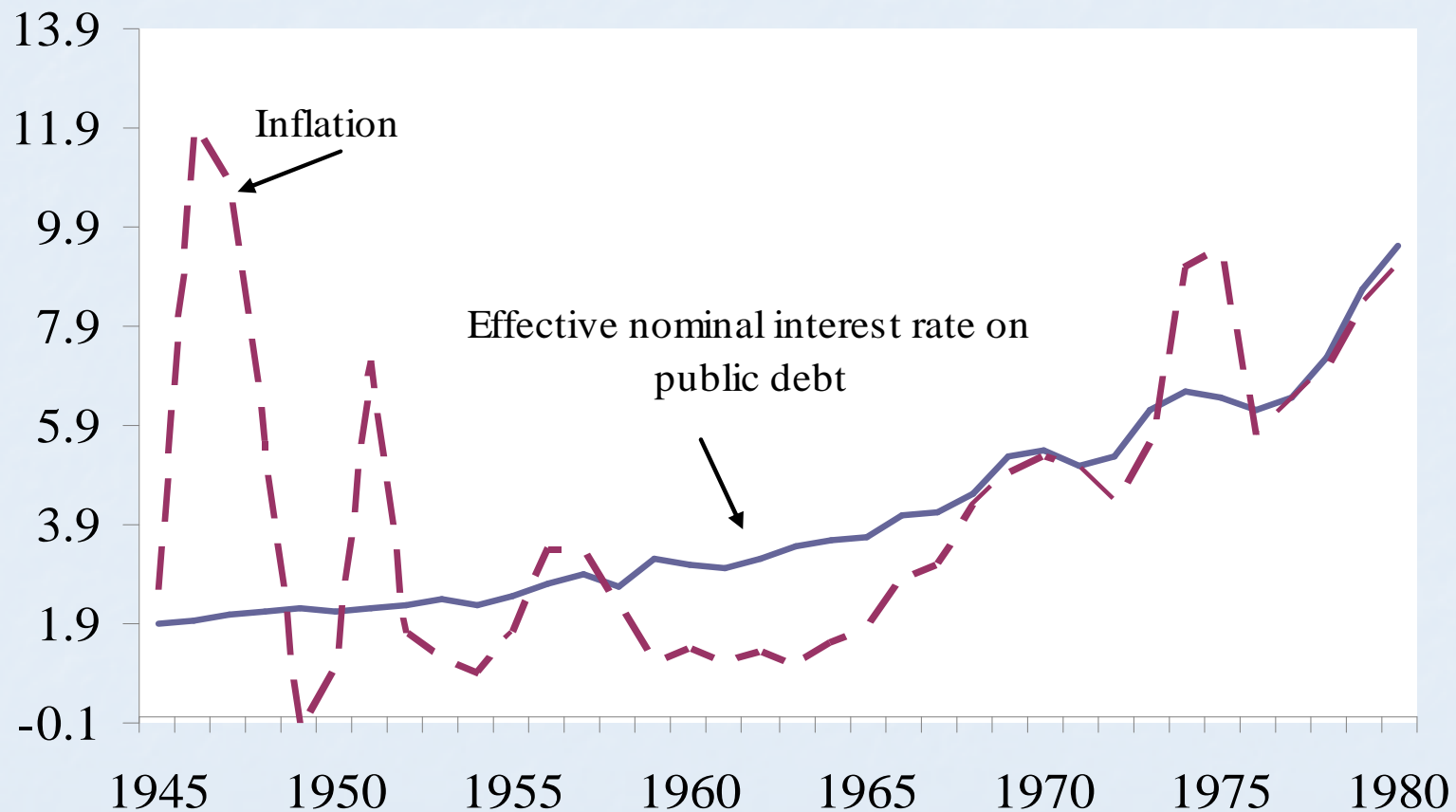# Two Examples of Effective Nominal Interest Rates on Public Debt:
# India and the United States

*India, 1949-1980*
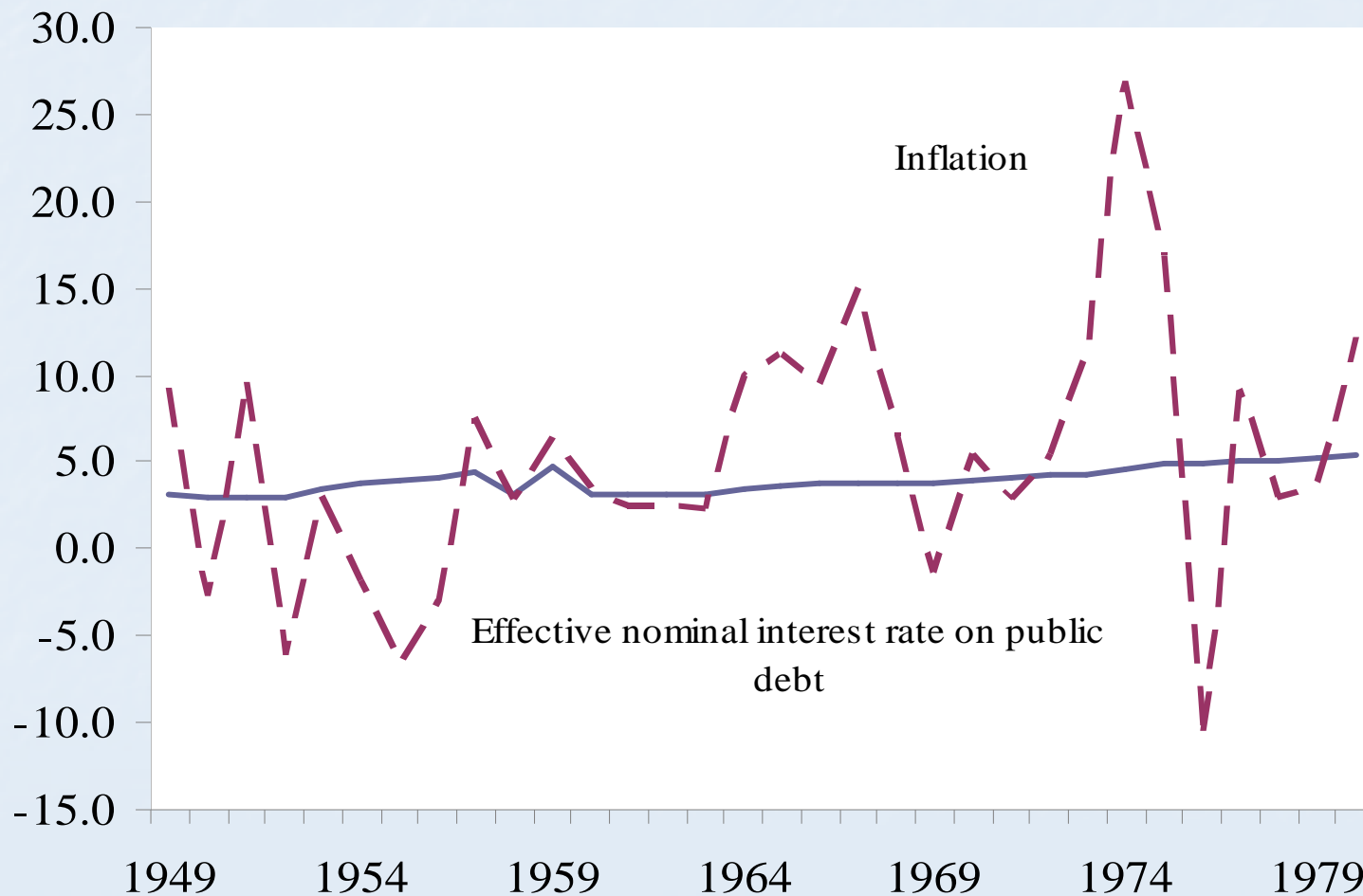


Inflation

Effective nominal interest rate on public debt

# Two Examples of Effective Nominal Interest Rates on Public Debt:
# India and the United States

*United States, 1945-1980*

# The Liquidation of government debt:
## *Empirical estimates*

# Incidence of Liquidation Years for Different Real Interest Rate Thresholds: Selected Countries, 1945-1980

| Country (1) | Period (2) | Share of Years with Real Interest Rate below: | | | |
|---|---|---|---|---|---|
| | | 0 percent(3) | 1 percent(4) | 2 percent (5) | 3 percent (6) |
| Argentina | 1944-1974 | 97.0 | 97.0 | 97.0 | 97.0 |
| Australia | 1945-1968, 1971,1976 | 48.0 | 65.4 | 80.8 | 92.3 |
| Belgium[1] | 1945-1974 | 48.0 | 65.4 | 72.0 | 80.0 |
| India | 1949-1980 | 53.0 | 62.5 | 71.9 | 78.1 |
| Ireland | 1965-1990 | 62.0 | 65.4 | 73.1 | 76.9 |
| Italy[2] | 1945-1970 | 41.0 | 50.0 | 53.8 | 76.9 |
| South Africa | 1945-1974 | 43.0 | 53.3 | 66.7 | 80.0 |
| Sweden | 1945-1965, 1984-1990 | 35.7 | 39.3 | 60.7 | 75.0 |
| United Kingdom | 1945-1980 | 47.8 | 72.2 | 86.1 | 97.2 |
| United States | 1945-1980 | 25.0 | 63.9 | 88.9 | 100.0 |

# Government Revenues from the *"Liquidation Effect:"* per year

| Country | Period | Benchmark Measure "Liquidation effect revenues" | | Alternative Measure of "Liquidation effect revenues" | |
|---|---|---|---|---|---|
| | | % GDP | % Tax Revenues | % GDP | % Tax Revenues |
| Argentina | 1944-1974 | 3.2 | 19.5 | 3.0 | 16.6 |
| Australia | 1945-1968, 1971,1978 | 5.1 | 20.3 | n.a. | n.a. |
| Belgium | 1945-1974 | 2.5 | 18.6 | 3.5 | 23.9 |
| India | 1949-1980 | 1.5 | 27.2 | 1.5 | 27.2 |
| Ireland | 1965-1990 | 2.0 | 10.3 | n.a. | n.a. |
| Italy | 1945-1970 | 5.3 | 127.5 | 5.9 | 143.5 |
| South Africa | 1945-1974 | 1.2 | 8.9 | n.a. | n.a. |
| Sweden | 1945-1965, 1984-1990 | 0.9 | 6.5 | 1.6 | 10.9 |
| United Kingdom[1] | 1945-1980 | 3.6 | 26.0 | 2.4 | 17.3 |
| United States | 1945-1980 | 3.2 | 18.9 | 2.5 | 14.8 |

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# Liquidation through Financial Repression: Selected Countries, 1945-1955

| Country | Public debt/GDP | | | Annual average: 1946-1955 | |
| --- | --- | --- | --- | --- | --- |
| | 1945 | 1955 (actual) | 1955 without repression savings (est.)[4] | "financial repression revenue"/GDP | inflation |
| Australia | 143.8 | 66.3 | 199.8 | 6.2 | 3.8 |
| Belgium[1] | 112.6 | 63.3 | 132.2 | 4.6 | 8.7 |
| Italy[2] | 66.9 | 38.1 | 81.9 | 3.7 | 10.8 |
| Sweden | 52.0 | 29.6 | 59.1 | 1.8 | 5.0 |
| United Kingdom[3] | 215.6 | 138.2 | 246.9 | 4.5 | 5.9 |
| United States | 116.0 | 66.2 | 141.4 | 6.3 | 4.2 |

# Inflation surprises and its broader role in debt reduction

Because we do not have a direct measure of inflation expectations for much of the sample, we define inflation bursts or "surprises" in a more mechanical, ex-post manner.

Specifically, we calculate a ten-year moving average for inflation and classify those years in which inflation was more than two-standard deviations above the 10-year average as an "inflation burst/surprise year".

As the 10-year window may be arbitrarily too backward looking, we also perform the comparable exercise using a five-year moving average.

# Do Inflation Surprises Coincide with Debt Liquidation? 10 countries, 1945-1980

| Country | Share of "inflation surprise" years | Share of liquidation years which are also "inflation surprise" years | Inflation surprise years* |
|---|---|---|---|
| Argentina | 26.7 | 27.6 | 1945,1946,1949-1951,1959,1972,1973 |
| Australia | 7.7 | 16.7 | 1951,1966 |
| Belgium | 12.0 | 25.0 | 1972-1974 |
| India | 6.3 | 10.5 | 1973,1974 |
| Ireland | 11.5 | 20.0 | 1970,1972,1973 |
| Italy | 7.7 | 18.2 | 1962,1963 |
| South Africa | 13.9 | 0.0 | *1964,1971-1974* |
| Sweden | 3.6 | 11.1 | 1951 |
| United Kingdom | 13.9 | 23.5 | *1970*,1971,1973-1975 |
| United States | 25.0 | 22.2 | 1946,*1966,1968,1969, 1970,1973*,1974,*1979, 1980* |

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# Inflation Performance during Major Domestic Public Debt Reduction Episodes: 28 Countries, 1790-2009

# Extended Sample for Inflation and Domestic Debt Reduction Analysis:
## 28 Countries, 1790-2009

| Country | Sample Period | Country | Sample Period |
|---|---|---|---|
| Argentina | 1884-2009 | Italy | 1914-2009 |
| Australia | 1914-2009 | Japan | 1885-1940, 1952-2009 |
| Belgium | 1920-1939,1946-2009 | Korea | 1976-2005 |
| Brazil | 1900-2009 | Malaysia | 1955-1957, 1976-2009 |
| Canada | 1925-2007 | Mexico | 1918-1967, 1976-2009 |
| Chile | 1927-1930,1937-1953,1978-2009 | New Zealand | 1932-2008 |
| Colombia | 1923-2009 | Philippines | 1948-2009 |
| Egypt | 1993-2009 | South Africa | 1911-2009 |
| Finland | 1915-2009 | Sweden | 1880-2009 |
| France | 1920-1938, 1949-2009 | Thailand | 1950-2009 |
| Germany | 1920-1938, 1950-2009 | Turkey | 1933-1972, 1976-2009 |
| Greece | 1920-1939, 1950-1965, 1978-1981, 1993-2009 | United Kingdom | 1830-2009 |
| India | 1950-2009 | United States | 1790-2009 |
| Ireland | 1948-2008 | Venezuela | 1921-2009 |

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| | **Major Debt Reduction Episodes\*** | | | **Full Sample** | |
| | | **Inflation** | | **Inflation** | |
| | **Dates** | **Average** | **Median** | **Average** | **Median** |
| --- | --- | --- | --- | --- | --- |
| Argentina | 1900-*1902* ,1990,2006-2007 | 479.8 | 8.2 | 82.5 | 8.6 |
| Australia | 1948,*1949* -1953 | 10.3 | 9.3 | 3.0 | 2.5 |
| Belgium | 1925-28, *1949* | 10.7 | 12.8 | 2.0 | 1.9 |
| France | 1924, 1926-1927, *1938* | 11.1 | 12.6 | 6.4 | 2.7 |
| Greece | *1925* -1927 | 23.7 | 12.8 | 8.0 | 5.1 |
| India | *1958* , 1996, 2006 | 7.1 | 6.2 | 6.6 | 6.2 |
| Italy | 1945, *1946* -1948 | 106.7 | 44.3 | 10.6 | 2.6 |
| Japan | 1898, *1912* -1913 | 7.6 | 6.7 | 3.6 | 2.6 |
| Malaysia | 1995 | 8.4 | 8.8 | 6.9 | 5.4 |
| Mexico | 1991, *1992* , 1993 | 18.9 | 20.0 | 13.3 | 5.6 |
| New Zealand | 1935-*1937* , 1950-1952 | 4.9 | 5.3 | 4.2 | 2.8 |
| South Africa | 1935, 1952, 1981, 2001-*2002* | 7.0 | 6.6 | 5.8 | 4.9 |
| Sweden | 1948, 1952, 1989, *2001* -2003, 2009 | 4.7 | 3.2 | 4.4 | 3.2 |
| Turkey | 1943, 2006-2008 | 23.2 | 9.2 | 25.3 | 9.7 |
| UK | 1836, 1846, 1854, 1936, 1940, 1948-*1950* ,1951-1954 | 4.7 | 3.7 | 2.7 | 1.8 |
| US | 1794-1796, 1881-1882, 1948-*1952* , 1953, 1957, 1966 | 4.0 | 2.6 | 1.6 | 1.7 |

# The return of financial repression?

**The collective buildup of public debts in the advanced economies during WWI was largely unwound through default in the 1930s**

**The even larger buildup in public debts of WWII was unwound partially through steady growth-but, more importantly, through "financial repression"**

# The return of financial repression?

To deal with the current debt overhang, similar policies to those documented here may re-emerge in the guise of prudential regulation rather than under the politically incorrect label of financial repression.

Moreover, the process where debts are being "placed" at below market interest rates in pension funds and other more captive domestic financial institutions is already under way in several countries in Europe.