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International Financial Crises

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An encompassing empirical approach to understanding crises

Long view: At the very least, multi-decade. Where possible, multi-century. Placing the crisis in its broader historical and international context.

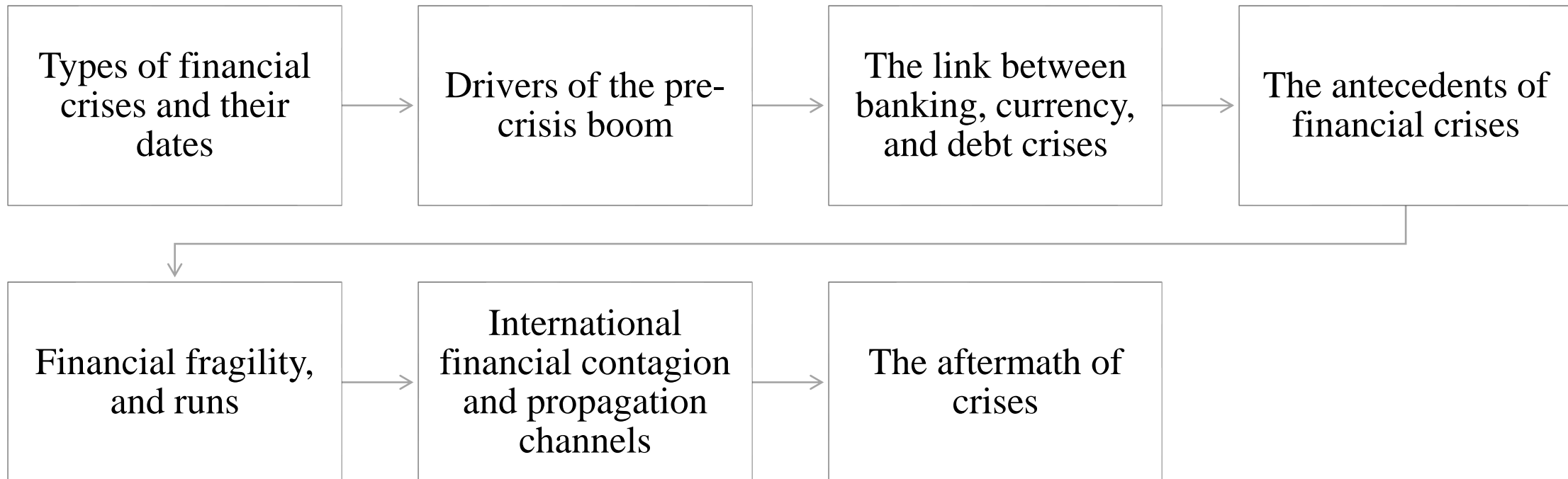
International in scope: Covering developed and advanced economies with broad regional coverage. Often incorporating less-known sources.

Two-track: (i) Cross-country groups with different aggregation schemes (regional, developmental, “eras”) (ii) Individual country chronologies and detailed country experience; case studies.

Interconnectedness of crises: Financial (banking) crises are often accompanied by other types of economic crises: currency, sovereign debt (external and domestic), stock market crashes, and sometimes inflation bursts.

Atheoretical but informed by theory: Atheoretical in that no particular model is imposed on the data in the search for recurring patterns; guided by theory in the selection of what variables to study and what the priors are, as to the evolution of these indicators around crises.

Roadmap



Types of financial crises

- This discussion is about financial crises in (partially-to-mostly) liberalized *market economies*; these are of the “boom-bust” variety. Within this group, we focus on *systemic* crises.
- What about banking crises in *financially repressed economies*? These have different drivers, antecedents and consequences. A common cause involves lending to an inefficient and/or bankrupt public sector.
- *Systemic crises* involve some combination of bank runs, losses in the financial system, and bank liquidations usually with attendant policy intervention to support the financial system.

Cross-country studies include: Conant, 1919, Kindelberger, 1978, Bernanke and James, 1991, Eichengreen, 1992, Caprio and Klingbiel, 1996, Kaminsky and Reinhart, 1999, Bordo, Eichengreen, Kliengbiel, and Martinez-Peria, 2001, Reinhart and Rogoff, 2008 and 2009, Schularick and Taylor, 2012, Laeven and Valencia, 2012, Bordo and Meissner 2016.

Drivers of the pre-crisis boom

*Financial liberalization, international capital market access, and
financial innovation*

Domestic and external financial liberalization and banking crises

- *Domestic monetary policy* is a source of liquidity that can facilitate domestic credit expansion and fuel private borrowing cycles (Friedman and Schwartz, 1963, and Kindleberger, 1978).
- *Domestic financial liberalization* involving the removal of interest rate ceilings, lowering (eliminating) reserve requirements, allowing easier entry to the industry, permitting the introduction of new products or repackaging old ones usually brings access to credit to a broader spectrum of the population; it boosts credit/debt growth in the commercial and shadow banking sectors.
- *Capital account liberalization* and integration into global capital markets permit countries to “import liquidity” by borrowing from abroad (capital inflows).
- *Capital inflows* and access to lower international interest rates (Calvo, Leiderman and Reinhart, 1993) often give rise to carry trade opportunities that fuel the domestic credit expansion. Commodity price booms, associated with capital inflow surges have a similar effect for commodity producers.

Financial liberalization and banking crises

Based on a sample of 20 advanced and emerging economies over 1970-1997, KR (1996 and 1999) present evidence that financial liberalization often precedes banking crises and increases their odds of occurrence.

$P(\text{banking crisis}) = 0.10 < P(\text{banking crisis beginning} \mid \text{financial liberalization}) = 0.14^*$

We also note that while the number of currency crashes per year does not increase much during the 1980's and 1990's (from an average of 2.60 per annum to 3.13 per annum), the number of banking crises per year more than quadruples in the post-liberalization period**

The *signals approach* introduced by KR is detailed in Kaminsky, Lizondo, and Reinhart (1998). Subsequently, this methodology has been widely incorporated in academic and policy research as well as surveillance.

*Denotes that the difference is statistically significant; logit and probit models yield comparable results, as shown in the 1996 working paper version of KR (1999).

**See also Tornell, Westermann, and Martinez (2003)

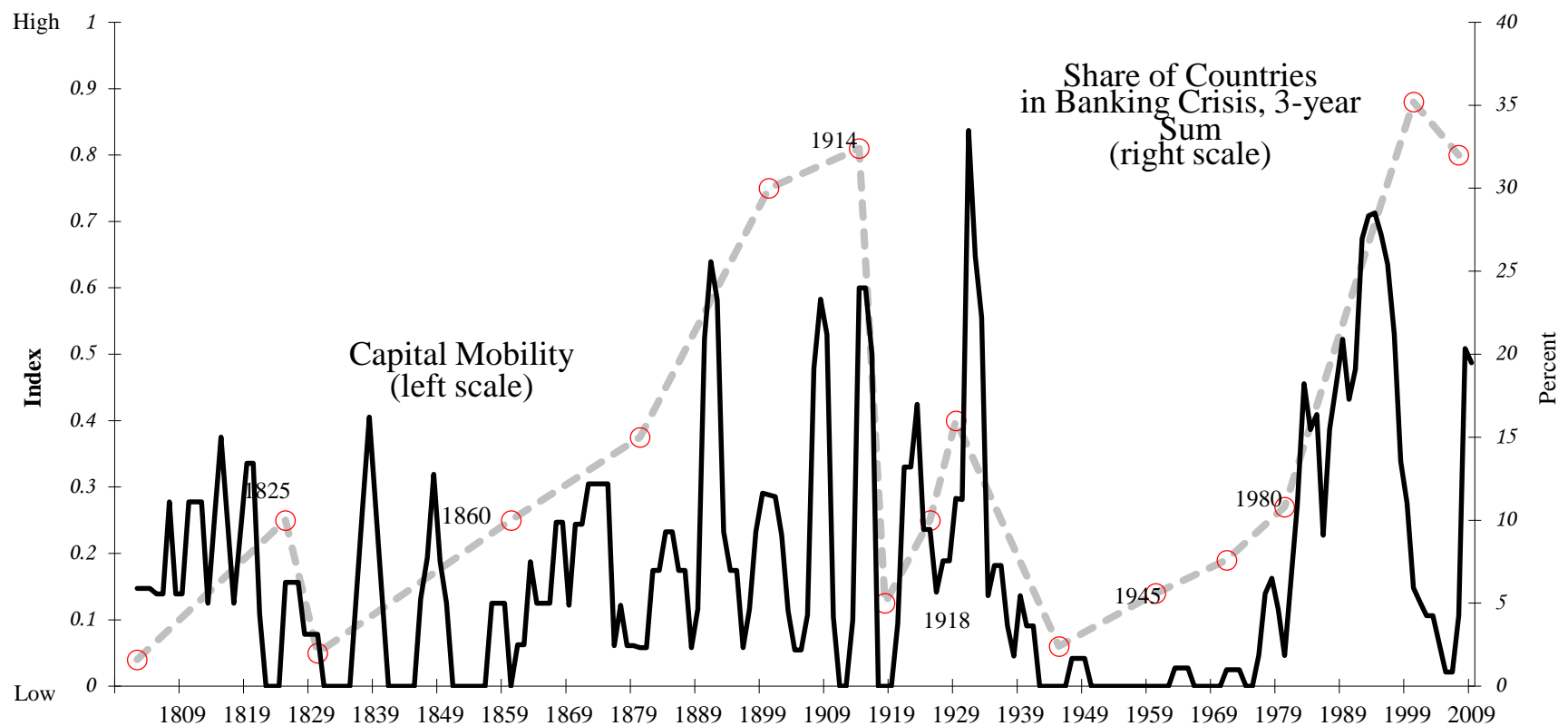
A global database on banking crises 1800-2008 and capital mobility

- *Sample:* RR (2008 and 2009) present a profile of financial crises for 100 emerging and developing economies and 25 advanced economies over 1800-2008. (RR core sample is 66 countries, see <http://www.carmenreinhardt.com/this-time-is-different/>)
- *Crises:* The sample covers 183 crises in emerging (EM) and developing (DM) markets. The 316 crisis tally includes both systemic and borderline cases.
- *Connection to liberalization:* Financial and capital account opening/closing has tended to be broadly synchronous across countries. Liberalization increases capital mobility across national borders.

Patterns

- In the post World War II era of financial repression studied in Reinhart and Sbrancia (2011 and 2015), the incidence of banking crises is markedly lower than in the prior and subsequent eras of high capital mobility and global capital market integration.
- There are no global (or near global) episodes of financial turmoil (as in 1820s, 1907, 1930s, 1980s (EMs and DMs), 2008-2009, to name a few) during the era of limited capital mobility and capital account restrictions.
- See also Martin and Rey (2006) on the financial globalization-financial integration nexus in EMs, and Calvo, Izquierdo and Mejia (2016) on the connection between capital market integration and sudden-stop type financial crises.

Financial liberalization increases cross-border capital mobility and the incidence of banking crises: 1800-2008



Sources: Reinhart and Rogoff (2008 and 2009); introspective index of capital mobility index of capital mobility based on Obstfeld and Taylor (2004) updated and backcast to 1800-1859. Reinhart, Reinhart, and Trebesch (2017) trace a very similar capital mobility index over 1815-2016 based on international bond issues and cross-border capital flows.

Two examples from a rich pool of case studies: Pre-crisis financial liberalization (innovation)

United States: Financial innovation and the Subprime crisis

As related in Reinhart (2011), in the early 2000s, foreign official entities had outsized demands for low-risk dollar-denominated assets, primarily Treasury securities. At the same time, the US was running a current account deficit, implying that the foreign private sector was accumulating other dollar debt.

Given the foreign private sector's preference for seemingly low-risk securities, US institutions collateralized mortgage-backed securities to create upper tranches that were triple A rated to meet that need. This spurred further US mortgage financing to create the collateral to securitize, which led to a decline in underlying standards of new home mortgages, even as the growing use of home equity loans allowed households to erode the value of the collateral. All of which was based on inflated home prices.

The result was that: The foreign private sector was left with securities vulnerable to substantial downgrades; US domestic institutions held the problematic low-end remainder; and US households were over-leveraged.

Mexico's privatization of banks and post-1989 domestic and external financial liberalization

The administrations of de la Madrid and Salinas privatized the largest banks in stages, and by 1992 they were nearly done. An immediate boom in credit followed. Total loans as a percent of GDP rose from 24% in 1991 to 38% in 1994. The growth in consumer credit was particularly pronounced as commercial banks competed to gain a larger share in this market. It had been relatively untapped while banks were under government control. (Musacchio 2012).

The high reserve requirements that had been a central feature of the Mexican banking system were eliminated and replaced with a zero-reserve requirement framework.

Haber (2005), among others, notes that the new bankers had little or no experience running commercial banks. Most were financial groups with experience in the stock market.

The government delayed the adoption of international banking standards and allowed banks to lend or buy securities without the appropriate reserves against loan losses.

Regulators allowed banks to misreport the riskiness of their loans. For instance, when a loan was past due, only the interest in arrears was counted as nonperforming.

The links between banking, currency, and debt crises

Twin crises: Prior to KR (1996, 1999), the theoretical and empirical literature on currency and banking crises studied these events separately; KR documented their frequent and systematic connectedness.

Does knowing that there is a banking crisis help predict a currency crash over a two-year horizon?

A vicious circle—emergent banking problems can trigger a currency crash

$P(\text{currency crash}) = 0.29 < P(\text{currency crash} \mid \text{banking crisis beginning}) = 0.46^*$

Currency crashes aggravate existing banking-sector problems and create new ones.

$P(\text{banking crisis}) = 0.10 < P(\text{banking crisis peak} \mid \text{currency crash}) = 0.16^*$

Financial-sector problems undermine the currency, as bailouts may require liquidity injections. The adverse feedback from a weaker currency can be amplified, for instance, by banks' inadequate hedging of foreign-exchange risk. An “interest rate defense” can also weaken bank balance sheets. These dynamics adversely affect credit risk and borrowing costs.

The presence of vicious circles would imply that, a priori, the twin crises are more severe than currency or banking crises in isolation.

See also https://en.wikipedia.org/wiki/Twin_crises

From financial crash to debt crises: RR (2008 and 2009) document the high-debt legacy of systemic financial crises, often increasing the vulnerability to a sovereign debt crisis. This nexus is the subject of considerable ongoing academic and policy research.

RR (2011) note that the causal direction between banking and debt crises can potentially run in either or both directions (see also Bordo and Meissner, 2016). The prevalent pattern from the country histories (Reinhart, 2011) appears to suggest that banking crises come before debt crises more often than not.

As both variables are dichotomous, the method of estimation is a multinomial logit; RR use a single lag of a three-year backward-looking moving average. The simple two-equation system is given by,

$$(1) \quad DC_t = \beta_k + \beta_{11}DC_{t-1 \text{ to } t-3} + \beta_{12}BC_{t-1 \text{ to } t-3} + \beta_{13}FC_t + u_{1t}$$

$$(2) \quad BC_t = \beta_k + \beta_{21}DC_{t-1 \text{ to } t-3} + \beta_{22}BC_{t-1 \text{ to } t-3} + \beta_{23}FC_t + u_{2t},$$

Where DC, BC, and FC denote sovereign debt crisis, domestic banking crisis and banking crisis in the financial center, respectively.

Temporal Patterns of Banking Crises and Sovereign Default: Multinomial Logit, panel Data

Do sovereign defaults and banking crises in financial centers anticipate domestic banking crises?

Dependent variable: First year of a banking crisis

Explanatory variables:	Sample period, 1824-2009
Banking crisis (t-1 to t-3)	0.305
<i>p</i> -value	0.640
Default (t-1 to t-3)	-0.380
<i>p</i> -value	0.681
Financial center crisis (t to t-2)	3.360
<i>p</i> -value	0.000

Do domestic and financial center banking crises and anticipate sovereign defaults?

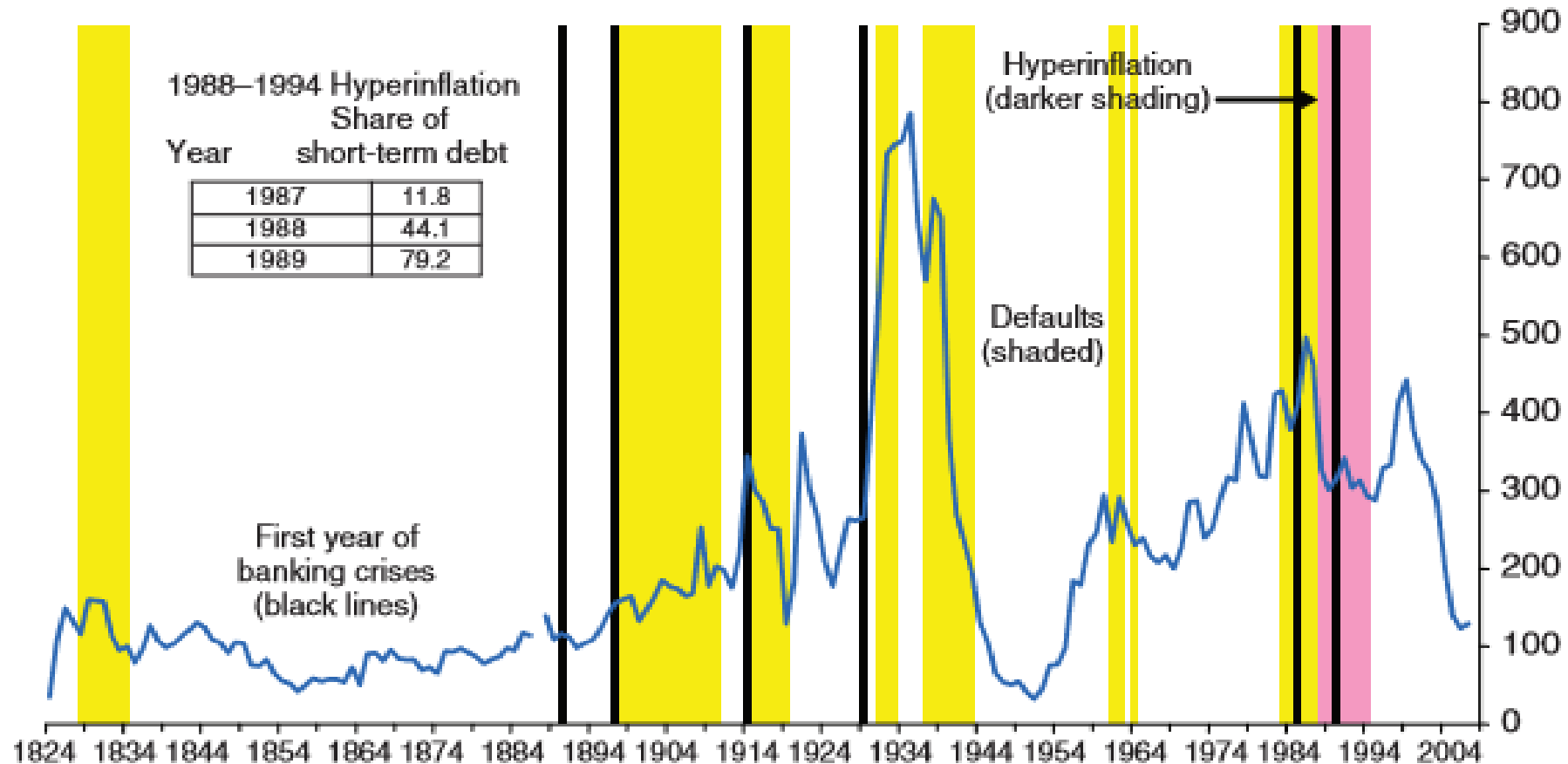
Dependent variable: First year of a sovereign default (credit event)

Explanatory variables	Sample period, 1824-2009
Banking crisis (t-1 to t-3)	2.663
<i>p</i> -value	0.000
Default (t-1 to t-3)	1.444
<i>p</i> -value	0.045
Financial center crisis (t to t-2)	0.933
<i>p</i> -value	0.113

Banking crises increase the probability of a sovereign debt crisis but not the other way around.

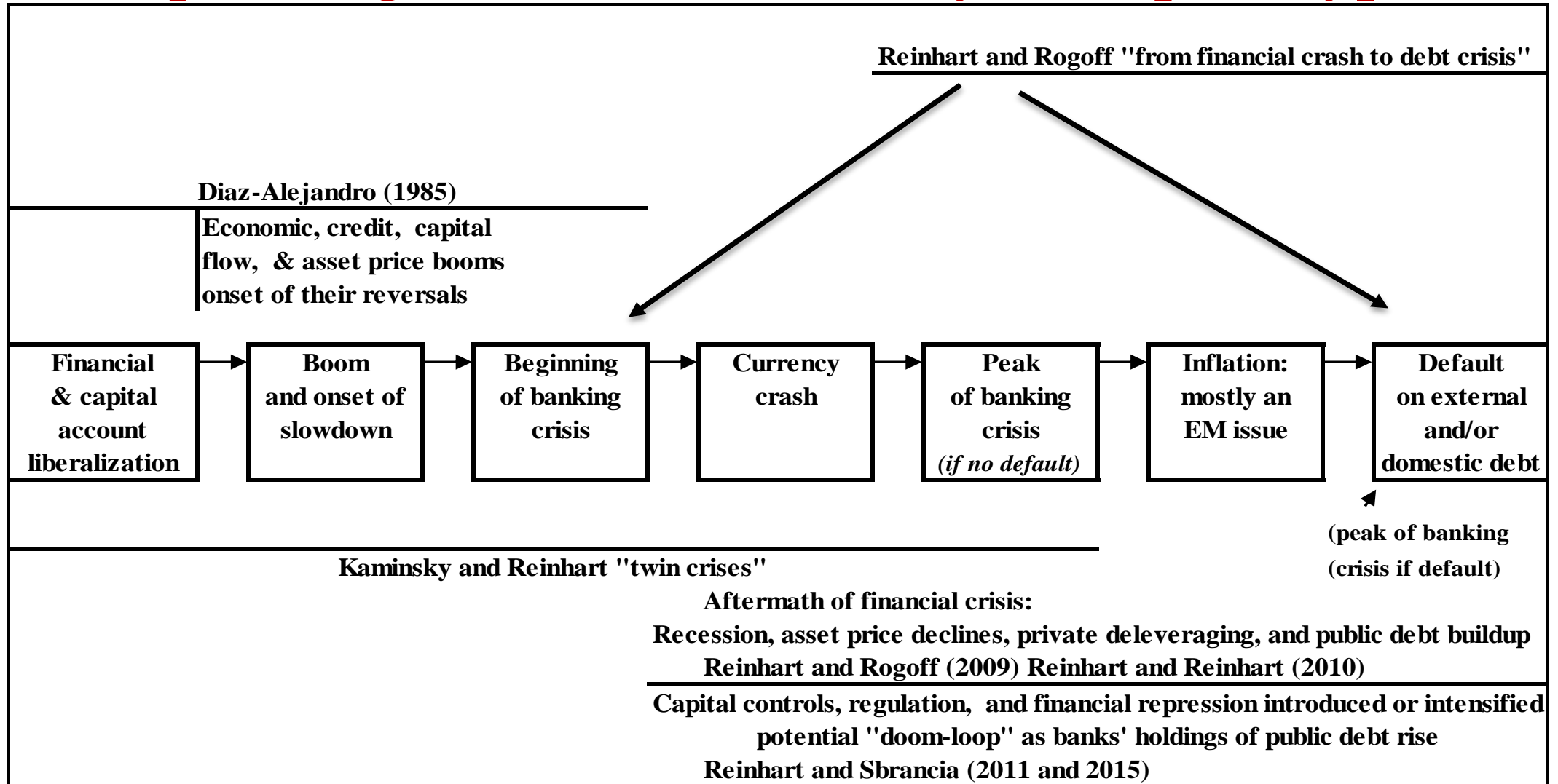
Brazil: External debt, default, hyperinflation, and banking crises, 1824–2009 (debt as a percent of exports)

An illustration from the many individual country histories of how banking crises (black lines) morphed into debt crises...



Source: Reinhart and Rogoff (2011). See also companion chartbook, Reinhart (2011).

The sequencing of the boom-bust cycle: a prototype



Sources: Reinhart (2018), Reinhart and Rogoff (2009) and numerous sources cited therein.

Composite crises: Twins, triplets, and crisis severity

- Of a subset of 100 systemic banking crises (1857-2013) identified in RR (2009 and 2014), $\frac{1}{4}$ of these also involved a sovereign credit event (i.e. default or restructuring).
- Another 9 involved large-scale bailouts involving the IMF and international community to avoid a sovereign credit event.
- Combined, the tally of debt crises accounts for just over a third (34) of the episodes. All but the more recent Greek crisis were triplets.
- The Greek and 2008-2018 case of banking and debt crisis without a currency crash is unique.
- More than $\frac{1}{2}$ of the cases (56 episodes) involved a currency crash.
- If the sample is confined to the banking crises since 1900, a full 70% of the banking crises were either “twins” or, worse yet, “triplets.”

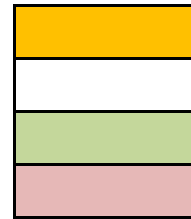
Composite crises and crisis severity

Guide to table on
next page



Within a two-year window around the
beginning of a banking crisis

Banking, Currency, and Debt
Banking only
Currency only
Debt only



Measuring the severity of the economic contraction as reflected in by *per capita GDP* (RR, 2009 and 2014)

An index that captures some of the depth and duration aspects for each crisis episode (denoted by subscript i),

Severity index_i =

Absolute value peak-to-trough % Δ_i + No. of years from peak to recovery of prior peak_i

There are numerous other ways of gauging the severity of a crisis (including focusing on shortfalls relative to potential output). The RR measure lends itself to comparisons across time and space (specifically to eras or countries where population growth is/was significantly greater than what we observe today, particularly in the advanced economies).

Ranking the banking crises from most to least severe and focusing on the 25 cases with the deepest and(or) most protracted output contractions, the exercise highlights that composite crises are usually more severe.

Crisis Severity: Percent Decline in Per Capita GDP, Duration of Contraction and Years to Full Recovery in 25 of the Worst Systemic Banking Crises, 1857-2018

Year	Country	% change		Number of years		Severity index
		Peak to trough	Peak to trough	Peak to recovery	Severity index	
1	1926 Chile	-46.6	3	16	62.6	
2	1931 Spain	-34.6	9	26	60.6	
3	1983 Peru	-32.0	11	25	57.0	
4	1931 Uruguay	-36.1	3	17	53.1	
5	1893 Australia	-28.0	8	20	48.0	
6	1929 Mexico	-31.1	6	16	47.1	
7	1921 Italy	-25.5	3	21	46.5	
8	1890 Brazil	-21.7	4	21	42.7	
9	2008 Greece	26.3	6	16	42.3	
10	1890 Uruguay	-21.0	2	19	40.0	
11	1981 Philippines	-18.8	3	21	39.8	
12	1980/1985 Argentina	-21.8	11	18	39.8	
13	1929 India	-8.2	9	31	39.2	
14	1929/1933 US	-28.6	4	10	38.6	
15	1994 Venezuela	-24.2	11	14	38.2	
16	1939 Netherlands	-16.0	6	21	37.0	
17	1931/1934 Argentina	-19.4	3	15	34.4	
18	1931 Poland	-24.9	4	9	33.9	
19	1929/1931 Austria	-23.4	4	10	33.4	
20	1981 Mexico	-14.1	7	17	31.1	
21	1920 UK	-18.7	3	11	29.7	
22	2001 Argentina	-20.9	4	8	28.9	
23	2008 Italy	-11.9	6	16	27.9	
24	1980 Chile	-18.9	2	8	26.9	
25	2002 Uruguay	-18.9	4	8	26.9	

Source: Reinhart (2018), Reinhart and Rogoff (2009 and 2014).

“Pure” (ie, unaccompanied banking crises) do not figure as prominently among the most severe recession episodes.

Debt crises (usually at the time of or following the banking crisis) add to the depth and duration of the post-crisis output decline.

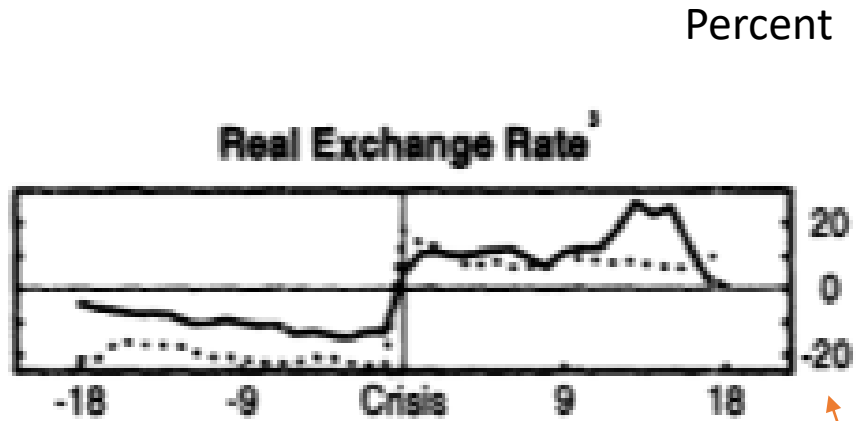
Besides a variety of crises, some of these episodes also encompassed wars.

22 of these 25 episodes are classified as GDP collapses by Barro and Ursua (2008) and another 3 (including Greece and Italy post-2008) are not in their sample.

The antecedents of financial crises

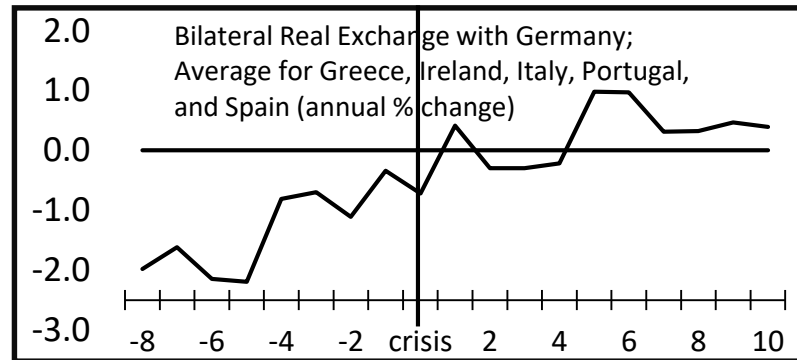
*Recurring patterns and some comparisons to the **Systemic 11**, that experienced systemic financial crises during 2007-2009. The group is comprised of France, Germany, Greece, Iceland, Ireland, Italy, Netherlands, Portugal, Spain, United Kingdom, and United States.*

Currency overvaluation:



Cumulative real exchange rate overvaluation (lower denotes appreciated) is also a recurring feature of the boom phase in the runup to a banking crisis. While the KR analysis predates the 2007-2009 crises, overvaluation and loss of competitiveness were an issue for much of periphery Europe and Iceland, where current account deficits swelled into double digits.

KR (1999) also present evidence that export growth begins to weaken prior to financial crises, presumably in connection with a cumulative overvaluation of the exchange rate. Relatedly, RR (2009) highlight the recurring presence of widening current account deficits ahead of the crisis.

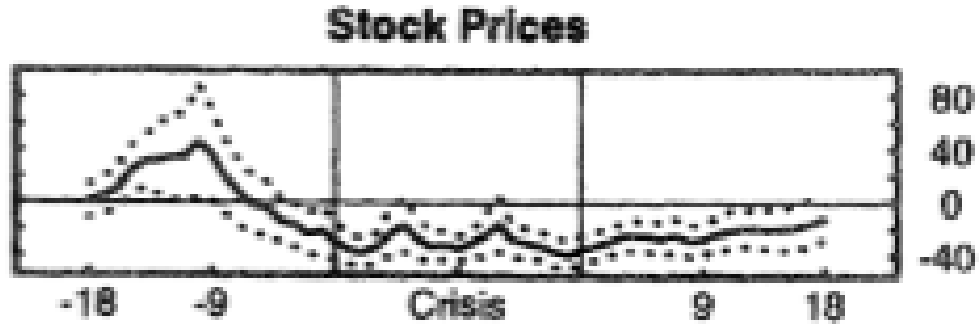


While the pre- and post-crises patterns look similar in both figures, the *scales* reflect the major difference in that periphery Europe's real depreciation has been effected through a recessionary deflation, akin to Friedman and Schwartz (1963) discussion of "internal pain of adjustment" during the Gold Standard.

Note: The values of the variables relative to "tranquil" times are reported on the vertical axes. The horizontal axes show the number of months before (negative sign) and after a crisis. The solid lines show the behavior during *twin-crises episodes*, and the dotted lines show the behavior during "single" currency crises.

Sources: Kaminsky and Reinhart (1999); Reinhart (2018) and IMF WEO (2018) for periphery EZ.

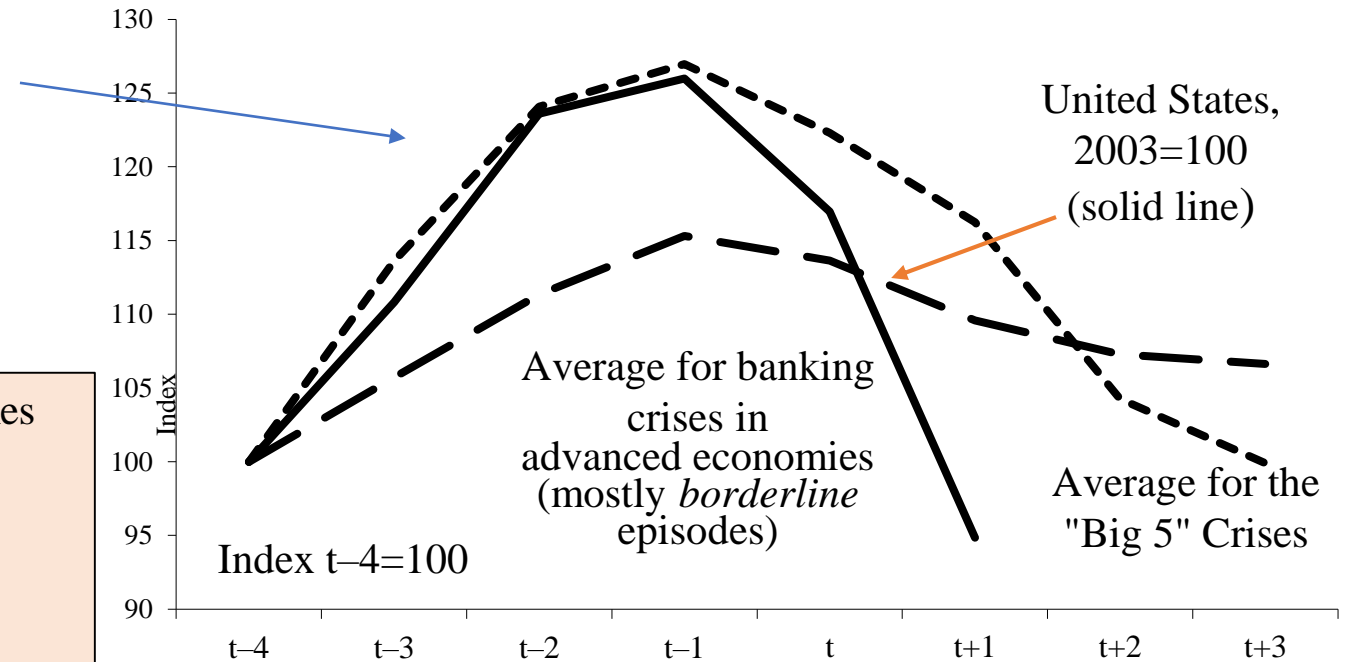
Asset price bubbles:



Pre-crisis equity price booms: Real equity returns about a year prior the onset of crises are significantly above tranquil period returns

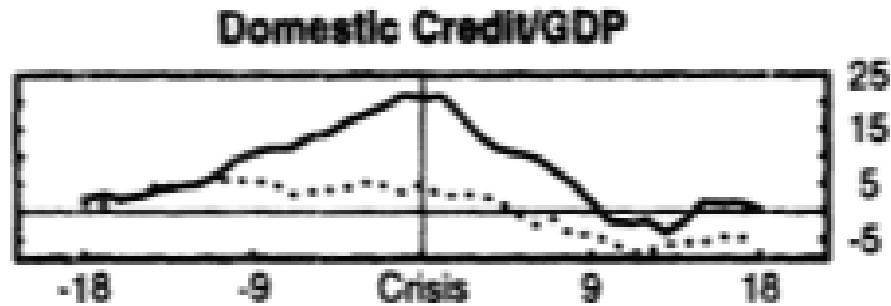
The pattern of real housing prices on the eve of banking crises is also consistent with the boom-bust depiction of the cycle. RR (2008a 2009)
 In the end, the peak-to-trough decline for the US was almost 40% from early 2006 to the bottom in mid-2011. Prices remain nearly 20% off their peak.

Note: The values of the variable relative to "tranquil" times are reported on the vertical axes. The horizontal axes show the number of months before (negative sign) and after the crisis. The solid line is the average for all the crises for which data was available. The dotted lines denote plus/minus one standard error around the average 12-month changes, in percent, relative to "tranquil" times.



Sources: Kaminsky and Reinhart (1999) and Reinhart and Rogoff (2008a and 2009)

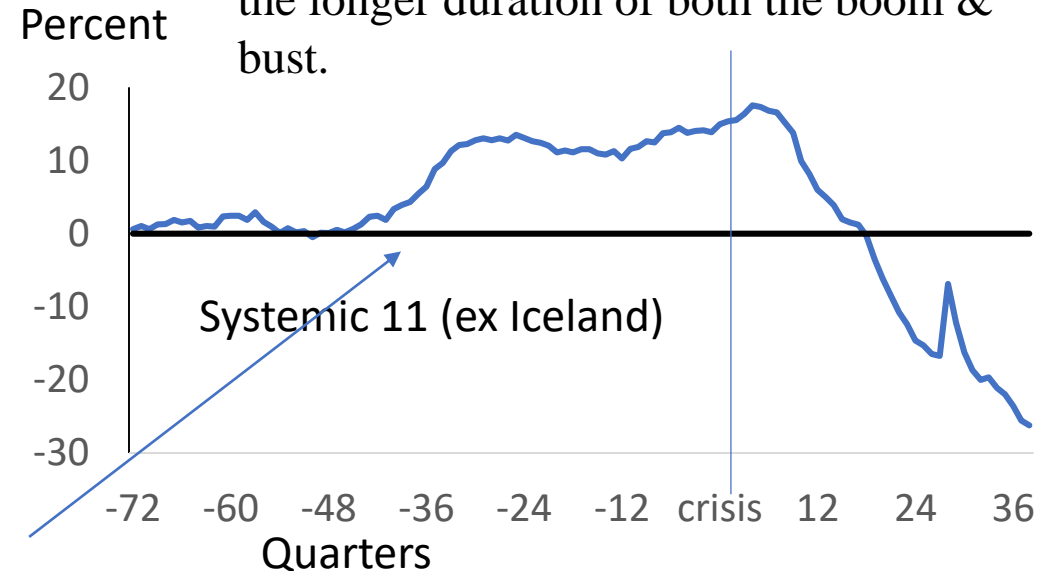
Credit boom:



The domestic credit build-up during twin crises episodes far exceeds ($\approx 25\%$) the growth of credit/GDP during tranquil times (KR, 1996). Schularick and Taylor (2012) provide a long view for 14 advanced economies; Mendoza and Terrones (2012) establish a tight link between capital inflows surges and reversals and domestic credit booms and busts. Reinhart and Reinhart (2009) show that the probability of a banking crisis increases significantly following a “capital inflow bonanza.”

Note: The values of the variables relative to "tranquil" times are reported on the vertical axes. The horizontal axes show the number of months before (negative sign) and after a crisis. The solid lines show the behavior during *twin-crises episodes*, and the dotted lines show the behavior during "single" currency crises. 12-month changes, in percent, relative to "tranquil" times.

The credit boom-bust around 2007-2009 crises shares similarities with the patterns described in KR; A notable difference is the longer duration of both the boom & bust.



The credit/GDP gap is the average. The gap is the difference between actual credit/GDP and an HP filtered series, see https://www.bis.org/statistics/about_credit_stats.htm?m=6%7C380
Sources: Kaminsky and Reinhart (1996) Reinhart (2018), BIS (2018).

Financial fragility and runs

Hidden debts and short-term liabilities

Varieties of runs and self-fulfilling panics in international financial crises

Bryant (1980) identified that runs may be the product of banks' willingness to honor deposits at face value without knowing the worth of loans. The deterioration in loan quality at the tail end of housing and investment booms is another recurring feature of the runup to the crisis.

Diamond and Dybvig (1983) can be interpreted narrowly as sleepy Northern Rock depositors for no obvious reason wake up one day and form a queue. More generally, key creditors are financial institutions that never sleep and queued for a reason via their day-to-day decisions on whether to roll over existing short term debts or not. The hurdle rate they face to "pull out" may be lower. Short-term debt exposure and bunching of payouts are a recurring feature in a variety of financial, currency and sovereign debt crises.

Other markets matter, as Allen and Gale, 2007 highlight in discussing KR (1999). Financial crises are often intertwined with runs on currencies (see also Chang and Velasco, 2000). In these instances, insurance on domestic deposits is still powerless to stop a run unless the central bank has a enough hard currency reserves (or credit lines) that can cover all or most of the liquid bank liabilities. Of course, even with credible backing, if depositors expect some confiscation via inflation, insurance may have to involve indexation.

Runs (refusal on the part of creditors to roll over existing debts, Calvo, 1988) extend well beyond commercial and central banks (commercial paper and repo markets during 2008-2009, see Gorton, 2010) sovereign, sub-sovereign, and corporate debts and equity markets, in countless episodes.

Financial fragility and short-term debt surges on the eve of banking crises

Multiple macroeconomic and financial fragilities (and occasionally political) are usually manifest on the eve of crises. Instances of a pure sunspot variety of panic among the rich historical international experience are extremely rare.

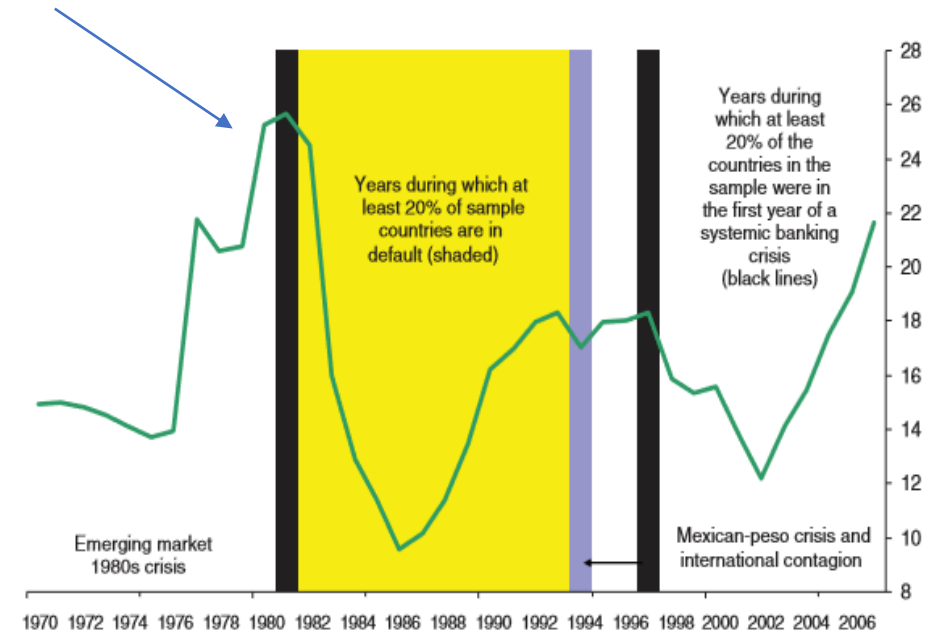
Among these manifestations of fragility is the change in the maturity composition of the debt. As the figure (from RR, 2011) illustrates, short-term debts escalate on the eve of banking crises; the ratio of short-term to total debt about doubles from 12 to 24 percent. A similar pattern emerges in the run-up to sovereign defaults.

Whether the rise in short-term debt reflects growing perceived risk and reluctance by lenders to extend longer term debt, (Broner, Lorenzoni, and Schmukler, 2013 present evidence of the sharp steepening of the yield curve prior to EM crises), or the hope of borrowers that better times and borrowing terms are around the corner (thus underestimating roll-over risks), a higher short-term debt ratio exposes a country to greater risk of a panic.

Many individual crisis episodes are equally, or possibly even more, compelling (see Reinhart, 2011).

The tilt toward shorter maturities as the crisis nears is not just an emerging market phenomenon.

Share of Short-term Gross External Debt (Public plus Private): Emerging Markets, 1970–2009 (in percent)



Banking crises (black bars)

Source: Reinhart and Rogoff (2011).

Elements of financial fragility: Noncredible guarantees, runs, and capital flight

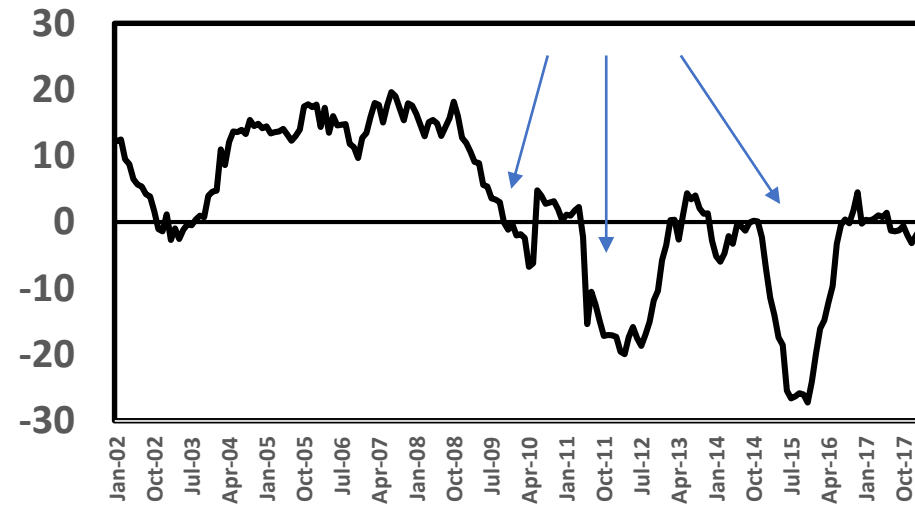
Below from KR (1999), 12-month % changes in bank deposits and M2/Reserves around twin crises.

Economic contraction and, in numerous cases, capital flight can account for the marked decline in deposits.

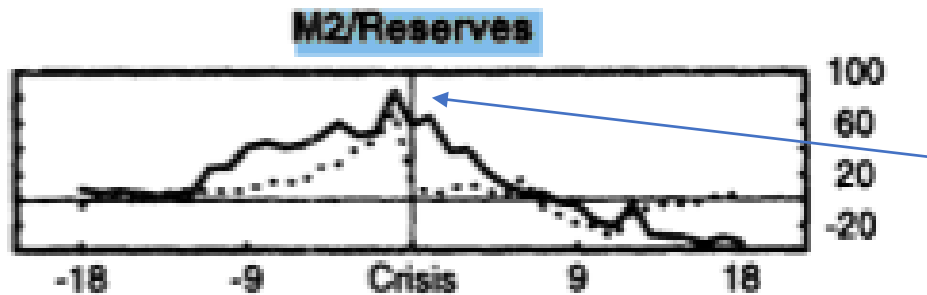
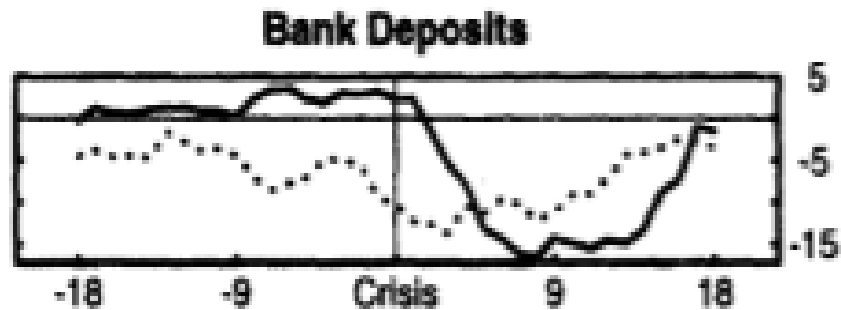
For Greece, the implosion of deposits comes in waves, as the crisis moves from an IMF bailout (2010) to a debt restructuring (fall 2011) to a brief default on the IMF and capital controls (summer 2015).

As of March 2018, the *level* of deposits are below those recorded at end 2004.

Bank Deposits: Greece 2002:1-2018:3
(12-month percent change)



Runs are often not limited to bank deposits; a run out of domestic currency assets altogether are common. In these cases, deposit guarantees do not resolve the run. When the hard currency reserves of the central bank are dwindling relative to the stock of banks' liabilities (a rising M2/reserves ratio), it can set the stage for runs and panics. The repo market analog of this problem during 2008-2009 is discussed in Lucas and Stokey (2011).



Sources: Bank of Greece, Kaminsky and Reinhart (1999), and Reinhart (2018)

Hidden debts RR(2011): are unpleasant surprises that when revealed have undermined the credibility of existing safety nets and may set runs in motion.

Central bank debt: To this day, even when the numbers are published, these are not included as part of *general government debt* (ie, Argentina's short-term Lebacs). In the event of Euro-area exits, Target2 balances (currently running at around 20-40% of GDP for Greece, Italy, Portugal and Spain) are *external* central bank debt. *Unseen:* In June 1997, the new Thai finance minister 'discovered' that the Bank of Thailand had already spent US\$ 28 billion out of US\$ 30 billion of its international reserves in the course of forward market interventions to defend the baht.

Nonsecuritized, floating debt (arrears): Unpaid bills to suppliers and, in more desperate cases (Russia 1998) unpaid pensions and wages to public sector employees.

Misreporting and other off-balance sheet: Greece-Goldman Sachs debt swaps: Greek dollar and yen-denominated debt was swapped at historical euro exchange rates to cosmetically reduce the overall level of debt.

Offshore derivative operations of banks: These can leverage banks' holdings of government debt (a significant hidden debt problem during the Mexican banking/peso crisis of 1994-1995). With Mexican bond (Tesobonos) as collateral, Mexican banks took on short-term dollar debt, that was for the most part unhedged. As the value of the collateral sank, margin calls increased along with rollover risk.

Implicit guarantees and moral hazard:

Private sector debt Especially external debt of banks (Diaz Alejandro, 1985) can overwhelm an otherwise healthy fiscal situation (Chile 1981, Iceland, Ireland, Spain, 2007-2008); corporate debt (Korea and Indonesia, 1997). Puerto Rico's "appropriation debt."

Puerto Rico (PR) began issuing "Appropriation bonds" in 2000 indirectly through *government-owned entities* and made repayment contingent upon the Legislature's appropriating funds for this purpose. These bonds are not counted as debt under the debt limit. Yet PR appropriation debt was, for practical purposes, guaranteed by the government and charged to its taxpayers.

International financial contagion and propagation channels

Common private lenders

Definitions and concepts

KR (2000) focus on contagion as a case where knowing of a crisis elsewhere increases the probability of a crisis at home, even when domestic and international fundamentals are controlled for (as in Eichengreen, Rose, and Wyplosz, 1996).

What constitutes elsewhere is defined a series of country clusters based on a variety of commercial trade and financial links.

KR also emphasize that financial linkages and specifically common creditors, be it commercial banks, hedge funds, or other institutions, play a key role in the transmission of shocks.

In the horserace between financial and trade linkages, the challenges in identifying these separately (as trade and finance often travel together) are discussed.

The two metrics used to “rank” the finance and trade clusters:

Probability (crisis | fundamentals) –

Probability(crisis | fundamentals & crisis elsewhere in the cluster)

and

Quadratic probability scores (QPS), which measure the accuracy of probabilistic predictions.

Defining the common creditors and their networks: *Some results*

Common bank clusters

KR (2000) identify two bank clusters, and while these tend to be regional in composition, they are not exclusively so.

US banks as the main lender (most relevant for 1980s): Argentina, Brazil, Chile, Colombia, Mexico, the Philippines, Uruguay, and Venezuela. Neither Bolivia nor Peru fall in this cluster. In the earlier part of the sample. Korea would have been part of this cluster.

Japanese banks as the main lender: Indonesia, Malaysia, and Thailand (also Korea) but not the Philippines.

Other financial links

Countries in which stock returns (even in normal times) show greater correlation are also more likely to be affected by crises in the countries that they are correlated with. This is especially true for countries with more liquid financial markets (which was measured as those comprising a larger share in global portfolios). These high correlation clusters have an important regional composition.

KR (2000) *On crisis, contagion, and confusion is about the channels of international propagation*

Previously, Friedman and Schwartz (1963) and Eichengreen (1992) have highlighted the role of the official sector via the Gold Standard in the international propagation of financial shocks.

Some results from KR (2000): The key role of private creditors and cross-border panics

Common private creditors are not the same across contagious episodes but play a similar role. For the 1980s US banks; Asian Crisis 1997-1998 Japanese banks (the dynamics of that episode are analyzed in KR, 2001); Mexican Tequila (1994-1995) spillovers, mutual funds, and liquid markets and cross-market hedging played a role in determining who was affected during the Russian 1998 crisis.

Contagion tends to be more regional than global

Susceptibility to contagion is highly nonlinear. A single country falling victim to a crisis is not a particularly good predictor of crisis elsewhere, be it in the same region or in another part of the globe. However, if several countries enter a crisis, the probability of a crisis at home rises sharply. Indeed, multiple crises elsewhere is one of the best univariate indicators of a future crisis at home.

As to the horserace, the financial links came ahead in identifying who was affected by *fast and furious* contagion both by QPS scores and conditional probability differences. Kaminsky, Reinhart and Vegh (2003) distinguish between fast and furious and slower moving spillover episodes.

The aftermath of financial crises

Recurring patterns and some comparisons to the Systemic 11 crises

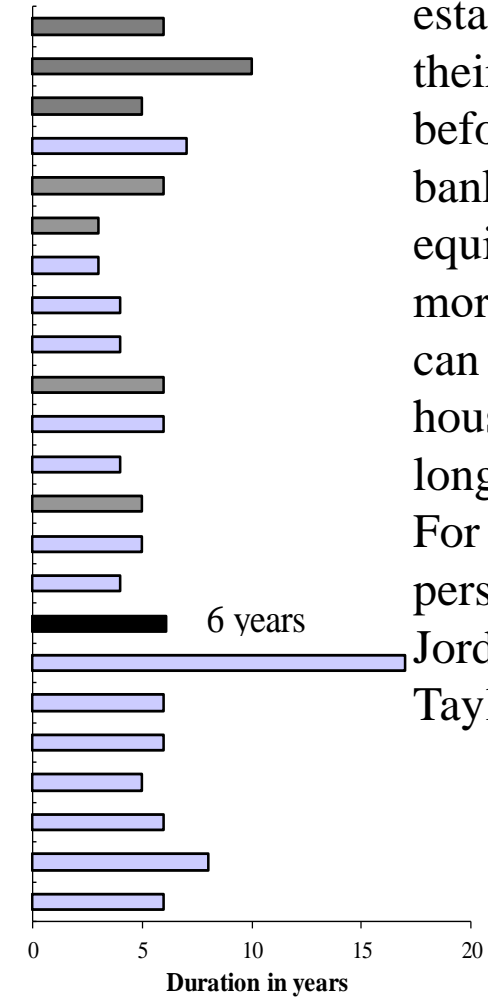
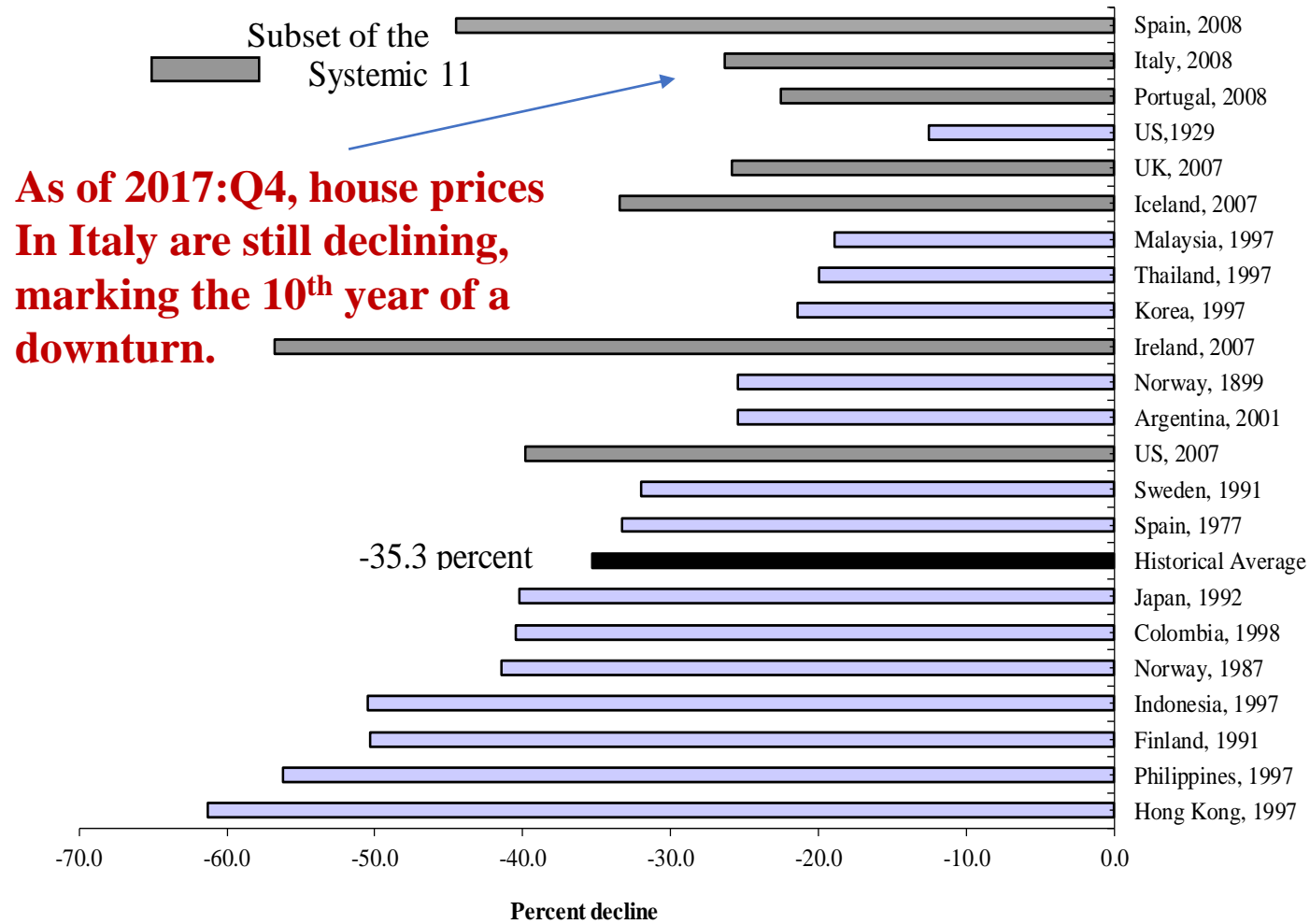
Key takeaways on the aftermath of financial crises:

Recessions following systemic financial crises tend to be deeper and more protracted than the “normal” business cycle variety RR (2008, 2009, 2009a).

Because:

- There is destruction of wealth (*asset price declines*); Declining house prices impair the balance sheet of households and financial institutions involved in lending (RR, 2008 and 2009). Wealth losses in equities may reinforce these effects. Also balance sheets can be impacted by a currency crash (KR, 1999).
- *Private sector deleveraging*, which is a multi-year process that delays the economic recovery Reinhart and Reinhart (2010). Deleveraging may be domestic, external or both.
- Countries that lose access to international capital markets and face a *sudden stop* (Calvo 1998 and co-authors); current account deficits are eliminated initially mostly via a recession-led import contraction.
- Dysfunction in credit markets (Bernanke, 1983). Whether it is supply, demand, or both, banking crises are usually followed by *credit crunches*.
- Procyclical financial regulation can contribute to the crunch.
- The extent of *public indebtedness* increases the odds of a sovereign debt crisis RR (2009 and 2011).
- In the case of periphery EZ subset of Systemic 11, one may add *lack of correction of the pre-crisis overvaluation* of the real exchange rate.

Cycles of past and one ongoing (updated through 2018:Q1) real house prices and banking crises: peak-to-trough price declines (left panel) and years duration of downturn (right panel)



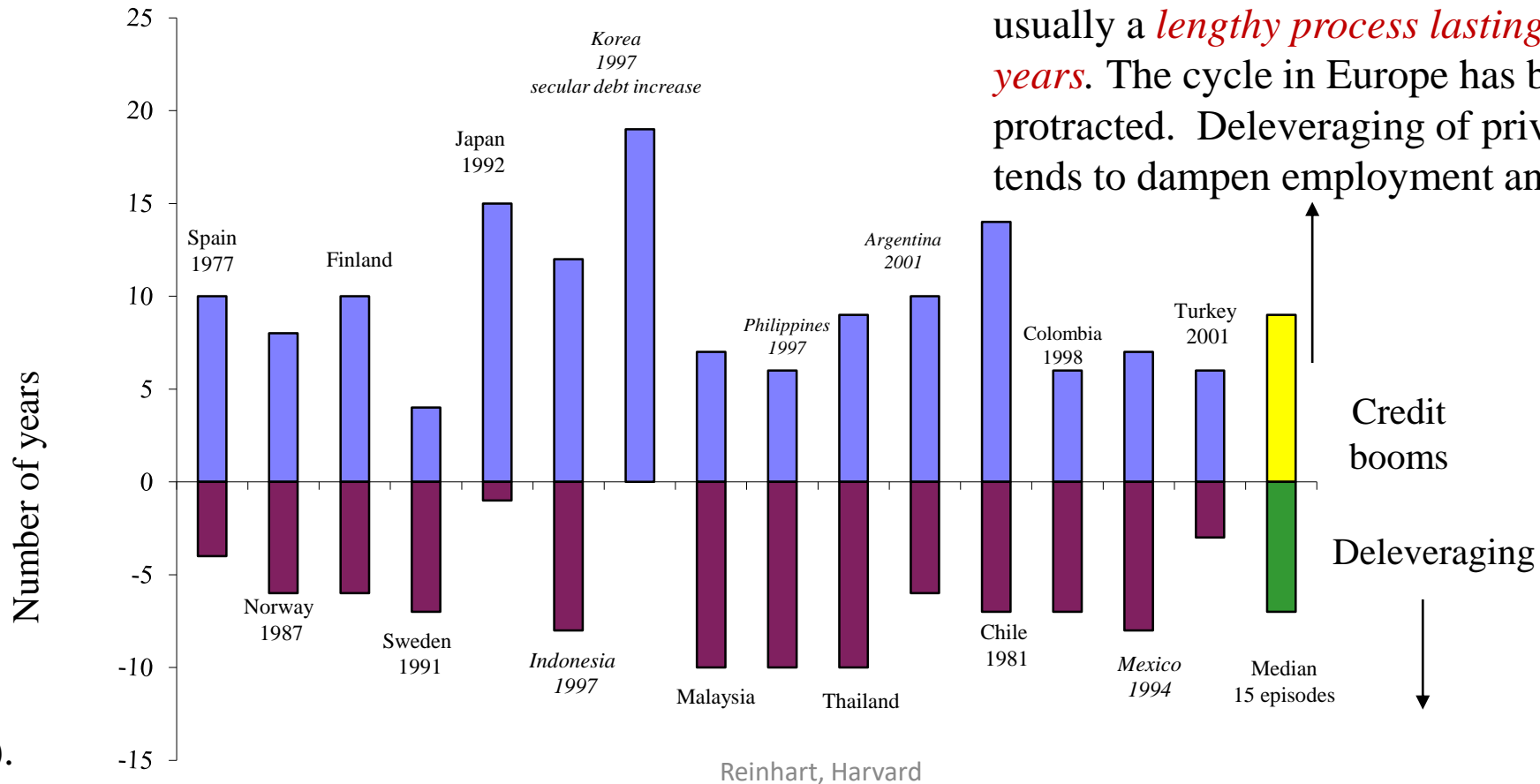
House prices (real estate) usually begin their steep decline before the onset of the banking crises. Unlike equity prices, which are more “spike-prone” and can quickly reverse, housing prices exhibit longer cycles. For a historical perspective, see Jorda, Schularick and Taylor (2015).

Sources: Reinhart (2018) update of Reinhart and Rogoff (2009); Bank of International Settlements.

Domestic credit/GDP 10 years before and after systemic financial crises: Duration of credit cycles in 15 Post-WWII episodes

The Biblical seven years?

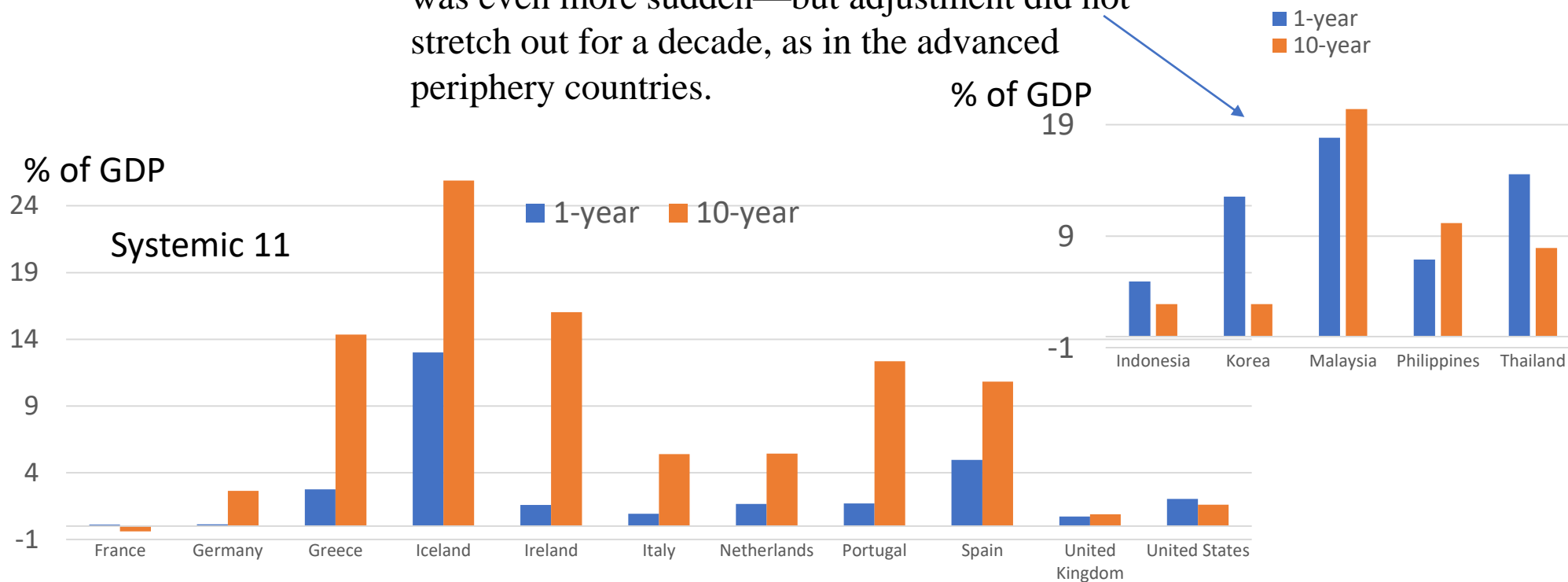
The decade that preceded the onset of the 2007 crisis fits the historic pattern of pre-crisis debt buildups (except an order of magnitude higher). Post-crisis deleveraging is often *delayed* and is usually a *lengthy process lasting about seven years*. The cycle in Europe has been even more protracted. Deleveraging of private balance sheets tends to dampen employment and growth.



Source:
Reinhart and
Reinhart (2010).

Sudden and Not-so-Sudden Stops *(change in the current account balance as a % of GDP)*

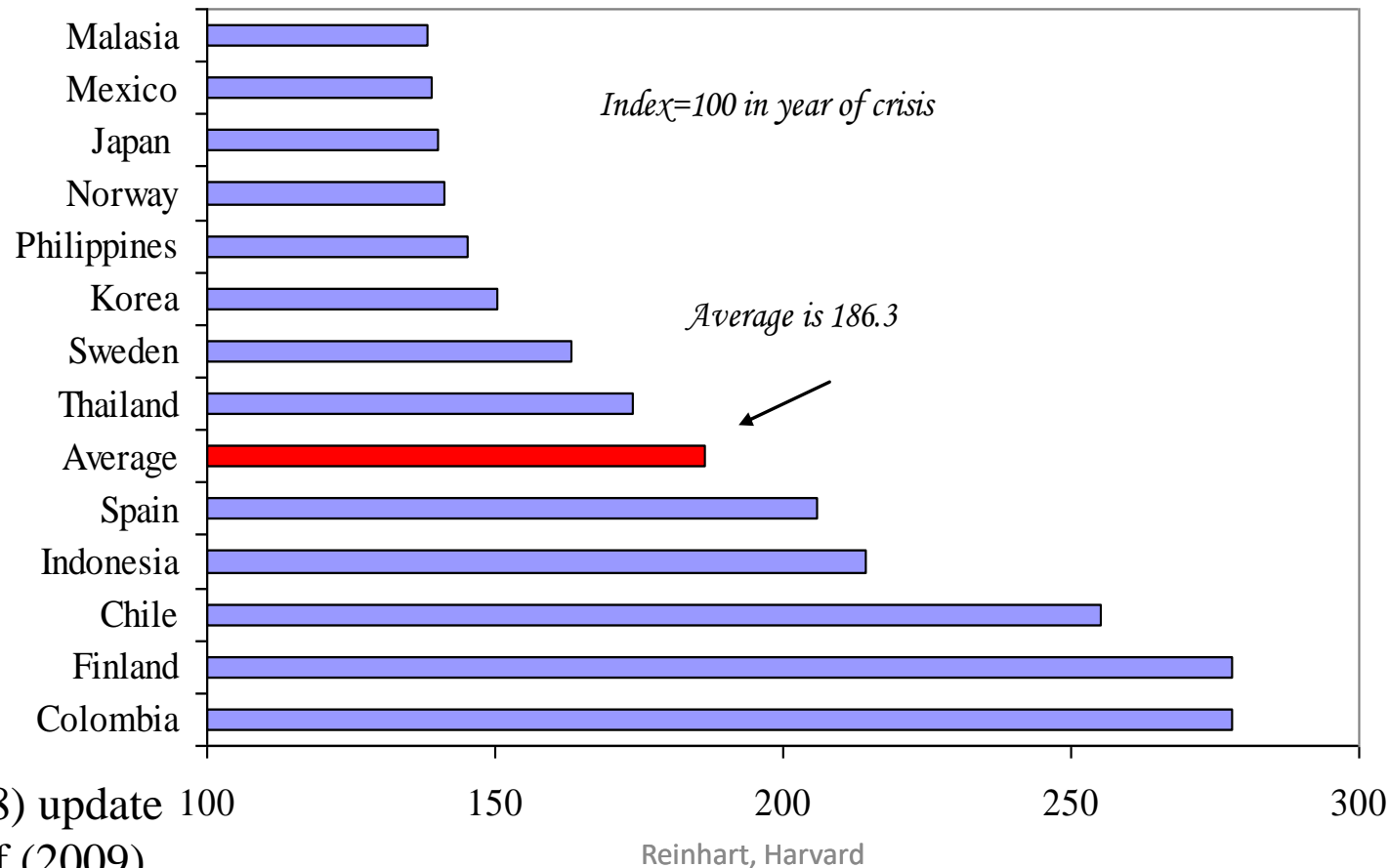
For the Asian crisis countries, the sudden stop was even more sudden—but adjustment did not stretch out for a decade, as in the advanced periphery countries.



The 10-year entry also highlights the longer post-crisis adjustment, primarily for periphery Europe, as dependence on external financing is either voluntarily avoided or not forthcoming.

The evolution of debt following major postwar crises: Advanced and emerging markets

*Cumulative increase in public debt in the three years following
the banking crisis*



The average increase in the first three years (2008=100) in general government debt for the *Systemic II* was about 50%.

As these crisis have been quite protracted by historical standards, however, **The average increase by 2018 is about 75%.**

The 2007-2009 post-crisis recovery: Not yet complete

- 10 years later, it is still premature to construct a definitive measure of the severity of the 2007-2009 crises.
- Greece and Italy are not yet close to their pre-crisis level of per capita income. According to the IMF (WEO, April 2018), these countries will not have closed that gap by 2023.
- Recall that the average number of years to recoup the pre-crisis per capita GDP level across the 100 systemic banking crises in advanced economies since the mid-1800s was 7 years; for the “*Systemic 11*”, the duration is about a decade (or about the same as the 1930s depression).

Protracted post-crisis recoveries

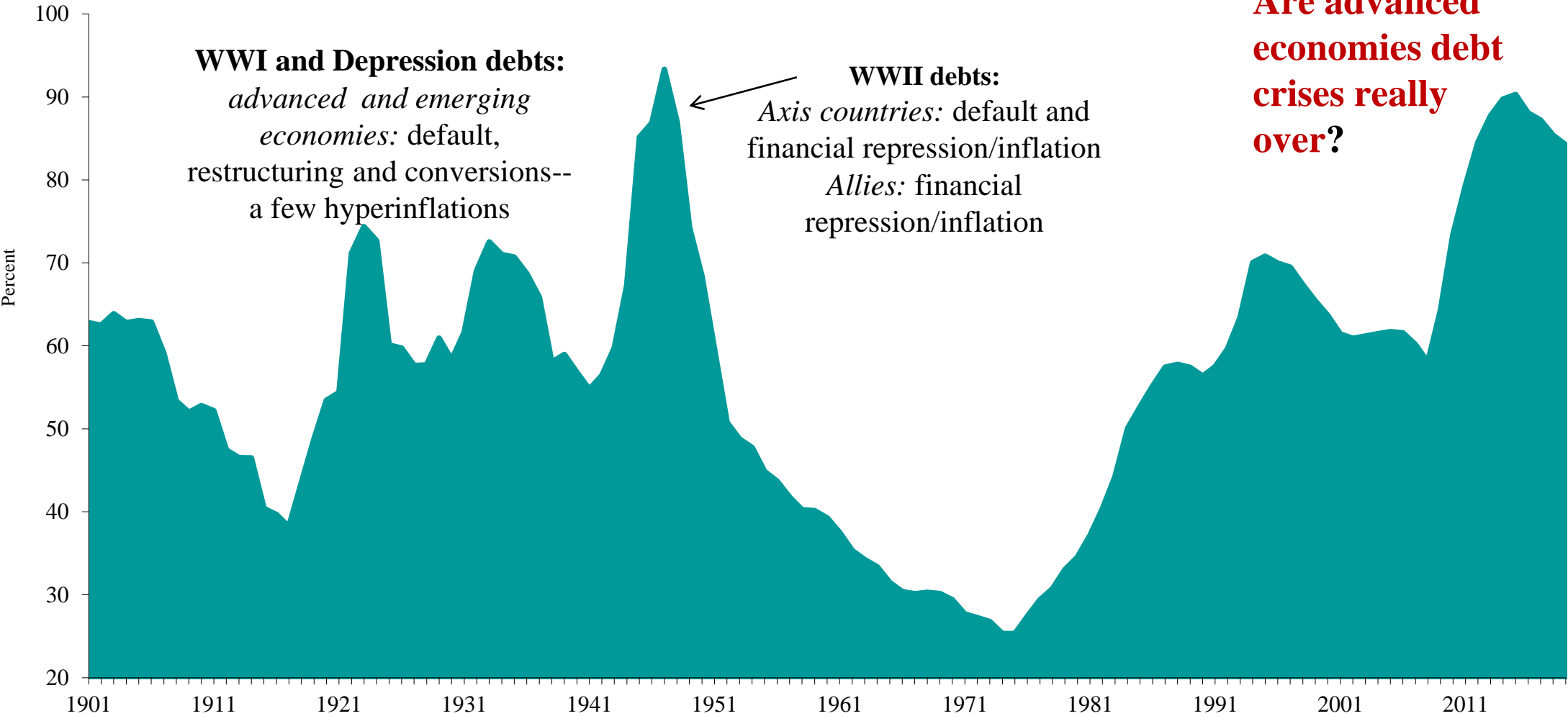
Crisis Year	Country	Real GDP per capita % change			Severity index	Breakeven year	General government gross debt crisis year
		peak to trough	peak to recovery				
2008	France	-3.8	8	11.8	2015	68.7	
2008	Germany	-5.2	3	8.2	2011	65.1	
2008	Greece	-26.3	16	42.3	beyond 2023	109.4	
2007	Iceland	-9.2	9	18.2	2016	27.3	
2007	Ireland	-9.3	7	16.3	2014	23.9	
2008	Italy	-11.9	16	27.9	beyond 2023	102.4	
2008	Netherlands	-4.1	9	13.1	2017	54.5	
2008	Portugal	-7.0	13	20.0	2017	71.7	
2008	Spain	-10.6	11	21.6	2017	39.4	
2007	UK	-6.1	8	14.1	2015	41.9	
2007	US	-4.8	6	10.8	2013	64.6	
Summary	Mean	-8.9	9.6	18.5			
	Median	-7.0	9	16.0			
63 crises: Avanced economies from 100 in Reinhart and Rogoff (2014)							
	Mean	-9.5	7.3	16.8			
	Median	-7.0	6	13.0			

Note: The italics denote IMF estimates for 2018-2023 are used.

In most countries, the policy response appears to have helped somewhat cap the magnitude of the initial output contraction **BUT**, as to the speed of recovery...

The track record is worse than historic norms, where the mean for advanced economies is about 7 years

Government debt/GDP, 1900-2017 These debts stand at or near historic highs in a number of advanced economies. If contingent liabilities (private debts and pensions) are added (not an issue at the end of WWII) current levels far exceed prior peaks.



Sources: Update Reinhart (2018) from Reinhart, Reinhart, and Rogoff (2012).

Are advanced economies debt crises really over?

Advanced economies are no strangers to sovereign default. Some of those defaults were preceded by severe banking crises.

Empires and world powers have not been an exception.

- Spain defaulted more than a dozen times as it ruled parts of several continents.
- The United Kingdom (along with 14 other countries) defaulted on its (official) external WWI debt to the US government in July 1934;*
- In the early 1930s, the United States had a banking, currency, and sovereign debt crisis.
- After being in default through much of the 1920s and 1930s, China, a more recent world power, repudiated its external debt in 1949.

Inflation and financial repression were a vehicle of debt reduction following the end of WWII (Reinhart and Sbrancia, 2011 and 2015).

Of course, many will argue that *this time is different* and such concerns about sovereign debt are out of place and out of the past; they would have probably have said the same about the odds of a 2007-2009 financial crisis during the “Great Moderation.”

*Reinhart and Trebesch (2016).

Note: An increasing share of advanced economy debt is held by official creditors (including the central banks)

Thank you

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