

NBER WORKING PAPER SERIES

A DECADE OF DEBT

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Working Paper 16827
<http://www.nber.org/papers/w16827>

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
February 2011

We wish to thank Fred Bergsten, Joseph Gagnon, Peter Peterson, Vincent R. Reinhart and participants at a meeting at the Peterson Foundation on September 27 for helpful comments and discussions. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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JEL No. F3,H6,N10

ABSTRACT

This paper presents evidence that public debts in the advanced economies have surged in recent years to levels not recorded since the end of World War II, surpassing the heights reached during the First World War and the Great Depression. At the same time, private debt levels, particularly those of financial institutions and households, are in uncharted territory and are (in varying degrees) a contingent liability of the public sector in many countries. Historically, high leverage episodes have been associated with slower economic growth and a higher incidence of default or, more generally, restructuring of public and private debts. A more subtle form of debt restructuring in the guise of “financial repression” (which had its heyday during the tightly regulated Bretton Woods system) also importantly facilitated sharper and more rapid debt reduction than would have otherwise been the case from the late 1940s to the 1970s. It is conjectured here that the pressing needs of governments to reduce debt rollover risks and curb rising interest expenditures in light of the substantial debt overhang (combined with the widespread “official aversion” to explicit restructuring) are leading to a revival of financial repression—including more directed lending to government by captive domestic audiences (such as pension funds), explicit or implicit caps on interest rates, and tighter regulation on cross-border capital movements.

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I. Introduction

Public debts in the advanced economies have surged in recent years to levels that have not been recorded since the end of World War II. Through 2010, the public debt-to-GDP ratio average for all the advanced economies has surpassed the pre-World War II peaks reached during the First World War and subsequently during the Great Depression.¹ Private debt levels, particularly those of financial institutions and households, are similarly in uncharted territory and represent (in varying degrees) potential contingent liability of the public sector in many countries, including the United States.

As documented in Reinhart, Rogoff, and Savastano (2003) for emerging market countries, large public debt overhangs do not unwind quickly, and seldom painlessly. In particular, debt-to-GDP ratios are seldom reduced entirely through consistent robust economic growth. More commonly, reducing debt levels significantly has relied on fiscal austerity, debt restructuring (sometimes outright default), or a combination of these.

In a complimentary analysis of private debt deleveraging episodes following systemic financial crises, Reinhart and Reinhart (2011) show that the debt reduction process goes on for an average of about seven years. Also, because of declining output

¹ Unless otherwise noted, public debt here refers to gross central government debt. As such, it does not include other levels of government indebtedness (for example, state and local debt in the United States), nor does it encompass public enterprise debt, or debt that carries an explicit (let alone implicit) government guarantee. Contingent liabilities of the government associated with social security benefits are not incorporated in our long (one hundred years or more) of government debt data and its analysis. Domestic public debt is government debt issued under domestic legal jurisdiction. Public debt does not include obligations carrying a government guarantee. Total gross external debt includes the external debts of **all** branches of government as well as private debt that issued by domestic private entities under a foreign jurisdiction.

and accumulating arrears on existing debts, private debt ratios usually continue to climb even until two or three years even after the height of the financial crisis—delaying the effective reduction of debt ratios.²

The combination of high and climbing public debts (a rising share of which is held by major central banks) and the protracted process of private deleveraging makes it likely that the ten years from 2008 to 2017 will be aptly described as a decade of debt.

As such, the issues we raise in this paper will weigh heavily on the public policy agenda of numerous advanced economies and global financial markets for some time to come.

The paper summarizes key aspects of our recent body of work on public debt and financial crises. Of course, if global real interest rates remain very low for an extended period, carrying costs of debt will be correspondingly low and exceptionally high leverage ratios can persist longer than usual. However, as Reinhart and Rogoff (2009) emphasize, interest rates can turn far faster than debt levels, so if deleveraging does not occur, debt will be a continuing vulnerability. Drawing on and expanding various strands of our earlier work, we document that:³

Historically, high leverage episodes have been associated with slower economic growth. This observation applies to the high-debt episodes that follow on the heels of

² Private deleveraging, as measured by **new** borrowing (see Fostel and Geanakoplos (2008) and Geanakoplos, 2009) usually begins to slow down markedly or decline during the crisis and in some cases, just before the onset of crisis

³Specifically, the analysis draws on Reinhart and Rogoff, 2008, 2009, 2010a, 2010b and 2011a, 2011b. Although much of the paper is devoted to synthesizing earlier work, there is important new material here including the discussion of how World I and Great Depression debt were largely resolved through outright default and restructuring, whereas World War II debts were often resolved through financial repression. We argue there that financial repression is likely to play a big role in the exit strategy from the current buildup. We also highlight here the extraordinary external debt levels of Ireland and Iceland compared to all historical norms in our data base.

wars as well as to their peacetime counterparts. It also characterizes episodes where high debt levels were not associated with markedly higher interest rates.⁴

Surges in private debt lead to private defaults (which most often become manifest in the form of banking crises).⁵ Banking crises are associated with mounting public debt, which ultimately lead to a higher incidence of sovereign default or, more generally, restructuring of public and private debts. Specifically, *banking crises and surges in public debt help to “predict” sovereign debt crises*. Of course, this historical pattern is the dominant one prior to the era of mega-bail-outs ushered in with the domestic 1992 Japanese banking crisis, followed by (on an international scale) the 1994-1995 Mexican peso crises, reinforced during the Asian crisis with the Korean package, and reaching ever-escalating historic highs on both domestic and international dimensions at the time of this writing. The “bail out approach” in the current episode began in the summer of 2007 in the United States in response to the sub-prime mortgage crisis and morphed into the most serious advanced economy debt crisis since the 1930s.

A more subtle form of debt restructuring takes the form of “financial repression” (which had its heyday during the tightly regulated Bretton Woods system). Limiting investment choices of the private sector importantly facilitated sharper and more rapid debt reduction from the late 1940s to the 1970s than would have otherwise been the case.⁶ *It is conjectured here that the pressing needs of governments to reduce debt rollover risks and curb rising interest expenditures in light of the substantial debt overhang, combined with an aversion to more explicit restructuring, may lead to a revival of financial repression. This includes more directed lending to government by*

⁴ See Gagnon and Hinterschweiger (2011) for an analysis of the links between debt and interest rates.

⁵ See Kaminsky and Reinhart (1999).

⁶ Reinhart and Sbrancia (2011).

*captive domestic audiences (such as pension funds), explicit or implicit caps on interest rates, and tighter regulation on cross-border capital movements.*⁷ A less generous depiction of financial repression (see definition in Box 1) would include the savaging of pension funds.

The paper proceeds as follows. The next section places the recent surge in government debt in the advanced economies in historical perspective, distinguishing the timing and magnitudes of earlier high-debt episodes. Section III summarizes our findings on the temporal causal links between financial crises, rapid surges in public debt, and subsequent sovereign restructuring or outright default. In Section IV, we document that high debt is associated with slower growth; a relationship which is robust across advanced and emerging markets since World War II, as well as an earlier era. The last large wave of sovereign defaults or restructurings in the advanced economies during the early 1930s (defaults were confined to the handful of countries on the losing side of World War II) is discussed in Section V, which also describes the heavy-handed financial regulation (often referred to as financial repression) that helped rapidly reduce the World War II debt overhang. The concluding section suggests many of the elements of financial repression have already begun to resurface (a trend which is likely to gather momentum in coming years), as governments simultaneously grapple with the difficult choices associated with substantial debt reduction.

⁷ There is a literature on financial repression in emerging market economies (see Easterly, 1989 and Giovannini and Di Melo (1993), for example). However, the Bretton Woods system embraced in 1946, established a system of tightly regulated financial markets based on the three pillars of (i) directed credit; (ii) interest rate ceilings; and (iii) foreign exchange controls (see Box 1).

Box 1. Financial Repression Defined

The pillars of “Financial repression”

The term financial repression was introduced in the literature by the works of Gurley and Shaw (1960), Ronald McKinnon (1984). Subsequently, the usage of the term became a way of describing emerging market financial systems prior to the widespread financial liberalization that began in the 1980 (see Giovannini and Di Melo, 1993 and Easterly, 1989). However, as we document in this paper, financial repression was also the norm for advanced economies during the post World War II and in varying degrees up through the 1980s. We describe here some of its main features.

(i) Explicit or indirect caps or ceilings on interest rates, particularly (but not exclusively) those on government debts. These interest rate ceilings could be effected through various means including: (a) explicit government regulation (for instance, Regulation Q in the United States prohibited banks from paying interest on demand deposits and capped interest rates on saving deposits). (b) In many cases ceilings on banks’ lending rates were a direct subsidy to the government in cases where the government borrowed directly from the banks (via loans rather than securitized debt); (c) the interest rate cap could be in the context of fixed coupon rate nonmarketable debt; (d) or it could be maintained through central bank interest rate targets (often at the directive of the Treasury or Ministry of Finance when central bank independence was limited or nonexistent). Metzler’s (2003) monumental history of the Federal Reserve (Volume I) documents the US experience in this regard; Cukierman’s (1992) classic on central bank independence provides a broader international context.

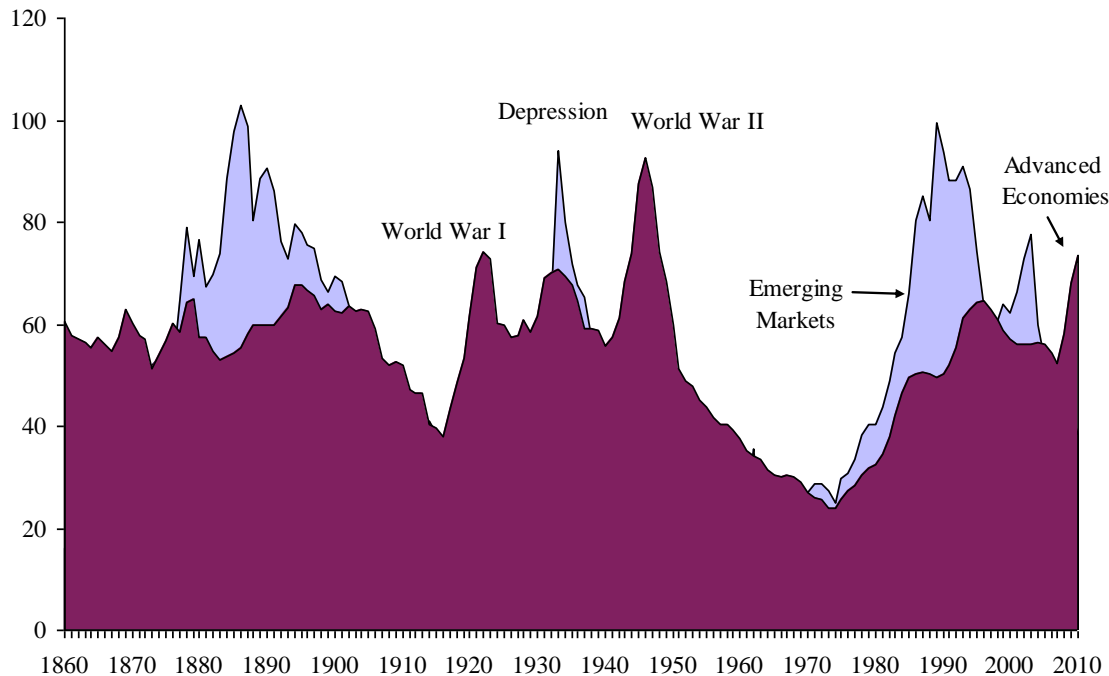
(ii) Creation and maintenance of a captive domestic audience that facilitated directed credit to the government. This was achieved through multiple layers of regulations from very blunt to more subtle measures. (a) Capital account restrictions and exchange controls orchestrated a “forced home bias” in the portfolio of financial institutions and individuals under the Bretton Woods arrangements. (b) High reserve requirements (usually nonremunerated) as a tax levy on banks (see Brock, 1989, for an insightful international comparison). (c) Among more subtle measures, “prudential” regulatory measures requiring that institutions (almost exclusively domestic ones) hold government debts in their portfolios (pension funds have historically been a primary target); and (d) transaction taxes on equities (see Campbell and Froot, 1994) also act to direct investors toward government (and other) types of debt instruments.

Source: Reinhart and Sbrancia (2011).

II. Surges in Public Debt

Throughout the ages and across continents, war has been a recurrent causal force behind rapid deteriorations in government finances and surges in public indebtedness. This pattern shows through in world debt aggregates and individual country histories. Thus, it is not surprising to see that, particularly for the advanced economies, there are two spikes in debt aggregates that correspond to the two world wars (Figure 1). The smaller set of independent (largely European) economies that populated the globe in the early 1800s experienced a similar sharp run-up in debt during the Napoleonic Wars.

FIGURE 1. Gross Central Government Debt as a Percent of GDP: Advanced and Emerging Market Economies, 1860-2010



Sources: Reinhart and Rogoff (2011a) and sources cited therein.

During peacetime, a leading factor behind rapid surges in public debt has been severe or systemic financial crises. With the growing tendency toward increasing government involvement in rescue operations, the link between public debt and financial crashes has become more pronounced in the past two decades or so. More general and chronic fiscal problems (because governments systematically overspend, do not have the political will or ability to tax effectively, or a combination of the two) tend to produce more gradual debt buildups.

Public debts in the advanced economies have surged in recent years to levels not recorded since the end of World War II, surpassing previous peaks reached during the First World War and the Great Depression. At the same time, private debt levels,

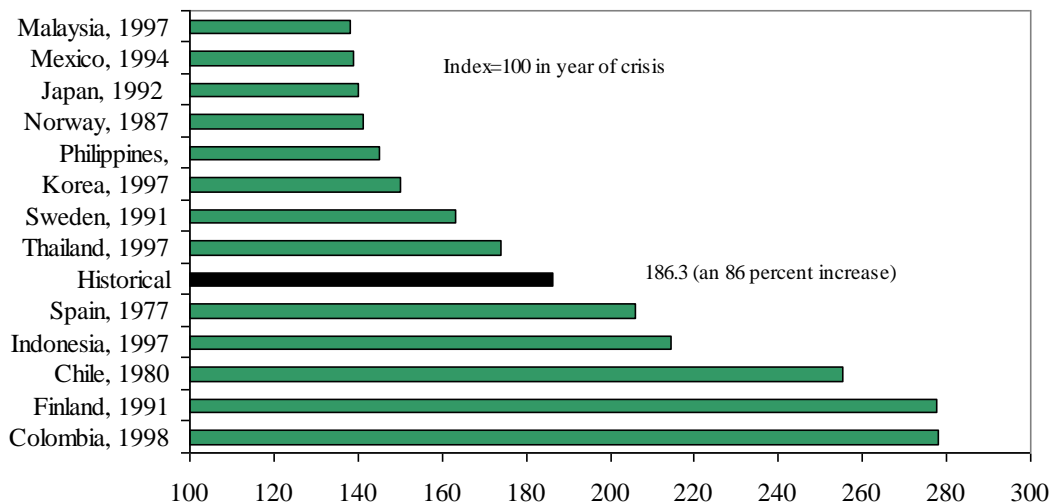
particularly those of households, are in uncharted territory and are (in varying degrees) a contingent liability of the public sector in many countries, including the United States. As Reinhart and Rogoff (2009 and 2011b) emphasize and as we discuss further below, most governments find it difficult to avoid backstopping significant amounts of private credit during a financial crisis.

1. Financial crises and debt

Figure 2 takes advantage of newly unearthed historical data on domestic debt to show the rise in real government debt in the three years following severe banking crises of the 20th century.⁸ A buildup in government debt has been a defining characteristic of the aftermath of banking crises for over a century, with government finances deteriorating to produce an average debt rise of 86 percent. This comparative exercise focuses on the percentage increase in debt, rather than the debt-to-GDP ratio, because steep output drops sometimes complicate the interpretation of debt–GDP ratios. As Reinhart and Rogoff (2008) note, the characteristic huge buildups in government debt are driven mainly by sharp falloffs in tax revenue, owing to the severe and protracted nature of post-crisis recessions. In some famous cases (notably Japan in the 1990s), this deterioration in fiscal balances also owes to surges in government spending to fight the recession. The much ballyhooed bank bailout costs are, in several cases, only a relatively minor contributor to post–financial crisis debt burdens.

⁸ This analysis was first introduced in Reinhart and Rogoff (2008).

FIGURE 2. Cumulative Increase in Public debt in the Three Years Following Systemic Banking Crisis: Selected Post-World War II Episodes



Source: Reinhart and Rogoff (2008 and 2009) and sources cited therein.

Notes: Each banking crisis episode is identified by country and the beginning year of the crisis. Only major (systemic) banking crises episodes are included, subject to data limitations. The historical average reported does not include ongoing crises episodes, which are omitted altogether, as these crises begin in 2007 or later, and debt stock comparison here is with three years after the beginning of the banking crisis.

More broadly, an examination of the aftermath of severe financial crises shows deep and lasting effects on asset prices, output and employment. Unemployment rises and housing price declines extend out for five and six years, respectively. Even recessions sparked by financial crises do eventually end, albeit almost invariably accompanied by massive increases in government debt.

2. The 2007-2010 Global Buildup in Public Debt

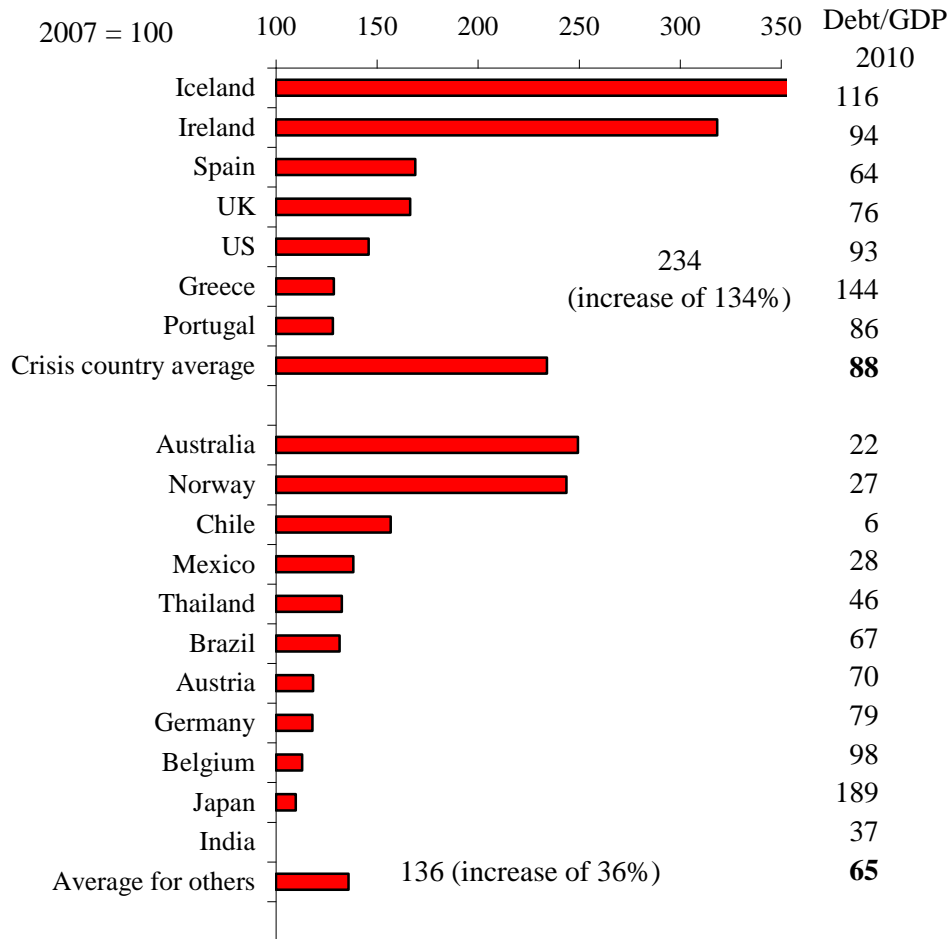
Figure 3 illustrates the increase in (inflation adjusted) public debt that has occurred since 2007. ***For the countries with systemic financial crises and/or sovereign debt problems (Greece, Iceland, Ireland, Portugal, Spain, the United Kingdom, and the***

United States), average debt levels are up by about 134 percent, surpassing by a sizable margin the three year 86 percent benchmark that Reinhart and Rogoff, 2009, find for earlier deep post-war financial crises. The larger debt buildups in Iceland and Ireland are importantly associated with not only the sheer magnitude of the recessions/depressions in those countries but also with the scale of the bank debt buildup prior to the crisis—which is, as far as these authors are aware—without parallel in the long history of financial crises. Nor is the 2010 (the third year of crisis for Iceland, Ireland, the UK and US and the second year for the others) the last year in which rising debt will be recorded. At present, forecasts for the US show rising debt levels in the foreseeable future; for several others, austerity programs notwithstanding, debts are likely to continue to mount as economic conditions remain subpar and debt servicing costs climb.

Even in countries that did not experience a major financial crisis, debt rose by an average of about 36 percent in real terms between 2007 and 2010.⁹ Many economies adopted stimulus packages to deal with the global recession in 2008-2009 and were hit by marked declines in government revenues. Moreover, some of the larger increases in debt loads of non-crisis countries (such as Norway, Australia, and Chile) relate to the cyclical downdraft in world commodity prices that accompanied the global recession.

⁹ Our focus on gross central government debt owes to the fact that time series of broader measures government are not available for many countries. Of course, the true run-up in debt is significantly larger than stated here, at least on a present value actuarial basis, due to the extensive government guarantees that have been conferred on the financial sector in the crisis countries and elsewhere, where for example deposit guarantees were raised in 2008.

FIGURE 2. Cumulative Increase in Real Public Debt Since 2007, Selected Countries



Notes: Unless otherwise noted these figures are for central government debt deflated by consumer prices.
Sources: Prices and nominal GDP from International Monetary Fund, *World Economic Outlook*. For a complete listing of sources for government debt, see Reinhart and Rogoff (2009) and Reinhart (2010).

III. The Financial Crash-Sovereign Debt Crisis Sequence

In this section, we summarize the main findings in Reinhart and Rogoff (2010b).

Our approach in that paper was to illustrate each main result with both a “big picture” based on cross-country aggregation and a “representative country case study (or case studies)” from country histories. Each of the main points highlighted in the figures is

complimented by the pertinent debt/GDP-crisis indicator regressions reported at the bottom of each figure. We begin by discussing sovereign default on external debt (that is, when a government defaults on its own external or private-sector debts that were publicly guaranteed.)

1. Public debt surges and sovereign default and restructuring

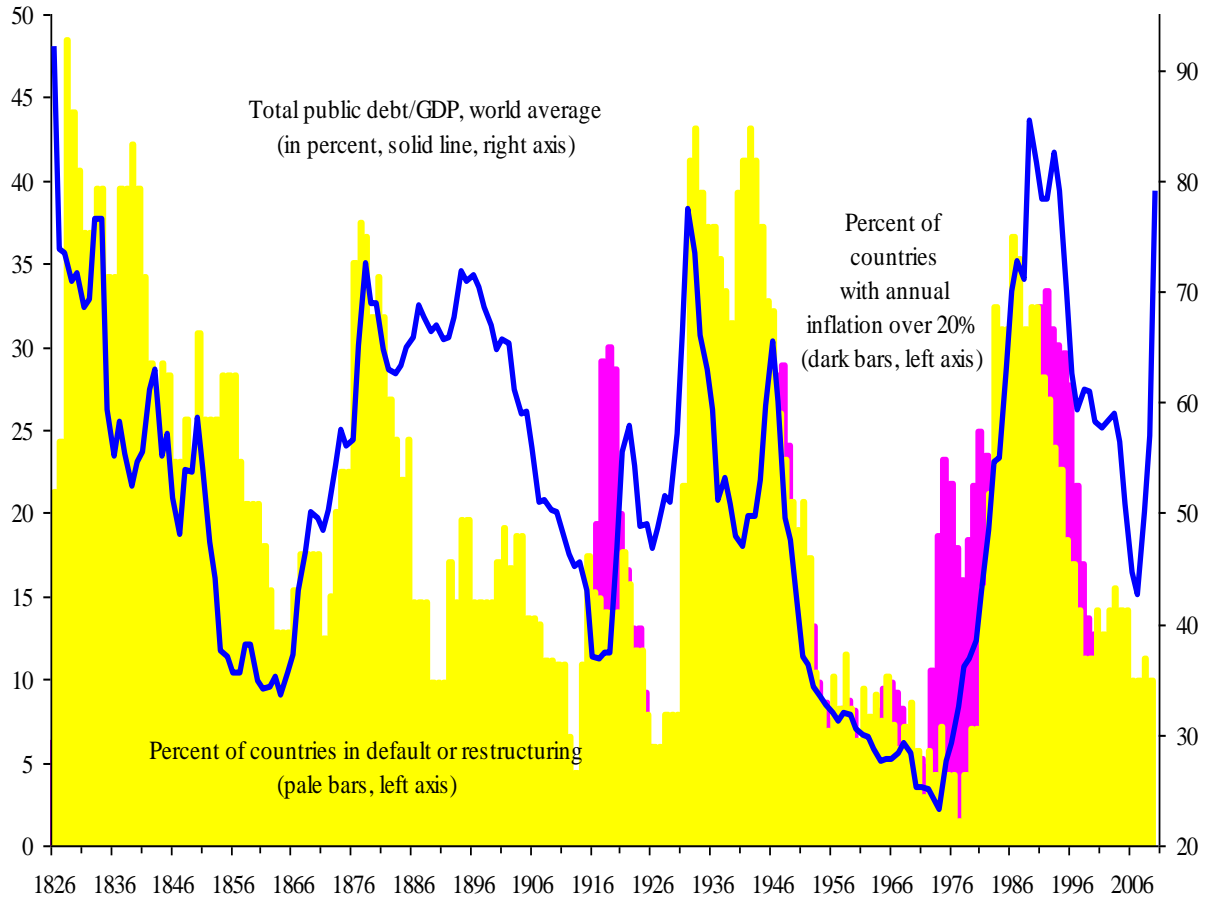
Public debt follows a lengthy and repeated boom-bust cycle; the bust phase involves a markedly higher incidence of sovereign debt crises. Public sector borrowing surges as the crisis nears. In the aggregate, debts continue to rise after default, as arrears accumulate and GDP contracts markedly.¹⁰ Figure 3 plots the incidence of external default (shaded bars) from 1824, when the newly independent Latin American economies first entered the global capital market, through 2010 against an unweighted average debt/GDP ratio for all the countries for which such data is available. Upturns in the debt ratio usually precede the rise in default rates, as the regressions (shown in Table 1) for the world aggregates shown at the bottom of Figure 3 confirm. Periods of higher indebtedness are also associated with a higher incidence of inflation crises (a more indirect form of default, highlighted as a darker shaded bar where the incidence of inflation exceeds that of default). Default through inflation is more prevalent since World War I, as fiat money became the norm and links to gold severed.

Serial default is a widespread phenomenon across emerging markets and several advanced economies. The most compelling evidence on serial default comes from the individual country histories, shown here for Greece in Figure 4. The 70 country histories

¹⁰ See Reinhart and Rogoff (2009 and 2011a) on evidence on output behavior before during and after debt crises.

presented in the Chartbook provide broad-based evidence that serial default cut across regions and across time.

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)



Sources: Reinhart and Rogoff (2011b) and sources cited therein.

Table 1. Public Debt and Sovereign Default and restructuring: All Countries, 1824-2009

Dependent variable	World: Share of countries in default or restructuring 1824-2009	
Sample	1824-2009	
Independent variables	<i>OLS</i> (robusterrors)	<i>Logit</i> (robusterrors)
World: Public debt/GDP (t-1)	0.346	0.008
<i>p</i> -value	0.000	0.000
Number of observations	184	184
R ²	0.224	0.246

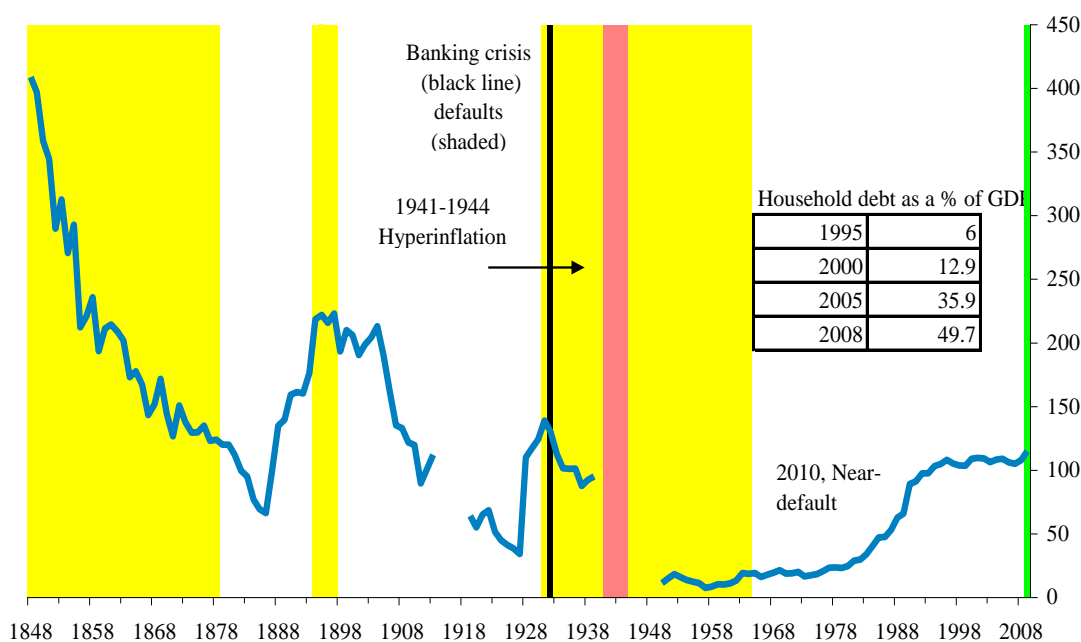
Sources: Reinhart and Rogoff (2011b), sources cited therein and authors' calculations.

Notes: The debt aggregate for the world is a simple arithmetic average of individual countries' debt/GDP ratios. For a few countries the time series on debt and exports are much longer dating back to the first half of the 19th

century than for nominal GDP. In these cases (Brazil, Canada, Egypt, India, Nicaragua, Thailand, Turkey and Uruguay) the debt/GDP series was spliced (with appropriate scaling) with the to the available debt/GDP data. The split between advanced and emerging economies is made along the present-day IMF classification.

The “hallmark” surge in debt on the eve of a debt crisis, banking crisis or both are quite evident in Greece’s last two defaults in 1894 and in 1932—the latter default spell lasted about 33 years from beginning to its eventual resolution in 1964.

FIGURE 4. Greece: Central Government (domestic plus external) Debt, Default, Hyperinflation, and Banking Crises, 1848-2009 (debt as a percent of GDP)



Sources: Lazaretou (2005), Reinhart (2010) and sources cited therein

2. Hidden debts--private debts that become public

The drama that has most notably engulfed Iceland and Ireland is only novel in the orders of magnitude of the debts, not in the causes and patterns of the crisis.¹¹ Writing about Chile’s crises in the early 1980s, Diaz Alejandro (1985) asks us to consider a

¹¹ Gross external debts 10 times the size of GDP (as the cases of Iceland and Ireland) are historically off the charts for both advanced and emerging market economies. In effect, Reinhart, Rogoff and Savastano (2003) calculate that more than half of all emerging market defaults or restructuring episodes since World War II occurred at debt levels of 60 percent or less (which would satisfy the Maastricht criteria).

country that had liberalized its domestic financial sector and was fully integrated into world capital markets.

“The recorded public sector deficit was nonexistent, miniscule, or moderate; the declining importance of ostensible public debt in the national balance sheet was celebrated by some observers.”

The private sector was a different matter. Their spending persistently exceeded their income, giving rise to large current account deficits. The current account deficit was financed by large and persistent capital inflows, which is a different way of saying that the domestic largesse was supported by borrowing heavily from the rest of the world. This abundance of foreign capital made it easy for domestic banks to lend liberally to businesses and households. During the credit boom, real estate and equity prices soared—so did debts. Growth seemed inevitable.

However, as Diaz Alejandro explains, the pity of the boom is that

“little effort was spent on investigating the credentials of new entrants to the ever-growing pool of lenders and borrowers...practically no inspection or supervision of bank portfolios existed...One may conjecture, however, that most depositors felt fully insured and foreign lenders felt that their loans to the private sector were guaranteed by the State.”

The two panels of Figure 5, which plot the public debt-to-GDP ratios for Iceland and Ireland (top panel) and total gross external (public and private) debt, faithfully mimic the pattern described by Diaz Alejandro of “apparent” sound fiscal finances at the outset of the financial crisis.¹² The most onerous sign of future sovereign debt difficulties is

¹² We would note that Iceland and Ireland (and also Spain), so often in the news for their present debt difficulties, were exemplary cases of successful public debt reduction up until the eve of the current crisis.

shown in the bottom panel of Figure 5, which highlights the scale of the buildup in mostly private external debts that carried implicit (or explicit) government guarantees.

After more than three years since the onset of the crisis, banking sectors remain riddled with high debts (of which a sizable share are nonperforming) and low levels of capitalization, while household sector have significant exposures to a depressed real estate market. Under such conditions, the migration of private debts to the public sector and central bank balance sheets are likely to continue, especially in the prevalent environment of indiscriminate, massive, bailouts.

3. Banking crises as predictors of sovereign debt problems

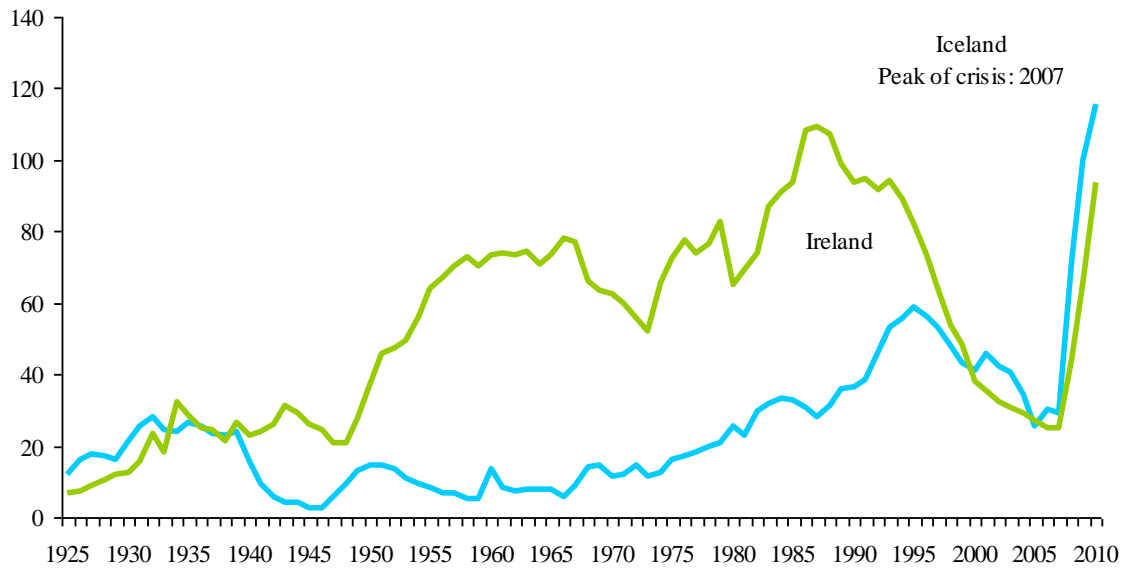
Banking crises most often either precede or coincide with sovereign debt crises.

The reasons for this temporal sequence may be the contingent liability story emphasized by Diaz Alejandro (1985) and formalized in Velasco (1986), in which the government takes on massive debts from the private banks, thus undermining its own solvency.¹³ The currency crashes that are an integral part of the “twin crisis” phenomenon documented by Kaminsky and Reinhart (1999) would also be consistent with this temporal pattern. If, as they suggest, banking crises precede currency crashes, the collapsing value of the domestic currency that comes after the banking crisis begins may undermine the solvency of both private and sovereign borrower who are unfortunate enough to have important amounts of foreign currency debts.

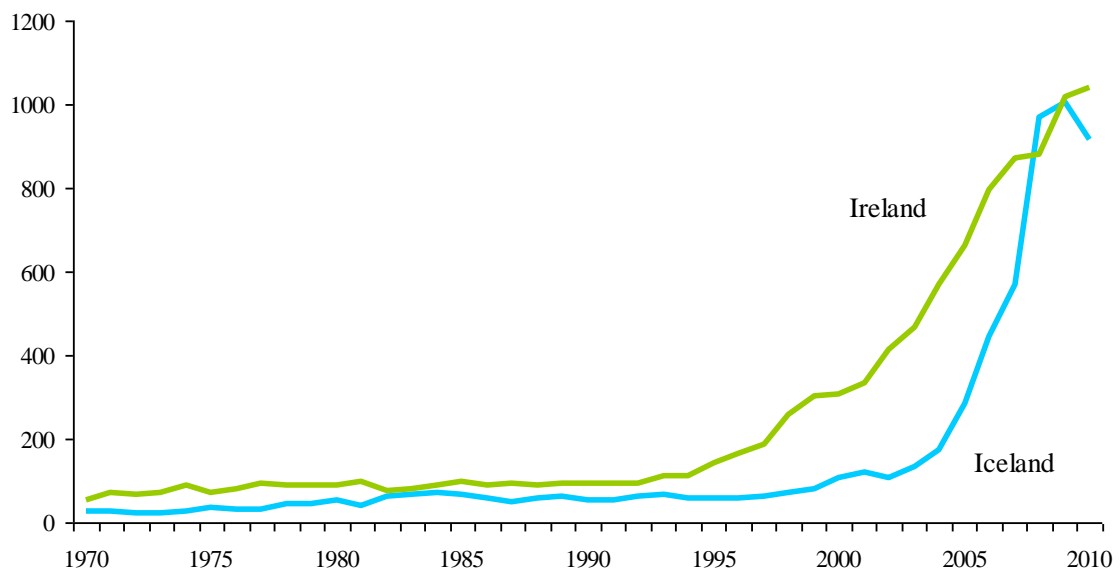
¹³ See Arellano and Kocherlakota (2008) for a framework that is consistent with these dynamics.

FIGURE 5. Iceland and Ireland:

a. General Government (domestic plus external) Debt, 1925-2010 (debt as a percent of GDP)



b. External (public plus private) Debt, 1970-2010 (debt as a percent of GDP)



Sources: Reinhart (2010).

Even absent large-scale bailouts (and without counting the post-crisis new government guarantees), we have shown that, largely owing to collapsing revenues, government debts typically rise about 86 percent in the three years following a systemic financial crisis, setting the stage for rating downgrades and, in the worst scenario, default.

A causal chain from sovereign debt crisis to banking crisis, perhaps obscured in these simple graphs, cannot be dismissed lightly. Financial repression and international capital controls may give the government scope to coerce otherwise healthy banks to buy government debt in significant quantities. A government default, in those circumstances, would directly impact the banks' balance sheet. The two crises may be more or less simultaneous. But even if banks are not overly exposed to government paper, the “sovereign ceiling” in which corporate borrowers are rated no higher than their national governments may make banks' offshore borrowing very costly or altogether impossible. The result would be a sudden stop that could give rise to bank insolvencies either immediately or subsequently.

4. Common fundamentals, contagion, or both?

In this section, we emphasize the fundamental distinction between international transmission that occurs due to common shocks (e.g., the collapse of the tech boom in 2001 or the collapse of housing prices in the crisis of the late 2000s) to transmission that occurs primarily due to mechanisms that are really the result of cross-border contagion emanating from the epicenter of the crisis. We offer a rationale for understanding which factors make it more likely that a primarily domestic crisis fuels *fast and furious contagion* (see Box 2). We use these concepts to discuss the basis for contagion scenarios in Europe and elsewhere. The bunching of banking crises and sovereign debt difficulties

across countries that is so striking in the late-2000s crisis, where both common shocks and cross-country linkages are evident.

Box 2. Contagion Concepts

In defining contagion here, we follow Kaminsky, Reinhart, and Vegh (2003), who distinguish between two types, the “slow-burn” spillover and the kind of fast-burn marked by rapid cross-border transmission that KRV label “fast and furious.”

We refer to contagion as an episode in which there are significant *immediate* effects in a number of countries following an event—that is, when the consequences are *fast and furious* and evolve over a matter of hours or days. This “fast and furious” reaction is a contrast to cases in which the initial international reaction to the news is muted. The latter cases do not preclude the emergence of gradual and protracted effects that may cumulatively have major economic consequences. We refer to these gradual cases as *spillovers*. *Common external shocks*, such as changes in international interest rates or oil prices, are also not *automatically* included in our working definition of contagion. We add to this classification that common shocks need not all be external. This caveat is particularly important with regard to the current episode. Countries may share common “domestic” macroeconomic fundamentals, such as the bursting of a housing bubble, capital inflow bonanzas, increasing private and (or) public leveraging, and so on.

The three pillars of fast and furious contagion

(i) Surprise Crises and Anticipated Catastrophes Fast and furious crises and contagion cases have a high degree of surprise associated with them, while their quieter counterparts are more broadly anticipated.

(ii) The Capital Flow Cycle and Leverage Fast and furious contagion episodes are typically preceded by a surge in capital inflows and rapidly rising leverage which come to an abrupt halt or sudden stop in the wake of a crisis. The inflow of capital may come from banks, other financial institutions or bondholders. The debt contracts typically have short maturities (which means that the investors and financial institutions will have to make decisions about rolling over their debts or not doing so.) With fast and furious contagion, investors and financial institutions who are often highly leveraged are exposed to the crisis country. Such investors can be viewed as halfway through the door, ready to back out on short notice.

(iii) Common creditors The previous distinction appears to be critical when “potentially affected countries” have a common lender. If the common lender is surprised by the shock in the initial crisis country, there is no time ahead of the impending crisis to rebalance portfolios and scale back from the affected country. In contrast, if the crisis is anticipated, investors have time to limit the damage by scaling back exposure or hedging their positions

As discussed in Reinhart and Rogoff (2009), the conjuncture of elements related to the current crisis is illustrative of the two channels of contagion: cross-linkages and common shocks. Without doubt, the U.S. financial crisis of 2007 spilled over into other markets through direct linkages. For example, German and Japanese financial institutions (and others ranging as far as Kazakhstan) sought more attractive returns in the U.S. subprime market, perhaps owing to the fact that profit opportunities in domestic real estate were limited at best and dismal at worst. Indeed, after the fact, it became evident that many financial institutions outside the United States had nontrivial exposure to the U.S. subprime market.¹⁴ This is a classic channel of transmission or contagion, through which a crisis in one country spreads across international borders. In the present context, however, contagion or spillovers are only part of the story.

However, that many other countries experienced economic difficulties at the same time as the United States (and continue to do) also owes significantly to the fact that many of the features that characterized the run-up to the subprime crisis in the United States were present in many other advanced economies as well. Two common elements stand out. First, many countries in Europe and elsewhere had their own home-grown real estate bubbles.¹⁵ Second, The United States was not alone in running large current account deficits and experiencing a sustained “capital flow bonanza.” Bulgaria, Iceland, Ireland, Latvia, New Zealand, Spain, and the United Kingdom, among others, were importing capital from abroad, which helped fuel a credit and asset price boom.¹⁶ These

¹⁴ Owing to the opaqueness of balance sheets in many financial institutions in these countries, the full extent of exposure is, as yet, unknown.

¹⁵ See Reinhart and Rogoff (2009).

¹⁶ Reinhart and Reinhart (2009).

trends, in and of themselves, made these countries vulnerable to the usual nasty consequences of asset market crashes and capital flow reversals irrespective of what may be happening in the United States.

Are more fast and furious episodes or spillovers underway? Applying the criteria that typically characterize fast and furious contagion (see Box 2) to the current environment yields a mixed picture but one that, on the whole, would suggest contagion (and the more gradual spillover) threats still loom large. *(i)* Surprise events are (by definition) always a distinct possibility. However, at the time of this writing the precarious nature of balance sheets in much Europe and the United States is more in the public eye than at the beginning of this crisis in the summer of 2007. This fact is plainly evident in the succession of rating downgrades of several sovereigns in Europe as well as Japan as well as the general widening and greater heterogeneity in sovereign spreads. *(ii)* As to the capital inflow cycle and leverage, the inflow peaks and surges in fresh private borrowing are well behind us but public debts continue to climb (see Figure 1) and private deleveraging, especially in Europe has been (at best) limited.¹⁷ Highly leveraged public and private sectors has been historically a “contagion amplifier”. So have been *(iii)* common creditors. Apart from the elevated levels of leverage in most advanced economies as discussed, the widespread presence of common creditors (most notable in Eurozone as well as the United Kingdom) is a second compelling factor indicating that the scope for fast and furious contagion remains high. This type of financial vulnerability is exacerbated by the lack of transparency in overall cross-border exposure, as highlighted in their extensive new database by Milesi Ferretti (2010) et.al.

¹⁷ See Reinhart and Reinhart (2011).

FIGURE 6. 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)

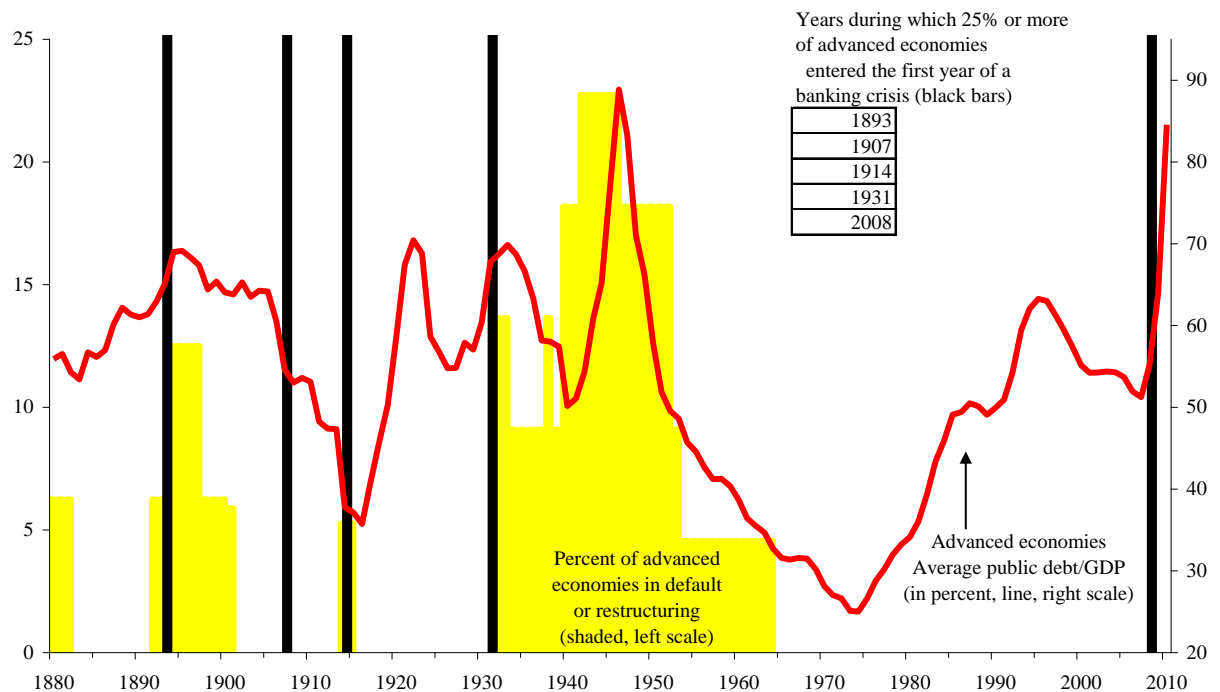


Table 2. Public Debt and Sovereign Default and restructuring: Advanced Economies, 1880-2009

Dependent variable	Advanced Economies: Share of countries in default or restructuring	
Sample	1880-2009	
Independent variables	<i>OLS</i> (robusterrors)	<i>Logit</i> (robusterrors)
Advanced Economies:		
Public debt/GDP (t-1)	0.209	0.002
<i>p</i> -value	0.000	0.000
Number of observations	130	130
R ²	0.176	0.167
Dependent variable	Advanced Economies: Share of countries in systemic banking crises	
Sample	1880-2009	
Independent variables	<i>OLS</i> (robusterrors)	<i>Logit</i> (robusterrors)
Advanced Economies:		
Public debt/GDP (t-1)	0.057	0.002
<i>p</i> -value	0.002	0.006
Number of observations	130	130
R ²	0.047	0.050

Sources: Reinhart (2010) Reinhart and Rogoff (2011b), sources cited therein and authors' calculations.

Notes: The debt aggregates for the advanced economies and the world are simple arithmetic averages (not weighted by a country's share in world GDP) of individual countries' debt/GDP ratios. For a few countries the time series on debt and exports are much longer dating back to the first half of the 19th century than for nominal GDP. In these cases (Brazil, Canada, Egypt, India, Nicaragua, Thailand, Turkey and Uruguay) the debt/GDP series was spliced (with appropriate scaling) with the to the available debt/GDP data. The split between

advanced and emerging economies is made along the present-day IMF classification, even though several countries, such as New Zealand, were “emerging markets” during most of the pre-World War I period.

III. Debt and Growth

The march from high public indebtedness to sovereign default or restructuring is usually marked by episodes of drama, punctuated by periods of high volatility in financial markets, rising credit spreads, and rating downgrades. However, the economic impacts of high public indebtedness are not limited to such episodes of high drama, as rising public debts are not universally associated with rising interest rates and imminent expectations of sovereign default (see Gagnon with Hinterschweiger, 2011, for a thorough examination of this issue.) Serious public debt overhangs may also cast a shadow on economic growth, even when the sovereign’s solvency is not called into question.

Here we summarize the main findings in Reinhart and Rogoff (2010a and 2010b), elaborate on some methodology issues and discuss some of the very recent literature that examines the debt and growth connection.

1. The basic exercise and key results

Our analysis was based on newly-compiled data on forty-four countries spanning about two hundred years. This amounts to 3,700 annual observations and covers a wide range of political systems, institutions, exchange rate arrangements, and historic circumstances.

The main findings of that study are:

First, the relationship between government debt and real GDP growth is weak for debt/GDP ratios below 90 percent of GDP.¹⁸ Above the threshold of 90 percent, median growth rates fall by one percent, and average growth falls considerably more. The threshold for public debt is similar in advanced and emerging economies and applies for both the post World War II period and as far back as the data permit (often well into the 1800s).

Second, emerging markets face lower thresholds for total external debt (public and private)—which is usually denominated in a foreign currency. When total external debt reaches 60 percent of GDP, annual growth declines about two percent; for higher levels, growth rates are roughly cut in half.

Third, there is no apparent contemporaneous link between inflation and public debt levels for the advanced countries as a group (some countries, such as the United States, have experienced higher inflation when debt/GDP is high). The story is entirely different for emerging markets, where inflation rises sharply as debt increases.

Figure 7 can be used to summarize our main conclusions. The top left panel applies to the twenty advanced countries in our forty-four country sample (where much of the public debate is centered).¹⁹ The remaining two panels of the figure present comparable results for emerging market public debt (top right) and gross external debt (bottom left).

¹⁸ In this paper “public debt” refers to gross central government debt. “Domestic public debt” is government debt issued under domestic legal jurisdiction. Public debt does not include obligations carrying a government guarantee. Total gross external debt includes the external debts of **all** branches of government as well as private debt that issued by domestic private entities under a foreign jurisdiction.

¹⁹ The comparable emerging market exercises are presented in the original paper.

In the figure, the annual observations are grouped into four categories, according to the ratio of debt-to GDP during that particular year: years when debt-to-GDP levels were below 30 percent; 30 to 60 percent; 60 to 90 percent; and above 90 percent.²⁰ The bars show average and median GDP growth for each of the four debt categories. Note that of the 1,186 annual observations, there are a significant number in each category, including 96 above 90 percent. (Recent observations in that top bracket come from Belgium, Greece, Italy, and Japan.) From the figure, it is evident that there is **no** obvious link between debt and growth until public debt exceeds the **90 percent** threshold. The observations with debt to GDP over 90 percent have median growth roughly 1 percent lower than the lower debt burden groups and mean levels of growth almost 4 percent lower. (Using lagged debt does not dramatically change the picture.) The line in Figure 1 plots the median inflation for the different debt groupings—which makes plain that there is **no** apparent pattern of **simultaneous** rising inflation and debt.

2. High debt episodes in the sample

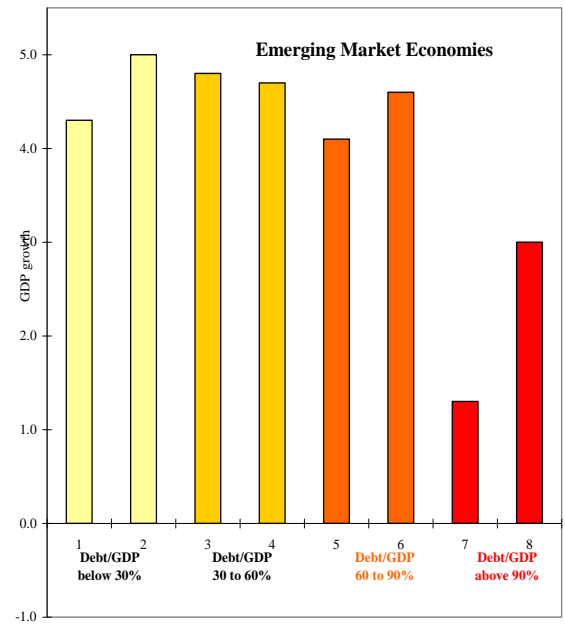
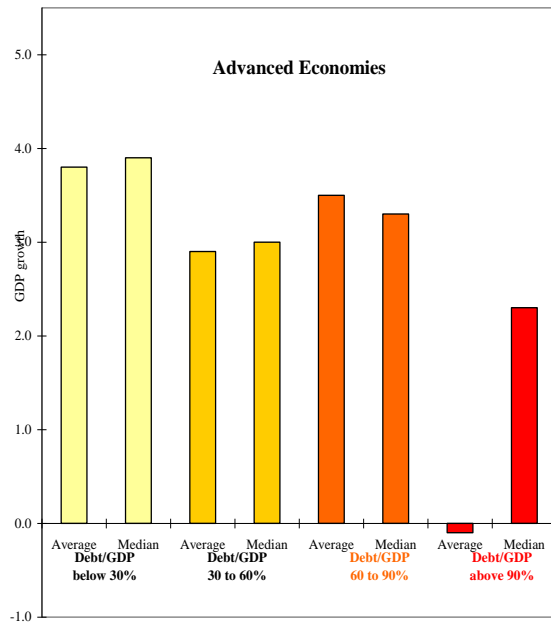
The episodes that attract our interest are those where debt levels were historically high. As convenient as it is to focus exclusively on a particular country or a single episode for a single country (like the U.S. around World War II, where the data is readily available or an interesting ongoing case, like Japan), the basis for an empirical regularity is multiple observations. Because our data span 44 countries with many going back to the 1800s or (at least the beginning of the 19th century), our analysis is based on all the episodes of high (above 90 percent) debt for the post World War II period; for the pre-

²⁰ The four “buckets” encompassing low, medium-low, medium-high, and high debt levels are based on our interpretation of much of the literature and policy discussion on what are considered low, high etc. debt levels. It parallels the World Bank country groupings according to four income groups. Sensitivity analysis involving a different set of debt cutoffs merits exploration, as do country-specific debt thresholds along the broad lines discussed in Reinhart, Rogoff, and Savastano (2003).

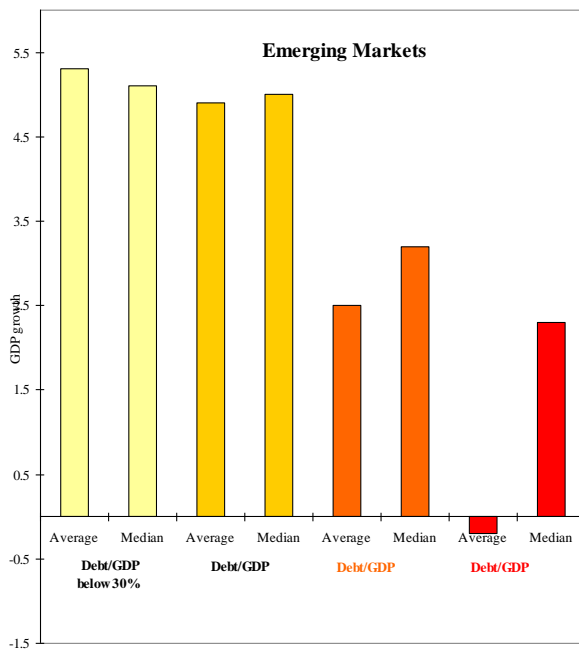
war sample it covers all those that are encompassed by the availability of data. Table 1 is reproduced from RR (2010a) and describes the coverage and the basic statistics for the various debt levels for the advanced economies.²¹

²¹ The interested reader is referred to the original paper for the comparable emerging market table.

FIGURE 7. Debt and Real Per Capita GDP Growth: Selected Advanced and Emerging Economies, 1946-2009
Gross Central Government Debt



Gross External (Public plus Private) Debt



Sources: Reinhart and Rogoff (2010a) and sources cited therein.

It is common knowledge that the United States emerged after World War II with a very high debt level. But this also held for Australia, Canada, and most markedly the United Kingdom, where public/debt GDP peaked at near 240 percent in 1948. These cases from the aftermath of World War II are joined in our sample by a number of peacetime high-debt episodes: the 1920s and 1980s to the present in Belgium, the 1920s in France, Greece in the 1920s, 1930s and 1990s to the present, Ireland in the 1980s, Italy in the 1990s, Spain at the turn of the last century, the U.K. in the interwar period and prior to the 1860s and, of course, Japan in the past decade. As will be discussed, episodes where debt is above 90 percent are themselves rare and as shown in Table 1, a number of countries have never had debt entries above 90 percent.

Table 3. Real GDP Growth as the Level of Government Debt Varies:

		Selected Advanced Economies, 1790-2009 (annual percent change)			
Country	Period	Central (Federal) government debt/ GDP			
		Below 30 percent	30 to 60 percent	60 to 90 percent	90 percent and above
Australia	1902-2009	3.1	4.1	2.3	4.6
Austria	1880-2009	4.3	3.0	2.3	n.a.
Belgium	1835-2009	3.0	2.6	2.1	3.3
Canada	1925-2009	2.0	4.5	3.0	2.2
Denmark	1880-2009	3.1	1.7	2.4	n.a.
Finland	1913-2009	3.2	3.0	4.3	1.9
France	1880-2009	4.9	2.7	2.8	2.3
Germany	1880-2009	3.6	0.9	n.a.	n.a.
Greece	1884-2009	4.0	0.3	4.8	2.5
Ireland	1949-2009	4.4	4.5	4.0	2.4
Italy	1880-2009	5.4	4.9	1.9	0.7
Japan	1885-2009	4.9	3.7	3.9	0.7
Netherlands	1880-2009	4.0	2.8	2.4	2.0
New Zealand	1932-2009	2.5	2.9	3.9	3.6
Norway	1880-2009	2.9	4.4	n.a.	n.a.
Portugal	1851-2009	4.8	2.5	1.4	n.a.
Spain	1850-2009	1.6	3.3	1.3	2.2
Sweden	1880-2009	2.9	2.9	2.7	n.a.
United Kingdom	1830-2009	2.5	2.2	2.1	1.8
United States	1790-2009	4.0	3.4	3.3	-1.8
Average		3.7	3.0	3.4	1.7
Median		3.9	3.1	2.8	1.9
Number of observations = 2,317		866	654	445	352

Notes: An n.a. denotes no observations were recorded for that particular debt range. There are missing observations, most notably during World War I and II years; further details are provided in the data appendices to Reinhart and Rogoff (2009) and are available from the authors. Minimum and maximum values for each debt range are shown in ***bolded italics***.

Sources: There are many sources, among the more prominent are: International Monetary Fund, *World Economic Outlook*, OECD, World Bank, *Global Development Finance*. Extensive other sources are cited Reinhart and Rogoff (2009).

3. Debt thresholds and nonlinearities: the 90 percent benchmark

Thresholds and non-linearities play a key role in understanding the relationship between debt and growth that should not be ignored in casual re-interpretations.

(i) **Thresholds.** Anyone who has done any work with data is well aware that mapping a vague concept, such as “high debt” or “over-valued” exchange rates to a workable definition for interpreting the existing facts and informing the discussion

requires making arbitrary judgments about where to draw lines. In the case of debt, we worked with four buckets 0-30, 30-60, 60-90, and over 90 percent. The last one turned out to be the critical one for detecting a difference in growth performance, so we single it out for discussion here.

Figure 2 shows a histogram of public debt-to-GDP as well as pooled descriptive statistics (inset) for the advanced economies (to compliment the country-specific ones shown in Table 1) over the post World War II period.²² The median public debt/GDP ratio is 36.4; about **92 percent** of the observations fall **below** the 90 percent threshold. In effect, about 76 percent of the observations were below the 60 percent Maastricht criteria. Put differently, our “high vulnerability” region for lower growth (the area under the curve to the right of the 90 percent line) comprises only about 8 percent of the sample population. The standard considerations about type I and type II errors apply here.²³ If we raise the upper bucket cutoff much above 90 percent, then we are relegating the high-debt analysis to case studies (the UK in 1946-1950 and Japan in recent years). Only about *two percent* of the observations are at debt-GDP levels at or above **120** percent—and that includes the aforementioned cases.

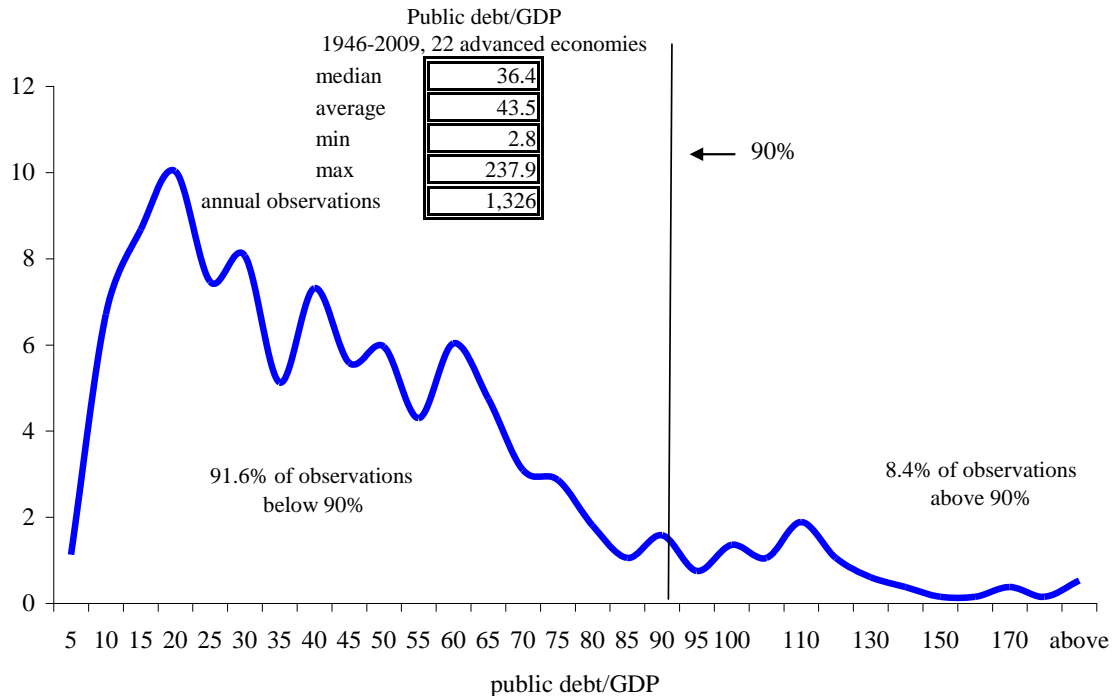
If debt levels above 90 percent are indeed as benign as some suggest, one might have expected to see a higher incidence of these over the long course of history.

Certainly our read of the evidence, as underscored by the central theme of our 2009 book,

²² Our sample includes 24 emerging market countries.

²³ The null hypothesis is whatever “normal” growth is versus the alternative of lower growth.

FIGURE 8. The 90 percent debt/GDP threshold: 1946-2009, Advanced economies
Probability density function



Sources: Reinhart and Rogoff (2009 and 2010b).

Notes: The advanced economy sample is the complete IMF grouping (Switzerland and Iceland were added). It includes Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

hardly suggests that politicians are universally too cautious in accumulating high debt levels. Quite the contrary, far too often they take undue risks with debt buildups, relying implicitly perhaps on the fact these risks often take a very long time to materialize. If debt to GDP levels over 90 percent are so benign, then generations of politicians must have been overlooking proverbial money on the street.

We do not pretend to argue that growth will be normal at 89 percent and subpar (about one percent lower) at 91 percent debt/GDP any more than a car crash is unlikely at 54mph and near certain at 56mph. However, mapping the theoretical notion of

“*vulnerability regions*” to bad outcomes by necessity involves defining thresholds, just as traffic signs in the U.S. specify 55mph.²⁴

(ii) **Nonlinear relationship.** We summarized the results in our paper by writing:

“the relationship between government debt and real GDP growth is weak for debt/GDP ratios below a threshold of 90 percent of GDP. Above 90 percent, median growth rates fall by one percent, and average growth falls considerably more.” RR (2010a)

Revisiting Figure 1 is useful for illustrating the importance of nonlinearities in the debt-growth link. Simply put, for 92 percent of the observations in our sample there is no systematic link between debt and growth.²⁵ Thus, if one were to do a simple scatterplot of all the observations on debt/GDP and on growth one would expect to find a “clouded mess.” We can highlight this general point with the U.S. case. As noted in the working paper version of RR (2010a), for the period 1790-2009, there are a total of 216 observations of which 211 (or 98 percent) are below the 90 percent debt to GDP cutoff.²⁶

It should be quite obvious, that a scatter plot of the U.S. data would not be capable of revealing a systematic pattern (as demonstrated in the work Iron and Bivens, 2010.)

Indeed, this example illustrates one of our main results, that there is no systematic relationship between debt and growth below a threshold of 90 percent of GDP.

4. Debt and growth causality

As discussed, we examine average and median growth and inflation rates **contemporaneously** with debt. Temporal causality tests are not part of the analysis. The application of many of the standard methods for establishing temporal precedence is

²⁴ These methodology issues are discussed in Kaminsky and Reinhart (1999).

²⁵ Bruno and Easterly (1998) find similar nonlinearities in the inflation-growth relationship.

²⁶ Figure 3 in the NBER WP is not included in the published version of the paper.

complicated by the nonlinear relationship between growth and debt (more of this to follow) that we have alluded to.

But where do we place the evidence on causality? For low-to-moderate levels of debt there may or may not be one; the issue is an empirical one, which merits study. For high levels of debt the evidence points to *bi-directional* causality.

Growth- to debt: As discussed in Section II, our analysis of the aftermath of financial crisis RR (2008) presents compelling **evidence** for both advanced and emerging markets over 1800-2008 on the fiscal impacts (revenue, deficits, debts, and sovereign credit ratings) of the recessions associated with banking crises (Figure 2)

There is little room to doubt that severe economic downturns, irrespective whether their origins was a financial crisis or not, will, in most instances, lead to higher debt/GDP levels contemporaneously and or with a lag. There is, of course, a vast literature on cyclically-adjusted fiscal deficits making exactly this point.

Debt-to-growth: A unilateral causal pattern from growth to debt, however, does **not** accord with the evidence. Public debt surges are associated with a higher incidence of debt crises (Figure 2).²⁷ This temporal pattern is analyzed in Reinhart and Rogoff (2008) and in the accompanying country-by-country analyses cited therein.²⁸ In the current context, even a cursory reading of the recent turmoil in Greece and other European countries can be importantly traced to the adverse impacts of high levels of government debt (or potentially guaranteed debt) on county risk and economic outcomes. At a very basic level, a high public debt burden implies higher future taxes (inflation is also a tax) or lower future government spending, if the government is expected to repay its debts.

²⁷ For a model where credit-financed government deficits lead to a currency crisis, see Krugman (1979).

²⁸ Reinhart and Rogoff (2010b).

There is scant evidence to suggest that high debt has little impact on growth.

Kumar and Woo (2010) highlight in their cross-country findings that debt levels have negative consequences for subsequent growth, even after controlling for other standard determinants in growth equations. For emerging markets, an older literature on the debt overhang of the 1980s frequently addresses this theme.

IV. The Aftermath of High Debt: The 1930s and World War II

Up until very recently, financial markets and policy makers had all but forgotten that default and restructuring were not alien to the advanced economies. For instance, Reinhart, Rogoff and Savastano (2003) and Reinhart and Rogoff (2009) document that several now-wealthy countries have a long history of serial default. This section does not attempt to review this rich sovereign debt crisis history; the focus is confined to the last two “global” debt spikes. These two high-debt episodes share some of the characteristics of the current debt spike, as they involve numerous advanced economies (accounting for an important share of world GDP).

The first part of the section presents a brief sketch of the last wave of sovereign defaults, restructurings, and forcible conversions in response to the debt overhang during the 1930s that engulfed the advanced economies while the second subsection outlines the more subtle debt restructuring that was facilitated by pervasive financial repression during the 1940s to the 1970s.

1. Default, restructurings and forcible conversions in the 1930s

Table 4 lists the known “domestic credit events” of the depression. Default on or restructuring of external debt (see the extensive notes to the table) also often

accompanied the restructuring or default of the domestic debt. All the allied governments, with the exception of Finland, defaulted on (and remained in default through 1939 and never repaid) their World War I debts to the United States as economic conditions deteriorated worldwide during the 1930s.²⁹

Thus, the high debts of the First World War and the subsequent debts associated with the Depression of the 1930s were resolved *primarily* through default and restructuring. Neither economic growth nor inflation contributed much. In effect, for all 21 now-advanced economies, the median annual inflation rate for 1930-1939 was barely above zero (0.4 percent).³⁰ Real interest rates remained high through significant stretches of the decade.

²⁹ Finland, being under continuous threat of Soviet invasion at the time, maintained payments on their debts to the United States so as to maintain the best possible relationship.

³⁰ See Reinhart and Reinhart (2011a).

Table 4. Selected Episodes of Domestic Debt Default or Restructuring, 1920s–1940s

Country	Dates	Commentary
For additional possible domestic defaults in several European countries during the 1930s, see notes below.		
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 entry. ¹
Bolivia	1927	Arrears of interest lasted until at least 1940.
Canada (Alberta)	April 1935	The only province to default—which lasted for about 10 years.
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.
Greece	1932	Interest on domestic debt was reduced by 75 percent since 1932; Domestic debt was about 1/4 of total public debt.
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).
Spain	October 1936–April 1939	Interest payments on external debt were suspended, arrears on domestic debt service.
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 <i>balboas</i> .
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.
Austria	December 1945	Restoration of schilling (150 limit per person). Remainder placed in blocked accounts. In December 1947, large amounts of previously blocked schillings invalidated and rendered worthless. Temporary blockage of 50 percent of deposits.
Germany	June 20, 1948	Monetary reform limiting 40 Deutschemark per person. Partial cancellation and blocking of all accounts.
Japan	March 2, 1946–1952	After inflation, exchange of all bank notes for new issue (1 to 1) limited to 100 yen per person. Remaining balances were deposited in blocked accounts.
Russia	1947	The monetary reform subjected privately held currency to a 90 percent reduction.
	April 10, 1957	Repudiation of domestic debt (about 253 billion rubles at the time).

¹ See [Schedvin \(1970\)](#) and [Prichard \(1970\)](#), for accounts of the Australian and New Zealand conversions, respectively, during the Depression. Michael Reddell kindly alerted us to these episodes and references.
Notes: We have made significant further progress in sorting out the defaults on World War I debts to the United States, notably by European countries. In all cases these episodes are classified as a default on external debts. However, in some case—such as the UK—some of the WWI debts to the US were also issued under the domestic law and, as such, would also qualify as a domestic default. The external defaults on June 15, 1934 included: Austria, Belgium, Czechoslovakia, Estonia, France, Greece, Hungary, Italy, Latvia, Poland, United Kingdom. Only Finland made payments. See *New York Times*, June 15, 1934.

2. Financial repression in 1940s-1970s: The “quiet” restructuring

Apart from emerging markets, many of which have continued to openly periodically default or restructure their debts (usually at times of severe economic stress) through the present, the only **explicit** defaults (or restructurings) in advanced economies since World War II were confined to either those of the countries that lost the war (Austria, Germany, Italy, and Japan) or those that never reestablished their credit since slipping into default in the 1930s (Greece, for instance, was in default from 1932 until 1964). “Financial repression” was the post-World War II then- “politically correct” replacement for the more open debt restructurings and defaults of the 1930s.

Generally, the aims of debt restructuring are: (i) reducing the value of the stock of existing debts (haircut); (ii) reducing debt servicing costs (by cutting or capping interest rates); (iii) minimizing roll over risk by lengthening maturities and/or shifting into nonmarketable debt. Financial repression achieves all three goals of debt restructuring—albeit that the first (reducing the value) is achieved more gradually than in open restructurings. Thus, as argued in [Reinhart and Rogoff \(2009\)](#), financial repression—a hallmark of the 1946-1970s-- it is nothing other than a more subtle form of debt restructuring.

Legislation or “moral suasion” limiting the range and amounts of non-government debt domestic assets financial institutions can hold; limiting further (or

outright forbidding) holdings of foreign assets; and requiring financial institutions to hold more government debt were all part of the “financially repressed landscape”. A whole range of interest rate ceilings (for example, on deposits) made holding low-yielding government also more palatable for individuals as well as institutions. Pension funds have historically provided the “captive audience par excellence” for placing vast sums of government debt at questionable rates of return (often negative ex post in real terms). It is worth noting that the real ex-post interest rate on public debt (appropriately weighted by the type of debt instrument) was *negative* for US debt for ¼ of the years during 1945-1980, while the comparable share for the UK was nearly 50 percent, as Reinhart and Sbrancia (2011) document.

Table 5 illustrates, for the examples of Italy, the United Kingdom and the United States, the important role played by financial repression (combined with some inflation) in the crucial debt-reduction decade that followed World War II.³¹ The savings range from an average of about 9 percent for Italy (which had higher inflation) to about 5 percent for the U.S. and U.K. In effect, the savings from financial repression are a lower bound for the U.K., as we use the “official” consumer price index for this period in the calculations and inflation is estimated to have been substantially higher than the official figure (see for example Friedman and Schwartz, 1963). Also, other factors (such as the 1951 U.S. conversion, which swapped marketable for nonmarketable debt) do not factor into these simple debt-reduction calculations. The simple fact is that ex-post real interest rates were significantly lower in both advanced and emerging market economies during the financial repression era that is sandwiched between World War II and the high real

³¹ See Reinhart and Sbrancia (2011) for a full fledged analysis of the international role played by financial repression in reducing the World War II debt overhang.

interest rates of the 1930s and the post-financial and capital account liberalization that swept through financial markets since the mid-1980s.

Table 5. Debt Liquidation through Financial Repression: Italy, U.K. and U.S., 1945-1955

Country	Public debt/GDP			Annual average: 1946-1955	
	1945	1955 (actual)	1955 without repression savings (est.) ³	“financial repression revenue”/GDP	inflation
Italy ¹	79.2	38.1	129.3	9.1	10.8
United Kingdom ²	215.6	138.2	182.9	4.5	5.9
United States	116.0	66.2	118.6	5.2	4.2

Sources: Reinhart and Sbrancia (2011)

¹ Italy was in default on its external debt 1940-1946.

² The savings from financial repression are a lower bound, as we use the “official” consumer price index for this period in the calculations and inflation is estimated to have been substantially higher than the official figure (see for example Friedman and Schwartz, 1963).

³ The simple cumulative annual savings without compounding.

Notes: The peaks in debt/GDP were: Italy 129.0 in 1943; United Kingdom 247.5 in 1946; United States 121.3 in 1946. An alternative interpretation of the financial repression revenue is simply as savings in interest service on the debt.

V. Conclusions

One need look no further than the stubbornly high unemployment rates in the United States and other advanced economies to be convinced of the importance of developing a better understanding of the growth prospects for the decade ahead. We have presented evidence suggesting that high levels of debt dampen growth. One can argue that the United States can tolerate higher levels of debt than other countries without having its solvency called into question. That is probably so.³² We have shown in our earlier work that a country’s credit history plays a prominent role in determining what levels of debt it can sustain without landing on a sovereign debt crisis. More to the point of this paper, however, we have no comparable evidence yet to suggest that the

³² Indeed, this is the central argument in Reinhart and Reinhart (2010) originally published in November 17, 2008.

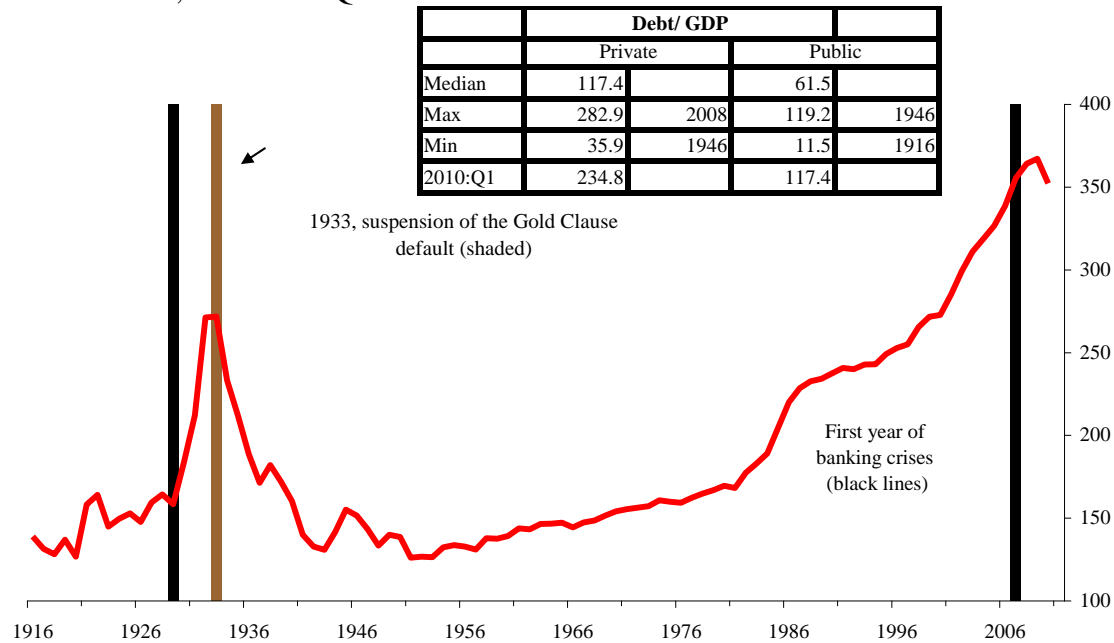
consequences of higher debt levels for *growth* will be different for the U.S than for other advanced economies

Figure 9, which plots total (public and private) credit market debt outstanding for the United States during 1916 to 2010:Q1 makes this point plain.³³ Despite considerable deleveraging by the private financial sector, total debt remains near its historic high in 2008. Total public sector debt during the first quarter of 2010 is 117 percent of GDP; since 1916 (when this series begins). It has only been higher during a one-year stint at 119 percent in 1945. Perhaps soaring U.S. debt levels will not prove to be a drag on growth in the decades to come. However, if history is any guide, that is a risky proposition and over-reliance on U.S. exceptionalism may only prove to be one more example of the “This Time is Different” syndrome.³⁴

³³ Flow of Funds aggregate the private and public sectors, where the latter is comprised of federal (net), state and local and government enterprises. To reiterate, this is not the public debt measure used in our historical analysis, which is gross central government debt (which for the U.S. is at present about 90 percent of GDP).

³⁴ The “This Time is Different Syndrome” is rooted in the firmly-held beliefs that: (i) Financial crises and negative outcomes are something that happen to other people in other countries at other times (these do not happen here and now to us);(ii) we are doing things better, we are smarter, we have learned from the past mistakes; (iii) as a consequence, old rules of valuation are not thought to apply any longer.

Figure 9. Total (Public and Private) Credit Market Debt Outstanding: United States, 1916-2010Q1



Sources: Historical Statistics of the United States, Flow of Funds, Board of Governors of the Federal Reserve International Monetary Fund, *World Economic Outlook*.

Notes: Beginning in 2010:Q1, almost all Fannie Mae and Freddie Mac mortgage pools are consolidated in Fannie Mae’s and Freddie Mac’s balance sheets and, thus, are included in the debt of government

The sharp run-up in public sector debt will likely prove one of the most enduring legacies of the 2007-2009 financial crises in the United States and elsewhere. We examine the experience of forty four countries spanning up to two centuries of data on central government debt, inflation and growth. Our main finding is that across both advanced countries and emerging markets, high debt/GDP levels (90 percent and above) are associated with notably lower growth outcomes. Much lower levels of external debt/GDP (60 percent) are associated with adverse outcomes for emerging market growth. Seldom do countries “grow” their way out of debts. The nonlinear response of growth to debt as debt grows towards historical boundaries is reminiscent of the “debt intolerance” phenomenon developed in Reinhart, Rogoff and Savastano (2003).As

countries hit debt intolerance ceilings, market interest rates can begin to rise quite suddenly, forcing painful adjustment.

For many if not most advanced countries, dismissing debt concerns at this time is tantamount to ignoring the proverbial elephant in the room. So is pretending that no restructuring will be necessary. It may not be called restructuring, so as not to offend the sensitivities of governments that want to pretend to find an advanced economy solution for an emerging market style sovereign debt crisis. As in other debt crises resolution episodes, debt buybacks and debt-equity swaps are a part of the restructuring landscape. Financial repression is not likely to also prove a politically correct term—so prudential regulation will provably provide the aegis for a return to a system more akin to what the global economy had prior to the 1980s market-based reforms.

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. Central banks on both sides of the Atlantic have become even bigger players in purchases of government debt, possibly for the indefinite future. For the United States, fear of currency appreciation continues to drive central banks in many emerging markets to purchase U.S. government bonds on a large scale. In other words, markets for government bonds are increasingly populated by nonmarket players, calling into question what the information content of bond prices are relatively to their underlying risk profile—a common feature of financially repressed systems.

References

- Bordo, Michael, Barry Eichengreen, 1999. "Is Our Current International Economic Environment Unusually Crisis Prone?" Prepared for the Reserve Bank of Australia Conference on Private Capital. Sydney. August.
- Bordo, Michael, Barry Eichengreen, Daniela Klingebiel, Maria Soledad Martinez-Peria, "Is the Crisis Problem Growing More Severe?" *Economic Policy* 16, April 2001, 51–82.
- Bruno, Michael and William Easterly (1998), "Inflation Crises and Long-Run Growth," *Journal of Monetary Economics* vol. 41, No. 1, February, 3-26.
- Calvo, Guillermo, "Servicing the Public Debt: The Role of Expectations," *American Economic Review* 78 (September): 647-661.
- Caprio, Gerard and Daniela Klingebiel, Luc Laeven and Guillermo Noguera, "Banking Crisis Database." In Patrick Honohan and Luc Laeven (eds.), *Systemic Financial Crises*, Cambridge: Cambridge University Press, 2005.
- Checherita, Christina, and Philipp Rother, (2010), "The Impact of High and Growing Debt on Economic Growth and Empirical Investigation for the Euro Area," European Central Bank Working Paper Series No. 1237, August.
- Diaz-Alejandro, Carlos (1985), "Goodbye Financial Repression, Hello Financial Crash," *Journal of Development Economics* 19.
- Easterly, William R. 1989. "Fiscal Adjustment and Deficit Financing During the Debt Crisis." In I. Husain and I. Diwan, eds., *Dealing with the Debt Crisis*. Washington DC: The World Bank: 91–113.
- Eichengreen, Barry, *Golden Fetters The Gold Standard and the Great Depression 1919–1939*, (New York: Oxford University Press, 1992).
- Eichengreen, Barry, and Peter H. Lindert, eds., *The International Debt Crisis in Historical Perspective* (Cambridge: MIT Press, 1989).
- Flandreau, Marc and Frederic Zumer, *The Making of Global Finance, 1880-1913*, (Paris: OECD, 2004.)
- Fostel, Ana and John Geanakoplos, (2008) "Leverage Cycles and the Anxious Economy," *American Economic Review* 98 (4): 1211-1244.
- Friedman, Milton, and Anna Jacobson Schwartz, *A Monetary History of the United States 1867–1960*, (Princeton: Princeton University Press, 1963).

Gagnon, Joseph, with Marc Hinterschweiger (2011). "The Global Outlook for Government Debt over the Next 25 Years: Implications for the Economy and Public Policy" Mimeograph, Peterson Institute for International Economics.

Geanokoplos, John (2009) "[The Leverage Cycle](#)." In D. Acemoglu, K. Rogoff and M. Woodford, eds., *NBER Macroeconomic Annual 2009*, vol. 24: 1-65, University of Chicago Press

Giovannini, Alberto and Martha de Melo. 1993. "Government Revenue from Financial Repression." *American Economic Review*, vol. 83 (No. 4): 953–963.

Gopinath, Gita, and Mark Aguiar, "Defaultable Risk, Interest Rates and the Current Account," *Journal of International Economics* 69 vol 1 (June 2006).

Jeanne, Olivier, "Debt Maturity and the International Financial Architecture," *American Economic Review* forthcoming, 2010.

Kaminsky, Graciela L. and Carmen M. Reinhart, "The Twin Crises: The Causes of Banking and Balance of Payments Problems," *American Economic Review*, Vol. 89 No. 3, June 1999, 473–500.

Kaminsky, Graciela L., Carmen M. Reinhart, and Carlos Vegh, "The Unholy Trinity of Financial Contagion" *Journal of Economic Perspectives*, Vol. 17 No. 4, Fall 2003, 51-74.

Kindleberger, Charles P., *Manias, Panics and Crashes: A History of Financial Crises* (New York: Basic Books, 1989).

Lazaretou, Sophia (2005) "Greek Monetary Economics in Retrospect: The Adventures of the Drachma," *Economic Notes by Banca Monte dei Paschi di Siena* Vol. 34, No. 3, 331–370.

Kumar, Mohan, and Jaejoon Woo (2010). "[Public Debt and Growth](#)," IMF Working Paper WP/10/174 (July).

Lindert, Peter H. and Peter J. Morton, "How Sovereign Debt Has Worked," in Jeffrey Sachs, ed., *Developing Country Debt and Economic Performance, Vol. 1* (University of Chicago Press), 39–106.

Mendoza, Enrique G. and Marco E. Terrones (2008). "An Anatomy of Credit Booms: Evidence from macro Aggregates and Micro Data," NBER Working Paper 14049, May.

Milesi-Ferretti, Gian Maria, Francesco Stobbe, and Natalia Tamirisa, 2010, "Bilateral Financial Linkages and Global Imbalances: a View on The Eve of the Financial Crisis," IMF Working Paper 10/257.

Obstfeld, Maurice and Kenneth Rogoff, *Foundations of International Economics*, MIT Press, 1995.

Reinhart, Carmen M., “This Time is Different Chartbook: Country Histories on Debt, Default, and Financial Crises,” NBER Working Paper, (February 2010).

Reinhart, Carmen M., and Vincent R. Reinhart, “Is the US Too Big to Fail,” VoxEU, May 10, 2010, originally published November 17, 2008.

Reinhart, Carmen M., and Vincent R. Reinhart, “Capital Flow Bonanzas: An Encompassing View of the Past and Present,” in Jeffrey Frankel and Francesco Giavazzi (eds.) *NBER International Seminar in Macroeconomics 2008*, (Chicago: Chicago University Press for the NBER, 2009). 1-54

Reinhart, Carmen M. , and Vincent R. Reinhart, “After the Fall,” forthcoming in Federal Reserve Bank of Kansas City Economic Policy Symposium, *Macroeconomic Challenges: The Decade Ahead* at Jackson Hole, Wyoming, on August 26-28, 2010, forthcoming 2011.

Reinhart, Carmen M., Kenneth S. Rogoff, and Miguel A. Savastano, “Debt Intolerance,” *Brookings Papers on Economic Activity*, Vol.1, Spring 2003, 1–74.

Reinhart, Carmen M., and Kenneth S. Rogoff, “The Modern History of Exchange Rate Arrangements: A Reinterpretation” *Quarterly Journal of Economics*, Vol. CXIX No. 1, February 2004, 1–48.

Reinhart, Carmen M., and Kenneth S. Rogoff, “This Time is Different: A Panoramic View of Eight Centuries of Financial Crises”, NBER Working Paper 13882, March 2008.

Reinhart, Carmen M. and Kenneth S Rogoff, *This Time is Different: Eight Centuries of Financial Folly*. (Princeton: Princeton University Press, October 2009).

Reinhart, Carmen M. and Kenneth S. Rogoff, “Growth in a Time of Debt,” *American Economic Review*, Vol. 100 No. 2, May 2010a, 573-578.

Reinhart, Carmen M. and Kenneth S. Rogoff, “Debt and Growth Revisited,” VoxEU, August 11, 2010b.

Reinhart, Carmen M., and Kenneth S. Rogoff, “Domestic Debt: The Forgotten History,” *Economic Journal*, forthcoming in the May 2011a.

Reinhart, Carmen M, and Kenneth S Rogoff, “From Financial Crash to Debt Crisis,” *American Economic Review*, forthcoming 2011b.

Reinhart, Carmen M., and M. Belen Sbrancia, “The Liquidation of Government Debts,” mimeograph, Peterson Institute for International Economics, 2011.

Rodrik, Dani and Andres Velasco, “Short-Term Capital Flows,” in Annual World Bank Conference on Development Economics April 2000.

Velasco, Andres. "Financial and Balance-of-Payments Crises." *Journal of Development Economics*, October 1987, 27(1/2), 263-83.

Winkler, Max, *Foreign Bonds: An Autopsy*, (Philadelphia: Roland Sway Co., 1933).

Wynne, William H., *State Insolvency and Foreign Bondholders: Selected Case Histories of Governmental Foreign Bond Defaults and Debt Readjustments* Vol. II (London: Oxford University Press, 1951).